AP42 Section:	10 Wood Products
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Title:	Texas Emissions Speciation Study Volumes 1 through 6 Prepared for Texas Paper Industry Environmental Committee by Roy F. Weston, Inc. January 1993 Not cited in AP42 but kept for source test information.

TEXAS EMISSIONS SPECIATION STUDY INTRODUCTION & QUALITY CONTROL

VOLUME 1 OF 6

Prepared For:

TEXAS PAPER INDUSTRY ENVIRONMENTAL COMMITTEE

CHAMPION INTERNATIONAL CORPORATION: LUFKIN, TEXAS
CHAMPION INTERNATIONAL CORPORATION: SHELDON, TEXAS
INLAND-ORANGE, INC.: ORANGE, TEXAS
SIMPSON PASADENA PAPER COMPANY: PASADENA, TEXAS
TEMPLE-INLAND FOREST PRODUCTS CORPORATION: SILSBEE, TEXAS

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WESTON
MANAGERS DESIGNERS CONSULTANTS

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Section 1

WESTON

SECTION 1. INTRODUCTION

The Clean Air Act Amendments of 1990 added a new dimension to the permitting of stationary emission sources, the control of hazardous air pollutants (HAPs), the reduction of emissions of ozone precursors, and the management of volatile organic compounds (VOCs). The Emission Inventory Branch of Texas Air Control Board (TACB) requested that the pulp and paper mills of Texas submit information about the amount of VOCs and the HAP compounds emitted from stationary sources at each mill. The data will be used in at least four different ways by the TACB:

- To provide a more complete inventory of VOC emissions from sources in ozone non-attainment areas.
- To use as input (VOC and class of compound) for the Urban Airshed Model.
- To identify and quantify the HAPs in accordance with Title III of the 1990 Clean Air Act Amendments.
- To develop mass emission rates to be used in preparing operating permits as described in Title V of the 1990 Clean Air Act Amendments.

A group of the Texas mills chose to take a proactive approach to this request by forming a group - the Texas Paper Industry Environmental Committee (TPIEC) - to provide a coordinated effort to collect and report the data required by TACB. This program - the Texas Emissions Speciation Study (TESS) - will address the TACB request and also provide valuable information for the industry.

The TPIEC is composed of personnel from the following mills:

Champion International	Lufkin, Texas
Champion International	Sheldon, Texas
Inland-Orange, Inc.	Orange, Texas
Simpson Pasadena Paper Company	Pasadena, Texas
Temple-Inland Forest Products Company	Silsbee, Texas

Table 1.1 lists the key personnel involved in the project. Tables 1.2 through 1.6 summarize the sources tested at each of the mills.

The objective of the consolidated testing program was to collect representative data from similar sources at various mills. These sources were defined as TPIEC - pooled sources. These data will be used to estimate mill-wide VOC emission rates. Other sources that were not "common" to most mills were tested during the same time period and were defined as mill-specific sources. Test procedures were comparable for all sources. Process operating conditions were recorded for each process throughout testing.

TABLE 1.1. KEY PERSONNEL INVOLVED IN THE TPIEC TEXAS EMISSION SPECIATION STUDY

Champion International	
Bonnie Ballenger	Lufkin, Texas
James Cutbirth	Sheldon, Texas
Charles Ayer	Stamford, Connecticut
Simpson Pasadena	
Don Padfield	Pasadena, Texas
David Brooks	Anderson, California
Temple-Inland	
John Orynawka	Diboll, Texas
G. Wayne Hardy	Diboll, Texas
Inland-Orange	
Michael Franklin	Indianapolis, Indiana
Thomas Noble	Orange, Texas
NCASI	
Ashok Jain	Gainesville, Florida
Roy F. Weston	
Bruce B. Ferguson	Auburn, Alabama

TABLE 1.2 SOURCES TESTED AT CHAMPION - LUFKIN

SOURCE TESTED	SOURCE CODE	Phase 2									
		M16 TRS	M18 M25A	VOST	MM5	CH2O	Metals	Cr+6	HCl	Acid Mist	Chloro-form
CHAMPION - LUFKIN											
TPIEC-POOLED SOURCES											
Brown Stock Washer Vent A	CL-BSWA	Y	Y								
Brown Stock Washer Vent B	CL-BSWB	Y	Y								
Lime Kiln w/ NCGs	CL-LK/1	Y	Y	Y							
Lime Kiln w/o NCGs	CL-LK/2	Y	Y	Y							
CHAMPION-POOLED SOURCES											
Gas Turbine Exhaust	CL-GT					Y					
Lime Kiln (added parameters)	CL-LK					Y	Y		Y		
MILL-SPECIFIC SOURCES											
Recovery Furnace	CL-RF						Y		Y	Y	
Smelt Dissolving Tank Vent	CL-SDTV						Y				
Combined Evap. and Stripper NCG Vent	CL-NCGESV	Y	Y								
Blow Heat Recovery NCG Vent	CL-NCGBHR	Y	Y								
Chlorine Tower Vent	CL-BPCLTV		Y						Y		Y
Chlorine Decker Hood Vent (1)	CL-BPCDHV		Y						Y		Y
Hypo Decker Hood Vent (1)	CL-BPHDHV		Y						Y		Y
Chlorine/Hypo Seal Pit Vent (1)	CL-BPCLSP		Y						Y		Y
Caustic Tower Vent	CL-BPCTV		Y						Y		Y
Caustic Seal Pit Vent	CL-BPCSPV		Y						Y		Y
Caustic Steam Mixer Vent	CL-BPCSMV		Y						Y		Y
Brown Stock Head Box Vent	CL-BPBSHB		Y						Y		Y

TABLE 1.3 SOURCES TESTED AT CHAMPION - SHELDON

SOURCE TESTED	SOURCE CODE	Phase 2									
		M16 TRS	M18 M25A	VOST	MM5	CH2O	Metals	Cr+6	HCl	Acid Mist	Chloro-form
CHAMPION - SHELDON											
TPIEC-POOLED SOURCES											
Tall Oil Reactor Vent	CS-TORV	Y	Y	Y							
Black Liquor Oxidation Vent	CS-BLOV	Y	Y	Y							
Recovery Furnace (Casc) w/ NaOAc	CS-RF/1	Y	Y	Y		Y	Y		Y	Y	
Recovery Furnace (Casc) w/o NaOAc	CS-RF/2	Y	Y			Y			Y		
Smelt-Dissolving Tank Vent	CS-SDTV	Y	Y				Y				
CHAMPION-POOLED SOURCES											
No. 1 Bark Boiler w/ Sludge	CS-BB1/1		Y	Y	Y	Y	Y	Y	Y	Y	
No. 1 Bark Boiler w/o Sludge	CS-BB1/2		Y	Y	Y	Y	Y	Y	Y	Y	
Groundwood, Old Grinder	CS-GWOG		Y								
Groundwood, New Grinder	CS-GWNG		Y								
Groundwood, Coarse Screen Vent	CS-GWCSV		Y								
MILL-SPECIFIC SOURCES											
NCG Vent at Lime Kiln	CS-NCGLK	Y	Y								
TMP No. 1 Preheater Vent	CS-TMP1PH		Y								
TMP No. 2 Preheater Vent	CS-TMP2PH		Y								
TMP Cyclone Vent	CS-TMPCV		Y								
TMP Deep Wash Water Drain Tank	CS-TMPDCW		Y								
Chlorine Scrubber Vent	CS-BPCSV		Y						Y		Y
Caustic Washer Hood Vent	CS-BPCWV		Y						Y		Y
Caustic Seal Tank Vent	CS-BPCSTV		Y						Y		Y
Hypo Washer Vent	CS-BPHWV		Y						Y		Y
Hypo Seal Tank Vent	CS-BPHSTV		Y						Y		Y
Hypo Tower Vent	CS-BPHTV		Y						Y		Y
Caustic Vent	CS-BPCV		Y						Y		Y

TABLE 1.4 SOURCES TESTED AT INLAND - ORANGE

SOURCE TESTED	SOURCE CODE	Phase 2									
		M16 TRS	M18 M25A	VOST	MM5	CH2O	Metals	Cr+6	HCl	Acid Mist	Chloro-form
INLAND - ORANGE											
TPIEC-POOLED SOURCES											
Lime Kiln w/ NCGs	IO-LK/1	Y	Y	Y							
Lime Kiln w/o NCGs	IO-LK/2	Y	Y								
MILL-SPECIFIC SOURCES											
Bark Boiler	IO-BB		Y	Y	Y	Y			Y		
"B" Brown Stock Washer Hood Vent	IO-BSWBHV	Y	Y	Y							
"B" Brown Stock Washer Filtrate Vent	IO-BSWBFV	Y	Y								
NCG System at Lime Kiln (a)	IO-NCGLK	Y	Y								
NCG Blow Heat Recovery Vent (b)	IO-NCGBHR	Y	Y								
NCG Multi-Effect Evap Hotwell Vent (c	IO-NCGEHV	Y	Y								
NCG Chemiwasher Filtrate Tank Vent	IO-NCGCFT	Y	Y								
NCG Chemiwasher Hood Vent	IO-NCGCHV	Y	Y								
Tall Oil Reactor Stack	IO-TORV	Y	Y								

Note a: T-ABLOW/T-BBLOW/T-TURDE/T-COMBC/P-MEEC
Note b: T-ABLOW/T-BBLOW/T-TURDE
Note c: T-COMBC/P-MEEC

TABLE 1.5 SOURCES TESTED AT SIMPSON - PASADENA

SOURCE TESTED	SOURCE CODE	Phase 2 M16 TRS	M18 M25A	VOST	MM5	CH2O	Metals	Cr+6	HCl	Acid Mist	Chloro-form
SIMPSON - PASADENA											
TPIEC-POOLED SOURCES											
Gas-Fired Power Boilers											
Marine Boiler A	SP-PBMBA		Y			Y					
Marine Boiler B	SP-PBMBB		Y			Y					
Recovery Furnace (Cyclone) No.7	SP-RF7	Y	Y	Y	Y	Y					
Smelt Dissolving Tank Vent	SP-SDTV7	Y	Y	Y	Y						
MILL-SPECIFIC SOURCES											
Lime Kiln	SP-LK	Y	Y			Y					
Thermal Oxidation Plant Vent	SP-TOPV	Y	Y			Y					
NCG Bypass Scrubber Vent	SP-NCGBS	Y	Y								
Softwood Bleach Plant (11 vents)											
Extraction Tower Vent	SP-BPSETV		Y						Y		Y
Extraction Washer Vent	SP-BPSEWV		Y						Y		Y
Extraction Seal Box Vent	SP-BPSESB		Y						Y		Y
First NaOCl Tower Vent	SP-BPSFHT		Y						Y		Y
First NaOCl Washer Vent	SP-BPSFHW		Y						Y		Y
First NaOCl Seal Box Vent	SP-BPSFHS		Y						Y		Y
Combined Chlorination Scrubber Vent	SP-BPSCCS		Y						Y		Y
Combined ClO2 Scrubber Vent	SP-BPSCSV		Y						Y		Y
Second NaOCl Tower Vent	SP-BPSSHT		Y						Y		Y
Second NaOCl Washer Vent	SP-BPSSHW		Y						Y		Y
Second NaOCl Seal Box Vent	SP-BPSSHS		Y						Y		Y
Hardwood Bleach Plant (11 vents)											
Chlorination Washer Vent	SP-BPHCWV		Y						Y		Y
Extraction Washer Vent	SP-BPHEWV		Y						Y		Y
Extraction Seal Box Vent	SP-BPHESB		Y						Y		Y
First NaOCl Washer Vent	SP-BPHFHW		Y						Y		Y
First NaOCl Seal Box Vent	SP-BPHFHS		Y						Y		Y
ClO2 Tower Scrubber Vent	SP-BPHCTS		Y						Y		Y
ClO2 Washer Vent	SP-BPHDWV		Y						Y		Y
Second NaOCl Washer Vent	SP-BPHSHW		Y						Y		Y
Second NaOCl Seal Box Vent	SP-BPHSHS		Y						Y		Y
Chlorination Seal Box Scrubber Vent	SP-BPHCSS		Y						Y		Y
ClO2 Seal Box Scrubber Vent	SP-BPHCSB		Y						Y		Y

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TABLE 1.6 SOURCES TESTED AT TEMPLE - INLAND

SOURCE TESTED	SOURCE CODE	Phase 2									
		M16 TRS	M18 M25A	VOST	MM5	CH2O	Metals	Cr+6	HCl	Acid Mist	Chloro-form
TEMPLE - INLAND (Evadale)											
TPIEC-POOLED SOURCES											
Gas-Fired Power Boiler	TI-PBGF		Y			Y					
Recovery Furnace (Non-Contact)	TI-RF2	Y	Y	Y		Y					
Brown Stock Washer SW Line (3 vents)											
BSW Vent No 4	TI-BSWV4	Y	Y	Y							
BSW Vent No 5	TI-BSWV5	Y	Y								
BSW Vent No 6	TI-BSWV6	Y	Y								
Brown Stock Washer HW Line (2 vents)											
BSW Vent No 1	TI-BSWV1	Y	Y	Y							
BSW Vent No 2	TI-BSWV2	Y	Y								
MILL-SPECIFIC SOURCES											
No. 6 Power Boiler	TI-PB6		Y			Y	Y				
NCG Incinerator Stack	TI-INCNCG	Y	Y								
Bleach Plant 1 Scrubber Outlet	TI-BPSO1		Y								Y
Bleach Plant 2 Scrubber Outlet	TI-BPSO2		Y								Y
Bleach Plant 3 Scrubber Outlet	TI-BPSO3		Y								Y
Lime Kiln Mud Washer Vent No 3	TI-LKMW	Y	Y								
Sewer Manhole Area	TI-SMA	Y	Y								

This report has been prepared in six volumes - Volume 1 presents general information relevant to all sites and Volumes 2 through 6 present results specific to each mill. Information from each mill is presented in the locations shown:

MILL LOCATION	MILL CODE	SOW IN TABLE	RESULTS IN VOLUME
Champion, Lufkin	CL	1.2	2
Champion, Sheldon	CS	1.3	3
Inland-Orange, Orange	IO	1.4	4
Simpson Pasadena, Pasadena	SP	1.5	5
Temple-Inland, Silsbee	TI	1.6	6

The analytical procedures used to collect the data are outlined in Section 2 of this volume and described in more detail in the Work Plan copied in Appendix A. Standard approved methodology was used for all testing.

Quality control was a significant part of the overall effort. Section 3 of this volume describes the procedures followed and summarizes the quality control data relevant to all sites. The data are presented in Appendix B of this volume. Quality control data specific to each source is included in the appropriate appendix of the volume including the source data.

Section 2

SECTION 2. ANALYTICAL METHODOLOGY

The objective of speciating and quantitating 90 percent of the mill-wide volatile organic compound (VOC) emission was accomplished by using a gas chromatograph with a flame ionization detector (GC/FID), a gas chromatograph with a flame photometric detector (GC/FPD), and a total hydrocarbon (THC) analyzer to simultaneously measure concentrations from each source. At least one analysis per hour was obtained and the VOC trend was monitored continuously using the THC analyzer.

The results obtained by the above-described system were verified by selective sampling using a volatile organics sampling train (VOST), a semi volatile organic sampling train (MM5), and various "trap and analyze" techniques for chloroform, methanol, and aldehydes. Hydrogen chloride and metals were analyzed by EPA Reference Methods.

Figure 2.1 schematically shows the monitoring system used to speciate VOC by the sampling and analysis of THC (Method 25A), TRS (Method 16), and VOCs (Method 18). Gas was continuously extracted from a source through a heated probe and filter assembly at the source. The gas was then transported to the mobile laboratory through a heated, sample line. A heated-head diaphragm pump was used to pressurize the sample for distribution to the various analyzers in the mobile laboratory. The mobile laboratory was located 100-400 feet from the source being tested.

The sampling probe was constructed of Teflon and electrically heated (~120°C) to maintain the sample temperature above the dew point. The probe was plumbed directly to an electrically heated (~130°C) Teflon filter. Heated (~120°C), thick-walled 3/8" Teflon sample lines were used to transfer the sample gas from the source to the mobile laboratory. The heads of the sample pumps were heated to approximately 120°C to prevent VOC and moisture condensation.

2.1. HYDROCARBONS

Total Hydrocarbons

Total hydrocarbon emission testing was conducted in accordance with EPA Reference Method 25A. Samples were withdrawn continuously at a single point and conveyed to the analyzer through the heated sample line as described above. All hydrocarbon measurements were made on a "hot, wet" basis. A J.U.M. Model VE-7 Heated Hydrocarbon Analyzer was used to measure the total hydrocarbons using a flame ionization detector (FID). This technique is not selective between species, and the results were reported as volume equivalents (ppm) as carbon using propane as the standard.

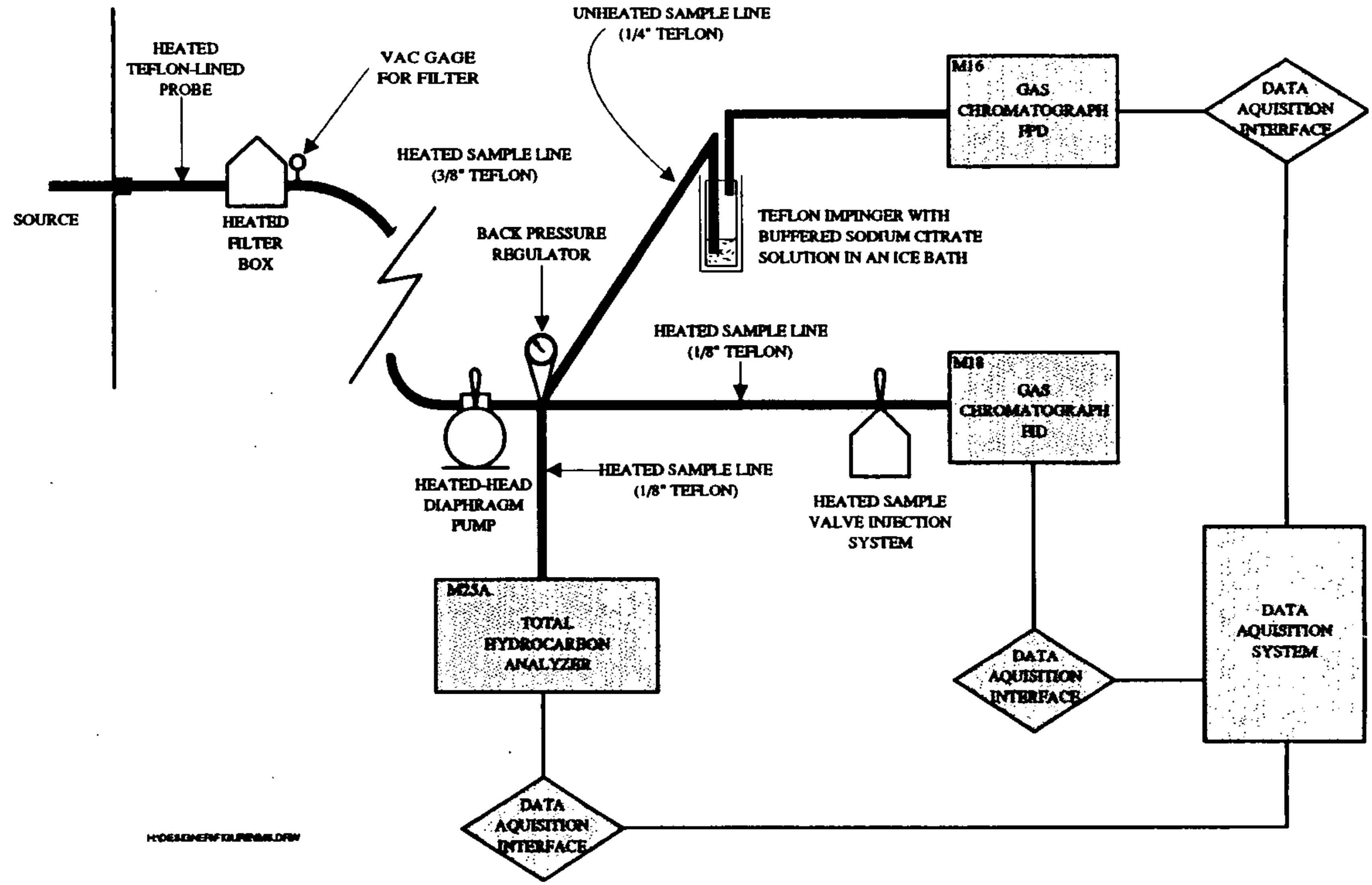

FIGURE 2.1. INSTRUMENTAL METHODS SCHEMATIC

Data were acquired continuously, averaged, and reported every one minute during the sampling periods. A computerized data acquisition system was used to perform all calculations and store data. The calculated results were electronically transported to data files to minimize data transfer errors. These results are presented graphically in the Total Hydrocarbon Trend Analyses for each source.

Volatile Organic Compounds

The VOC concentration in the gas stream was determined using the techniques and procedures described in EPA Reference Method 18. The direct interface sampling method described above was used. Analysis was performed using a Hewlett-Packard Model 5890 Series II gas chromatography with a flame ionization detector (GC/FID).

The gas chromatograph was calibrated for the components of interest by preparing standards at three different concentration levels. Two-microliter aliquots of each standard were injected into the GC. The standard volatile organic compounds were prepared in hexane or methyl isobutyl ketone.

Calibration curves were verified daily in the field by analyzing a check standard containing all components of interest. The previously-generated calibration curve was used if the check standard was within ± 20 percent of the known concentration.

The approximate retention times of the compounds for which the GC was calibrated are shown below.

Analyte	Retention Time (min)	Analyte	Retention Time (min)
Methanol	5.7	Toluene	23.2
Ethanol	6.8	Ethyl benzene	27.2
Acetone	7.8	m,p-Xylene	27.5
2-Propanol	7.9	o-Xylene	28.5
DMS	8.9	Cumene	29.8
Benzene	18.7	a-Pinene	30.3
Bromodichloromethane	20.6	b-Pinene	32.1
Methyl ethyl ketone	-	3-Carene	33.3
Chloroform	-	p-Cymene	33.7
DMDS	22.2		

The analog signal from the FID was converted to a digital signal by a Perkin-Elmer/Nelson interface system. This signal was directed to a computer equipped with Turbochrom 3 software. Identification was made by comparison of sample peak retention times to those of the standard. Quantitation was accomplished by comparing sample peak areas to those of the standards. Slight (insignificant) deviations in the retention times of compounds in liquid standards and gas standards were noted, and no corrections were made to the data.

2.2. VOLATILE ORGANICS SAMPLING TRAIN (VOST)

The volatile organics were collected according to EPA Method 0030. In this method the air sample is drawn from the stack using a heated probe. After the air stream is cooled in a condenser, it passes through a sorbent resin trap containing Tenax. Liquid condensate is collected in an impinger immediately following the Tenax trap. The air stream is then passed through a second resin trap (Tenax/petroleum-based charcoal). Sampling is normally conducted at 1 L/min for 20 minutes. Smaller volumes were collected by reducing the flow rate to the 0.25-0.50 L/min range.

Collected air volumes were 2, 5, and 10 liters. In a few unusual cases, the sample volumes were even further reduced in an attempt to prevent overloading of the sorbent tubes.

The sorbent tubes and condensate were analyzed by Thermal Desorption Gas Chromatography/Mass Spectrometry (TDGCMS). This procedure is EPA Method 5040. The target compounds for this analysis included those in EPA Method 8240 and additional compounds of interest to the pulp and paper industry.

The analysis was performed using a 30-meter DB624 column. Temperature programming was initiated at -30°C and continued up to 200°C.

The 5-liter sample was analyzed first. In those cases where the sorbent tube was overloaded, then the 2-liter sample was analyzed it by stripping the organics with methanol and analyzing by GC/MS. This hi-level VOST was implemented on several occasions (e.g., Tall Oil Reactor Vent).

2.3. SEMI-VOLATILE ORGANICS (MM5)

The semi-volatile organics were collected according to EPA Method 0010. Samples were collected isokinetically. Components of interest are collected on a glass fiber filter and in a resin tube packed with XAD-2 porous polymer resin.

The filter and resin tube were Soxhlet extracted with methylene chloride for 16 hours and analyzed by GC/MS according to EPA Method 8270. The impinger fractions were extracted with methylene chloride in a separatory funnel (at pH 12 and pH 2). All extracts were combined and brought to a volume of one milliliter (mL) prior to analysis. Additional compounds of interest were included in the analysis as target compounds. Separate analyses (8270 and Clean Air Act (CAA)) were necessary due to the large number of analytes. Calibration for the combined set of analytes would be impossible because several analytes co-elute and react with each other.

The gas chromatographic analysis was performed on a 30-meter DB5-625 column, with temperature programming from 40° to 300°C.

2.4. METALS

The metals were collected using the EPA multi-metal train. Samples were prepared for analysis by microwave and hotplate digestion. Inductively-Coupled Plasma (ICP) Emission Spectroscopy was used to analyzed Ba, Be, Cd, Cr, Cu, Mn, Ni, P, and Ag. Antimony, arsenic, selenium, lead and thallium were analyzed by Graphite Furnace Atomic Absorption (GFAA). Sodium was determined by Flame Atomic Absorption Spectrophotometry (AAS). Mercury was determined by Cold Vapor AAS.

2.5. REDUCED SULFUR COMPOUNDS

An aliquot of a gas sample was extracted from an emission source and analyzed for total reduced sulfur as specified by EPA Reference Method 16. Total reduced sulfur (TRS) consists of hydrogen sulfide (H_2S), methyl mercaptan (MeSH), dimethyl sulfide (DMS), and dimethyl disulfide (DMDS) reported collectively. Speciation of the reduced sulfur compounds and carbonyl sulfide (COS) was accomplished by gas chromatography using a Carbosorb BHT 100 column and flame photometric detector (FPD). Integration of peak area counts and calculations was performed by a computerized data acquisition system.

The sample system described above was used to transport the sample to the mobile laboratory. The sample was pulled from the heated sample line through the sample conditioning system. The sample conditioning system consisted of a pair of Teflon impingers containing 2 M citrate buffer, pH 5.4 to 5.8. The impingers were arranged in series and maintained in an ice bath. A Balston filter was installed between the impinger outlet and sample line inlet to prevent fine particulate from depositing in the sample lines.

The hydrogen sulfide recovery gas was introduced directly to the GC/FPD. Recovery was calculated by dividing the H_2S concentrations measured through the entire system by that obtained by direct injection onto the GC. The sample results were corrected for the measured sample-line loss. Sampling proceeded when recoveries of 100 ± 20 percent were achieved.

Vendor-certified permeation tubes for each reduced sulfur compound were used to calibrate the FPD response on the GC. The permeation chamber was maintained at 50.0 ± 0.1 C; the temperature was verified with an NIST traceable mercury-in-glass thermometer.

Permeant concentrations of the reduced sulfur compounds were obtained by varying the flow rate of the gas over the tubes. A calibration curve was prepared by using three different permeant concentrations ranging from 0.1 - 30 ppm. The three readings for each concentration were within five percent of the mean peak area.

Line recovery was performed after every three hours of sampling. Recovery (for H_2S) was determined by injecting a low concentration of H_2S at the probe tip and recovering the sample through the sample conditioning and transport subsystems. This gas stream was then introduced directly to the GC sample loop. The line recovery was determined by dividing the "line" analysis by the "loop" analysis. This recovery factor was not applied to measured reduced sulfur compound concentrations.

2.6. ALDEHYDES AND KETONES

The formaldehyde sampling and analysis was conducted in accordance with the Research Triangle Institute (RTI) procedure described in "Development and Validation of a Test Method for Formaldehyde Emissions." Samples were withdrawn from the source at a flow rate of 0.5 to 1.0 liter per minute through a Teflon probe electrically heated to ~120°C. The probe outlet was connected to a series of four midget impingers maintained in an ice bath. The first two impingers each contained 20 mL of 2,4-dinitrophenylhydrazine in acetonitrile acidified with perchloric acid. The third impinger was empty; the fourth impinger contained 10 g silica gel. The outlet of the last impinger was connected to the inlet of a dry gas meter. The dry gas meter outlet was plumbed to the vacuum side of a diaphragm pump.

The impinger contents were combined for all sample runs except one. In this one case the impingers were analyzed separately to determine the extent of any breakthrough. Duplicate analyses were carried out on selected samples. Analysis was performed by high performance liquid chromatography. Working curves of reference standards were prepared for instrument calibration.

Field blanks and blank DNPH solution were analyzed as a check on the reagents used for sample collection. Analysis of these blanks yielded nondetectable levels of the analytes.

2.7. HYDROGEN CHLORIDE

Hydrochloric acid was sampled in accordance with EPA Method 26. Samples were withdrawn from the source at a flow rate of 0.5 to 1.0 liter per minute through a PTFE probe which was electrically heated to ~120°C. The probe outlet was plumbed directly to a PTFE filter which was electrically heated to ~130°C. The filter outlet was plumbed to a series of five impingers maintained in an ice bath. The first impinger was empty. The second and third impingers were charged with 20 mL of 0.1 N H_2SO_4. The fourth impinger was charged with 20 mL of 0.1 N NaOH. The fifth impinger was charged with 20 grams of indicating silica gel.

The contents of the first three impingers were transferred to a 100-mL volumetric flask and diluted to volume with deionized water. Hydrogen chloride analysis was performed by ion chromatography. Working curves of reference standards were prepared for instrument calibration.

A field blank of the 0.1N H_2SO_4 was analyzed as a check on the purity of the reagents used. Nondetectable levels of HCl were reported.

An EPA audit cylinder of HCl gas (104 ppm) was bled through the impingers. Laboratory analysis of this audit sample (for HCl) resulted in a concentration of 110 ppm, giving a recovery of 106 percent.

2.8. CHLOROFORM

Chloroform was determined using the NCASI Procedure by adsorption on a 600-mg charcoal tube, desorption with hexane, and analysis by gas chromatography with electron capture detection. The sample volume was determined from the flow rate through the critical orifice and the sampling train.

2.9. VOLUMETRIC FLOW

The volumetric flow was measured from each source during the time of sampling using EPA Methods 1-4. The measured volumetric flow rate was used to calculate the mass emission rate for each compound.

Section 3

SECTION 3. RESULTS AND DISCUSSION

A new era in the measurement and control of air emissions dawned in November 1991 when the Texas Air Control Board (TACB) requested the industry in and adjacent to the Gulf Coast Ozone Nonattainment Area to provide, within 90 days, an inventory of all volatile organic compounds (VOCs) emitted in 1990. The speciated VOC data were to be used to predict ozone attainment based on the Urban Airshed Model. Needless to say, the information necessary to fulfill TACB's request was unavailable and could not be generated within the 90-day period.

Representatives from five of the Texas kraft pulp and paper mills met to discuss ways and means of accomplishing the task presented by the TACB. Within two weeks the Texas Paper Industry Environmental Committee (TPIEC) was established and a preliminary action plan was developed. Delegates from TPIEC met with the TACB staff and presented the preliminary, 10-month program to gather the emission data. The TACB was receptive to the program and agreed to allow time for the mills to implement the test program.

The TACB emphasized the need for the emission data no later than December 1992 so they could meet EPA deadline for completion of the modeling by the first quarter of 1993. The TACB also indicated that this data base would be the mill's baseline emissions relative to Title I of the Clean Air Act Amendments and that the data must be accurate. If future data indicated emissions where higher than originally reported, consideration would not be given for increased allowances. Basically, the 1990 baseline data would be a permit bubble and any increase beyond these levels would require control. The TACB also requested data on other HAPs, so they could respond to a directive from the Texas Legislature to identify potential health risk of toxic air pollutant emissions.

The National Council of the Paper Industry for Air and Streams Improvement (NCASI) supported the TPIEC from the first meeting by assigning a knowledgeable person to attend all meetings and provide technical advise. During the development of the work plan, NCASI also agreed to provide quality assurance to the project by providing quality control samples, concurrent sampling and analysis, audits of methodology, and review of work plans and reports.

After several meetings in early January 1992 between TPIEC and the consultant (WESTON), a work plan was developed to complete the study. That Work Plan (copied in Exhibit A) was reviewed by all TPIEC members, NCASI, and TACB.

The TESS involved two phases of sampling and analysis activity. The first phase consisted of testing designed to develop the scope of work for the actual emission inventory testing in the second phase.

Phase 1 - Preliminary Screening. The main goal of the preliminary testing was to refine the list of VOCs emitted from a "typical" mill. Emission testing for the compounds had not been performed and the presence (or absence) of many of these compounds in the emissions had not been confirmed. The preliminary testing was used to determine which suspect compounds may be present in significant concentrations.

Generally, compounds with emission rates of less than one ton per year from any source were not a concern to the TACB. The test protocols (methods) used to collect the data had to be acceptable to TACB, parallel concurrent work by EPA, and still provide concentration detection limits capable of detecting one ton per year at the source flow rate.

Screening samples from representative sources to analyze for the volatile organic compounds as described by EPA Method 0030 (VOST) and semivolatile organic compounds by EPA Method 0010 (MM5). These samples were analyzed by gas chromatography with mass spectrometry detection (GC-MS) to identify the organic compounds present. At the same time, virtually all sources were examined by a field-portable organic vapor analyzer (OVA) to provide information on the VOC concentration range to expect. Selected sources were also examined by collection of grab samples and analysis by EPA Reference Method 18 (GC-FID), to determine VOC concentration by compound.

Phase 2 - Emission Inventory. The data obtained during the screening study were used to develop the scope of work for the second phase of the project. Phase 2 included the detail sampling and analysis of the identified sources using appropriate standard EPA Methods for determining stack flow and chemical composition.

Each source was tested for VOCs on at least two different days for three hours each day. If the mean concentrations did not agree within a predetermined amount, a third day of testing was performed. This procedure was used to evaluate the day-to-day variability of the emissions.

At least three GC-FID analyses were performed to speciate the VOCs during each three-hour sampling period. The compounds were quantitated as the compound and as carbon to enable the percentage of unknown compounds to be calculated. The total hydrocarbon concentration was plotted during each sampling interval to determine the trend of the VOC concentration during sampling. The trend plot gave an indication of the source stability at the times the GC-FID analyses were made.

3.1. OBSERVATIONS ON TESTING METHODOLOGY

The need for on-site data management. The task of data management was enormous. Source volumetric flow rates, GC data for 20 compounds (six analyses from each source), impinger sample results, and other parameters created large amounts of data to be managed. Adequate personnel and computational equipment must be utilized on-site to make sure that all the real-time data is calculated, reviewed, and evaluated before leaving the source. At times, all raw data were not reduced until after leaving the site and occasionally more test data should have been collected. If the data had all been reduced validated, and evaluated, immediately after collection, it would have been possible to make decisions based on the data at hand rather than to second guess (weeks later) what should have been done.

The importance of sampling equipment maintenance. From time to time throughout the project, the sampling equipment would fail during testing periods. The need for maintenance and cleaning before sampling became evident. A routine preventive maintenance schedule was developed after testing the first mill to minimize equipment failure. The high particulate, high moisture sources posed the most problems for the real-time sampling. The large volume of sample gas pulled through the heated, Teflon sample lines without adequate filtration caused particulate and organic matter to collect in the sample lines, thus requiring cleaning before sampling could proceed. Preventive maintenance minimized delay due to sampling equipment.

The requirement for accurate volumetric flow measurements. Many sources were not designed for volumetric flow sampling. Small diameter pipes were the normal vent for many tanks and processes. The gas volumetric flow was (many times) very low and even though a high VOC concentration was measured, the variability of the volumetric flow measurements left considerable uncertainty in the mass emission rate. Several techniques for gas dilution and measurement of the volumetric flow were developed throughout the project.

The impact of fugitive emissions. On sources that pull large volumes of ambient air (e.g., brown stock washer vents), fugitive emissions from other areas of the mill may significantly affect the measured concentration from the vent. At one mill, a cyclic trend in total hydrocarbon concentration was traced to fugitive emissions from a batch digester vent (in the same general vicinity as the brown stock washer) being drawn through the brown stock washer vent, thus increasing the apparent emissions from the washer vent.

The difficulty in sampling certain sources. A few extremely high-moisture or high concentration sources could not be sampled with normal techniques. Some of the sources, such as thermo mechanical pulping vents, were 99 percent moisture. Sampling procedures specific to sampling these sources were developed. Other sources (such as black liquor oxidation vents and tall oil reactor vents) required sample dilution before analysis because the concentration exceeded the instrument's upper detection level.

The importance of the analytical detection limit. The goal of the project was to quantify compounds with greater than one ton per year emission rate. This VOC emission rate is dependent on the volumetric flow and the concentration. The higher the volumetric flow rate, the lower the required detection limit to ensure that a minimum mass rate detection limit is met. It was determined that a two ppm detection limit for methanol was achievable for the project. This gave a detection limit of less than one ton per year for most sources.

3.2. EMISSION INVENTORY RESULTS

The significance of methanol. The amount of methanol found in various emission sources, as well as its presence in almost every source, was somewhat of a surprise. Methanol generated from the pulp digestion carries throughout the washing process (due to its water solubility). Once methanol is in wash water, the water reused in scrubbers and other processes transfer it throughout the mill.

The variation of VOC emission rate with this process. The VOC emission rate may vary significantly based on the type process. For example, the methanol emission factor for recovery furnaces was shown to be in the ratio of 1:3:9 for noncontact: cascade contact: cyclone contact, respectively. Process similarity may be pertinent to the development of emission factors.

The presence of methane in combustion emissions. In some lime kilns, the VOC emissions were found to have a total hydrocarbon concentration (more than 20 ppm) but no VOC compounds were found above the detection limit. Methane from unburned natural gas showed up as a VOC by EPA Method 25A (total hydrocarbon analysis). Methane is not counted as a volatile organic compound for emission purposes, and care should be exercised when using Method 25A to measure VOC emissions to ensure that methane interference is not a problem.

The presence of unexpected compounds. Throughout the VOC speciation, several unexpected compounds were found. For example, chloroform was found in certain sources at an unbleached mill and chloroform was found in the emissions from a direct contact recovery furnace. Target compound lists should be prepared with care.

The relevance of makeup chemicals. A thorough knowledge of the makeup chemicals can explain emissions (and change the emissions). For example, the use of makeup chemicals in a recovery furnace was found to significantly change the emission of aromatic organic compounds. While the chemistry of the reaction is not understood, aromatic compounds would appear and disappear with the addition of makeup chemicals. Makeup chemical addition should be documented during emission testing.

The consequence of the scrubber makeup solution. It was confirmed throughout the testing that the makeup solution of an emission scrubber can directly affect the VOC emissions. The VOC concentration varied significantly whether fresh water or condensate was used as a scrubbing media. The VOCs in the condensate were stripped by the stack gas.

The variation of emissions with time. Certain sources (especially batch sources) have emissions that vary significantly with time. For instance, the VOC concentration from a tall oil reactor at the beginning of the cook was approximately 14 percent as carbon. This extremely high concentration decreased more than a thousand-fold during the cook. The time at which sampling is conducted during the process can significantly affect the estimate of the emissions. The use of a total hydrocarbon analyzer (EPA Method 25A) to monitor the VOC trend was found to be an excellent tool to evaluate the magnitude of the emissions.

The comparison of VOC measured by GC and total hydrocarbon analyzer. Many permits are currently written with limits based on EPA Method 25A. The analytical result is dependent on the carbon content of the compound and the response of every compound to the flame ionization detector. The VOC concentration calculated as carbon from this method may be 5 to 20 times different from the VOC emission rate measured as the specific compound. For instance, the mass emission rate of chloroform as measured by speciating the chloroform will be more than 20 times that as measured by the total hydrocarbon analyzer. Care must be taken with the analytical method used for the sampling.

3.3. QUALITY CONTROL RESULTS

Quality assurance was provided by NCASI for the project. Major aspects of the QA included:

- Review of the WESTON Project Work Plan
- Field Audit of the Test Team performance at each mill
- Office audit of data and calculation procedures.
- Preparation of Audit samples for volatile organic compounds
- Audit of Triangle Laboratory (VOST, Multiple Metals, and MM5 analyses)
- Parallel sampling at selected sources.

An NCASI representative visited each mill during the time of sampling by the WESTON team. During the visit, the procedures used by the team were observed and verified as being those presented in the Work Plan. All procedures were deemed acceptable.

Comments to the draft Work Plan made by NCASI personnel were incorporated into the final Work Plan. The review proved to be a valuable third-party input.

The office audit by NCASI (Ashok Jain) and a TPIEC member (Michael Franklin) indicated good data organization by WESTON and correct calculation procedures. The visit demonstrated successful performance.

Appendix B includes a summary of the results of the NCASI - provided audit samples. The WESTON's performance on the audit samples was deemed to be satisfactory.

Appendix C is a copy of the audit report for Triangle Laboratory as prepared by Alex Gholson. The performance and procedures of the laboratory was determined to be adequate.

Appendix D summarizes the results of the comparative sampling by NCASI at Champion-Lufkin, Inland-Orange, and Temple-Inland (the only mills at which the comparative testing was performed). The data were used to demonstrate the validity of the data collected by WESTON.

Appendix A

WESTON
MANAGERS DESIGNERS CONSULTANTS

APPENDIX A. PROJECT WORK PLAN

WESTON

MANAGERS DESIGNERS/CONSULTANTS

PROJECT WORK PLAN
TEXAS EMISSIONS SPECIATION STUDY

Prepared For:

TEXAS PAPER INDUSTRY ENVIRONMENTAL COMMITTEE

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JUNE 1992

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SECTION 1. INTRODUCTION

The Clean Air Act Amendments of 1990 have added a new dimension to the permitting of stationary emission sources, the control of hazardous air pollutants (HAPs), the reduction of emissions of ozone precursors, and the management of volatile organic compounds (VOCs). The Emission Inventory Branch of Texas Air Control Board (TACB) has requested that the pulp and paper mills of Texas submit information about the amount of VOCs and the HAP compounds emitted from stationary sources at each mill. The data will be used in at least four different ways by the TACB:

- To provide a more complete inventory of VOC emissions from sources in ozone non-attainment areas.
- To use as input (VOC and class of compound) for the Urban Airshed Model.
- To identify and quantify the HAPs in accordance with Title III of the 1990 Clean Air Act Amendments.
- To develop mass emission rates to be used in preparing operating permits as described in Title V of the 1990 Clean Air Act Amendments.

A group of the Texas mills has chosen to take a proactive approach to this request by forming a group - the Texas Paper Industry Environmental Committee (TPIEC) - to provide a coordinated effort to collect and report the data required by TACB. This program - the TACB Emissions Speciation Study (TESS) - will address the TACB request and also provide valuable information for the industry.

1.1. DESCRIPTION OF THE PROCESS

Figure 1.1 outlines the processes used to produce paper using the kraft pulping process. Kraft pulping is the major chemical pulping process used by the pulp and paper industry for the liberation of cellulosic fibers from the structural matrix of wood. Figure 1.2 shows a schematic representation of the kraft pulping process including the liquor recovery cycle. This process has the versatility and adaptability needed to use diversified raw materials such as mixed hardwoods, southern pine, etc. All the mills involved in the TESS use the kraft process for making pulp. Most of the mills utilize both hardwoods and softwood as raw material.

The kraft process uses sodium hydroxide and sodium sulfide as effective chemicals for pulping. The chemicals, along with wood chips, are charged into a pressure vessel (digester) and the contents are brought to the reaction temperature at a preset rate. Both batch and continuous digesters are used in industry. The digestion process is carried out at high

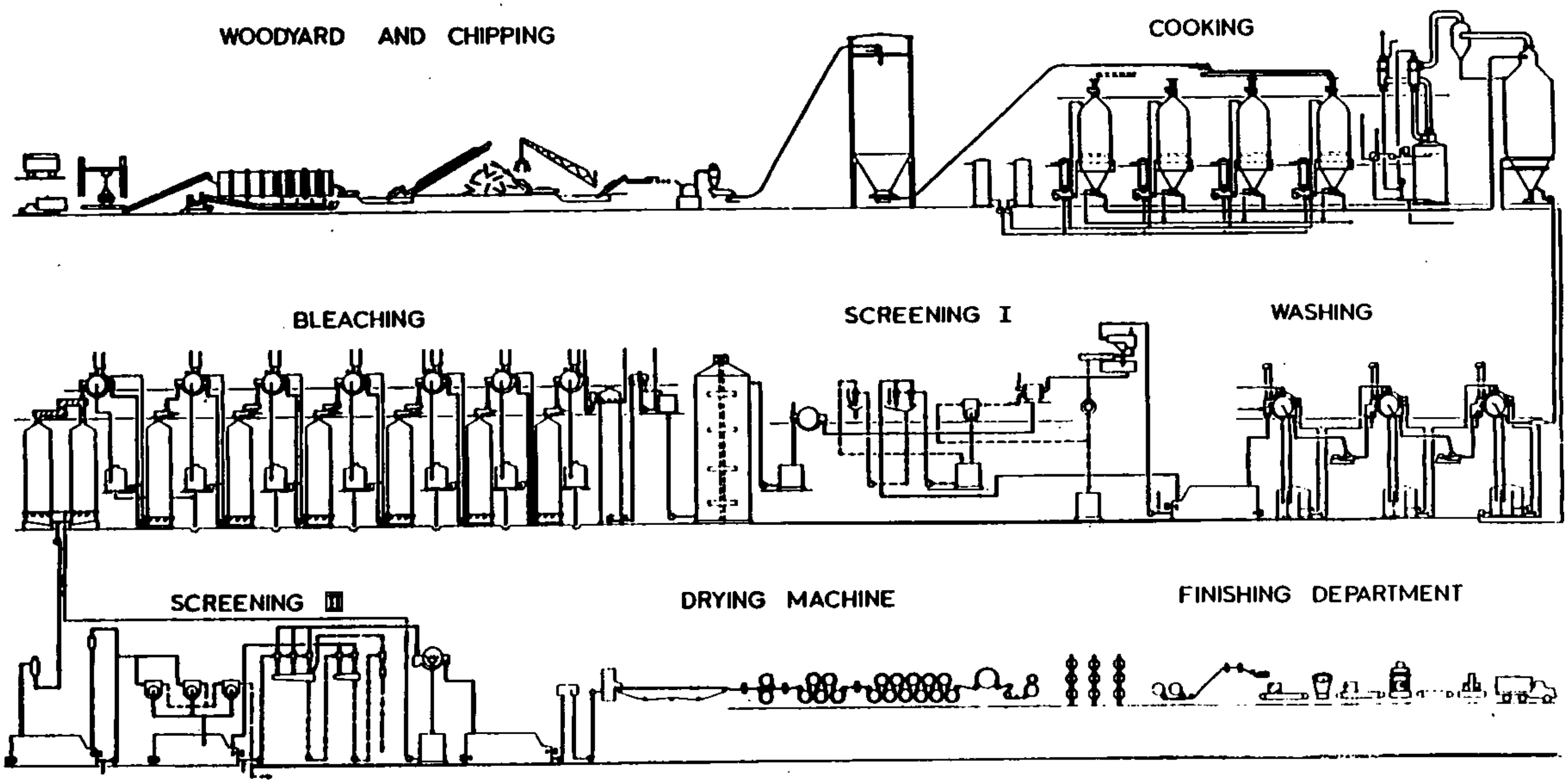

FIGURE 1.1. SCHEMATIC FLOWSHEET FOR KRAFT DISSOLVING PULP MILL.

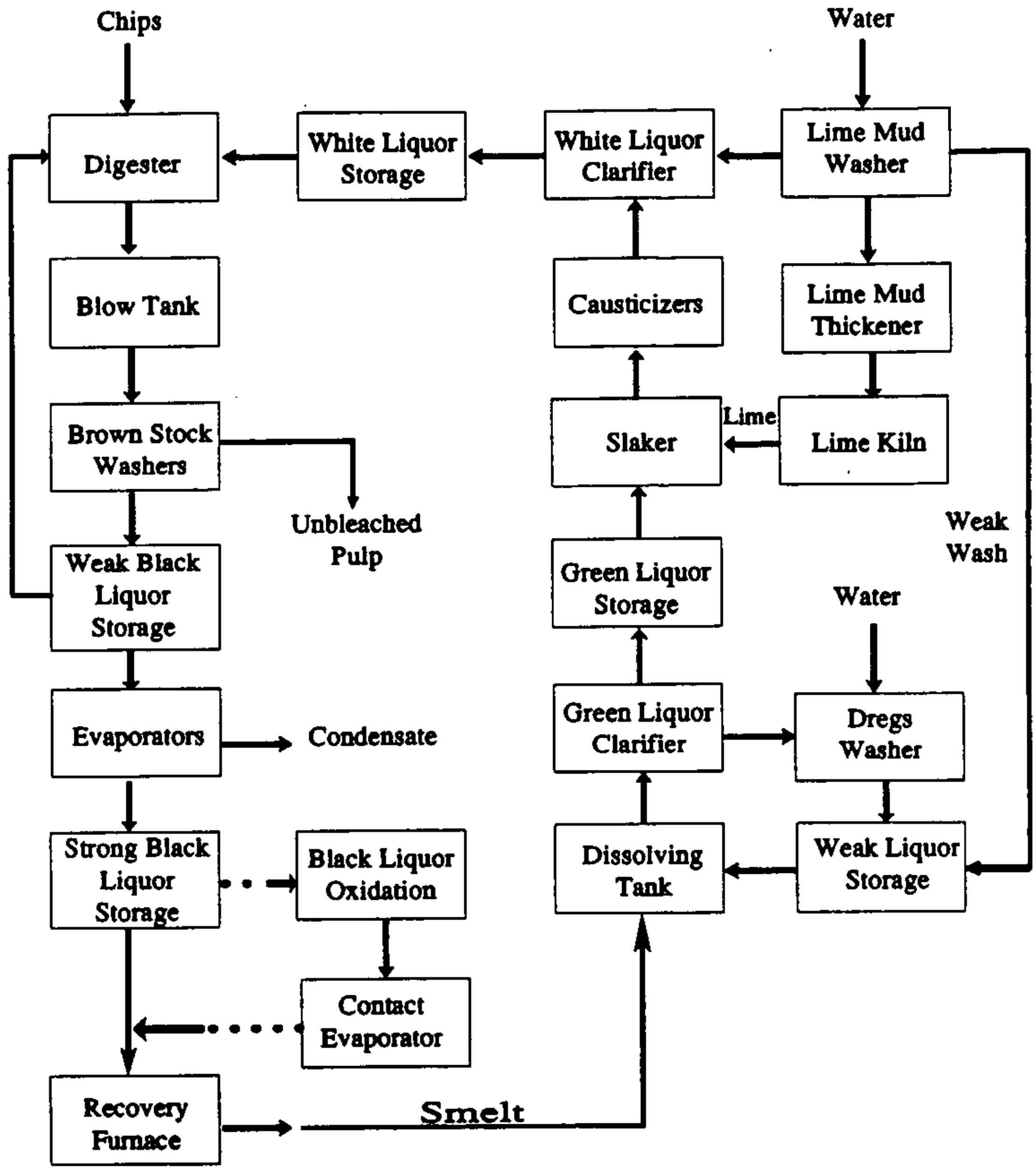

FIGURE 1.2. SCHEMATIC DRAWING OF THE KRAFT PULPING PROCESS

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pressure and elevated temperature (160-180°C). After the digestion, the chips are disintegrated by being "blown" into a tank and then sent for further processing.

Wood contains mainly cellulose, hemicellulose, lignin, and small quantities of extractives. The primary purpose of chemical pulping is to remove the lignin binding the fibers in the wood and liberate the cellulosic fibers. It is important to remove the lignin to the maximum possible extent with the minimum yield loss. The extent to which lignin needs to be removed depends on the type of pulp being produced based on the end-product needs. Maximum retention of cellulose and hemicellulose leads to the highest possible yield of pulp per unit weight of wood at the desired delignification level. In the pulping reaction, delignification of wood chips is accomplished by fragmentation of the lignin due to the action of the hydroxyl ion in the cooking liquor. In a typical pulping operation, approximately 80 percent of the lignin, 50 percent of the hemi-celluloses, and 10 percent of the cellulose are dissolved.

The pulp resulting from digestion and disintegration of the wood chips is washed thoroughly in a countercurrent system of washers to produce spent liquor or "black liquor". The pulp produced, thus called "brown stock", may be used for the manufacture of brown paper. All of the facilities produce brown or unbleached pulp and four of the mills under study also produce bleached pulp for the production of white paper.

Additional process steps are used and several bleaching chemicals such as chlorine, chlorine dioxide, sodium hypochlorite, oxygen, hydrogen peroxide, etc. are utilized to bleach or brighten the pulp. During the bleaching process the residual lignin in the brown stock is either solubilized and removed or converted to colorless form. Bleaching process differ from facility to facility and even within a given mill if the mill produces two different pulp (such as hardwood and softwood bleached pulps) or different products from the pulp.

The black liquor leaving the washing process contains 12-17 percent dissolved solids of which approximately 50 to 65 percent are organic compounds. The organic components are the partially fragmented lignin, solubilized either as phenolates or carboxylates, cellulose and hemicellulose degradation products and their solubilized derivatives, and the extractives. Composition of the black liquor varies depending on the wood type, alkali charge, and the pulp yield.

It is necessary to recover the inorganic chemicals and dispose of the dissolved organics for economic and environmental reasons. This is accomplished by sending the black liquor through a recovery cycle. The process involves concentration of black liquor to 60-70 percent solids by evaporation in a set of multiple effect evaporators and concentrators or direct contract evaporator (DCE) and burning of the concentrated black liquor in a furnace. Those mills having direct contact evaporators (in order to reduce the emission of reduced sulfur compounds) utilize an oxidation step wherein the reduced sulfur compounds in the black liquor is converted to sulfates and thiosulfates by contact with oxygen. In the furnace the organic materials are burned to generate steam, the sodium-sulfur compounds are reduced to sodium sulfide, and the remainder of the inorganic components are converted to sodium carbonate.

The inorganic compounds are withdrawn as smelt from the furnace, dissolved, and then sent to a causticizing section to regenerate sodium hydroxide by treating with burned lime. The clarified liquor from the causticizing section, containing mainly sodium hydroxide, sodium sulfide, and small quantities of unconverted sodium carbonate, is called "white liquor" and is recycled as the cooking liquor to the digester. Calcium carbonate or the lime mud separated from the white liquor in the clarifier is converted to calcium oxide in a lime kiln. In fact, one of the major reasons for the success of the kraft pulping process is the established, efficient chemical recovery process whereby more than 95 percent of the chemicals used in the cooking process can be recovered. It is also estimated that in an integrated pulp and paper mill approximately 50 percent of the energy requirement can be satisfied by the burning of the organics in the black liquor.

During the pulping and recovery operations, the volatile organic compounds (VOC) emissions are similar but the quantity of the various components may vary depending on the ration wood species variation and the process conditions. On the other hand, the VOC emissions from bleach plant sources vary from mill-to-mill depending on the bleach sequence used.

1.2. PROJECT GOALS AND USE OF THE DATA COLLECTED

The tables in Appendix A list the sources to be tested during the project and provide the TACB identifiers (FIN, EPN, and CIN) for each. Portions of the emission data collected through this program will be shared among the TPIEC members to allow emission data collected from representative sources to be used by all mills. Emission factor data will be developed based on the process tested and the process operating conditions during the test period. The emission factor data will then be made available to the paper mills participating in this project.

The air emission data from the TPIEC program will be evaluated and compared with similar emission values reported by the industry nationally through the National Council of Air and Stream Improvement (NCASI). The pooled toxic air pollutant emission factors obtained from the TESS will also be compared to those available for similar mill processing systems outside the study to enlarge the data base.

The TACB has requested that the emission inventory be submitted by the end of October 1992. This time constraint means that the project must proceed in a scheduled, time-effective manner. Roy F. Weston, Inc. (WESTON®) has been retained by the TPIEC to perform selected sampling and analysis studies. This work plan describes the efforts anticipated for the TESS.

One purpose of the testing at various facilities is to refine the list of VOCs present at a "typical" facility. Emission testing for the compounds identified on the target list has not been performed and the presence (or absence) of many of these compounds in the emissions has not been confirmed. This testing will be used to determine which of the target compounds should be of concern.

TACB has established the goal of speciating and quantitating 90 percent of the mass emissions of volatile organic compounds from each source. Generally, compounds with emission rates of less than one ton per year from any source will not be of concern to the TACB. The testing protocols (test methods) used to collect the data must be acceptable to TACB and they should parallel efforts by EPA as it performs similar work concurrently.

The objectives of the TPIEC study are to identify and quantify 90 percent of the mill-wide emissions of volatile organic compounds and to identify hazardous air pollutants from typical sources at mills in Texas. During this testing, WESTON will gather data from selected sources, identified by the TPIEC in consultation with WESTON and NCASI, by engineering evaluation of the process, which will be used as a pool of data by each facility. In addition, a number of other sources will be examined at each mill involved, due to the unique nature of certain pulping and papermaking processes described earlier. The results of these efforts will be presented in terms of both concentrations and emission rates. Each individual mill will then be able to calculate the emission factors for the various processes in order to response to the TACB request for information.

The TPIEC plans to collect emission data that will meet data quality and regulatory requirements for submission to the TACB. During the time of the emission testing, mill personnel at each facility will collect pertinent operating data for the processes associated with each emission point tested. The operating data will be correlated with the emission rates in order to establish emission factors.

Because of the variability in many of the processes and emission levels with time, the test program will be developed to provide data from each source during representative operations. Up to four weeks of field testing may be performed at any one location. Some locations will require longer periods of testing than others due to the number of sources, lack of characterization of the emissions, and the variability of the processes. It may be possible to complete testing at some of the less complex locations within a shorter time period.

Most of the results should be generated on-site as close to real-time as possible. The methodologies selected for initial evaluation will, therefore, involve on-site analysis and reporting for many compounds. Most of the VOC compounds lend themselves well to field gas chromatographic analysis. Other analytical techniques, which will be necessary for quantifying other compounds, may require off-site analytical techniques.

1.3. DATA COLLECTION OBJECTIVES

The TESS involved two phases of sampling and analysis activity. The first phase included collection of screening samples from certain sources using the volatile organic sampling train (VOST). SW-846 Methods 0010 and 8270 (Modified Method 5 or MM5) was used for determining semi-volatile organic compounds (S-VOCs). These samples were analyzed by gas chromatography with mass spectrometry detection (GC/MS) to identify and quantify the organic compounds present. The results from these samples provided additional knowledge about the compounds emitted by various process elements. At the same time, several sources were examined by a field portable organic vapor analyzer (OVA) to provide information on the VOC concentrations presents. Selected sources were also examined by collection and analysis of grab samples by EPA Reference Method 18, to determine their composition by compound. The data obtained during the screening study were used to develop the scope of work for the second phase of the project.

The second phase of the project will include the detailed sampling and analysis of the identified sources using appropriate standard EPA Methods for determining stack flow and chemical composition. Appendix B presents the scope of work for Phase 2. The sources to be tested for each parameter are noted. The process operating conditions to be monitored and recorded are included in Appendix C. Section 4 describes the test protocol for each parameter.

1.4. DATA QUALITY OBJECTIVES

The data quality objectives for the Phase 2 effort will be developed along with the analytical methods.

Section 5 generally describes the quality assurance associated with the project. The calibration drift data will require that no analytical work will be performed unless the calibration curves have been validated to ±10 percent by the injection of the check samples. Should the calibration check data fail to meet this limit, the field team will halt sample collection and determine the cause of the problem. Once this problem has been corrected, an additional check sample will be analyzed and the results again compared. If these results are found to be acceptable, data gathering activities will resume. If the problem that has been detected involved something which would have affected the previous sample results, such as a leak in a gas sampling valve or a change in the response of the detector, these data will be discarded and the samples re-collected.

The technical approach for this effort requires that two 3-hour sampling periods be used to determine the average emission rate from each source. These sampling periods will be on different days. WESTON will review the unvalidated field results for each three-hour period immediately after they have obtained and compare them to the previous period. All valid data gathered for each period will be averaged and the two averages compared. In the event that an error in these results is detected during the data validation step, WESTON will return to the sample location and repeat the sampling effort until the data quality criteria are met. However, since all data acquisition is directed into the computers, it is unlikely that such a situation will occur.

SECTION 2. SCOPE OF WORK FOR FIELD SAMPLING

The scope-of-work for this project includes two discrete phases of work, to permit an orderly and systematic examination of the emission sources from these kraft-process mills. The details of this effort are well-defined and understood for the screening effort, which will provide data on the composition of the sources of interest. The results of these studies will then be used as a source of information to refine the efforts for the quantification phase that will follow.

2.1. SCREENING STUDIES (PHASE 1)

Field sampling during the screening studies included the collection of selected samples for volatile and semi-volatile organic compound identification. In addition, grab samples were collected in Tedlar bags and glass containers from selected sources and analyzed in the field using GD/FID to estimate concentrations of selected organic compounds present in certain emission points. Total VOC measurements were also made using a field portable analyzer. During this time, flow measurements were also taken from these sources in order to develop information to indicate which of the sources and compounds should be of concern in meeting the goal of quantifying at least 90 percent of the mill-wide VOC mass emissions. Samples collected on sorbent media were analyzed by GC/MS to determine the identity of those major compounds whose identity is unknown. These results have been evaluated, based on the compounds present and their concentrations to determine those for which emission rates must be determined during Phase 2 of the Project.

2.2. SCOPE OF WORK FOR QUANTITATION STUDIES (PHASE 2)

The Phase 2 sampling and analysis program will include the collection of samples using direct interface procedures as described by EPA Reference Methods 16, 18, and 25A, wherever possible. The first two methods will serve to quantify the emissions of most volatile and many semi-volatile organic compounds as well as the sulfur-containing compounds emitted from these emission sources. The latter will provide an indication of the total VOC emissions produced by the operation under the conditions and at the time that each GC sample was injected.

Figure 2.1 shows a schematic drawing of the sampling systems to be used to collect the data. EPA Reference Methods 1-4 will be performed, during the same time, to determine stack gas velocity, temperature, moisture content, and gas composition for determining the volumetric flow rate of each source. Other information, such as process operating parameters, will also be gathered during the sampling period to allow calculation of mass emission rates and emission factors based on differing production scenarios. A variety of techniques will be performed in conjunction with this sampling program to determine the emission rates of certain organic compounds, including formaldehyde, which are not otherwise detected. At the conclusion of these efforts, the concentration data for specific species will be compared to the

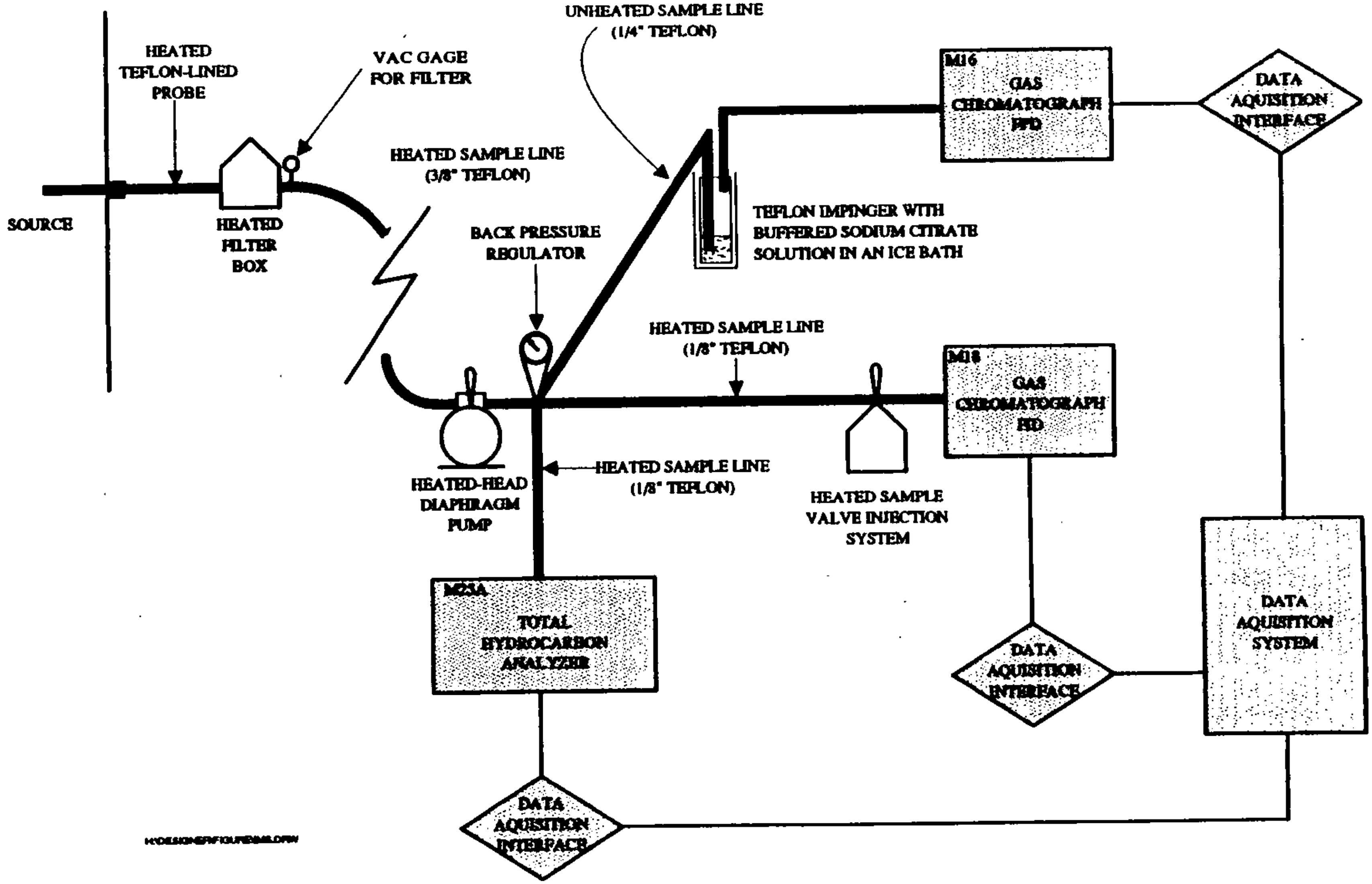


FIGURE 2.1. INSTRUMENTAL METHODS SCHEMATIC

results of the total hydrocarbon analyses run in parallel to the Method 18 system, to provide an estimate of the percent of total VOC emissions identified. Additional screening samples may be collected, if previously unidentified compounds are found, using the same Methods as employed during screening. Section 4 describes the methodology to be used for each parameter.

Sampling will be performed at each of the five facilities participating in this study. Certain sources, which relate to processes that are typical of the mills as a whole, will be tested on a pooled source basis. Others will be tested on a mill-by-mill basis, due to the many differences in the processes that may be employed by individual mills. Appendix A identifies the sources to be tested at each mill and provides the TACB source identifiers for each. Appendix B includes the same list and shows the parameters to be tested on each source. Appendix C summarizes the process operating conditions (parameters) to be monitored and recorded during the test effort on each type source.

2.3. PROJECT SCHEDULE

A pre-test site visit was performed by WESTON during the week of 03 February 1992. This effort is being followed by the Phase 1 Sampling program during the period of 02-13 March 1992 which was designed to identify and provide semi-quantitative data on emission rates.

The field studies associated with the emission rate determinations (Phase 2) will be performed beginning in April 1992 and concluding during July of the same year. WESTON anticipates that a three- to four-week sampling effort will be required at each facility to gather the required data from the sources that are identified during the preliminary phase of this effort. The expected test schedule for Phase 2 is presented in Appendix A.

SECTION 3. MANAGEMENT APPROACH

This effort will require the coordination of efforts among the kraft-pulp mills, one or more sub-contract laboratories, and multiple field teams. A clear management approach is required to ensure that this coordination occurs so that the objectives of the study are net in a timely, cost-effective manner. WESTON has designated a project team for this project that includes skilled personnel in each critical position. Each mill has designated a primary and a secondary contact at each site who will serve to coordinate the required efforts within each facility.

3.1. PROJECT ORGANIZATION AND STAFF RESPONSIBILITIES

WESTON believes in and implements project performance using the matrix approach - i.e. the project staff is assigned based on project requirements and disciplines needed. Figure 3.1 presents WESTON's project organization.

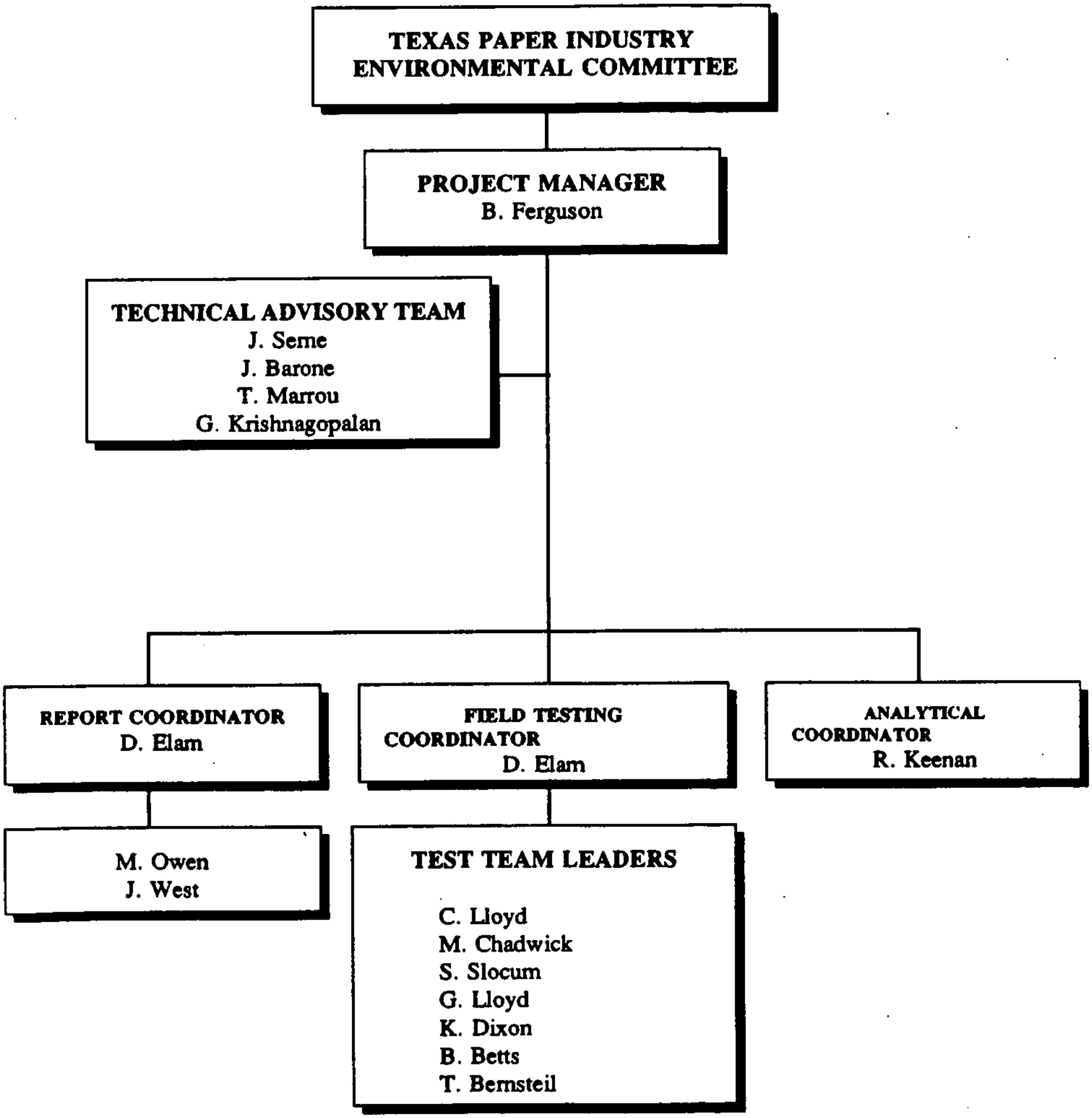
Project Manager

The job of Project Manager is critical to the successful completion of this project, because the project requires extensive experience in source test methodology and analytical chemistry training. The Project Manager has both technical and managerial responsibilities. His managerial responsibilities will include day-to-day management of personnel and resources, and will include the responsibility of coordination of activities such as scheduling, cost management, and client contact. His technical responsibilities are to ensure that the most appropriate sampling and analytical procedures and used for each source and each compound.

The Project Manager for this project is Dr. Bruce Ferguson, a nationally recognized expert in the field of Air Quality Management. He will ensure that project goals are achieved in the most cost-effective and technically-competent manner; that necessary corporate resources are available to this project; and that any administrative problems that require resolution are addressed. He will also provide a general oversight function regarding contract performance, cost-monitoring, quality control, and schedule control. It is important to note that Dr. Ferguson will be a "hands-on" Project Manager who will be involved in all aspects of this project.

Dr. Ferguson, a Corporate Vice President, has over 18 years of experience in all areas of Air Quality Management. He is known throughout the pulp and paper industry for his ability to develop and validate test methodology for unique situations. He has directed more than 500 testing efforts during the past ten years and he has collected source emission data from more than 50 pulp mills.

FIGURE 3.1. WESTON'S PROJECT ORGANIZATION



Field Testing and Report Coordinator

The preparation and review of the test reports will ensure that the data are complete, the results are accurately calculated and the data are representative. This function will be carried on currently with testing and analytical efforts to ensure the availability of timely results. Mr. David Elam, a chemist with more than ten years of relevant air quality testing experience, will manage the preparation of emission test reports for the Project Manager.

Mr. Elam will also coordinate the efforts of the Field Test Teams. As a Department Manager, all of the team leaders report to him routinely. He will be a natural extension of the Project Manager to ensure that test methodologies are implemented as planned.

Mr. Elam has conducted or managed more than 150 source testing efforts at pulp and paper facilities. These efforts range from VOC sampling and analyses at printing operations to non-condensible gas analyses at kraft mills to mill-wide emission inventories. His technical expertise is noted through his authorship of a Technical Assistance Document for EPA on the subject of measuring toxic air pollutants.

Analytical Support Coordinator

Timely, high quality analytical support will be required to ensure that the project objectives and schedule will be met. To achieve this, all analyses will be coordinated by a single individual. He will be responsible for in-house analysis as well as subcontract services. The analytical support coordinator must understand the analyses required and the quality control associated with each.

Dr. Richard Keenan, an analytical chemist, will coordinate the analytical laboratory support for the project. He has more than 10 years of analytical laboratory management experience, and through that experience, he is thoroughly familiar with the methodology required and the results expected. Dr. Keenan serves as the laboratory Manager for WESTON's laboratory in Auburn (where the routine analysis will be performed). He will direct the in-house analyses and coordinate analyses subcontracted to outside laboratories.

Testing Teams

Each project team will be staffed with qualified Team Leader and support staff as necessary for the particular scope of work. The decision regarding staffing of each effort will be made by the Project Manager with input from the Project Director. The decision will be based on the scope of work and the expertise required. A minimum number of team leaders and team numbers will be used to enhance consistency.

WESTON has more than ten team leaders qualified to lead the effort. Three or more of the five listed in the organization chart will be assigned to the project. Each proposed leader has direct experience with the sampling methodology and the sources to be tested at the mills. The specific staffing plan will be developed prior to initiation of the testing effort.

Technical Review Team

The Technical Review Team is composed of senior personnel with broad expertise in area relating to the scope of work. The purpose of the team is to (a) provide input to and review of the project work plan; (b) meet with members of the TPIEC, as necessary, to discuss technical issues; and (3) review and comment on test reports. The Technical Review Team has been chosen to provide expertise to augment the project team as summarized in Table 3.1.

TABLE 3.1. TECHNICAL REVIEW TEAM EXPERTISE

TEAM MEMBER	HIGHEST DEGREE	ACADEMIC DISCIPLINE	YEARS OF EXPERIENCE	AREAS OF EXPERTISE
J. Serne	M.S.	Ch. Engg.	16	Source testing: VOC collection and analysis; control equipment evaluation.
J. Barone	Ph.D.	Meteorology	20	Modelling; permitting strategy; regulatory requirements.
T. Marrou	M.S.	Env. Engg.	15	TACB strategy; source permitting; environmental engineering.
G. Krishnagopalan	Ph.D.	Ch. Engg.	20	Pulp and paper processes; process safety; training.

3.2. CONTACT INFORMATION

Appendix D summarizes the contact information for all participants of the project. Changes in contact data should be submitted to Dr. Ferguson who will be responsible for maintaining the current information.

The principal contacts for the project are listed below:

TPIEC	Mr. Don Padfield
NCASI	Mr. Ashok Jain
WESTON	Dr. Bruce Ferguson
TACB	Mr. Macrio Mayorga

SECTION 4. TECHNICAL APPROACH FOR DATA COLLECTION

The technical approach which will be used for data collection entails the application of standard EPA methodologies to the greatest extent possible. The projects will require two phases of efforts, utilizing different sampling and analysis concepts.

4.1. SOURCE EMISSION CHARACTERIZATION STUDIES (PHASE 1)

The screening studies used several methods to qualitatively determine the composition of the stack gas from selected sources. The intent of this effort was to identify the components present in the mills to permit the development of GC methods for quantitative determination of their concentrations during the Phase 2 effort. The methods selected for use to accomplish this were cited earlier and include two standard screening techniques developed by the EPA. The table in Appendix B indicates the sources included in the screening test effort.

The VOST technique (EPA SW-846 Method 0030) was developed for use in determining the emissions from hazardous waste incinerators. This method entails the cooling of the stack gas followed by collection of the VOCs in the stack gas sample on a two-part sorbent tubes. The first sorbent tube contains specially prepared Tenax resin, while the second tube contains the same Tenax material followed by a small quantity of activated charcoal. The stack gas is drawn from the stack through a filter which is held at a temperature of 130 degrees Celsius (130°C), plus or minus five degrees. The hot gases passing through this filter flow into a water-cooled condenser in order to lower the sample temperature and condense any moisture which may be present. The gas sample and condensed moisture then flow into a cyclonic-type separator where the moisture, as well as any dissolved organic compounds, is retained and the non-condensed gas continues through the sorbent tubes. Sample volume is determined by the dry gas meter in the sampling console while other information on stack conditions is gathered during sampling, (i.e. temperature, moisture content, and stack gas velocity).

Blank sorbent tubes and spiked samples were prepared to provide a measure of the effectiveness of the analytical techniques in recovering and identifying the compounds present in the stacks.

Samples collected on Tenax tubes were analyzed by a laboratory experienced in these methods. Based on the current state-of-the-art for analysis of samples collected in paper mills, WESTON had the samples analyzed in three parts, rather than as a single sample. These component analyses will include the condensate collected, the front Tenax trap, and the back Tenax/charcoal trap. The accumulated mass spectra of the VOCs collected will be examined by comparison to several reference libraries of compound mass spectra, including:

- The approximately 40 VOCs on the Clear Air Act Amendments (CAAA) list of 189 Hazardous Air Pollutants (HAPD).

- The EPA Reference Method 8240 Compound List.
- A list of compounds suspected to be formed during paper manufacture, based on previous experience and process knowledge.
- Volume I VOC Species Profiles for Pulp and Paper (seven compounds).

The GC/MS laboratory also attempted to identify the ten largest unidentified peaks in the total ion chromatograms which are not from compounds present on these lists.

Samples for characterizing the semi-volatile organic compounds present were collected, where appropriate, using EPA SW-846 Method 0010, a modified version of EPA Reference Method 5, which is sometimes referred to as the semi-VOST method. This sampling method requires the collection of a sample, using isokinetic techniques, by employing the standard Method 5 train, to which a sorbent cartridge containing XAD-2 resin has been added. WESTON recognizes that it may be impossible to maintain isokinetic sampling conditions for certain sources to be tested, but every reasonable effort was made to do so whenever possible.

The stack gas and particulate matter were drawn through the heated probe assembly to a heated particulate filter. The gases passed through the particulate filter flow into a condenser trap where water removal occurs. The dried gas sample then was drawn through the XAD-2 sorbent cartridge, which has a strong affinity for many organic compounds having higher boiling points. Field blanks and spiked samples for this method were also prepared in accordance with accepted procedures.

The filter, condensate, and XAD-2 resin were extracted by the laboratory using Soxhlet extraction techniques. The extracts were then concentrated using Kuderna-Danish evaporation systems to a small volume, typically one milliliter (mL). One of more aliquots of the extract(s) were then injected onto the GC/MS system where compounds on the following list will be identified and quantified:

- The approximately 60 S-VOCs on the EPA CAAA HAP List.
- The EPA SW-846, Method 8270 List.
- Compounds expected to be present in the paper mill sources.
- Volume I VOC Species Profiles for Pulp and Paper (seven compounds).

The ten largest remaining unidentified peaks were examined and tentative identifications were made, where possible, based on spectral interpretation, library searches, and retention time matches.

Gas chromatography analyses were performed on selected sources to determine the magnitude of certain selected organics. The general techniques described by EPA Method 18 were used for analyses. Samples were collected in Tedlar bags or evacuated glass containers for analysis. Samples were analyzed on an "as-collected" basis (i.e., no moisture removal). Analyses were performed on site on the same day of collection with a GC/FID calibrated with the various compounds of interest. These analyses were performed for ranging purposes only.

The total hydrocarbon concentration (THC) was measured on most sources using a portable organic vapor analyzer (OVA) calibrated with methane. The purpose of these measurements was to determine the magnitude of the organic emissions. A volumetric flow rate measurement was performed simultaneously to estimate the mass emission rate. These data were used to finalize the scope of testing for Phase 2.

Table 4.1 lists the volatile organic compounds expected to be the major contributors to the VOC mass emission rate. These data are based on the results of the screening study, preliminary EPA data, knowledge of the processes and scientific judgement.

TABLE 4.1. VOLATILE ORGANIC COMPOUNDS SUSPECTED TO BE PRESENT IN KRAFT PULP MILL SOURCES AT SIGNIFICANT CONCENTRATIONS

acetone	dimethyl disulfide (DMDS)
alpha-pinene	dimethyl sulfide (DMS)
benzene	ethanol
beta-pinene	ethyl benzene
bromodichloromethane	methanol
2-butanone (MEK)	methyl mercaptan (MeSH)
carbon disulfide	2-propanol
3-carene	toluene
chloroform	m-/p- xylene
cumene	o- xylene
p- cymene	

4.2. EMISSION RATE CHARACTERIZATION MEASUREMENTS

The sample collection scheme that is anticipated for Phase 2 entails the collection of two samples from each source, on different days. Each sample duration will be approximately three hours. The result reported will be the average of both samples. Samples during which analytical problems such as power failures, instrument noise, or other uncontrollable events occur, will be excluded from these data.

Since the field measurements that are proposed for emission characterization entail the use of direct interface sampling and real-time on-line injections, a sample is defined as follows:

- Method 16 samples typically will include six injections per hour for a three-hour period.

- Method 18 samples will typically include the injection of one or two samples per hour for a three-hour period (assuming that the compounds present permit a run time of no greater than 45 minutes for each injection). This will result in at least three analyses per sample.

- Integrated samples such as formaldehyde, SO_2 by EPA Reference Method 6, HCl by EPA Method 26, or similar grab sampling techniques will include at least one one-hour sample per sampling period.

- A sample for continuous emission monitoring methods will include three hours of data with calibration before and after the sampling period.

Emission rates from the facilities will be determined during a separate effort, based on the compounds identified during Phase 1 and the methods have been modified as necessary to permit direct, on-line analysis wherever possible. The compounds of interest identified during the Phase 1 efforts will include those indicated to be present by the laboratory results from that effort.

WESTON will mobilize personnel, equipment, and mobile laboratories to each of the sites to be evaluated. The stack gases will be collected and analyzed using methods appropriate for the individual sources. These techniques are expected to include the following EPA Methods:

- EPA Reference Methods 1 - 4 for stack flow, moisture content, etc.

- EPA Reference Method 16 for sulfur-containing compounds.

- EPA Reference Method 18 for volatile and many semi-volatile organic compounds.

- EPA Reference Method 25A for total hydrocarbons.

- EPA Reference Method 26 for hydrogen chloride gas.

- EPA SW-846 Method 0030 (VOST Method) for identification of volatile organic compounds from selected sources.

- EPA SW-846 Method 0010 (Semi-VOST Method) for the collection and analysis of additional semi-volatile compounds.

- Draft RTI Method for the collection and analysis of samples for the determination of formaldehyde and other aldehydes and ketones.

Samples for the two on-line GC methods will be collected from the stack using different sampling approaches as described below, while the methods requiring grab samples will utilize the procedures described in the individual methods. Figure 2.1 shows the sampling approach for the real-time sampling. A summary of the sampling and analytical methods is provided in the following section.

4.2.1. Volumetric Flow Measurement Using EPA Methods 1 - 4

Sampling points will be selected in accordance with EPA Reference Method 1 so that a representative sample of stack gas is taken. The traverse points will be located in the centers of equal area zones. The number of zones will be determined by the stack dimensions and the number of stack diameters upstream and downstream from the sampling points to the nearest disturbance.

The velocity of the gas stream will be determined according to EPA Reference Method 2 by reading the instantaneous velocity head with an inclined manometer at each sampling point with a calibrated S-type pitot tube attached adjacent to the sample nozzle. The stack pressure will be measured with the static side of the pitot tube. A calibrated pyrometer or dial thermometer will be used to measure stack temperature at each sampling point.

Carbon dioxide and oxygen concentrations will be determined using EPA Reference Method 3 or 3A. A grab sample of gas will be collected from the source and analyzed with an Orsat or Fyrite combustion gas analyzer. The molecular weight of the gas was calculated using the moisture, oxygen, and carbon dioxide contents.

The moisture content of the gas stream will be determined by wet bulb/dry bulb psychrometry when the source temperature is less than 200°F. When the source temperature is above 200°F, the moisture content will be determined using preweighed impingers, silica gel cartridges and a calibrated dry gas meter. The weight gain the impingers and silica gel cartridge will be used in conjunction with the dry gas volume to calculate the moisture content of the gas stream.

4.2.2. Total Reduced Sulfur Sampling and Analysis using EPA Method 16

The total reduced sulfur testing will be performed using the techniques and procedures described in EPA Reference Method 16. A Teflon-lined, stainless steel probe of sufficient length to monitor the gas stream without wall effects will be used to extract a gas sample from the emission source. The probe tip will be directed away from stack gas flow to reduce particulate and moisture entrainment. The probe will be plumbed directly to the recovery gas line and sample conditioning system. EPA Reference Method 16 assumes uniform mixture of the stack gas; therefore, the stack will not traversed during testing.

The sample conditioning system will consist of a pair of Teflon impingers containing 2M citrate buffer, pH 5.4 to 5.8, arranged in series and maintained in an ice bath. Moisture will be condensed in the impingers, yielding a dry sample and thus eliminating the need for heated sample lines. A Balston[R] AQ Microfiber filter will be installed between the impinger outlet and sample line inlet to prevent very fine particulate which is insoluble in the citrate buffer from depositing in the sample lines.

An unheated nylon line will be plumbed from the impinger outlet to the sample pump inlet. Sample line length and connections will be minimized to reduce surface adsorption of TRS and the possibility of leaks. A sample flow rate will be selected to yield one to two sample residence times per injection cycle.

The pump outlet will be plumbed directly to a constant pressure bottle. At this point, the bulk of the sample will be vented to the atmosphere, and the balance will be used to charge the GC sample loop. Separation of hydrogen sulfide (H_2S), carbon disulfide (CS_2) methyl mercaptan (MeSH), dimethyl sulfide (DMS), and dimethyl disulfide (DMDS) will be accomplished by gas chromatography on a Carbosorb BHT 100 column. The Carbosorb BHT 100 column will be backflushed to achieve separation of all four compounds within ten minutes. The gas chromatograph will be operated on a ten-minute cycle to give six injections per hour.

Detection of reduced sulfur compounds will be accomplished with a flame photometric detector (FPD). The FPD response will be calibrated before and after each three-hour run. The FPD responses were recorded by an IBM-PC/XT compatible computer which was equipped with software specially designed by WESTON for Method 16 TRS analysis. The software will control the timing of the gas-chromatographic cycle, integrated and recorded peaks, performed all calculations, and printed the results. Calibration curves were calculated by the software using log-log linear least squares best fit of the data.

Recovery of hydrogen sulfide throughout the entire sampling and analytical system will be evaluated before and after each three-hour sampling period by introducing hydrogen sulfide at the tip of the sampling probe. When three suitable injections have been obtained, the hydrogen sulfide recovery gas will be introduced directly to the GC/FID. Recovery will be calculated by dividing the H_2S concentrations measured through the entire system by that obtained by direct injection onto the GC.

4.2.3. Volatile Organic Compound Sampling and Analysis using EPA Method 18

The applicability of the EPA Method 18 sampling and analysis procedure is to a wide variety of VOCs and sources. Many of the compounds and most of the sources that are to be studied in these mills fall under these general guidelines. The sampling techniques that are provided within the method range from "direct-interface" sampling, with or without sample dilution, to collection in bags or on sorbent tubes of various types. The analytical methods that may be used also vary widely, but the most common one for most organic compounds is GC/FID. The direct interface sampling, GC/FID analysis approach will be used for this Phase of the sampling and analysis effort. Figure 2.1 shows the schematic drawing of the sample conditioning and transport.

The sample collection system will require drawing the sample through a probe heated to approximately 130°C to ensure that all water in the stack gas is in the vapor phase. The stack gas will then be pulled into a heated sampling box containing a Teflon filter maintained at 130°C, where particulate matter will be removed. This filter, as a result, will provide some discrimination between volatile and non-volatile species. The filtered stack gas will be transported to the WESTON mobile laboratory through sample lines heated to at least 130°C at flow rates in the range of five to 15 liters per minute (LPM), using heated head sampling pumps.

Once the stack gas is drawn into the laboratory through the heated pump, the gas stream will be split to two analyzers. One gas stream will flow to a total hydrocarbon analyzer which will determine the total hydrocarbon content of the wet, hot gas stream by Method 25A, as described later. Another portion of the gas will flow through heated lines to the heated gas sampling valve enclosure of a GC equipped with flame ionization detectors. The sampling valves will contain appropriately sized sample loops for injection of gas samples onto the GC columns. The remaining stack gas will be vented to the outside of the mobile laboratory facility.

The Method 18 GC analysis will utilize column switching techniques developed by WESTON for this project to separate and quantify organic compounds ranging in volatility from methanol and similar compounds through the terpenes and related species which are known to be present. Retention times, response factors and quantitative results will be obtained for the compounds listed in Table 4.1. The final details of the column technology that will be employed will be summarized in the final work plan. WESTON anticipates the use of one or more types of capillary GC columns in conjunction with column switching valves, as necessary, to resolve the peaks associated with most compounds. The output of the flame ionization detector will be recorded on a laboratory data station and concentrations will be determined by comparison of responses to the responses of external standards of the materials of interest.

During the field sampling effort, WESTON will calibrate the analyzer using a combination of cylinder gas standards and liquid standard injections. Selected compounds will be used for calibration and response factors for those compounds will be determined. Relative response factors will be developed for all other identified compounds. The use of relative response factors provides a means for relating the response of a compound of interest, for which no calibration data is obtained, to that of a similar compound which is included in the calibration effort. The concentrations of unidentified compounds may be reported as equivalent concentrations of known materials eluting from the column during the same time period. These techniques are standard approaches for the quantification of complex matrices in other media.

The results obtained will be reported in concentration terms of µg/L on a wet-gas basis. These data, coupled with moisture determinations and flow rate measurements, will permit

WESTON to calculate the emission rates from each source on a pounds per hour basis for each compound.

4.2.4. Total Hydrocarbon Analysis Using EPA Method 25A

Total hydrocarbon emission testing will be conducted in accordance with Method 25A and using an FID analyzer. Three one-hour sampling runs will be conducted at each location.

Samples will be withdrawn continuously at a single point and conveyed to the FID through a heated Teflon sample line. All hydrocarbon measurements will be made on a "hot, wet" basis. The sampling probe will be made of PTFE and heated electrically (~120°C) to maintain the sample temperature above the dew point. The probe will be plumbed directed to an electrically heated (~120°C) Teflon filter. Heated thick-walled ⅜-inch Teflon sample lines will be used to transfer the sample gas form the sampling locations to the THC analyzers located in the mobile laboratory. These sample lines and in-line Teflon filters for particulate removal will be heated to ~130°C.

A J.U.M. VE-7 will be used to determine the total hydrocarbon concentration in the source gas. This analyzer utilizes a flame ionization detector (FID) as required by Method 25A. In the FID, the combustion of hydrocarbons in a hydrogen flame results in the generation of ions and electrons, which enter an electrode gap, decrease the gas resistance, and permit a current flow in an external circuit. The current is directly proportional to the carbon content of the molecules in the gas stream. The technique is not selective between species and the results are reported as volume equivalents of the calibration gas (propane in nitrogen).

At the beginning of each test day, the instrumental measurement system will be leak checked. Then the analyzers will be calibrated with program using a minimum of three certified calibration gases (zero and two upscale). This step will be followed by a calibration error check utilizing two or three certified gases. The acceptance criterion for the calibration error check will be less than five percent of the certified gas value.

Immediately following each three-hour run, zero and span gases will be introduced into the sampling system to check for drift. The drift must be within three percent of span. All instrumental results will be drift corrected.

The data acquisition system (DAS) to be employed for this test program uses a portable computer with a 20 MB hard disk and an internal 12-bit analog-to-digital converter with a 16-channel multiplexer. In addition to providing an instantaneous display of analyzer responses, the DAS compiles and averages the analyzer data collected once each second, calculates emission rates, and documents analyzer calibrations. Test data will be reduced to provide one-hour averages for each of the three one-hour sampling periods. In addition, a total hydrocarbon trend plot will be generated for each three-hour period.

4.2.5. Chlorine, Chlorine Dioxide and Chloroform Sampling and Analysis Using NCASI Methodology

Chlorine, chlorine dioxide and chloroform will be measured on selected sources in accordance with NCASI methodologies. Samples will be withdrawn from the source at a flow rate of approximately 200 mL/min through a probe and Teflon line to two midget impingers in series. The two impingers will each contain 10 mL of potassium iodide (KI) solution, buffered with potassium dihydrogen phosphate (KH_2PO_4) and sodium hydroxide (NaOH). The sample flow rate will be measured at the probe inlet with a calibrated rotameter before and after each run.

The outlet of the second impinger will be connected to an activated charcoal adsorbent tube to collect any chloroform present. The outlet of the charcoal tube will be connected to the sample pump inlet.

After sampling, the probe will be removed from the source and washed with 2 mL of deionized water which will be collected in the first impinger. The sample train will then be purged for 15 minutes with ambient air filtered through a charcoal tube.

The contents of the impingers will be combined in a flask and titrated with sodium thiosulfate solution to the first endpoint (Tn). Five mL of ten percent sulfuric acid solution will be added, and the titration will be continued to the second endpoint (Ta). Concentrations of chlorine and chlorine dioxide will be calculated using the number of moles of each detected during the titration and the gas volume collected.

The charcoal tubes will be sealed and placed on ice to preserve them until shipment to the WESTON Laboratory in Auburn, Alabama. The charcoal tubes will be desorbed in hexane to prepare them for analysis. Standards will be prepared and used to measure the instrument response. The concentration of chloroform will be measured by gas chromatography using an electron-capture detector (GC/ECD).

4.2.6. Formaldehyde Sampling and Analysis Using Draft Research Triangle Institute Method

The formaldehyde sampling and analysis will be conducted in accordance with the Research Triangle Institute (RTI) procedure described in "Development and Validation of a Test Method for Formaldehyde Emissions" dated April 1989 and prepared under contract to EPA. Samples will be withdrawn from the source at a flow rate of 0.5 to 1.0 liter per minute through a Teflon probe electrically heated to ~120°C. The probe outlet will be connected to a series of four midget impingers maintained in an ice bath. The first two impingers will each contain 20 mL of 2,4 - Dinitrophynylhydrazene in acetonitrile and acidified with perchloric acid. The third impinger will be empty and the fourth impinger will contain a known amount of silica gel (~10g). The outlet of the last impinger will be plumbed to the inlet of a dry gas meter. The dry gas meter outlet will be plumbed to the vacuum side of a diaphragm pump.

Each sample run will be one hour in duration. At the end of each run the impinger contents will be weighed, combined, and mixed. The sample will be transferred to an amber VOA vial and shipped to the Johnson Research Center at the University of Alabama in Huntsville for analysis by high performance liquid chromatography.

4.2.7. Hydrogen Chloride Sampling and Analysis Using EPA Method 26

Hydrochloric acid will be sampled at all select locations in accordance with EPA Method 26. Samples will be withdrawn from the source at a flow rate of 0.5 to 1.0 liter per minute through a PTFE probe which is electrically heated to ~120°C. The probe outlet will be plumbed directly to a PTFE filter which is electrically heated to ~130°C. The filter outlet will be plumbed to a series of five impingers maintained in an ice bath. The first impinger will be empty. The second and third impingers will be charged with 20 mL of 0.1 N H_2SO_4. The fourth impinger will be charged with 20 mL of 0.1 N NaOH. The fifth impinger will be charged with 20 grams of indicating silica gel.

Each source will be sampled for 60 minutes. At the end of each run the contents of the first three impingers will be rinsed into a glass container with a Teflon-lined cap. The sample will be shipped to the Johnson Research Center at the University of Alabama in Huntsville for chloride analysis by high performance liquid chromatography. The contents of the fourth and fifth impingers will be discarded after recording any data necessary for moisture calculations.

4.2.8. Semivolatile Organic Compound Sampling and Analysis Using EPA Modified Method 5 (SW846 Method 0010)

Select sources will be sampled to evaluate semivolatile organic compound (SVOC) emission rates. SVOC sampling will be conducted in accordance with SW-846 Method 0010 (Modified Method 5). Two runs will be performed on each source. It is anticipated that each sampling run will require 60 minutes.

The impinger train will be assembled in the sample recovery area. The pre-cleaned impingers are assembled with the first impinger being an empty knockout impinger with a short stem. The purpose of this impinger is to collect the majority of the condensate which forms in the condenser coil and XAD resin module. The next two impingers are standard type Greenberg-Smith impingers, each containing 100 mL of deionized water. The fourth impinger is empty and the fifth charged with 300 grams of blue indicating silica gel. The fiber glass filter is placed in a filter holder and connected to the coil and XAD resin module. The train components are then transferred to the sampling location and assembled completely.

After the train is assembled, the heaters are switched on along with the sorbent module/condenser coil recirculating pump. When the system reaches the appropriate temperature (~30 minutes), a leak check is performed. During sampling, the temperature of the sorbent module resin must not exceed 70°F. The probe temperature shall be maintained above 212°F, the filter temperature will be controlled at 248°F±25°F, and the outlet of the silica gel impinger will be maintained at less than 68°F during operation.

The sampling train will be leak-checked at the beginning and end of the run and each port change. However, if a train component is exchanged, leak checks shall be conducted prior to and following the component exchange. An acceptable leak rate is less than 0.02 acfm at the highest vacuum measured plus one inch of Hg or less than 1.5 percent of the sampling rate.

After a successful pre-test leak check, the train assembly will be placed in the stack and operated along each of the traverse points for each of the two horizontal axes. The sample shall be collected for a total of one hour using a sampling rate between 0.5 and 0.75 scfm to collect approximately 30 scf. Sampling train data will be recorded on standard data forms.

During the one of the runs, a MM5 field blank train will be assembled with glassware that has been previously used for MM5 sampling. This train will be charged exactly as the other MM5 trains and left at a sampling location during the test run. The field blank train will then be recovered with the other MM5 train for that run. The field blank results will be used to assess the level of contamination that occurs from handling, charging, recovering, and transporting the sampling train.

Note that certain sources will not accommodate the modified method five train as an integral unit. In these instances, the sampling train will be split into the hot and cold sections. A suitable length of Teflon tubing will be used to connect the heated train module to the iced train module. At the completion of a run, any condensate present in the length of tubing used to connect the two modules will be rinsed into the first impinger.

The MM5 sampling trains will be recovered following the procedures described in SW846 M0010. Liquid samples will be placed in pre-cleaned amber glass sample containers with Teflon™ liners. The filters will be placed in pre-cleaned glass petri dishes or amber glass sample containers. The sample containers for the various train fractions are listed in below.

CONTAINER	FRACTION
1	Probe, nozzle front half MeOH/$MeCl_2$ rinse
2	Glass fiber filter
3	Solvent rinses of filter housing back half, filter support, condenser coil and connecting glassware.
4	XAD sorbent module

5	Impingers contents
6	Solvent rinse of impingers and connecting glassware
7	Silica gel

Reagent blank samples will be collected as follows:

REAGENT	AMOUNT	FRACTION	NUMBER OF BLANKS
HPLC Water	300 mL	CON	2
Methanol/Methylene Chloride	200 mL	PR, BH	2
XAD Sorbent Module[a]	N/A	-----	1
Glass Fiber Filter[b]	N/A	-----	1

[a]XAD sorbent module will be randomly selected from the on-site XAD Modules used for the test program.

[b]One glass fiber filter is required for each train blank.

Duplicate blank samples will be retained. The second set of blanks will be archived for future examination, if contamination is determined. A lab method blank will also be analyzed by TLI that will consist of using the control XAD blank that was withheld during the XAD module preparation phase.

The MM5 semi-volatile samples will be analyzed by Triangle Laboratories, Inc. Analysis in accordance with SW-846 Method 8270. The methanol/methylene chloride front half (fh) probe rinse will be concentrated to about 2 mL using a Kudema-Danish (KD) apparatus and then combined with the filter in a soxhlet apparatus. A set of 8 Base/Neutral/Acid (BNA) surrogates along with the above labeled standards will be spiked into the Soxhlet at 100 ug levels. The combined filter and FH rinses will then be soxhlet extracted with methylene chloride for 16 hours (Fraction A).

The methanol/methylene chloride back half rinses (BHR) will be concentrated to about 2 mL using a KD apparatus and then combined with the XAD resin in a soxhlet apparatus. The eight BNA surrogates along with the labeled standards will be piked into the soxhlet and then the combined XAD and BHR will be soxhlet extracted with methylene chloride for 16 hours (Fraction B).

The impinger water will be spike with the eight BNA surrogates and labeled standards at 100 ug levels and then liquid-liquid extracted with methylene chloride (Fraction C).

Each extract is dried over sodium sulfate, concentrated to a volume of five mL, cleaned using gel permeation chromatography (GPC) and concentrated to one mL. Internal standards are added to the extract, and a one µL aliquot of the extract is injected into the gas chromatograph (GC). The organic compounds are separated by high resolution GC (HRGC) and detected by low resolution mass spectrometer (LRMS).

4.2.9. Volatile Organic Compound Sampling and Analysis Using SW846 Method 0030

Select sources will be sampled in accordance with SW846 0030 Methodology to determine the emission rates of volatile organic compounds. Three runs will be performed on each sampled source. The run time and sampling flow rate will be based on preliminary total hydrocarbon analytical data to optimize loading of the solid sorbent media present in the SW846 0030 sampling train.

The volatile organic sampling train will be assembled as required by Method SW846-0010. Samples will be collected using paired Tenax and Tenax/charcoal cartridges, with each cartridge preceded by a condensing module. The first condenser cools the gas stream and condenses the water vapor present. The flue gas and condensed moisture then pass through a cartridge containing 1.5 grams of Tenax resin (60-80 mesh). The condensate is collected in an impinger that is continually purged by the gas stream. The second condenser and cartridge containing Tenax/charcoal serves as a backup for low volume breakthrough compounds. Following the second cartridge is a silica gel drying tube for residual moisture removal.

The system will be leak-checked by closing the valve at the inlet to the first condenser and evacuating the system at 10 inches Hg. The system will then be isolated and the leak rate noted. The leak rate must be less than 1 inch Hg after one minute. The train will be returned to atmospheric pressure by purging through a charcoal tube. The leak checks will be conducted before and after each pair of VOST tubes is collected.

Gas sample temperatures will be monitored at the outlet of the sampling probe and the inlet to the Tenax cartridge using thermocouples. The gas temperature through the probe will be maintained above 130°C to prevent the premature condensation of the volatile components. The temperature of the gas through the resin cartridges will be maintained at less than 20°C.

Sample recovery activities for the VOST will include:

- leak-checking system as required,
- capping the VOST cartridges.
- placing the cartridges in their original glass culture tubes with glass wool to absorb shock,
- measuring the volume of the condensate impinger with a precleaned graduated cylinder (after final pair of tubes for the run),

- transferring the measured condensate volumes to 40 mL VOA vials and diluting the volume of HPLC water to decrease headspace and reduce the possibility of revolatilization of the compounds, and

- reducing reactivity by storing samples at 4°C.

The samples collected during each VOST run should consist of four pairs of sorbent tubes (Tenax cartridge, Tenax/charcoal cartridge), and the condensate.

One pair of Tenax and Tenax/charcoal cartridges will serve as field blanks. The pair will be taken to the sampling site and the end caps removed for the period of time required to exchange two pairs of traps on the VOST. After the VOST traps have been exchanged, the end caps will be replaced on the field blanks, and they will be stored and analyzed with the field samples.

A second pair of blank cartridges will be included in the cartridge shipment to the test site. These trip blanks will be treated like the other cartridges except that the end caps will not be removed during storage at the site. These will also be analyzed with the field samples.

One pair of blank cartridges, a laboratory blank, will remain stored in the laboratory. This blank will only be analyzed if the field or trip blanks show high contaminant concentrations.

The volatile organic contents of each cartridge and condensate sample will be thermally desorbed onto a gas chromatographic column (GC). The Tenax "front" cartridge will be analyzed separately from the Tenax/charcoal cartridge; likewise the condensate fractions will also be analyzed separately. Prior to sample recovery, the contents of the sorbent cartridges will be spiked with a deuterated standard as well as other unlabeled internal standards that are similar to the analytical characteristics of the compounds of interest. Following spiking, the solvent cartridge contents will be thermally desorbed using an inert gas which is then bubbled through organic-free water. The desorbed components pass into the bottom of the water column where they are purged from the water, and collected on an adsorbent trap. After completion of the desorption, the compounds are described from the adsorbent trap onto a gas chromatographic column.

For the condensate sample, the sample fraction will be spiked with the same internal standards listed above. Afterward, an inert gas is bubbled through the solution at ambient temperature and the volatile compounds are transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the volatile compounds are trapped. After purging has been completed, the sorbent column is heated and backflushed with inert gas to desorb the components onto a gas chromatographic column.

The volatile organic CAA compounds and the 8240 target compounds of interest will be analyzed following the procedures specified in EPA Reference Methods 5040A and 8240 of the SW-846 guidance manual. Library identifications for the non-target compounds will be performed using both the CAA and 8240 (NBS) libraries.

Following the procedures outlined in Method 8240, the volatile compounds are directed into the GC/MS system. The volatile compounds are separated by temperature programmed gas chromatography and detected by low-resolution mass spectrometry. The concentrations of the volatile compounds of interest are calculated using the labeled and unlabeled internal standard technique.

Quantitative analysis is performed in one of four ways by GC/MS using extracted ion current profile (EICP) areas:

(1) For compounds where standards and labeled analogs are available, the GC/MS system is calibrated and the compound concentration is determined using an isotope dilution technique.

(2) For compounds where authentic standards but no labeled compounds are available, the GC/MS system is calibrated and the compound concentration is determined using an internal standard technique.

(3) For compounds where standards are not available, compound concentration are determined using known response factors.

(4) For compounds for which neither standards nor known response factors are available, compound concentrations are determined using the sum of the EICP areas relative to the sum of the EICP areas of the internal standard.

4.2.10. Multiple Metals Sampling and Analysis Using Multiple Metals Train

Select sources will be sampled for multiple metals in accordance with the EPA Draft Methodology for the determination of metals emissions in exhaust gases from stationary source combustion processes. The sampling train is comprised of heated probe and filter (~250°F), a series of six impingers, a sample flow control system, and a stack gas velocity measurement system.

A calibrated borosilicate nozzle will be attached to a heated (~250°F) borosilicate probe. The probe will be connected to a heated (~250°F) borosilicate filter holder with Teflon filter support containing a Pallflex® type 2500 9-cm quartz fiber filter. The filter holder will then be connected to the first of six impingers by a rigid borosilicate connector. The first impinger will be empty, the second and third impingers will each contain 100 mL of nitric acid (HNO_3)/hydrogen peroxide (H_2O_2) solution, the fourth and fifth impingers will each contain 100 mL of freshly acidified potassium permanganate $KMnO_4$ and the sixth impinger will contain 300 grams of dry preweighed silica gel. The third impinger is a standard Greenburg-Smith type, and all other impingers are of a modified design with the exception of the dry impinger which has no impinger stem. All impingers will be maintained in a crushed ice bath. A Nutech control console with a leakless vacuum pump, a calibrated dry gas meter, a calibrated orifice, and inclined manometers will be connected to the final impinger via an umbilical cord to complete the train.

Filter chamber and impinger exit gas temperatures will be monitored with a calibrated direct readout pyrometer equipped with chromel-alumel thermocouples positioned in the heated chamber around the filter and in the sample gas stream after the last impinger, respectively.

Flue gas velocity was measured with a calibrated "S" type pitot tube (provided with extensions) fastened along side the sampling probe. Flue gas temperature was monitored with a calibrated direct readout pyrometer equipped with a chromel-alumel thermocouple positioned near the sampling nozzle.

At the conclusion of each test, the sampling train will be dismantled, the openings sealed, and the components shipped to the WESTON Laboratory in Auburn, Alabama for analysis. Field recovery procedures are outlined below.

1. The quartz filter will be removed from its holder with plastic tweezers and placed in its original container (plastic petri dish) along with any loose particulate and filter fragments (sample type 1).

2. The particulate adhering to the internal surfaces of the borosilicate nozzle, probe and front half of the filter holder will be rinsed with 0.1 N $HN0_3$ into a borosilicate container while brushing a minimum of three times with a non-metallic (Teflon) brush until no visible particulate remained. Particulate adhering to the brush will be rinsed with the 0.1N $HN0_3$ into the same container. The container will be sealed with a Teflon-lined closure (sample type 2).

3. The total volume of HNO_3/H_20_2 and condensate in impingers 1, 2 and 3 will be measured to the nearest milliliter and the value recorded. The liquid will then be placed in a borosilicate container along with a nitric acid rinse of the impingers, connectors, and back half of the filter holder. The container will be sealed with a lid fitted with a Teflon liner (sample type 3).

4. The total volume of the four percent KM_nO_4 and condensate in impingers 4 and 5 will be measured to the nearest milliliter and the value recorded. The liquid will then be placed in a borosilicate container along with a 100 mL potassium permanganate and 20 mL 8N HCl rinse of the impingers and connectors. The container will be sealed with a Teflon-lined lid (sample type 4).

5. The silica gel will be removed from the last impinger and immediately weighed to the nearest tenth gram. The weight gain will be recorded.

6. Nitric acid and potassium permanganate blank samples will be placed into borosilicate/Teflon containers for analysis.

Each container will be labeled to clearly identify its contents. The height of the fluid level will be marked on the container of each liquid sample to determine whether or not leakage occurred during transport.

Samples collected for metals analysis are contained in four different media:

Front Half Nitric Acid
Filter
Back Half Nitric Acid
Potassium Permanganate Solution (Acidified)

The front half nitric acid and the filter samples are combined in the laboratory for analysis. The back half nitric acid impingers are treated as a separate sample as is the acidified potassium permanganate sample. After the front half nitric acid and the filter samples are combined, the metals are solubilized by the addition of nitric acid and 30 percent hydrogen peroxide. Sample volume is reduced to 50 mL on a hot plate. The sample is then brought to 300 mL final volume with 100 mL being split off for Hg analysis and the remaining 200 mL being analyzed for Atomic Absorption Spectroscopy (AAS) and Inductively Coupled Argon Plasma (ICP) metals. The back half impinger solution is treated similarly to the front half acetone/filter combination. The sample is solubilized in nitric acid and 30 percent hydrogen peroxide and reduced to 50 mL final volume. The sample is then diluted and split for mercury and AAS/ICP metals.

The acidified potassium permanganate samples are analyzed for mercury only. The volume of the samples are reduced to 100 mL and analyzed directly for mercury.

Following digestion, the samples are ready for analysis. Arsenic, selenium and lead are analyzed by graphite furnace atomic absorption spectrometry while the remaining metals chromium, cadmium, nickel, cobalt, beryllium, antimony, and manganese were analyzed by ICP-AAS. Mercury was quantified by Cold Vapor Atomic Absorption Spectroscopy (CVAAS). The remaining metals are quantified by graphite furnace atomic absorption spectroscopy or inductively coupled argon plasma spectroscopy.

At the conclusion of each NO_x grab sample acquisition period, the flask was sealed then transported to the field laboratory.

4.2.11. Hexavalent Chromium Sampling and Analysis Using Hexavent Chromium Train

The sampling train that will be utilized to perform the hexavalent chromium will follow the Determination of Hexavalent Chromium Emissions From Stationary Sources, (EPA/530 SW-91-010 December 1990 test procedure).

A calibrated borosilicate or Teflon® nozzle will be attached to an unheated Teflon® line probe. The probe will be connected directly to the first of five impingers. The first impinger will contain 150 mL of 0.1 N potassium hydroxide (KOH) solution. The second and third impingers will each contain 75 mL of the 0.1 N KOH solution. The fourth impinger will be dry. The fifth impinger will contain 300 grams of dry pre-weighed silica gel. Impingers one, two, three, and four will be constructed of Teflon®. Impinger five will be borosilicate. All impingers will be of the modified design.

A peristaltic pump will be used to recirculate KOH solution between the first impinger and a Teflon® T-union positioned between the probe exit and first impinger. A ¼" Teflon® line will transport the KOH solution through the T-Union up to the sample probe end near the nozzle. The KOH solution will be discharged near the sample nozzle, will mix with the sampled gas, and flow back through the probe to the first impinger.

To complete the train, a Nutech® control console with a leakless vacuum pump, a calibrated dry-gas meter, a calibrated orifice, and inclined manometers will be connected to the final impinger via an umbilical cord.

Impinger exit-gas temperature will be monitored with a calibrated direct-readout pyrometer, equipped with chromel-alumel thermocouples positioned in the sample gas stream after the last impinger.

Flue-gas velocity will be measured with a calibrated "S" type pitot tube (provided with extensions) which will be strapped to the sampling probe. Flue-gas temperature will be monitored with a calibrated direct-readout pyrometer, equipped with a chromel-alumel thermocouple positioned near the sampling nozzle.

Each Cr^{6+} test run will be at least two hours in duration and $\geq$ 60 dscf sample volume.

At the conclusion of each test, the sample train will be dismantled. The openings of all components sealed and the components transported to the field laboratory.

A consistent procedure will be employed for sample recovery:

1. The impingers (1 through 4) will be purged with nitrogen at a rate of 10 L/min for a period of 30 minutes.

2. After the N_c purge, the pH of the first impinger will be measured with a pH meter and recorded.

3. The impinger solution will be measured to the nearest mL and the value recorded. The impinger liquid, plus a distilled water wash of the impingers and connectors will be placed in a 1,000-mL polyethylene container (sample type 1).

4. The internal surfaces of the nozzle, probe and KOH recirculation lines will be washed with distilled water. The distilled water wash will be added to sample type 1.

5. Sample type 1 will then be filtered through a 0.45 micron acetate filter into a 1,000-mL graduated cylinder. The filter holder and filter will be rinsed with distilled water into the same graduated cylinder.

6. The total volume of sample type 1 will be measured and returned to the original sample container. The container will be sealed.

7. The silica gel will be removed from the last impinger and immediately weighed to the nearest tenth (0.1) gram. The weight gain will be recorded.

8. Field blanks of the 0.1 N KOH and distilled water will be placed into separate plastic containers for analysis.

Each container will be labeled to clearly identify its contents. The height of the fluid level will be marked on the outside of each container. All samples will be placed into a sealed shipping crate, then transported to the laboratory under chain-of-custody for analysis.

The impinger and distilled water rinses (sample type 1) and associated blank samples will be analyzed for Cr^{6+} content by ion chromatography equipped with a post-column reaction and a visible reactor.

4.2.12. Sulfuric Acid Mist Sampling and Analysis Using NCASI Methodology

Sulfuric acid emission testing will be performed in accordance with the NCASI procedure for measurement of sulfuric acid mist in a kraft process gas stream. The procedure is essentially a modification of the EPA Method 6 train and relies on filtration of particulate sulfates followed by selective condensation of sulfuric acid. Other sulfur species are captured in the isopropanol-water and hydrogen peroxide impingers that comprise the Method 6 component of the train.

Gas is extracted from the source through a glass probe which is electrically heated to 500°F. The probe outlet is connected to a glass fiber filter which is also heated to 500°F. The filter assembly outlet is plumbed to a Graham condenser which is maintained at 170°F by means of circulating heated water. A glass frit at the outlet of the condenser serves to trap condensed sulfuric acid. The outlet of the condenser is then plumbed to a standard Method 6 train comprised of five impingers. The first impinger in the series contains 80 percent isopropanol in water; the second and third impingers contain 6 percent hydrogen peroxide is water; the fourth impinger is empty and the fifth impinger contains a known quantity of silica gel. The outlet of the last impinger is plumbed to a dry gas meter which plumbed to a diaphragm pump.

The source is sampled at a rate of 1 liter per minute for a period of 30 to 60 minutes. At the end of each run, the condenser is removed and quantitatively rinsed with deionized water to recover the sulfuric acid. An aliquot of the recovered sample will be placed into a polyethylene container and shipped to the WESTON laboratory for analysis using titrimetric procedures.

Impinger contents will be measured for moisture calculations and the dry gas meter volume will be recorded. The filter media and contents of all impingers will be discarded unless a field decision is make to recover the impinger contents for sulfur dioxide analysis.

SECTION 5. QUALITY ASSURANCE APPROACH

WESTON's policy is to provide quality services to its clients in a cost-effective manner. Quality assurance (the core ingredient to the continued viability and well being of the Company) contributes to a high degree of client satisfaction, a high professional reputation, and cost-effective financial and project management.

5.1. WESTON'S QUALITY ASSURANCE POLICY

WESTON has established an operating practice which discusses the importance of and the company's commitment to quality assurance. It provides the framework for more detailed procedures which are to be developed ;and implemented by the various work center managers, the Project Technical Review Team and his staff, the Project Manager, and the Team Leaders. This operating practice establishes basic responsibilities and provides the authorities and general guidelines relative to project quality control, including the implementation and monitoring of detailed quality control procedures by the operating divisions. A quality control plan will be established and implemented as a part of the project work plan.

Quality Assurance (QA) may be defined as planning and actions taken in providing confidence to WESTON that the services provided meet the project's objectives. Quality assurance is quality control plus program management to ensure that proper quality objectives are established and that quality control procedures are effectively implemented.

Quality Control (QC) may be defined as maintaining a specified level of quality through the application of various control procedures, such as plans, checks, and reviews.

Therefore, quality assurance is extremely broad and consists of virtually everything we do in the planning and execution of a project. It begins during work scope preparation when the project scope and WESTON and client responsibilities are developed and defined. Quality assurance is not simply seeing that a final review of a report is made prior to its submission.

5.2. QUALITY ASSURANCE OBJECTIVES

Quality may be characterized as the meeting of a project's defined objectives, including schedule. For example, a report that does not meet the defined objectives cannot be considered of high quality, even though it may be accurate, complete, well presented, and contain state-of-the-art graphics. In addition to specific technical objectives, such factors as timeliness, degree of completeness, accuracy, compatibility, applicability, reliability, presentability, cost-effectiveness, operability, constructability, etc., must also be considered.

Project QA objectives are as follows:

- Scientific data generated will be of sufficient quality to stand up to scientific and legal scrutiny.

- Data will be gathered or developed in accordance with procedures appropriate for the intended use of the data.

- Data will be of known or acceptable precision, accuracy, representativeness, completeness, and comparability within the limits of the project.

WESTON will utilize an in-house, but separate, quality assurance team to ensure that these studies are performed in a manner which will produce data that meets the goals of the project. Due to the nature of the data use, WESTON anticipates that a high degree of quality control will be required. This quality control will involve the analysis of blind spike samples or gas samples from cylinder or bags, as appropriate for each method.

The Phase 1 screening effort was intended primarily to identify those compounds that are present, prior to performing the quantitative studies in Phase 2. As a result, the strict QC procedures normally associated with the VOST and S-VOST methods were not performed in their entirety. Field blanks were prepared and analyzed to identify any compounds that are present as a result of sorbent handling or laboratory contamination. No contamination was found.

The purpose of the Phase 2 testing is to quantify the VOC emissions for the various paper mills. Since the results of these efforts will be used by the Texas Air Control Board (TACB) to establish baseline values for VOC emissions from the pulp and paper industry, a significant level of QA/QC is planned. The data gathered will include species specific concentrations and emission rates from the major sources at each facility. Quality control for this effort will involve the collection of duplicate samples, preparation of spiked samples, and analysis of standard reference materials.

Quality control procedures to be applied to this effort are dependent on the phase of the effort to which they are applied. Quality control activities for the Phase 1 screening effort significantly differs from that of the quantitative effort in Phase 2. The specific details of these efforts are described in the following paragraphs.

5.3. QUALITY CONTROL METHODS FOR SCREENING SAMPLES (PHASE 1)

The quality control procedures that were employed for the screening studies include the basic quality control steps that the EPA is currently employing in similar studies within the pulp and paper industry. The VOST samples were collected on specially prepared Tenax and Tenax/charcoal tubes. These tubes were obtained from the test laboratory performing the analyses. QC procedures for this effort involve the preparation of field blanks to document the level of contamination that may be introduced in the samples through handling, transport and storage. The laboratory ran these and lab blanks to indicate the presence of any compounds detected due to laboratory contaminants. In addition, matrix spikes were prepared by placing a known quantity of selected compounds on the Tenax traps. These were analyzed to provide a measure of the recovery of compounds from the sorbent tubes. All recoveries were acceptable.

The quality control approach for semi-volatile sampling required a similar effort. The MM5 procedure entails the collection of a sample of stack gas by drawing it through a standard pre-cleaned filter of a Method 5 train followed by cooling of the sample and passage of the gas through a cartridge XAD-2 resin. The XAD-2 resin was obtained from the analytical laboratory, and it has been specially treated and pre-cleaned prior to its use. Field blanks and spiked sorbents were used to validate the results in the same manner as for the VOST samples.

5.4. QUALITY CONTROL FOR QUANTITATIVE METHODS (PHASE 2)

The quality control procedures utilized for the quantitative effort in Phase 2 are far more important and far more detailed than those selected for Phase 1. The planned QC efforts entail use of the following techniques:

- Analysis of external standards on a daily basis.
- Analysis of spiked samples prepared in bags.
- Analysis of matrix spiked samples collected in bags.
- Analysis of EPA reference materials.
- Analysis of blind samples provided by NCASI.
- Analysis of duplicate samples.
- Performance of recovery studies through the sampling system.
- Analysis of audit gases provided by TACB.

Table 5.1 summarizes the quality control steps for the continuous sampling procedures. Since the routine Method 16, Method 25A and Method 18 procedures are being performed as real-time, direct-interface techniques, the use of procedures such as replicate and duplicate samples is not practical. The use of an internal standard is also not believed to be practical, since there is no reliable procedure for introducing such a material into the sample stream for FID analysis. WESTON estimates that the QC methods described above will require that the field team spend approximately 10 percent of the total analysis time performing QC efforts. The details of the QC approach are described in the following sections.

TABLE 5.1. SUMMARY OF QUALITY CONTROL FOR CONTINUOUS SAMPLING METHOD

METHOD	COMPOUND(S)	QUALITY CONTROL PROCEDURES
Method 16	Reduced Sulfur	• Calibrate w/certified permeation devices daily • Verify calibration curve after every three hours of sampling • Perform sample system recovery w/ H_2S after every three hours of sampling
Method 18	VOC	• Determine response factor and retention time for 15 expected compounds with respect to propane. • Check calibration curve and retention time for three compounds before and after each three hours of sampling. • Audit systems with propane standard before and after each three hours of sampling. • Perform system recovery study with methanol, chloroform and pinene once per day. • Perform limited methanol sampling using absorption procedure • Perform limited chloroform using adsorption procedure.
Method 25A	THC	• Calibrate daily with three concentrators of propane. • Perform systems bias check after every three hours of sampling.

5.4.1. Determination of the Method Detection Limits

The instrument response for the Method 16 GC/FPD technique will be established based on the analysis of different concentrations of standards, producing multi-point calibration curves for each parameter. These standards will be prepared using certified permeation devices which emit the compounds of interest at a known standard rate. The different concentrations are then produced by the dilution of these materials with varying volumes of diluent gas. A permeation system including dilution gas flow measuring capability will be placed in the mobile laboratory and will be used for this purpose. The method is clearly established within EPA guidelines and the working range and limits of detection for the method are generally well known. WESTON will analyze sufficient samples to confirm that the limits of detection cited are correct for the system as it is operated, and that the working range of the detector is not exceeded.

For the Method 18 analyses, the methods are less clear. Column technologies must be developed which will provide adequate separation of the components of interest within a reasonable time frame. As the column technologies are developed, calibration curves will be run for each component of interest, as identified through the Phase 2 sampling effort. Certain compounds were identified earlier as candidates since their presence in these processes is already known or suspected. The limit of detection for these compounds depends on the nature of the individual compound. Compounds having a fewer number of carbons will have higher limits of detection on a parts per million basis. For example, the limit of detection for methanol will be less than ten percent of that of pinene, if all other factors are equal. WESTON will determine the limit of detection for each compound following the guidance provided in proposed EPA Method 301. This Method includes techniques for establishing the detection and quantitation limit values for analytical methods developed for use in air toxics analyses.

5.4.2. Field QC Procedures

WESTON anticipates that during the course of the field work, calibration standards containing every component of interest will not be analyzed on a daily basis. WESTON will verify the detector response utilizing selected compounds which are readily resolved and from which standards can be reliably prepared. Due to the necessity of utilizing a solvent and liquid injections for calibration purposes, calibration for compounds eluting during certain portions of the chromatogram may not be performed in the field. WESTON will select the compounds of interest based on the methods as they are developed. It is anticipated that three components will be used in the liquid standards to verify the calibration of the instrumentation. The calibration of the instrument will be verified at least three times per day; at the beginning of the work day, prior to collection of any sample, at mid-day or approximately six hours after the initial calibration, and at the end of each day or no later than 12 hours after the initial calibration.

In addition to checks of the calibration curve using liquid standards, WESTON will perform an instrument calibration using a series of gas standards containing methanol. These gas standards will serve to verify that the overall sample collection system is performing properly. WESTON will analyze a methanol sample by injection through the gas sampling system directly at the gas chromatograph, on the same time schedule as for the liquid samples. On a daily basis, WESTON will challenge the entire sampling system by introducing a gaseous sample at a point near the tip of the sampling probe to test the entire sampling and conditioning system. An alternate cylinder gas standard such as methane or propane may be required to do this test. This will be determined during the methods development stage. A recovery test will also be performed at least once per week using a bag sample spiked with a selection with a selection of the compounds of interest covering the retention time range for the sources studied. This sample will be analyzed at the GC and through the sampling system to verify that all of its components are being transferred to the analytical system.

WESTON will verify retention times by preparation of a series of gas standards, each containing a group of the compounds expected to be present in the sample. Some of these, such as methanol, are stable for extended periods in cylinders but others, such as pinenes, can not be prepared in cylinder gases. Therefore, this standard will be used for retention time purposes only. A gas bag, made of Tedlar or similar material, will be used. A known volume of each of the liquids of interest will be injected into the bag and a known volume of air will be added, such that the concentrations may be calculated within the prescribed limits. However, experience has shown that such standards do not always provide reliable results for quantitative purposes due to wall loss and reactivity of certain components. This sample will be analyzed using the gas sample loops to determine the retention time of the key components.

WESTON requests that the TACB provide one or more cylinder gas standards to the TPIEC group for use as blind standards for accuracy checks. Such standards are available through the EPA Standards Repository in Research Triangle Park, North Carolina. WESTON suggests that the standard contain compounds of interest such as methanol, acetone, or isopropanol. WESTON will analyze this standard at least once for each facility. Wherever possible, WESTON will analyze the reference standard on a weekly basis to determine the accuracy of calibration. The results of these analyses will be used to determine the accuracy of the calibration curves generated in the preliminary stage of this effort.

Since the analytical techniques to be employed in this effort are real-time, the use of internal standards, duplicate analyses, and spiked samples is not normally practical. WESTON will rely on external standards and the results of analysis of standard reference materials for determining the accuracy of the data collected. At certain sampling locations, only one source may be sampled at any given time, but there will be two full sets of instrumentation within the mobile laboratory. Where such opportunities present themselves, WESTON will perform duplicate analysis using the dual-column GC/FID system planned for the project. At these times, WESTON will collect samples from one source using both instruments and both sampling systems for three sampling runs. Results of these studies will demonstrate the reproducibility of the data from the two sampling systems.

Quality assurance techniques specified for other sampling and analysis methods which may be run, such as the formaldehyde analysis, will follow the recommendations made in the EPA method. For formaldehyde analysis, laboratory analysis of collected samples is necessary. To demonstrate the accuracy of the laboratory analysis, WESTON will provide spiked samples to the laboratory intermixed with the actual samples. The results of these analyses will be used to determine the accuracy of the laboratory results. WESTON will also sample and analyze any standard reference materials that may be provided and provide results top the client group and the state agency.

Other quality control techniques will be implemented as time permits and as the research and development effort indicates appropriateness. WESTON anticipates that these QC procedures will be revised somewhat during the methods research and development process. Revisions to the QC approach will be provided for review on a timely basis during this period, to ensure that the data gathered will be of the quality required by both the TPIEC group and the TACB.

5.4.3. NCASI Quality Assurance Procedures

NCASI staff will be assisting the Quality Assurance activities by providing technical expertise for auditing the WESTON effort. As a minimum, the following assistance and activities are expected:

1. NCASI staff will audit field operation. This would entail an on-site inspection and/or independent review of the QA data.

2. For tests at each sampling site, NCASI will provide blind spiking standards and/or audit samples for acetone, chloroform, methanol, method 18 compounds, and VOST train.

3. NCASI will perform split sample analyses for methanol, acetone, chloroform, and formaldehyde on selected sources at two or more facilities.

4. NCASI will perform an audit of the laboratory which is used for analyzing the VOST samples.

5.5. DATA MANAGEMENT

WESTON has structured this project to eliminate, to the greatest extent possible, any external data manipulation. However, certain values, such has stack flow, cannot be reliably measured with other than manual techniques; hence data verification steps are required for these measurements. All instrumental methods will result in the capture of analytical data directly to the data system. The results will be stored without manipulation by the analyst. All chromatograms will be examined after the runs have been completed to determine whether the integration and peak separation are adequate for the purpose. Once this is done, the data will be validated and will be used to calculate concentrations and emission rates. Both the Method 18 and the Method 16 GCs are directly interfaced to these data systems so the possibility of typographical errors is minimize or eliminated.

All manual calculations or manual data entry steps will be performed by one individual and checked by a second individual before the data are accepted into the system. Once this has been done, standard spreadsheets are used throughout to convert the actual manual measurements, such as temperature, moisture, and velocity head, to stack velocity and to stack flows. These values are then entered into other spreadsheets containing the concentration data for the compounds of interest. These standard spreadsheets have been developed and verified for the accuracy of all equations used. Once the flow rate information is entered, all other data will not require manipulation outside of the computer, so data verification is not required.

All results will be reviewed for reasonableness prior to release by a WESTON person or person not directly associated with the data collection effort. WESTON will establish a telephone modem link between the field personnel and the project QC reviewer, who will be located in the WESTON Auburn, Alabama offices. The project QC reviewer will examine the data collected, spot check the calibration and the concentration data that are acquired for each spreadsheet, and approve the data for release. Once this step has been completed, the data will be released to the client on a day to day basis. Once this step has been completed, the data will be released to the client on a day to day basis. WESTON anticipates that a 24-48 hour delay will normally be encountered between the completion of a day's data collection and the release of data to the client.

APPENDIX A. SOURCES TO BE TESTED AND PROJECT SCHEDULE

MILL SOURCE TESTED	SOURCE CODE	FIN	EPN	CIN
SIMPSON - PASADENA				
TPIEC-POOLED SOURCES				
Travel & Setup				
Gas-fired Power Boilers				
Marine Boiler A	SP-PBMBA	PN2301	SN47	NA
Marine Boiler B	SP-PBMBB	PN2302	SN48	NA
Recovery Furnace (Cyclone) No.7	SP-RF7	PN1310	SN17	CN1311 & 2
Smelt Dissolving Tank Vent	SP-SDTV7	PN1313	SN18	CN1314
MILL-SPECIFIC SOURCES				
Lime Kiln	SP-LK	PN1414	SN22	CN1420
Thermal Oxidation Plant Vent	SP-TOPV	PN1606	SN27	CN1607 & 8
NCG Bypass Scrubber Vent	SP-NCGBS	PN1606	SN28	CN1609
Softwood Bleach Plant (11 vents)				
Extraction Tower Vent	SP-BPSETV	PN2130	SN56	NA
Extraction Washer Vent	SP-BPSEWV	PN2131	SN57	NA
Extraction Seal Box Vent	SP-BPSESB	PN2132	SN58	NA
First NaOCl Tower Vent	SP-BPSFHT	PN2133	SN59	NA
First NaOCl Washer Vent	SP-BPSFHW	PN2134	SN60	NA
First NaOCl Seal Box Vent	SP-BPSFHS	PN2135	SN61	NA
Combined Chlorination Scrubber Vent	SP-BPSCCS	PN2128	SN80	CN2129
Combined ClO2 Scrubber Vent	SP-BPSCSV	PN2138	SN81	CN2139
Second NaOCl Tower Vent	SP-BPSSHT	PN2140	SN62	NA
Second NaOCl Washer Vent	SP-BPSSHW	PN2141	SN63	NA
Second NaOCl Seal Box Vent	SP-BPSSHS	PN2142	SN64	NA
Hardwood Bleach Plant (11 vents)				NA
Chlorination Washer Vent	SP-BPHCWV	PN2151	SN66	NA
Extraction Washer Vent	SP-BPHEWV	PN2155	SN68	NA
Extraction Seal Box Vent	SP-BPHESB	PN2156	SN69	NA
First NaOCl Washer Vent	SP-BPHFHW	PN2158	SN71	NA
First NaOCl Seal Box Vent	SP-BPHFHS	PN2159	SN72	NA
ClO2 Tower Scrubber Vent	SP-BPHCTS	PN2160	SN73	CN2161
ClO2 Washer Vent	SP-BPHDWV	PN2162	SN74	NA
Second NaOCl Washer Vent	SP-BPHSHW	PN2166	SN75	NA
Second NaOCl Seal Box Vent	SP-BPHSHS	PN2167	SN76	NA
Chlorination Seal Box Scrubber Vent	SP-BPHCSS	PN2152	SN88	CN2153
ClO2 Seal Box Scrubber Vent	SP-BPHCSB	PN2163	SN89	CN2164

MILL	SOURCE TESTED	SOURCE CODE	FIN	EPN	CIN
TEMPLE - INLAND (Evadale)					
TPIEC-POOLED SOURCES					
	Travel & Setup				
	Gas-fired Power Boiler	TI-PBGF	P-6	1	511
	Recovery Furnace (Non-Contact)	TI-RF2	P-7	2	617 & 9
	Brown Stock Washer SW Line (3 vents)				
	BSW Vent No 4	TI-BSWV4	P-2 SW	4	NONE
	BSW Vent No 5	TI-BSWV5	P-2 SW	5	NONE
	BSW Vent No 6	TI-BSWV6	P-2 SW	6	NONE
	Brown Stock Washer HW Line (3 vents)				
	BSW Vent No 1	TI-BSWV1	P-2 HW	1	NONE
	BSW Vent No 2	TI-BSWV2	P-2 HW	2	NONE
MILL-SPECIFIC SOURCES					
	No. 6 Power Boiler	TI-PB6	P-6	50	131001 261001
	NCG Incinerator Stack	TI-INCNCG	P-12	60	012 & 013
	Bleach Plant 1 Scrubber Outlet	TI-BPSO1	P-3	11-1	134a&135a
	Bleach Plant 2 Scrubber Outlet	TI-BPSO2	P-3	11-2	134b&135b
	Bleach Plant 3 Scrubber Outlet	TI-BPSO3	P-3	11-3	134c&135c
	Lime Kiln Mud Washer Vent No 3	TI-LKMW	P-9	43-MW	NONE
	One sewer manhole area (possibly)	TI-SMA	P-13	Mn.Hle	NONE

MILL	SOURCE TESTED	SOURCE CODE	FIN	EPN	CIN
INLAND - ORANGE					
TPIEC-POOLED SOURCES					
	Travel & Setup				
	Lime Kiln w/ NCGs	IO-LK/1	P-LIMK	11	C-28
	Lime Kiln w/o NCGs	IO-LK/2	P-LIMK	11	C-28
MILL-SPECIFIC SOURCES					
	Bark Boiler	IO-BB	P-BARKB	02	C-33
	"B" Brown Stock Washer Hood Vent	IO-BSWBHV	P-BSWB	17	-
	"B" Brown Stock Washer Filtrate Vent	IO-BSWBFV	T-BFILT	60	40
	NCG System at Lime Kiln	IO-NCGLK	Note a	99	-
	NCG Blow Heat Recovery Vent	IO-NCGBHR	Note b	99	-
	NCG Multi-Effect Evap. Hotwell Vent	IO-NCGEHV	Note c	99	-
	NCG Chemiwasher Filtrate Tank Vent	IO-NCGCFT	T-CWFLT	100	-
	NCG Chemiwasher Hood Vent	IO-NCGCHV	P-CW	100	-
	Tall Oil Reactor Stack	IO-TORV	P-TOR	12	C-31
	Lime Kiln Mud Washer Vent	IO-LKMWV	T-MWASH	41	-

Note a: T-ABLOW/T-BBLOW/T-TURDE/T-COMBC/P-MEEC

Note b: T-ABLOW/T-BBLOW/T-TURDE

Note c: T-COMBC/P-MEEC

MILL	SOURCE TESTED	SOURCE CODE	FIN	EPN	CIN
CHAMPION - LUFKIN					
TPIEC-POOLED SOURCES					
	Travel & Setup				
	Brown Stock Washer Vent A	CL-BSWA	G-4	G-4(a)	-
	Brown Stock Washer Vent B	CL-BSWB	G-4	G-4(b)	-
	Lime Kiln w/ NCGs	CL-LK/1	79-1	79-1	260012
	Lime Kiln w/o NCGs	CL-LK/2	79-1	79-1	260012
CHAMPION-POOLED SOURCES					
	Gas Turbine Exhaust	CL-GT	G-6	G-6	-
	Lime Kiln (added parameters)	CL-LK	79-1	79-1	260012
MILL-SPECIFIC SOURCES					
	Recovery Furnace	CL-RF	81-1	81-1	351019
	Smelt Dissolving Tank Vent	CL-SDTV	81-2	81-2	351020
	Combined Evap. and Stripper NCG Vent	CL-NCGESV	79-11	E11	-
	Blow Heat Recovery NCG Vent	CL-NCGBHR	79-11	B10	-
	Chlorine Tower Vent	CL-BPCLTV	BLPT-1	12-2	-
	Chlorine Decker Hood Vent (1)	CL-BPCDHV	BLPT-1	12-8	-
	Hypo Decker Hood Vent (1)	CL-BPHDHV	BLPT-1	12-5	-
	Chlorine Seal Pit Vent (1)	CL-BPCLSP	BLPT-1	12-7	-
	Caustic Tower Vent	CL-BPCTV	BLPT-1	12-1	-
	Caustic Seal Pit Vent	CL-BPCSPV	BLPT-1	12-11	-
	Caustic Steam Mixer Vent	CL-BPCSMV	BLPT-1	12-12	-
	Brown Stock Head Box Vent	CL-BPBSHB	BLPT-1	12-13	-

MILL SOURCE TESTED	SOURCE CODE	FIN	EPN	CIN
CHAMPION - SHELDON				
TPIEC-POOLED SOURCES				
Travel & Setup				
Tall Oil Reactor Vent	CS-TORV	7100	E41	-
Black Liquor Oxidation Vent	CS-BLOV	5000	E35	-
Recovery Furnace (Casc) w/ NaOAc	CS-RF/1	5000	E40	EC13,PN5005
Recovery Furnace (Casc) w/o NaOAc	CS-RF/2	5000	E40	EC13,PN5005
Smelt-Dissolving Tank Vent	CS-SDTV	5000	E41	EC14
CHAMPION-POOLED SOURCES				
No. 1 Bark Boiler w/ Sludge	CS-BB1/1	5200	E40	EC22, EC21
No. 1 Bark Boiler w/o Sludge	CS-BB1/2	5200	E40	EC22, EC21
Groundwood, Old Grinder	CS-GWOG	-	-	-
Groundwood, New Grinder	CS-GWNG	3000	FE	-
Groundwood, Coarse Screen Vent	CS-GWCSV	-	-	-
MILL-SPECIFIC SOURCES				
NCG Vent at Lime Kiln	CS-NCGLK	7200	E74	-
TMP No. 1 Preheater Vent	CS-TMP1PH	2000	E9A	-
TMP No. 2 Preheater Vent	CS-TMP2PH	2000	E9B	
TMP Drainer Pressate Tank	CS-TMPDCW	2000	E9C	-
Chlorine Scrubber Vent	CS-BPCSV	4500	FE26A	EC4
Caustic Washer Hood Vent	CS-BPCWV	4500	FE26B	-
Caustic Seal Tank Vent	CS-BPCSTV	-	-	-
Hypo Washer Vent	CS-BPHWV	4500	EC26C	-
Hypo Seal Tank Vent	CS-BPHSTV	-	-	-
Hypo Tower Vent	CS-BPHTV	-	-	-
Caustic Vent	CS-BPCV	-	-	-

Inter-Office Memorandum

WESTON
MANAGERS DESIGNERS/CONSULTANTS

Auburn Operations

IF IT'S NOT DOCUMENTED
IT DIDN'T HAPPEN

TO:	Staff TPIEC Project		
FROM:	Bruce B. Ferguson BBF	DATE:	20 April 1992
PROJECT:	TACB Emissions Speciation Study	W.O. NO.:	6848-01-01-0021
SUBJECT:	Project Coding		
ACTION:	Follow Established Codes.		

We have established a standard coding system for all sources, samples, files, runs, etc. Please use the standards throughout the project.

1. The following mill codes have been established:

Champion-Lufkin	CL
Champion-Sheldon	CS
Inland-Orange	IO
Simpson-Pasadena	SP
Temple-Inland	TI

2. The source codes are given on the attached pages. The mill code should always be used with the source identified for the source code.

   - If additional sources are identified for testing during the project, or if an error is found in the assigned codes, contact Bruce Ferguson for a code.
   - If a source has more than one vent, use an A or B at the end of the source code to ensure that the source code is unique to the TACB identified for the source.
   - Note the TACB identifiers for the sources.

FIN	Facility Identification Number
EPN	Emission Point Number
CIN	Control Identification Number

3. A slash/followed by a number will be used to identify different operating conditions on the same source (i.e. CL-LK/1 and CL-LK/2 indicates the Champion-Lufkin lime kiln with and without NCG's, respectively.

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RFW 04-08-004/A-5/85

4. Standard Spreadsheet Templates will be used to calculate all parameters. The following designators will be used:

Designator	Template Name	Spreadsheet Use
E	EMISVOC	M18, M16, M25A Data
P	PROCESS	Process Data
V	VOST	VOST Data
S	SEMIVOST	Semivost Data
M	METALS	Metals Data
O	OTH EMIS	Other Miscellaneous Parameters

5. Spreadsheets will be stored under a mill subdirectory (i.e. CS\ ) using the following scheme:

CS\E1BSWA

- Brown Stock Washer Vent A
- Operating Condition 1
- M16, M18, M25A Data
- Champion-Sheldon

- Data spreadsheets stored on the office LAN will be under \A503\68480101 subdirectory also.
- All administrative and management spreadsheets will be stored under the \A502\68480101 subdirectory.

6. Samples will be identified using the source code - parameter/date/run number.

CS-BSWA/1-CHCL3/0422/1A

- Fraction A (closest to source)
- Run 1 for Day
- Date - Month (04) and Day (22)
- Parameter (see below for list of std)
- Condition 1
- Source Code

- If the sample has multiple fractions, add a letter (A,B,C etc.) after the run number. Begin with A for the fraction closest to the source. (For example, A for probe wash, B for filter, C for impingers.
- If the fraction has multiple containers, use the same sample number but write 1 of 3, 2 of 3, 3 of 3, etc.
- The following standard abbreviations will be used for parameter:

Abbreviation	Parameter
M16	Reduced Sulfur or TRS
M18	VOC Compounds by GC
M25A	THC by FID
VOST	VOST Volatile Organic Sampling Train
MM5	Semi-VOST by MM5
CH20	Formaldehyde and Other Aldehydes
METL	Multi Metals
CR+6	Hexivalent Chromium
HCL	Hydrochloric Acid
ACID	Sulfuric Acid
CHCL3	Chloroform
MEOH	Methanol
PART	Particulate
NOX	Nitrogen Oxides
SO2	Sulfur Dioxide
CO	Carbon ~~Dioxide~~ Monoxide
O2	Oxygen
CO2	Carbon Dioxide

- Abbreviations for additional parameters that may be needed can be assigned by the Field Team Leader. All personnel involved should be notified of the abbreviation.

jb

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Phase 2 TACB Emissions Speciation Study
6848-01-01 Current 3/27/92

No. Test Days	WEEK OF	4/13	4/20	4/27	5/4	5/11	5/18	5/25 No Test	6/1	6/8	6/15	6/22	6/29 No Test	7/6	7/13	7/20	7/20	7/27
15	Champion-Lufkin				------	-===---												
			BBBBBB	BBBBBB	BBB													
15	Champion-Sheldon		==	==														
						BBBBBB	BBB	....	BBBBBB									
20	Simpson-Pasadena			=======														
						CCCCCC	CCC	....	CCCCCC	CCCCC								
17	Inland-Orange	---		-------	--													
											CCCC	CCC	....	CCCCCC	CCC			
21	Temple-Inland			------	-						BBBBBB	BBB		---	------			
									=	======			....	BBBBBB	BBBBBB			

------ Partial Mill Outage
====== Total Mill Outage
BBBBBB Test Team "B"
CCCCCC Test Team "C"

J:\123DATA\A502\68480101\PH2SCH

APPENDIX B. PHASE 2 SCOPE OF WORK

MILL / SOURCE TESTED	SOURCE CODE	M16 TRS	M18 M25A	VOST	MM5	CH2O	METL	Cr+6	HCl	ACID MIST	Chlo form	SCRB H20
		Phase 2										
SIMPSON - PASADENA												
TPIEC-POOLED SOURCES												
Travel & Setup												
Gas-fired Power Boilers												
Marine Boiler A	SP-PBMBA		Y			Y						
Marine Boiler B	SP-PBMBB		Y			Y						
Recovery Furnace (Cyclone) No.7	SP-RF7	Y	Y	Y	Y	Y						
Smelt Dissolving Tank Vent	SP-SDTV7	Y	Y	Y	Y							
MILL-SPECIFIC SOURCES												
Lime Kiln	SP-LK	Y	Y			Y						
Thermal Oxidation Plant Vent	SP-TOPV	Y	Y			Y						
NCG Bypass Scrubber Vent	SP-NCGBS	Y	Y									
Softwood Bleach Plant (11 vents)												
Extraction Tower Vent	SP-BPSETV		Y						Y		Y	
Extraction Washer Vent	SP-BPSEWV		Y						Y		Y	
Extraction Seal Box Vent	SP-BPSESB		Y						Y		Y	
First NaOCl Tower Vent	SP-BPSFHT		Y						Y		Y	
First NaOCl Washer Vent	SP-BPSFHW		Y						Y		Y	
First NaOCl Seal Box Vent	SP-BPSFHS		Y						Y		Y	
Combined Chlorination Scrubber Vent	SP-BPSCCS		Y						Y		Y	
Combined ClO2 Scrubber Vent	SP-BPSCSV		Y						Y		Y	
Second NaOCl Tower Vent	SP-BPSSHT		Y						Y		Y	
Second NaOCl Washer Vent	SP-BPSSHW		Y						Y		Y	
Second NaOCl Seal Box Vent	SP-BPSSHS		Y						Y		Y	
Hardwood Bleach Plant (11 vents)												
Chlorination Washer Vent	SP-BPHCWV		Y						Y		Y	
Extraction Washer Vent	SP-BPHEWV		Y						Y		Y	
Extraction Seal Box Vent	SP-BPHESB		Y						Y		Y	
First NaOCl Washer Vent	SP-BPHFHW		Y						Y		Y	
First NaOCl Seal Box Vent	SP-BPHFHS		Y						Y		Y	
ClO2 Tower Scrubber Vent	SP-BPHCTS		Y						Y		Y	
ClO2 Washer Vent	SP-BPHDWV		Y						Y		Y	
Second NaOCl Washer Vent	SP-BPHSHW		Y						Y		Y	
Second NaOCl Seal Box Vent	SP-BPHSHS		Y						Y		Y	
Chlorination Seal Box Scrubber Vent	SP-BPHCSS		Y						Y		Y	
ClO2 Seal Box Scrubber Vent	SP-BPHCSB		Y						Y		Y	

		Phase 2										
MILL / SOURCE TESTED	SOURCE CODE	M16 TRS	M18 M25A	VOST	MM5	CH2O	METL	Cr+6	HCl	ACID MIST	Chlo form	SCRB H2O
TEMPLE - INLAND (Evadale)												
TPIEC-POOLED SOURCES												
Travel & Setup												
Gas-fired Power Boiler	TI-PBGF		Y			Y						
Recovery Furnace (Non-Contact)	TI-RF2	Y	Y	Y		Y						
Brown Stock Washer SW Line (3 vents)												
BSW Vent No 4	TI-BSWV4	Y	Y	Y								
BSW Vent No 5	TI-BSWV5	Y	Y									
BSW Vent No 6	TI-BSWV6	Y	Y									
Brown Stock Washer HW Line (3 vents)												
BSW Vent No 1	TI-BSWV1	Y	Y	Y								
BSW Vent No 2	TI-BSWV2	Y	Y									
MILL-SPECIFIC SOURCES												
No. 6 Power Boiler	TI-PB6		Y			Y	Y					
NCG Incinerator Stack	TI-INCNCG	Y	Y									
Bleach Plant 1 Scrubber Outlet	TI-BPSO1		Y								Y	
Bleach Plant 2 Scrubber Outlet	TI-BPSO2		Y								Y	
Bleach Plant 3 Scrubber Outlet	TI-BPSO3		Y								Y	
Lime Kiln Mud Washer Vent No 3	TI-LKMW	Y	Y									
One sewer manhole area (possibly)	TI-SMA	Y	Y									

MILL / SOURCE TESTED	SOURCE CODE	M16 TRS	M18 M25A	VOST	MM5	CH2O	METL	Cr+6	HCl	ACID MIST	Chlo form	SCRB H2O
		Phase 2										
INLAND - ORANGE												
TPIEC-POOLED SOURCES												
Travel & Setup												
Lime Kiln w/ NCGs	IO-LK/1	Y	Y	Y								Y
Lime Kiln w/o NCGs	IO-LK/2	Y	Y									
MILL-SPECIFIC SOURCES												
Bark Boiler	IO-BB		Y	Y	Y	Y		Y	Y			
"B" Brown Stock Washer Hood Vent	IO-BSWBHV	Y	Y	Y								
"B" Brown Stock Washer Filtrate Vent	IO-BSWBFV	Y	Y									
NCG System at Lime Kiln	IO-NCGLK	Y	Y									
NCG Blow Heat Recovery Vent	IO-NCGBHR	Y	Y									
NCG Multi-Effect Evap. Hotwell Vent	IO-NCGEHV	Y	Y									
NCG Chemiwasher Filtrate Tank Vent	IO-NCGCFT	Y	Y									
NCG Chemiwasher Hood Vent	IO-NCGCHV	Y	Y									
Tall Oil Reactor Stack	IO-TORV	Y	Y									
Lime Kiln Mud Washer Vent	IO-LKMWV	Y	Y									

Note a: T-ABLOW/T-BBLOW/T-TURDE/T-COMBC/P-MEEC

Note b: T-ABLOW/T-BBLOW/T-TURDE

Note c: T-COMBC/P-MEEC

MILL / SOURCE TESTED	SOURCE CODE	Phase 2 M16 TRS	M18 M25A	VOST	MM5	CH2O	METL	Cr+6	HCl	ACID MIST	Chlo form	SCRB H2O
CHAMPION - LUFKIN												
TPIEC-POOLED SOURCES												
Travel & Setup												
Brown Stock Washer Vent A	CL-BSWA	Y	Y									
Brown Stock Washer Vent B	CL-BSWB	Y	Y									
Lime Kiln w/ NCGs	CL-LK/1	Y	Y	Y								Y
Lime Kiln w/o NCGs	CL-LK/2	Y	Y	Y								Y
CHAMPION-POOLED SOURCES												
Gas Turbine Exhaust	CL-GT					Y						
Lime Kiln (added parameters)	CL-LK					Y	Y		Y			
MILL-SPECIFIC SOURCES												
Recovery Furnace	CL-RF						Y		Y	Y		
Smelt Dissolving Tank Vent	CL-SDTV						Y					
Combined Evap. and Stripper NCG Vent	CL-NCGESV	Y	Y									
Blow Heat Recovery NCG Vent	CL-NCGBHR	Y	Y									
Chlorine Tower Vent	CL-BPCLTV		Y						Y		Y	
Chlorine Decker Hood Vent (1)	CL-BPCDHV		Y						Y		Y	
Hypo Decker Hood Vent (1)	CL-BPHDHV		Y						Y		Y	
Chlorine Seal Pit Vent (1)	CL-BPCLSP		Y						Y		Y	
Caustic Tower Vent	CL-BPCTV		Y						Y		Y	
Caustic Seal Pit Vent	CL-BPCSPV		Y						Y		Y	
Caustic Steam Mixer Vent	CL-BPCSMV		Y						Y		Y	
Brown Stock Head Box Vent	CL-BPBSHB		Y						Y		Y	

MILL / SOURCE TESTED	SOURCE CODE	Phase 2 M16 TRS	M18 M25A	VOST	MM5	CH2O	METL	Cr+6	HCl	ACID MIST	Chlo form	SCRB H2O
CHAMPION - SHELDON												
TPIEC-POOLED SOURCES												
Travel & Setup												
Tall Oil Reactor Vent	CS-TORV	Y	Y	Y								
Black Liquor Oxidation Vent	CS-BLOV	Y	Y	Y								
Recovery Furnace (Casc) w/ NaOAc	CS-RF/1	Y	Y	Y		Y		Y				
Recovery Furnace (Casc) w/o NaOAc	CS-RF/2	Y	Y			Y		Y				
Smelt-Dissolving Tank Vent	CS-SDTV	Y	Y									
CHAMPION-POOLED SOURCES												
No. 1 Bark Boiler w/ Sludge	CS-BB1/1		Y	Y	Y	Y	Y		Y	Y		
No. 1 Bark Boiler w/o Sludge	CS-BB1/2		Y	Y	Y	Y	Y		Y	Y		
Groundwood, Old Grinder	CS-GWOG		Y									
Groundwood, New Grinder	CS-GWNG		Y									
Groundwood, Coarse Screen Vent	CS-GWCSV		Y									
MILL-SPECIFIC SOURCES												
NCG Vent at Lime Kiln	CS-NCGLK	Y	Y									
TMP No. 1 Preheater Vent	CS-TMP1PH		Y									
TMP No. 2 Preheater Vent	CS-TMP2PH		Y									
TMP Drainer Pressate Tank	CS-TMPDCW		Y									
Chlorine Scrubber Vent	CS-BPCSV		Y						Y		Y	
Caustic Washer Hood Vent	CS-BPCWV		Y						Y		Y	
Caustic Seal Tank Vent	CS-BPCSTV		Y						Y		Y	
Hypo Washer Vent	CS-BPHWV		Y						Y		Y	
Hypo Seal Tank Vent	CS-BPHSTV		Y						Y		Y	
Hypo Tower Vent	CS-BPHTV		Y						Y		Y	
Caustic Vent	CS-BPCV		Y						Y		Y	

APPENDIX C. PROCESS PARAMETERS TO BE RECORDED DURING TESTING

APPENDIX C. PROCESS PARAMETERS TO BE RECORDED

Digesters

Batch or Continuous
Wood Species
Production Rate
Active Alkali
Sulfidity
Temperature
Pressure
Kappa no. of Pulp (Identify Where Measured)

Brown Stock Washers

Pulp Flow
Shower Water Temperature and Flow Rate, Source
Vat Temperatures

Black Liquor Oxidation Systems

Liquor Na_2S Content, Inlet and Outlet
Liquor Flow Rate
Liquor Volume in the Tank
Air Flow Rate
Liquor Temperature, In and Out
Liquor Solids Content

Recovery Furnaces

Type, Manufacturer, When Constructed, When Modified
Liquor Firing Rate
Sulfidity (Green Liquor) - Total Alkali Basis
Primary, Secondary, Tertiary Air
Excess Air or O_2 in Furnace
Make-up Chemicals and Addition Rates
CO in the Furnace at 8% O_2, NO_x, SO_2 if Measured, TRS
Liquor Chloride Content
Liquor Btu Content

APPENDIX C. PROCESS PARAMETERS TO BE RECORDED (Continued)

Smelt Dissolving Tanks

BLS Firing Rate
Source of Scrubbing Liquid
Scrubbing Liquid Flow Rate
Pressure Drop
Scrubber Type (4 Mesh Pads - Thickness, Density)

Lime Kilns

Btu/ton Product
Fuel Type and Firing Rate
Production Rate (tons lime (CaO)/hr)
Particulate Control Device
Solids Content of Mud
Na_2S and Soda Content of Mud
Hot and Cold End Temperatures
Oxygen Content, CO in the Kiln, NCG Burning, Kiln Dimensions, Chain Section
Scrubber Make-up Solution Source, Volume
Scrubber Pressure Drop
Scrubbing Solution Recirculation Rate
NO_x, Other CEM Data

Bleach Plants

Bleaching Sequence
Wood Species
Production Rate
Kappa Number
Chemical Usage (Cl_2, ClO_2, NaOH, NaOCl, O_2 in E Stage, pH in Towers, etc.)
Percent ClO_2 Substitution
Tower Temperatures and Retention Times
CE Kappa Number

APPENDIX C. PROCESS PARAMETERS TO BE RECORDED (Continued)

Bleach Plant Scrubbers

Scrubber Type (Design Information)
Scrubbing Medium (White Liquor, Weak Wash, Caustic, etc.)
Flow Rate (Liquid and Gases)

Power Boilers

Boiler Type
Fuel Type
Fuel Firing Rate
Excess Air or O_2 in the Economizer
CEM Data
Fuel Btu Content, Moisture Content

Tall Oil Plants

Production Rate
Scrubber Parameters, Solution, Flow Rate
Cooking Time
Acid/Oil Ratio

Incinerators

CEM Data
Fuel Type, Rate, Characteristics
Gas Flow Rates
CO and O_2
Scrubber Parameters
Sources of NCG
Combustion Temperature, Retention Time

APPENDIX D. CONTACT AND DISTRIBUTION LIST

DISTRIBUTION LIST
TACB EMISSIONS SPECIATION STUDY
10 APRIL 1992
6848-01-01

I. TEXAS PAPER INDUSTRY ENVIRONMENTAL COMMITTEE

Simpson Pasadena Paper Company (SP)
Pasadena, TX

TPIEC Contact
Mr. Don Padfield
Simpson Pasadena Paper Company
901 N. Shaver
Pasadena, TX 77506
Phone: (713) 475-6257
Fax: (713) 475-6390

Corporate Contact
Mr. David L. Brooks
Simpson Pasadena Paper Company
P.O. Box 637
21091 Hawes Road
Anderson, CA 96007-0637
Phone: (916) 378-6429
Fax: (916) 378-6409

Mill Contact
Mr. A. J. Navarre
Simpson Pasadena Paper Company
901 N. Shaver
Pasadena, TX 77506
Phone: (713) 475-6269
Fax: (713) 475-6390

Mill Contact
Mary (Don's Secretary)
Simpson Pasadena Paper Company
901 N. Shaver
Pasadena, TX 77506
Phone: (713) 475-6441
Fax: (713) 475-6390

Champion International Corporation (CS)
Sheldon, TX

TPIEC Contact
Mr. James W. Cutbirth
Champion International Corporation
11611 Fifth Street
Sheldon, TX 77044
Phone: (713) 456-6975
Fax: (713) 456-6940

Corporate Contact
Mr. Charles H. Ayer
Champion International Corporation
1 Champion Plaza
Stamford, CT 06921-0001
Phone: (203) 358-7117
Fax: (203) 358-7407

Mill Contact
Mr. Louis Sverio
Champion International Corporation
11611 Fifth Street
Sheldon, TX 77044
Phone: (713) 456-6939
Fax: (713) 456-6940

DISTRIBUTION LIST
TACB EMISSIONS SPECIATION STUDY
10 APRIL 1992
6848-01-01
(Continued)

Champion International Corporation (CL)
Lufkin, TX

TPIEC Contact
Ms. Bonnie Blickhahn
Champion International Corporation
Lufkin Mill Highway, 1303 East
P.O. Box 149
Lufkin, TX 75902-0149
Phone: (409) 633-1589
Fax: (409) 633-1234

Corporate Contact
Mr. Charles H. Ayer
Champion International Corporation
1 Champion Plaza
Stamford, CT 06921-0001
Phone: (203) 358-7117
Fax: (203) 358-7407

Mill Contact
Ms. Bonnie Blickhahn
Champion International Corporation
Lufkin Mill Highway, 1303 East
P.O. Box 149
Lufkin, TX 75902-0149
Phone: (409) 633-1589
Fax: (409) 633-1234

DISTRIBUTION LIST
TACB EMISSIONS SPECIATION STUDY
10 APRIL 1992
6848-01-01
(Continued)

Inland Orange Inc. (IO)
Orange, TX

TPIEC/Corporate Contact
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Appendix B

WESTON
MANAGERS DESIGNERS CONSULTANTS

APPENDIX B. RESULTS OF NCASI AUDIT SAMPLES - M18 AND VOST

WEST COAST REGIONAL CENTER
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NATIONAL COUNCIL OF THE PAPER INDUSTRY FOR AIR AND STREAM IMPROVEMENT, INC.

December 16, 1992

TO: Bruce Ferguson

FROM: Alex Gholson AG

SUBJECT: Performance Audit Results For the Texas Mill Study to be Included in a TAPPI Presentation

The following is a brief discussion of the preparation of the audit samples, the analytical procedures, and the results of the performance audit that NCASI conducted during the Texas Mill Study. This can also be provided in Wordperfect magnetic media if that would be helpful. I have been asked to remind you that the paper needs to be reviewed by Ashok Jain for mill approval before submittal, and I would also like to have the opportunity to review the final version.

Please give me a call if you have and questions or need any additional material for the paper.

For Inclusion Into Texas Mill Study TAPPI Paper

Preparation of Method 18 Audit Samples

In addition to requesting EPA audit samples for this program, additional performance checks were desired both to determine the performance of the measurements for more compounds than those available from EPA, and to have the information sooner with more detail than the pass/fail provided with the EPA audit program. It was hoped that these audit samples could provide the necessary feedback so that corrections in the sampling program could be made during the study. The level of validation that exists for the EPA audit program was not possible for this study, but a sample made from standards independent of those used to calibrate the Method 18 instrument would be useful. Certified gas standards for the compounds of interest were not available for the first two sampling episodes of this study so standards were prepared in the NCASI laboratory and sent to the field for analysis.

For the first two episodes, Champion-Lufkin and Champion-Sheldon/Simpson-Pasadena, standards were prepared in an 18-L passivated stainless steel tank. The tank was certified as clean, evacuated, and spiked with a known volume of a gravimetrically prepared solution of the compounds of interest. An injection port from a GC was heated to 150°C and attached to the inlet of the tank. A 30 mL/min purge of nitrogen was passed through the injection port while a known volume of standard solution was injected. An injection of 100 µL of water preceded the injection of the standard solution to insure passivation of the tank. After injection and additional purging, the tank was allowed to pressurize to approximately 30 psig with nitrogen. The exact pressure was then recorded, and the theoretical analyte concentrations were calculated using ideal gas law equations.

For the third sampling episode, Inland-Orange/Temple-Inland, a certified gas standard obtained from a specialty gas company (Airco) was available for the audit. A clean 18-L stainless steel tank was evacuated, injected with 100 µL of water and then filled with the certified gas standard. The certified concentration was assumed to be the concentration of the prepared sample because no dilution had occurred.

Laboratory measurement of audit samples

Before sending the samples into the field, they were analyzed by NCASI, and for the first two audit samples, they were analyzed again when they returned. The analyses were performed in an attempt to validate the theoretical concentrations and to determine if the standard was stable over the audit period. Methanol in the audit samples was analyzed by passing 500 mL of the sample through a silica gel trap. The trapped methanol was eluted from the silica gel with water and analyzed by direct aqueous injection into a gas chromatograph with a flame ionization detector (GC-FID). The FID response was calibrated with aqueous methanol standards using 2-propanol as an internal standard. Recovery of methanol was determined to be greater than 98 percent, and no methanol was detected on the back half of the silica gel tube confirming that no breakthrough had occurred.

The remaining compounds in the audit sample were analyzed by injecting 2 mL from the tank with a gas tight syringe into a cryogenically cooled trap. The trap was thermally desorbed into a gas chromatograph/mass spectrometer (GC/MS). A gas mixture containing the internal standards was injected and trapped with the sample. The GC/MS analyses were calibrated using multi-level standards prepared in the same manner as the audit samples except different standard solutions were used for injection into the tanks and different dilutions were performed. Ideally an independent calibration procedure would have been used for the verification analyses, but none was available at the time of the study.

Method 18 Analysis and Reporting

The audit sample was sent to the field with instructions for analysis. The sample line to the onsite-GC was connected to the tank with a stainless steel fitting and a metering valve and purged with the standard. The standard was then analyzed in the same manner as the vent samples analyzed for the study. The results were calculated by the same procedures used during the study, and the results were reported to NCASI. The contractors performing the audit sample analysis did not know the levels in the audit sample.

Results of Audit Sample Analyses

Tables 1-3 list the composition of the three Method 18 audit samples and both the NCASI measured concentration and the results of the Method 18 analysis. The bias of the measurements was based on the theoretical concentrations for the first two audit samples and the certified concentration for the third audit sample. The verification measurements were not used because of the high variability found in the non-methanol measurements. The relative standard deviations were greater than 10 percent for all the compounds analyzed by GC/MS and as high as 38 percent. A consistently negative bias was also found in the GC/MS verification measurements. Methanol did not show a consistent bias. Because methanol was analyzed with good agreement by a separate method and high variability was found in the GC/MS results, it was concluded that the negative bias was more likely the result of the GC/MS analysis than the standard preparation. Comparing the before audit and after audit sample analysis, no significant difference (greater than two standard deviations) could be found for any compound except α-pinene which showed a drop in concentration after the Champion-Lufkin audit. Other standards prepared and analyzed regularly using this technique, have shown good stability for the non-monoterpene audit compounds for several months. Terpene loss, particularly β-pinene, has been seen occasionally and appears to be a function of poor tank passivation.

TABLE 1 METHOD 18 AUDIT SAMPLE RESULTS FROM CHAMPION LUFKIN

Compound	Theoretical	Measured		Method 18 Audit	
	Conc. (ppmv)	Conc.[a] (ppmv)	Bias (%)	Conc. (ppmv)	Bias (%)
Methanol	71.9	72.0 (1.8)	0.1	70.2	-2.3
Dimethyl sulfide	10.0	7.4 (1.9)	-26.1	11.1	11.0
Methylene chloride	11.4	6.1 (1.4)	-46.0	NA	
2-Butanone (MEK)	8.00	7.2 (2.1)	-10.0	4.28	-34.0
Chloroform	9.08	3.4 (0.5)	-62.7	7.62	-16.3
Toluene	6.88	3.7 (1.4)	-46.0	6.72	-2.6
α-Pinene	4.59	3.0 (1.1)	-33.7	4.63	0.7

[a] Average concentration with standard deviation in parenthesis.
NA is for not a target analyte.

TABLE 2 METHOD 18 AUDIT SAMPLE RESULTS FROM CHAMPION SHELDON AND SIMPSON PASADENA

Compound	Theoretical Conc. (ppmv)	Measured Conc.[a] (ppmv)	Measured Bias (%)	Method 18 Audit: Sheldon Conc. (ppmv)	Sheldon Bias (%)	Pasadena Conc. (ppmv)	Pasadena Bias (%)
Chloromethane	30.7	25.9 (1.9)	-15.6	NA		NA	
Methanol	97.6	117	20.0	108.1	10.8	104.9	7.5
Acetone	23.8	19.8 (2.4)	-16.9	36.31	52.6	38.24	60.7
Dimethyl sulfide	6.09	4.6 (0.3)	-24.3	7.78	27.9	8.09	32.8
2-Butanone (MEK)	19.5	15.9 (1.3)	-18.6	NR		NR	
Chloroform	2.79	1.9 (0.2)	-30.9	NR		2.99	7.2
Benzene	5.02	3.2 (0.4)	-36.1	5.98	19.1	6.37	26.9
Dimethyl disulfide	4.99	2.3 (0.4)	-54.3	6.33	26.9	6.14	23.0
Toluene	4.18	2.9 (0.5)	-31.7	6.09	45.7	5.62	34.4

[a] Average concentration with standard deviation in parenthesis.
NA is for not a target analyte.
NR is for not reported.

TABLE 3 METHOD 18 AUDIT SAMPLE RESULTS FROM INLAND-ORANGE AND TEMPLE INLAND

	Certified	Measured		Method 18 Audit			
				Inland-Orange		Temple-Inland	
Compound	Conc. (ppmv)	Conc.[a] (ppmv)	Bias (%)	Conc. (ppmv)	Bias (%)	Conc. (ppmv)	Bias (%)
Chloromethane	48.4	67.1 (7.2)	38.6	NA		NA	
Methanol	105	81.3 (4.9)	-22.5	111	5.7	108	2.9
Acetone	80.0	69.5 (3.5)	-13.1	93.9	17.4	82.6	3.2
Methylene chloride	56.5	50.6 (4.7)	-10.4	NA		NA	
Chloroform	67.6	52.4 (8.3)	-22.5	60.1	-11.1	56.0	-17.2

[a] Average concentration with standard deviation in parenthesis.
NA is for not a target analyte.

The method 18 audit results shown in Tables 1-3 indicate that the onsite-GC performed well for some compounds while some significant negative and positive bias was found for others. Methanol values for the method 18 analysis were within 10.8 percent of the theoretical or certified concentration at all five sites audited. Acetone was within twenty percent of the certified value at both sites during the third episode (Inland-Orange/Temple-Inland), but was greater than 50 percent above the theoretical value at both sites during the second episode (Champion-Sheldon/Simpson-Pasadena). No explanation could be found for the high bias, but all the results for method 18 at both sites during the second episode had high bias, several exceeding 30 percent. MEK had a low bias of greater than 30 percent at Champion-Lufkin and was not reported at Champion-Sheldon or Simpson-Pasadena. MEK was not reported because the retention time had shifted outside the window required for qualitative identification. Chloroform values were found to be within 20 percent for all but one of the sites audited with both positive and negative biases found.

Several compounds were added to the audit samples which were not target analytes for this study. These were added to see if other compounds could interfere with the method 18 analyses. There is no indication from the results found that these compounds interfered with the target analytes.

Even though the confidence level in the verification analysis and subsequently in the audit samples themselves was not as high as originally desired, the audit program did provide useful information and feedback to the emission measurement program. The original results of the first audit at Champion-Lufkin showed a large positive bias for methanol. With the results of this performance audit, the analyst was able to locate an error in the determination of correction factors for the FID responses. This allowed the data to be recalculated using the corrected values.

In summary, the method 18 performance audit program confirmed that the methanol measurements at all five sites were within ten percent or less of a verified true value. The other target compounds at Champion-Lufkin, Champion-Sheldon, and Simpson-Pasadena are not as well documented due to lack of verification. Acetone and MEK values appear to be of questionable quality at those sites. For the certified sample provided at Temple-Inland and Inland-Orange, the audit results show very little bias for all target analytes.

Preparation of Volatile Organic Sample Train (VOST) Audit Sample

A performance audit sample was prepared to challenge the analysis of the adsorbent trap portion of the VOST sample. A trap was spiked with a known volume of a gravimetrically prepared standard. The standard was prepared in methanol and injected several centimeters inside the Tenax resin of a front trap. The trap was then resealed and sent to the laboratory for analysis.

The adsorbent trap was analyzed and reported as any sample collected for the project.

Results of VOST Audit Sample

The results of the VOST audit sample analysis are listed in Table 4. The results are reported in three groups; targets, tentatively identified compounds (TICs) and not identified. All target compounds in the standard were detected and reported by the laboratory. The reported values for acetone and 2-butanone (MEK) are significantly lower (less than -50 percent bias) than the spiked values. Two other compounds, p-cymene and dimethyl disulfide, were found to have negative biases, between 30 and 50 percent, while the other target compounds were all within 30 percent of the spiked values. One compound, n-hexane, was reported as a target that was not added to the spiking solution, but it is known to be a common contaminant in the solvent used to prepare the standard and in the laboratory where the standard was prepared.

Two of the spiked compounds, chlorothiophene and thiophene, were correctly identified as TICs by the method, and the reported amounts were within 50 percent of the spiked values. The TIC results are very good considering only an approximate response factor was used to calculate the amount on the trap. Four compounds, limonene, 3-carene, dichlorothiophene, and dimethyl trisulfide, were not identified by the TIC procedure; however, limonene and 3-carene could fit the general designations (hydrocarbon or substituted hydrocarbon) given to four TICS in the laboratory report.

This audit sample indicates the analysis of the VOST adsorbent tubes was of acceptable quality for the compounds checked, possibly with the exclusion of acetone and 2-butanone. This audit was only testing the ability to desorb and analyze the analytes and not the collection of the analytes and the effect of sample matrix.

TABLE 4. CHAMPION SHELDON AND SIMPSON PASADENA MILL VOST CHECK SAMPLE RESULTS

Compound	Spiked Amount (µg)	Audit Results	
		Trap Amount (µg)	Bias (%)
Targets			
Methylene chloride	0.334	0.420	25.9
Acetone	0.695	0.192	-72.4
Carbon disulfide	1.109	1.197	8.0
Chloroform	0.293	0.263	-10.2
Dimethyl disulfide	0.149	0.096	-35.5
Dimethyl sulfide	0.136	0.118	-13.0
2-Butanone (MEK)	0.716	0.237	-66.9
Bromodichloromethane	0.298	0.239	-19.7
Benzene	0.778	0.693	-10.9
Toluene	0.767	0.772	0.7
α-Pinene	0.271	0.252	-7.1
β-Pinene	0.302	0.240	-20.6
p-Cymene	0.148	0.085	-42.4
TICs			
Chlorothiophene	0.336	0.206	-38.7
Thiophene	0.168	0.145	-13.7
Not Found			
Limonene	0.144	NR	
3-Carene	0.149	NR	
Dichlorothiophene	0.372	NR	
Dimethyl trisulfide	0.203	NR	

NR is not reported and was not a target analyte.

c.c. Ashok Jain
Larry LaFleur

Appendix C

APPENDIX C. RESULTS OF NCASI AUDIT OF TRIANGLE LABORATORY

WEST COAST REGIONAL CENTER
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NATIONAL COUNCIL OF THE PAPER INDUSTRY FOR AIR AND STREAM IMPROVEMENT, INC.

June 15, 1992

MEMO TO: Ashok Jain

FROM: A. R. Gholson ARG

SUBJECT: Systems Audit of Triangle Laboratory for VOST Analysis of TACB Emission Speciation Study Samples

As part of Phase Two of the TACB Emissions Speciation Study, Roy F. Weston has subcontracted Triangle Laboratories to analyze samples collected by the volatile organic sample train (VOST) and modified method 5 (MM5). On May 8, 1992, I performed a systems audit at the Research Triangle Park Laboratories of Triangle Laboratories, Inc. (TLI). Mr. Tim Brice of Research and Development was my primary contact and escort throughout the audit. The following comments are the result of this audit.

The audit started with an initial meeting where the scope of the project, specific instructions, and data concerns from previous sample analyses were discussed. It was determined that VOST samples from Champion Lufkin were in house and initial calibration was being performed. The laboratory's analysis of VOST samples were targeted for this audit. The major concerns for this project were identified as high level analyte interference and detector saturation, method performance for compounds added to the Method 8240 list, and trap blank interference.

A dilution method was discussed so that high level samples could be analyzed, however; more development and validation is needed to make the method useful. Extending the calibration range of the instrument appears to be possible and would provide up to a five fold increase in the operating range of the analysis for some compounds. Interference during a sample analysis due to high level of one or more analytes was recognized as a potential problem. Surrogate recovery and internal standard area will detect most but not all occurrences of this interference. Cross contamination of samples due to high analyte levels present in previous samples is another potential source of interference. The method specifies that a blank be performed between samples containing high levels of analytes and this practice is very important.

A list of Clean Air Act compounds and compounds of interest to the pulp and paper industry has been added to the normal compound list of Method 8240. Triangle Labs has some experience with these compounds but no formal (Method 301) validation has been performed. QA/QC procedures for these compounds consist of an initial multipoint calibration and daily calibration checks. The calibration criterion for Method 8240 is applied to the additional compounds.

The problem of adsorbent contamination or artifacts is always a potential problem. Phase 1 results indicated that chloromethane was found at high levels in the field blank but not in the laboratory blanks. Differences in the handling of the two types of blanks were discussed as well as the preparation procedures, adsorbent sources, and blank reporting procedures.

After the initial meeting, the different stages of the analysis were visited and the operations reviewed. These included sample control, standards preparation, trap preparation, instrument analysis, report generation, and quality assurance. No critical deficiencies were found with the sample control or the standards preparation procedures. Trap preparation was performed as specified by the method with a substitution of coconut charcoal for petroleum based charcoal due to a supply problem. One problem found with the traps was the absence of any label on the trap itself which could result in a field sampler or an analyst mismatching the unmarked tubes with the marked containers. One out of every 16 tubes is blank checked using a complete GC/MS scan rather than an FID analysis specified by the method. The tubes are reused but the adsorbent is replaced after use.

The initial calibration of the GC/MS for the trap analysis was observed. The analytical procedures used conformed to those specified by Method 5030 and Method 8240 with the exception of the substitution of a carbon based adsorbent trap rather than the Tenax/Silica/Charcoal trap specified by the method and the use of a capillary column in place of the packed column specified by the method. Both of these modifications have been shown to provide comparable results. The range of calibration was that specified by the method and included the addition compounds. Results of the calibration indicated that the upper range of the analysis could be extended by a factor of 5 or more for some if not all the compounds. Additional calibration points would need to be performed to confirm that an extended range is valid.

The analysis of laboratory blanks and field blanks was reviewed with the analyst. The only difference in the analysis of the traps is that field traps are analyzed separating the Tenax and Tenax/charcoal traps while for laboratory blanks the traps are combined. This difference may be the reason why some compounds such as chloromethane appear only in field blanks and not laboratory blanks although field contamination is still a possibility.

Throughout the audit the multiple levels of data review and QA were noted and examined. Before data leaves the instrument lab, a instrument QA supervisor checks the analysts work and the QC results. The results are then sent to report generation where an initial interpretation of the results are prepared. It is at this point where identifications and quantitations are checked and nontarget compounds are tentatively identified. An independent QA officer will then check the method specific QA/QC for the report and incorporate and compare the results with previous results. Results for compounds not specified by the method such as the Clean Air Act Compounds were not found to be addressed by the ongoing QA/QC review. If the report is found to be acceptable by the QA officer, it is released to Research and Development where it is reviewed again with the specific project objectives taken into perspective. This level of QA seems appropriate for standard VOST method analysis. It would be advisable to load the project with additional matrix spikes and/or audit samples to make up for the lack of a QA/QC history for the additional compounds.

In summary, no critical concerns were found during the audit of TLI. A high level of QA with three independent levels of data review was found for the VOST sample analysis. The quality of the data for the standard compound list of method 8240 could be expected to be as good or better than specified by the method. For the additional Clean Air Act and pulp and paper industry compounds, the data quality is not as well defined. More historical data and additional matrix spike recovery information is needed to establish the data quality achieved for these compounds.

Several points of major concern were found with the VOST analysis and include the following:

- Marking of the VOST tubes was inadequate. Labels of some kind should be placed on the tubes to prevent switching of tubes between labeled containers in the field or the lab.

- Acceptable blank levels should be established after a sample containing high analyte levels (above detector saturation) has been analyzed.

Several points of minor concern or of a suggestive nature include:

- Laboratory blanks and field blanks should be analyzed by the same procedure as the samples to distinguish between possible analytical artifacts and true field contamination.

- Extending the calibration range to include the full dynamic range of the instrument would conserve both laboratory and field resources.

A memo dated May 18, 1992 from Tim Brice of TLI, has been received and indicates that the major concerns of the audit are being addressed and the suggestions are being considered.

cc. Tim Brice, TLI
L. LaFluer
J. Pinkerton

Appendix D

APPENDIX D. RESULTS OF NCASI SOURCE MEASUREMENTS

6249-01-01

NCASI MEMORANDUM

October 16, 1992

TO: Ashok K. Jain

FROM: Robert J. Crawford RJC

SUBJECT: Results of NCASI Quality Assurance Source Measurements for the TPIEC VOC Speciation Study

Attached are the results of the subject measurements.

RJC/sck

Attachments

cc: Bruce Ferguson

ncasi • P.O. Box 141020 • ...inesville, FL 32614-1020 • (904) 377-4708

TABLE L-1 NCASI SOURCE VOC MEASUREMENTS AT CHAMPION, LUFKIN

TPIEC SOURCE CODE	DATE	NCASI SAMPLE Start Time	NCASI SAMPLE Stop Time	Chloroform NCASI	Chloroform Weston GC[1]	Chloroform Weston Sorbent	Methanol NCASI	Methanol Weston	Acetone NCASI	Acetone Weston	MEK NCASI	MEK Weston	Formaldehyde NCASI	Formaldehyde Weston
				ppmvd										
CL-BSWA	4/22	17:14	18:32	0.088	<1.1									
CL-BSWA	4/22	18:45	20:03	0.120										
CL-BSWB	4/24	10:19	11:39	0.144	<0.5									
CL-BSWB	4/24	11:48	13:18	0.142										
CL-BSWB	4/24	10:21	13:18				23.5	12.3	0.48	0.8	0.22	<0.5		
CL-BPCTV	4/27	13:41	16:42				103	90.0	0.90	<0.6	0.25	<0.6		
CL-BPCTV	4/27	15:36	16:12	49.8	40.4	73.2								
CL-BPCTV	4/27	16:47	17:40	53.9		55.8								
CL-BPCLTV	4/27	19:21	21:01	4.20	3.2	4.2[7]								
CL-BPCLTV	4/27	19:21	21:16				60.4	65.7	0.51	1.2	<0.15	<0.6		
CL-BPHDHV	4/28	12:10	12:40	13.7	10.7	18.9								
CL-BPHDHV	4/29	14:18	14:47	13.9	8.9	45.2[2]								
CL-BPCLSP	4/28	16:56	19:09				19.2	<2.2	0.25	<0.5	<0.13	<0.5		
CL-BPCLSP	4/28	18:49	19:09	1570	1021	1980[3]								
CL-BPCSPV	4/29	17:00	19:10				39.0	36.8	1.0	0.6[5]	<0.16	<0.6		
CL-BPCSPV	4/29	17:08	17:28	118	132	199[4]								
CL-GT	4/30	10:25	11:25				<0.7		<0.17	<0.5	<0.10	<0.5	<0.16	<0.5
CL-LK/1	4/30	15:06	16:05				<0.7	<2.5	<0.17	<0.5	<0.10	<0.6	0.50	ND[6]

[1] All Method 18 data in this table are the average of 3 runs.
[2] Two runs with values of 80.7 and 9.6 were averaged to obtain this value.
[3] Two runs with values of 2671 and 1289 were averaged to obtain this value.
[4] Two runs with values of 208 and 190 were averaged to obtain this value.
[5] Two of these runs were below the detection limit.
[6] Not Detected
[7] Two runs with values of 4.6 and 3.7 were averaged to obtain this value.

TABLE L-2 NCASI METHANOL, ACETONE AND MEK CAPTURE EFFICIENCY RESULTS FROM THE LUFKIN TPIEC VOC SPECIATION STUDY

TPIEC SOURCE CODE	DATE	START TIME	PERCENT OF MASS COLLECTED								
			Methanol			Acetone			MEK		
				Silica Gel			Silica Gel			Silica Gel	
			Impingers	Front	Back	Impingers	Front	Back	Impingers	Front	Back
CL-BSWB	4/24/92	10:21	93.2	4.5	2.3	20.2	65.6	14.2	11.4	88.6	0
CL-BPCTV	4/27/92	13:41	96.1	2.5	1.4	38.3	55.8	5.9	23.3	76.7	0
CL-BPCLTV	4/27/92	19:21	98.0	1.3	0.7	45.6	44.7	9.7	Below Detection Limit		
CL-BPCLSP	4/28/92	16:56	96.6	2.2	1.1	28.6	50.4	21.0	Below Detection Limit		
CL-BPCSPV	4/29/92	17:00	97.6	1.6	0.8	42.7	46.3	11.0	Below Detection Limit		
CL-GT	4/30/92	10:25	------------Below Detection Limit------------								
CL-LK	4/30/92	15:06	------------Below Detection Limit------------								

TABLE L-3 NCASI CHLOROFORM BREAKTHROUGH DATA FROM THE LUFKIN TPIEC VOC SPECIATION STUDY

TPIEC SOURCE CODE	DATE	START TIME	CHLOROFORM, μg Front	Back
CL-BSWA	4/22/92	17:14	5	<0.1
CL-BSWA	4/22/92	17:14	4.7	<0.1
CL-BSWA	4/22/92	18:45	6.8	<0.1
CL-BSWA	4/22/92	18:45	7.2	<0.1
CL-BSWB	4/24/92	10:19	7.9	<0.1
CL-BSWB	4/24/92	11:48	9.3	<0.1
CL-BPCTV	4/27/92	15:36	1320	<0.1
CL-BPCTV	4/27/92	15:36	1250	<0.1
CL-BPCTV	4/27/92	16:47	2190	<0.1
CL-BPCTV	4/27/92	16:47	2130	<0.1
CL-BPCLTV	4/27/92	19:21	353	<0.1
CL-BPCLTV	4/27/92	19:21	261	<0.1
CL-BPHDHV	4/28/92	12:10	302	<0.1
CL-BPHDHV	4/28/92	12:10	296	<0.1
CL-BPHDHV	4/29/92	14:18	313	<0.1
CL-BPHDHV	4/29/92	14:18	291	<0.1
CL-BPCLSP	4/28/92	18:49	23850	6.4
CL-BPCLSP	4/28/92	18:49	22810	4.3
CL-BPCSPV	4/29/92	17:08	1830	<0.1
CL-BPCSPV	4/29/92	17:08	1750	<0.1

TABLE L-4 NCASI FORMALDEHYDE CAPTURE EFFICIENCY RESULTS FROM THE LUFKIN TPIEC VOC SPECIATION STUDY

TPIEC SOURCE CODE	DATE	START TIME	FORMALDEHYDE, μg First Impinger	FORMALDEHYDE, μg Second Impinger
CL-GT	4/30/92	10:25	28.7	2.7
CL-GT	4/30/92	10:25	39.1	2.7
CL-LK	4/30/92	15:06	Below Quantitation Limit	
CL-LK	4/30/92	15:06	Below Quantitation Limit	

TABLE L-5 PRECISION OF NCASI DUPLICATE SAMPLES COLLECTED DURING THE LUFKIN TPIEC VOC SPECIATION STUDY

ANALYTE	TPIEC SOURCE CODE	DATE	START TIME	ppmvd Duplicate 1	ppmvd Duplicate 2	ppmvd Average	DIFFERENCE, PERCENT
Chloroform	CL-BSWA	4/22/92	17:14	0.093	0.083	0.088	11
Chloroform	CL-BSWA	4/22/92	18:45	0.121	0.119	0.120	2
Chloroform	CL-BPCTV	4/27/92	15:36	51.6	47.9	49.8	7
Chloroform	CL-BPCTV	4/27/92	16:47	55.4	52.3	53.9	6
Chloroform	CL-BPCLTV	4/27/92	19:21	4.68	3.72	4.20	23
Chloroform	CL-BPHDHV	4/28/92	12:10	13.6	13.8	13.7	1
Chloroform	CL-BPHDHV	4/29/92	14:18	14.3	13.4	13.9	6
Chloroform	CL-BPCLSP	4/29/92	18:49	1577	1557	1567	1
Chloroform	CL-BPCSPV	4/29/92	17:08	120	115	118	4
Methanol	CL-GT	4/30/92	10:25	<0.7	<0.7	<0.7	0
Methanol	CL-LK	4/30/92	15:06	<0.7	<0.7	<0.7	0
Acetone	CL-GT	4/30/92	10:25	<0.17	<0.17	<0.17	0
Acetone	CL-LK	4/30/92	15:06	<0.17	<0.17	<0.17	0
MEK	CL-GT	4/30/92	10:25	<0.10	<0.10	<0.10	0
MEK	CL-LK	4/30/92	15:06	<0.10	<0.10	<0.10	0
Formaldehyde	CL-GT	4/30/92	10:25	<0.16	<0.16	<0.16	0
Formaldehyde	CL-LK	4/30/92	15:06	0.45	0.54	0.50	18

TABLE L-6 RESULTS OF NCASI BLANK ANALYSES FROM LUFKIN TPIEC VOC SPECIATION STUDY

ANALYTE	BLANK TYPE	ANALYSIS RESULT
Chloroform	Tenax Tube No. 3	<0.1 μg
Chloroform	Tenax Tube No. 25	<0.1 μg
Methanol	Field Water	<0.8 mg/L
Acetone	Field Water	<0.4 mg/L
MEK	Field Water	<0.3 mg/L
Formaldehyde	Field Water	<0.01 mg/L

TABLE IO-1 NCASI SOURCE VOC MEASUREMENTS FROM THE INLAND-ORANGE TPIEC VOC SPECIATION STUDY

TPIEC SOURCE CODE	DATE	NCASI SAMPLE Start Time	NCASI SAMPLE Stop Time	ppmvd Methanol NCASI	Methanol Weston	Acetone NCASI	Acetone Weston	MEK NCASI	MEK Weston	Formaldehyde NCASI	Formaldehyde Weston
IO-BB	7/8/92	18:06	20:05	<0.82	<2.5	<0.70	<0.6	<0.54	<0.6	2.43	NM*
IO-BB	7/9/92	11:40	13:52	0.70	<3.1	<0.70	<0.7	<0.55	<0.7	2.88	NM
IO-TORV	7/14/92	14:38	16:38	177	189	18.0	<8.6	3.91	<8.6		
IO-LK/1	7/15/92	13:22	15:31	9.67	10.6	<0.64	<0.8	<0.52	<0.8	0.60	NM

*Not measured

TABLE IO-2 NCASI METHANOL, ACETONE AND MEK CAPTURE EFFICIENCY RESULTS FROM THE INLAND-ORANGE VOC SPECIATION STUDY

TPIEC SOURCE CODE	DATE	START TIME	PERCENT OF MASS COLLECTED											
			Methanol				Acetone				MEK			
			Impinger		Silica Gel		Impinger		Silica Gel		Impinger		Silica Gel	
			Front	Back	Front	Back	Front	Back	Front	Back	Front	Back	Front	Back
IO-BB	7/8/92	18:06	Below Detection Limit				Below Detection Limit				Below Detection Limit			
IO-BB	7/9/92	11:40	>68.0	<27.2	<4.7	0	Below Detection Limit				Below Detection Limit			
IO-TORV	7/14/92	14:38	96.0	None	3.2	0.8	37.9	None	58.8	3.3	28.5	None	71.5	0
IO-TORV	7/14/92	14:38	96.1	None	3.3	0.7	43.1	None	56.3	0.6	36.1	None	63.9	0
IO-LK/1	7/15/92	13:22	77.4	21.5	0.7	0.4	Below Detection Limit				Below Detection Limit			
IO-LK/1	7/15/92	13:22	97.0	1.3	1.4	0.3	Below Detection Limit				Below Detection Limit			

TABLE IO-3 NCASI FORMALDEHYDE CAPTURE EFFICIENCY RESULTS FOR SAMPLES COLLECTED DURING INLAND-ORANGE TPIEC VOC SPECIATION STUDY

TPIEC SOURCE CODE	DATE	START TIME	FORMALDEHYDE, µg Front Impinger	FORMALDEHYDE, µg Back Impinger
IO-BB	7/8/92	18:06	328	3.3
IO-BB	7/9/92	11:40	446	1.2
IO-LK/1	7/15/92	13:22	67	21.5
IO-LK/1	7/15/92	13:22	67	2.9

TABLE IO-4 PRECISION OF NCASI DUPLICATE SAMPLES COLLECTED DURING INLAND-ORANGE TPIEC VOC SPECIATION STUDY

ANALYTE	TPIEC SOURCE CODE	DATE	START TIME	ppmvd Duplicate 1	Duplicate 2	Average	DIFFERENCE, PERCENT
Methanol	IO-TORV	7/14/92	14:38	181	172	177	5
Methanol	IO-LK/1	7/15/92	13:22	9.68	9.65	9.67	<1
Acetone	IO-TORV	7/14/92	14:38	19.6	16.4	18.0	18
Acetone	IO-LK/1	7/15/92	13:22	Below Detection Limit			
MEK	IO-TORV	7/14/92	14:38	4.13	3.68	3.90	12
MEK	IO-LK/1	7/15/92	13:22	Below Detection Limit			
Formaldehyde	IO-LK/1	7/15/92	13:22	0.61	0.59	0.60	3

TABLE IO-5 RESULTS OF NCASI BLANK ANALYSES FOR SAMPLES COLLECTED DURING INLAND-ORANGE TPIEC VOC SPECIATION STUDY

ANALYTE	BLANK TYPE	ANALYSIS RESULT, mg/L
Methanol (7/8)	3 mL water extract of silica gel	<0.8
Methanol (7/9)	3 mL water extract of silica gel	0.92
Acetone (7/8)	3 mL water extract of silica gel	1.4
Acetone (7/9)	3 mL water extract of silica gel	0.98
MEK (7/8)	3 mL water extract of silica gel	<0.8
MEK (7/9)	3 mL water extract of silica gel	<0.8
Formaldehyde (BBS)	water	<0.03
Formaldehyde (LKS)	water	<0.03

TABLE TI-1 NCASI SOURCE VOC MEASUREMENTS FROM THE TEMPLE-INLAND TPIEC VOC SPECIATION STUDY

TPIEC SOURCE CODE	DATE	NCASI SAMPLE Start Time	NCASI SAMPLE Stop Time	Chloroform (ppmvd) NCASI	Chloroform Weston GC	Chloroform Weston Sorbent	Methanol NCASI	Methanol Weston	Acetone NCASI	Acetone Weston	MEK NCASI	MEK Weston
TI-BPS01	7/9/92	09:51	11:53				11.8	15.0	<0.23	<0.6	<0.42	<0.6
TI-BPSO1	7/9/92	10:12	10:32	39.8	45.6	NM*						
TI-BPSO1	7/9/92	11:16	11:38	36.4	45.6	NM						
TI-BPSO1	7/10/92	08:00	10:00				12.5	11.5	<0.28	<0.6	<0.51	<0.6
TI-BPSO1	7/10/92	08:17	08:38	37.7	36.5	NM						
TI-BPSO3	7/9/92	16:28	18:31				32.4	40.5	<0.36	<0.6	<0.51	<0.6
TI-BPSO3	7/9/92	16:32	16:54	216	253	200**						
TI-BSWV5	7/13/92	15:14	17:00				18.5	15.9	<0.42	<0.5	<0.49	<0.5
TI-BSWV6	7/13/92	15:14	17:00				7.25	<2.7	<0.33	0.9	<0.48	<0.5

*Not measured
**The time of this sample collection will have to be checked to determine if it was collected concurrently with the NCASI sample.

TABLE TI-2 METHANOL, ACETONE AND MEK CAPTURE EFFICIENCY RESULTS FROM THE TEMPLE-INLAND TPIEC VOC SPECIATION STUDY

			PERCENT OF MASS COLLECTED								
			Methanol			Acetone			MEK		
				Silica Gel			Silica Gel			Silica Gel	
TPIEC SOURCE CODE	DATE	START TIME	Impingers	Front	Back	Impingers	Front	Back	Impingers	Front	Back
TI-BPSO1	7/9/92	09:51	91.4	5.3	3.3	Below Detection Limit			Below Detection Limit		
TI-BPSO1	7/10/92	08:00	92.0	7.4	0.6	Below Detection Limit			Below Detection Limit		
TI-BPSO3	7/9/92	16:28	87.4	11.1	1.5	Below Detection Limit			Below Detection Limit		
TI-BPSO3	7/9/92	16:28	89.4	9.4	1.3	Below Detection Limit			Below Detection Limit		
TI-BSWV5	7/13/92	15:14	91.1	8.6	0.4	Below Detection Limit			Below Detection Limit		
TI-BSWV6	7/13/92	15:14	92.2	7.4	0.4	Below Detection Limit			Below Detection Limit		

TABLE TI-3 NCASI CHLOROFORM BREAKTHROUGH FOR SAMPLES COLLECTED DURING THE TEMPLE-INLAND TPIEC VOC SPECIATION STUDY

TPIEC SOURCE CODE	DATE	START TIME	$CHCl_3$, µg Front	Back
TI BPSO 3	7/9/92	16:32	3200	<1.5
TI BPSO 1	7/9/92	10:12	630	<1.5
TI BPSO 2	7/9/92	11:16	640	<1.5
TI BPSO 4	7/9/92	08:17	640	<1.5

TABLE TI-4 PRECISION OF NCASI DUPLICATE SAMPLES COLLECTED DURING THE TEMPLE-INLAND TPIEC VOC SPECIATION STUDY

ANALYTE	TPIEC SOURCE CODE	DATE	START TIME	ppmvd Duplicate 1	Duplicate 2	Average	DIFFERENCE, PERCENT
Methanol	TI BPSO 1	7/9/92	16:28	33.5	31.3	32.4	7
Acetone	TI BPSO 1	7/9/92	16:28	Below Detection Limit			
MEK	TI BPSO 1	7/9/92	16:28	Below Detection Limit			

TABLE TI-5 RESULTS OF BLANK ANALYSES FOR SAMPLES COLLECTED DURING TEMPLE-INLAND TPIEC VOC SPECIATION STUDY

ANALYTE	BLANK TYPE	ANALYSIS RESULT, mg/L
Chloroform	100 mL hexane extraction of Tenax tube #71	<0.05
Chloroform	100 mL hexane extraction of Tenax tube #84	<0.05
Methanol	3 mL water extract of silica gel tube	<0.8
Acetone	3 mL water extract of silica gel tube	<0.8
MEK	3 mL water extract of silica gel tube	<0.8

TEXAS EMISSIONS SPECIATION STUDY
EMISSION TEST RESULTS
CHAMPION INTERNATIONAL
LUFKIN, TEXAS

VOLUME 2 OF 6

Prepared For:

TEXAS PAPER INDUSTRY ENVIRONMENTAL COMMITTEE

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CHAMPION INTERNATIONAL CORPORATION: SHELDON, TX
INLAND-ORANGE, INC.: ORANGE, TX
SIMPSON PASADENA PAPER COMPANY: PASADENA, TX
TEMPLE-INLAND FOREST PRODUCTS CORPORATION: SILSBEE, TX

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06848-001-001

WESTON
MANAGERS DESIGNERS/CONSULTANTS

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WESTON.

EXECUTIVE SUMMARY

This volume of the report presents the results of the sources tested at the Champion International mill in Lufkin, Texas. Volume 1 describes the objectives of the study, methodology used to collect the data, and the quality control results which are applicable to the entire study at the five mills. A copy of the project work plan is also included as an Appendix to Volume 1.

The table on the following page summarizes the sources tested for the various parameters. The testing was conducted during the time period of 22 April through 05 May by a WESTON test team led by Mr. Gary Lloyd. Ms. Bonnie Ballenger of Champion was responsible for collection of process operating data and coordination of testing activities with mill operations.

The data are presented in separate sections for each source. A brief narrative is used to highlight data for the source and the data collected for each source is summarized in tabular form. A trend plot is included for the total hydrocarbon concentration. Subsections are used to present specific source results, quality control results and process operating conditions. The preliminary data collected during the screening phase is included as an appendix. Supporting data (chromatograms, calibration data, field data sheets, etc.) will remain on file for a period of three years.

SOURCES TESTED AT CHAMPION - LUFKIN

SOURCE TESTED	SOURCE CODE	Phase 2 M16 TRS	M18 M25A	VOST	MM5	CH2O	Metals	Cr+6	HCl	Acid Mist	Chloro-form
CHAMPION - LUFKIN											
TPIEC-POOLED SOURCES											
Brown Stock Washer Vent A	CL-BSWA	Y	Y								
Brown Stock Washer Vent B	CL-BSWB	Y	Y								
Lime Kiln w/ NCGs	CL-LK/1	Y	Y	Y							
Lime Kiln w/o NCGs	CL-LK/2	Y	Y	Y							
CHAMPION-POOLED SOURCES											
Gas Turbine Exhaust	CL-GT					Y					
Lime Kiln (added parameters)	CL-LK					Y	Y		Y		
MILL-SPECIFIC SOURCES											
Recovery Furnace	CL-RF						Y		Y	Y	
Smelt Dissolving Tank Vent	CL-SDTV						Y				
Combined Evap. and Stripper NCG Vent	CL-NCGESV	Y	Y								
Blow Heat Recovery NCG Vent	CL-NCGBHR	Y	Y								
Chlorine Tower Vent	CL-BPCLTV		Y						Y		Y
Chlorine Decker Hood Vent (1)	CL-BPCDHV		Y						Y		Y
Hypo Decker Hood Vent (1)	CL-BPHDHV		Y						Y		Y
Chlorine/Hypo Seal Pit Vent (1)	CL-BPCLSP		Y						Y		Y
Caustic Tower Vent	CL-BPCTV		Y						Y		Y
Caustic Seal Pit Vent	CL-BPCSPV		Y						Y		Y
Caustic Steam Mixer Vent	CL-BPCSMV		Y						Y		Y
Brown Stock Head Box Vent	CL-BPBSHB		Y						Y		Y

SECTION 1

BROWN STOCK WASHER

(CL-BSWA, CL-BSWB)

SECTION 1
BROWN STOCK WASHER VENTS
(CL-BSWA AND CL-BSWB)

Throughout the sampling period, the total hydrocarbon concentration (THC) was monitored continuously while gas chromatographic analyses were performed by EPA Methods 16 and 18. The times of the Method 18 GC injections are indicated on the total hydrocarbon trend analyses by an arrow along the baseline.

The total amount of pulp processed was monitored throughout the testing. Because only one washer system was tested, the production rate for this system was one half of the total. Vents C and D were not tested.

Total Hydrocarbons (M25A)

Figures 1.1-1.4 present the THC trends for the test periods on 22 and 24 April 1992.

4/22/92 Total Hydrocarbon (THC) values varied erratically over the 3½-hour sampling period. Readings in the vents roughly followed the same fluctuating pattern, exhibiting an overall downward trend.

4/24/92 Vent A THC readings were approximately 70 percent of those observed for Vent B.

Volatile Organic Compounds (M16 and M18)

Table 1.1 summarizes the results for the Method 16 and Method 18 target compounds, and Sections 1.1 and 1.2 are a tabulation of the data. More than 95 percent of the VOC emissions were speciated and quantitated. Methanol was the major VOC found. All four of the reduced sulfur compounds were present during the testing.

4/22/92 The second M18 GC injection was discarded because it was not consistent with the other five analyses. No reason is known for the variation.

4/24/92 The three M18 analyses were consistent.

VOC Quality Control Results

The VOC quality control data is tabulated in Section 1.3. An explanation of the data is included in the section.

WESTON

Process Description and Operating Conditions

Section 1.4 includes the process operating data as recorded and provided by mill personnel. The process operated in a stable manner throughout both days of testing. Source emission data were recorded for brown stock washer systems being vented through Vents A and B. Systems vented through Vents C and D were not tested. Pulp flow recorded was for both washer systems. The production data in Table 1.1 is for the system vented through Vents A and B.

FIGURE 1.1
THC TREND ANALYSIS (4/22/92)

BROWN STOCK WASHER

VENT A (CL-BSWA)

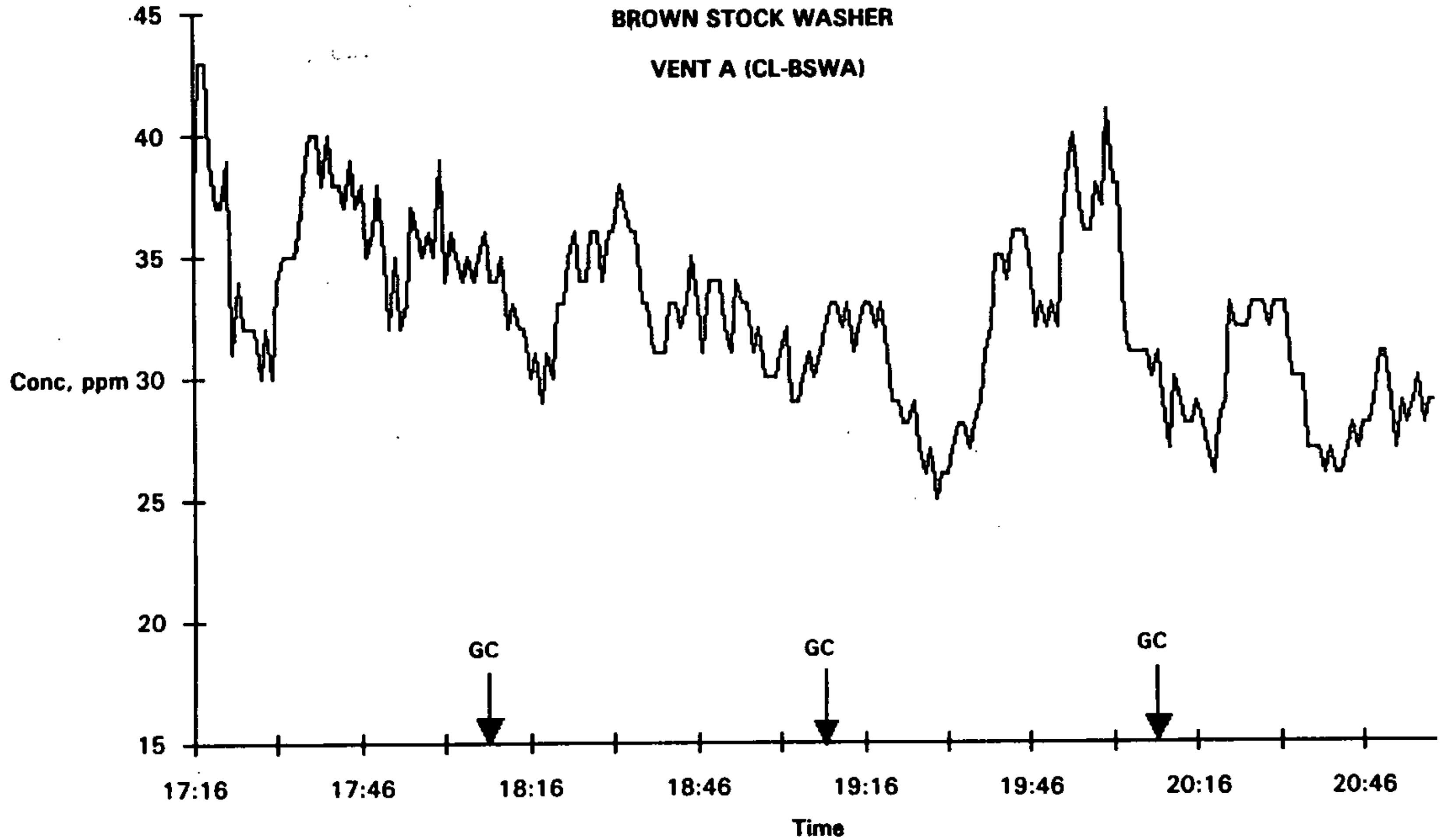

FIGURE 1.2
THC TREND ANALYSIS (4/22/92)
BROWN STOCK WASHER
VENT B (CL-BSWB)

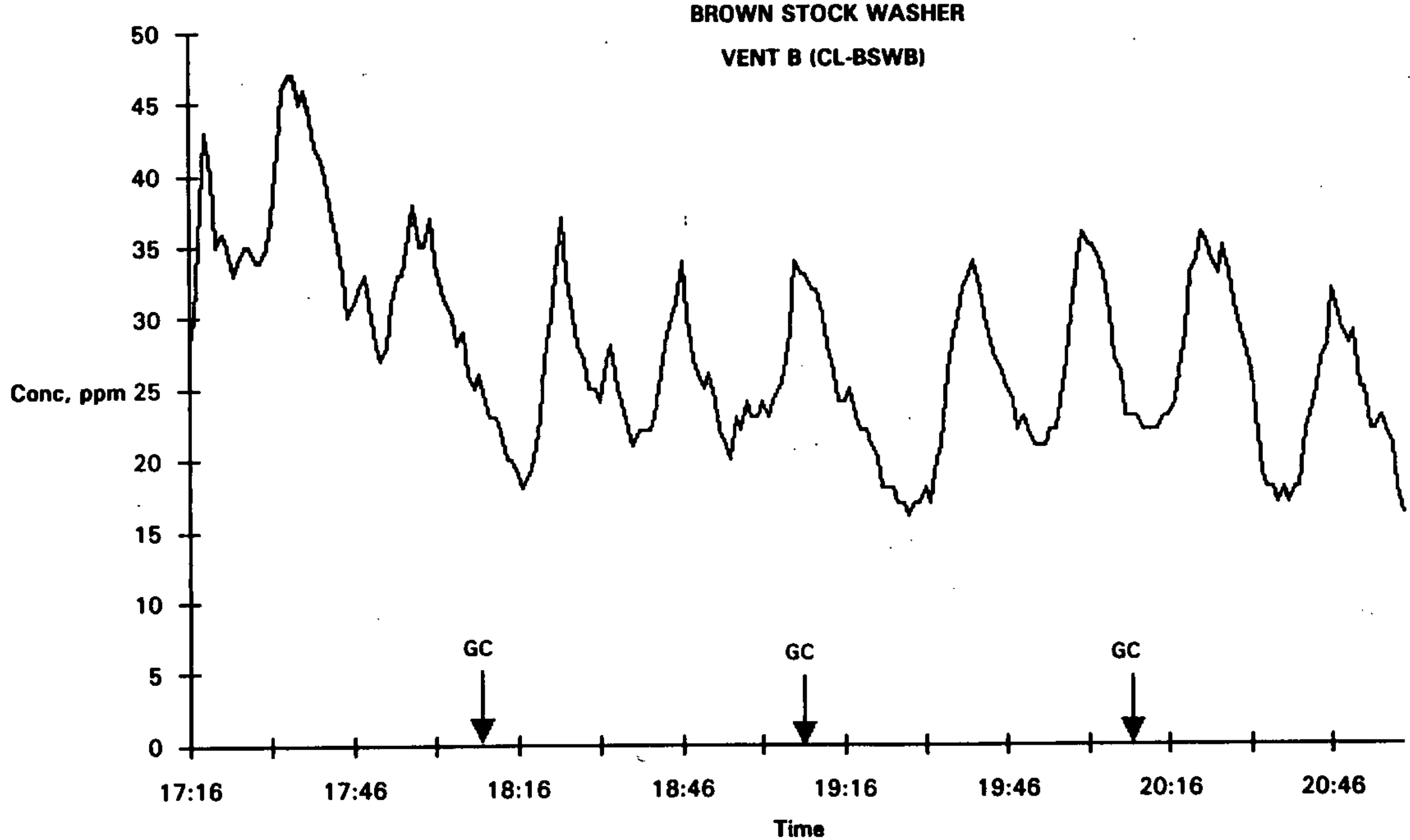

FIGURE 1.3
THC TREND ANALYSIS (4/24/92)
BROWN STOCK WASHER
VENT A (CL-BSWA)

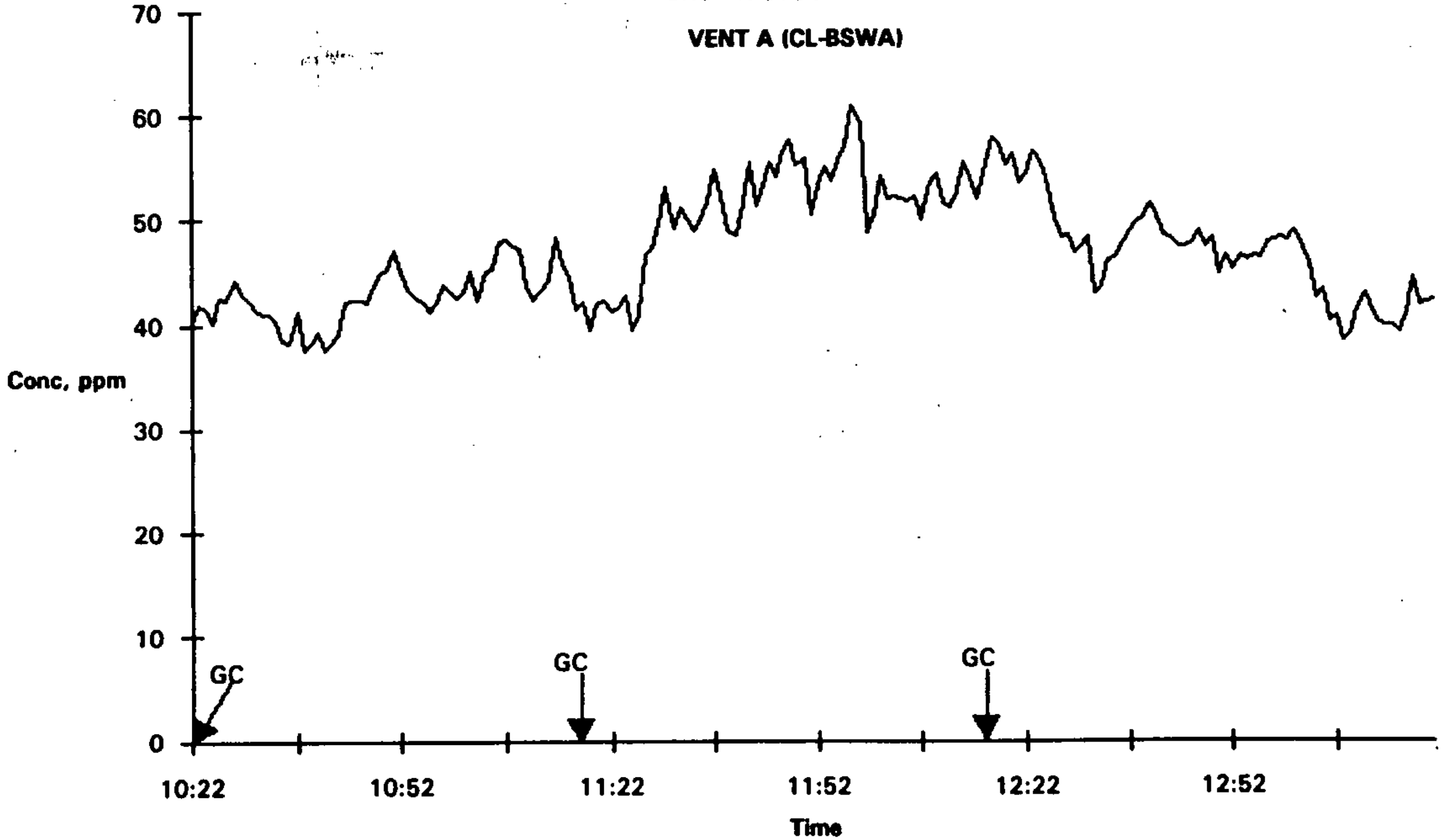

FIGURE 1.4
THC TREND ANALYSIS (4/24/92)

BROWN STOCK WASHER

VENT B (CL-BSWB)

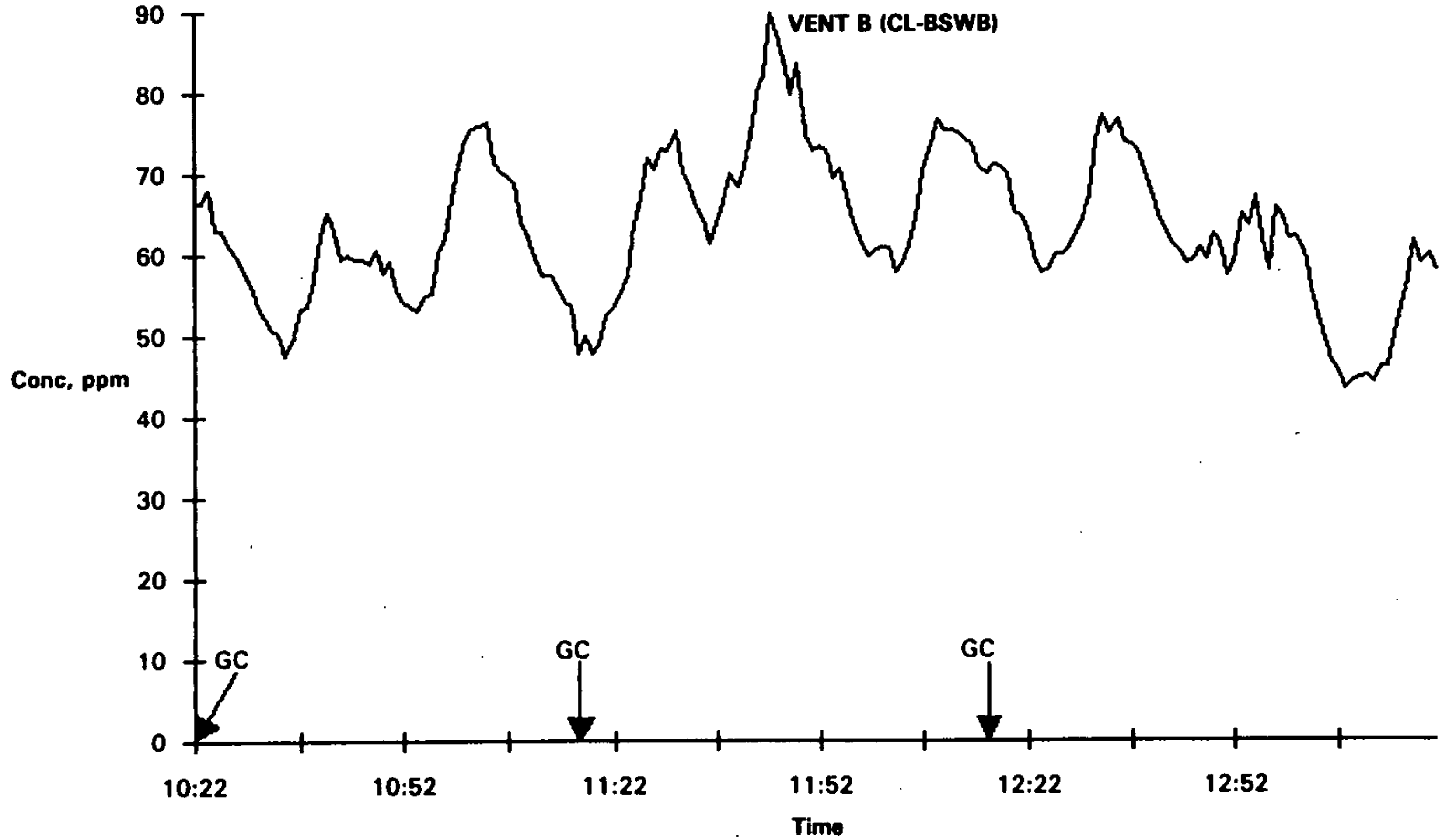

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TABLE 1.1
SUMMARY OF VOC RESULTS

Mill: CHAMPION-LUFKIN
Source Code: CL-BSWA & CL-BSWB
FIN: G-4 EPN: G-4(a) and G-4(b)

Source: Brown Stock Washer Vents
Test Dates: 4/22,24/92
CIN: -

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	101	103	102	
Volumetric Flow Rate, x 10^3 DSCFM	38.3	38.3	38.3	
Process Operating Conditions				
Production Rate, ADT pulp/hr	10.0	10.9	10.5	
Method 16 Data, lb/hr				
Hydrogen sulfide	0.4	0.4	0.4	0.2
Methyl mercaptan	0.8	1.0	0.9	0.2
Dimethyl sulfide	1.4	2.0	1.7	0.2
Carbon disulfide	ND	ND	ND	0.2
Dimethyl disulfide	1.2	1.4	1.3	0.4
Method 18 Data, lb/hr				
Methanol	2.3	3.4	2.9	0.2
Ethanol	ND	ND	ND	0.2
Acetone	ND	0.5	0.3	0.2
2-Propanol	ND	ND	ND	0.2
2-Butanone	ND	ND	ND	0.2
Chloroform	ND	ND	ND	0.4
Benzene	ND	ND	ND	0.2
Bromodichloromethane	ND	ND	ND	0.6
Toluene	ND	ND	ND	0.2
Ethyl benzene	ND	ND	ND	0.2
m-, p-Xylene	ND	ND	ND	0.2
o-Xylene	ND	ND	ND	0.2
Cumene	ND	ND	ND	0.2
alpha-Pinene	0.2	1.1	0.6	0.2
beta-Pinene	ND	0.6	0.4	0.2
3-Carene	ND	ND	ND	0.2
Terpenes (Unspecified)	ND	0.3	0.2	0.2
p-Cymene	ND	ND	ND	0.2
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	1.6	3.4	2.3	0.2
Unknowns as C, lb/hr	ND	<0.2	0.2	0.2
Sum of Compounds as C, lb/hr	1.7	3.5	2.6	0.2

ND = Not Detected
DL = Detection Limit

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SECTION 1.1 BSWA EMISSION TEST RESULTS - VOC

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Brown Stock Washer Vent A | FIN: G-4
Source Code: CL-BSWA | Date: 4/22/92 | EPN: G-4(a) | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1800	1900	2000	
Flow Data				
Stack Temperature, °F	103			103
Moisture Content, %	7.1			7.1
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	22.0			22.0
Volumetric Flow Rate, x10^3 DSCFM	19.1			19.1
Process Operating Conditions				
Production Rate, ADT pulp/hr	10.0	10.0	10.0	10.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	2.1	2.1	2.1	2.1
Emission Rate, lb/hr	0.2	0.2	0.2	0.2
Methyl mercaptan				
Concentration, ppmvd	2.6	2.6	2.8	2.7
Emission Rate, lb/hr	0.4	0.4	0.4	0.4
Dimethyl sulfide				
Concentration, ppmvd	3.9	3.8	3.8	3.8
Emission Rate, lb/hr	0.7	0.7	0.7	0.7
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	2.1	2.1	2.1	2.1
Emission Rate, lb/hr	0.6	0.6	0.6	0.6
Method 18 Data				
Methanol				
Concentration, ppmvd	18.0		17.8	17.9
Emission Rate, lb/hr	1.7		1.7	1.7
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *		0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *		0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *		0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Brown Stock Washer Vent A | FIN: G-4
Source Code: CL-BSWA | Date: 4/22/92 | EPN: G-4(a) | CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *		0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.1 *		1.1 *	1.1 *
Emission Rate, lb/hr	0.4 *		0.4 *	0.4 *
Benzene				
Concentration, ppmvd	0.5 *		0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *		1.1 *	1.1 *
Emission Rate, lb/hr	0.5 *		0.5 *	0.5 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *		0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *		0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *		0.2 *	0.2 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *		0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *		0.2 *	0.2 *
o-Xylene				
Concentration, ppmvd	0.5 *		0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *		0.2 *	0.2 *
Cumene				
Concentration, ppmvd	0.5 *		0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *		0.2 *	0.2 *
alpha-Pinene				
Concentration, ppmvd	0.6		0.5	0.6
Emission Rate, lb/hr	0.3		0.2	0.2
beta-Pinene				
Concentration, ppmvd	0.5		0.5 *	0.4
Emission Rate, lb/hr	0.2		0.2 *	0.2
3-Carene				
Concentration, ppmvd	0.5 *		0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *		0.2 *	0.2 *
Terpenes (Unspecified)				
Concentration, ppmvd	1.1		0.5 *	0.7
Emission Rate, lb/hr	0.4		0.2 *	0.3

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN	Source:	Brown Stock Washer Vent A		FIN:	G-4
Source Code: CL-BSWA	Date:	4/22/92	EPN: G-4(a)	CIN:	-

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *		0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *		0.2 *	0.2 *
Knowns as Carbon				
Concentration, ppmvd	36.8		28.5	32.7
Unknowns as Carbon				
Concentration, ppmvd	2.7		2.0	2.4
Sum M18 as Carbon, lb/hr	1.4		1.1	1.3
Unknown Compounds % of Total	6.8%		6.7%	6.8%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	35.5	34.4	32.3	34.1
Emission Rate, lb/hr as C	1.3	1.2	1.2	1.2

COMMENTS

M18 data for run 2 on 4/22/92 was rejected because not consistent with other injections.

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Brown Stock Washer Vent A | FIN: G-4
Source Code: CL-BSWA | Date: 4/24/92 | EPN: G-4(a) | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1021	1121	1221	
Flow Data				
Stack Temperature, °F			102	102
Moisture Content, %			6.9	6.9
Oxygen Concentration, %			20.8	20.8
Carbon Dioxide Concentration, %			0.0	0.0
Volumetric Flow Rate, x10^3 ACFM			22.0	22.0
Volumetric Flow Rate, x10^3 DSCFM			19.2	19.2
Process Operating Conditions				
Production Rate, ADT pulp/hr	10.9	10.9	10.9	10.9
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	2.1	2.1	2.1	2.1
Emission Rate, lb/hr	0.2	0.2	0.2	0.2
Methyl mercaptan				
Concentration, ppmvd	2.7	2.6	2.5	2.6
Emission Rate, lb/hr	0.4	0.4	0.4	0.4
Dimethyl sulfide				
Concentration, ppmvd	4.2	4.4	4.0	4.2
Emission Rate, lb/hr	0.8	0.8	0.7	0.8
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	2.2	2.3	2.2	2.2
Emission Rate, lb/hr	0.6	0.6	0.6	0.6
Method 18 Data				
Methanol				
Concentration, ppmvd	19.8	22.0	19.9	20.6
Emission Rate, lb/hr	1.9	2.1	1.9	2.0
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.9	1.9	1.2	1.3
Emission Rate, lb/hr	0.1	0.3	0.2	0.2
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN　　Source: Brown Stock Washer Vent A　　FIN: G-4

Source Code: CL-BSWA　　Date: 4/24/92　　EPN: G-4(a)　　CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 •	0.5 •	0.5 *	0.5 •
Emission Rate, lb/hr	0.1 •	0.1 •	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	0.5 *	0.5 *	0.5 •	0.5 *
Emission Rate, lb/hr	0.2 •	0.2 •	0.2 •	0.2 *
Benzene				
Concentration, ppmvd	0.5 *	0.5 •	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 •	0.1 *	0.1 •	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.5 *	0.5 •	0.5 •	0.5 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 •	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 •	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 •	0.5 •	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 •	0.2 *	0.2 *	0.2 *
m-, p-Xylene				
Concentration, ppmvd	0.5 •	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 •	0.2 *	0.2 *
o-Xylene				
Concentration, ppmvd	0.5 •	0.5 *	0.5 •	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 •	0.2 •	0.2 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 •
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
alpha-Pinene				
Concentration, ppmvd	0.8	1.5	1.1	1.1
Emission Rate, lb/hr	0.3	0.6	0.4	0.5
beta-Pinene				
Concentration, ppmvd	0.5 *	0.8	0.5 *	0.4
Emission Rate, lb/hr	0.2 *	0.3	0.2 *	0.2
3-Carene				
Concentration, ppmvd	0.5 •	0.5 •	0.5 •	0.5 •
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5	0.6	0.5	0.6
Emission Rate, lb/hr	0.2	0.3	0.2	0.2

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN	Source:	Brown Stock Washer Vent A		FIN:	G-4
Source Code: CL-BSWA	Date:	4/24/92	EPN: G-4(a)	CIN:	

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Knowns as Carbon				
Concentration, ppmvd	34.2	50.9	37.1	40.7
Unknowns as Carbon				
Concentration, ppmvd	0.9	1.0	0.8	0.9
Sum M18 as Carbon, lb/hr	1.3	1.9	1.4	1.5
Unknown Compounds % of Total	2.5%	1.9%	2.0%	2.1%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	46.2	55.9	49.4	50.5
Emission Rate, lb/hr as C	1.7	2.0	1.8	1.8

COMMENTS

M18 data for run 2 on 4/22/92 was rejected because not consistent with other injections.

* One or more values were less than the detection limit.

SECTION 1.2 BSWB EMISSION TEST RESULTS - VOC

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Brown Stock Washer Vent B | FIN: G-4
Source Code: CL-BSWB | Date: 4/22/92 | EPN: G-4(b) | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1800	1900	2000	
Flow Data				
Stack Temperature, °F	101			101
Moisture Content, %	6.8			6.8
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	22.0			22.0
Volumetric Flow Rate, x10^3 DSCFM	19.2			19.2
Process Operating Conditions				
Production Rate, ADT pulp/hr	10.0	10.0	10.0	10.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	2.1	1.6	2.1	1.9
Emission Rate, lb/hr	0.2	0.2	0.2	0.2
Methyl mercaptan				
Concentration, ppmvd	3.0	2.9	2.5	2.8
Emission Rate, lb/hr	0.4	0.4	0.4	0.4
Dimethyl sulfide				
Concentration, ppmvd	3.9	3.8	3.7	3.8
Emission Rate, lb/hr	0.7	0.7	0.7	0.7
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	2.1	2.1	2.1	2.1
Emission Rate, lb/hr	0.6	0.6	0.6	0.6
Method 18 Data				
Methanol				
Concentration, ppmvd	5.8	11.5	8.2	8.5
Emission Rate, lb/hr	0.6	1.1	0.8	0.8
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.6	1.1	0.5 *	0.7
Emission Rate, lb/hr	0.1	0.2	0.1 *	0.1
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Brown Stock Washer Vent B | FIN: G-4
Source Code: CL-BSWB | Date: 4/22/92 | EPN: G-4(b) | CIN:

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5	0.5 *	0.4
Emission Rate, lb/hr	0.2 *	0.2	0.2 *	0.1
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN   Source: Brown Stock Washer Vent B   FIN: G-4
Source Code: CL-BSWB   Date: 4/22/92   EPN: G-4(b)   CIN: -

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Knowns as Carbon				
Concentration, ppmvd	17.8	26.2	17.6	20.5
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.6	0.9	0.6	0.7
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	26.8	26.8	27.9	27.2
Emission Rate, lb/hr as C	1.0	1.0	1.0	1.0

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN	Source:	Brown Stock Washer Vent B			FIN:	G-4
Source Code: CL-BSWB	Date:	4/24/92	EPN:	G-4(b)	CIN:	-

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1021	1121	1221	
Flow Data				
Stack Temperature, °F			103	103
Moisture Content, %			7.1	7.1
Oxygen Concentration, %			20.8	20.8
Carbon Dioxide Concentration, %			0.0	0.0
Volumetric Flow Rate, x10^3 ACFM			22.0	22.0
Volumetric Flow Rate, x10^3 DSCFM			19.1	19.1
Process Operating Conditions				
Production Rate, ADT pulp/hr	10.9	10.9	10.9	10.9
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	2.1	2.1	2.1	2.1
Emission Rate, lb/hr	0.2	0.2	0.2	0.2
Methyl mercaptan				
Concentration, ppmvd	4.0	3.9	3.4	3.8
Emission Rate, lb/hr	0.6	0.6	0.5	0.5
Dimethyl sulfide				
Concentration, ppmvd	6.5	6.4	5.6	6.2
Emission Rate, lb/hr	1.2	1.2	1.0	1.1
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	2.7	2.8	2.7	2.7
Emission Rate, lb/hr	0.8	0.8	0.8	0.8
Method 18 Data				
Methanol				
Concentration, ppmvd	13.5	13.2	10.1	12.3
Emission Rate, lb/hr	1.3	1.3	1.0	1.2
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.9	1.0	0.6	0.8
Emission Rate, lb/hr	0.1	0.2	0.1	0.1
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Brown Stock Washer Vent B | FIN: G-4
Source Code: CL-BSWB | Date: 4/24/92 | EPN: G-4(b) | CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
alpha-Pinene				
Concentration, ppmvd	1.1	1.3	1.3	1.2
Emission Rate, lb/hr	0.4	0.5	0.5	0.5
beta-Pinene				
Concentration, ppmvd	0.6	0.9	0.8	0.8
Emission Rate, lb/hr	0.3	0.3	0.3	0.3
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *

* One or more values were less than the detection limit.

...S - VOC

...ock Washer Vent B

...4/92 EPN: G-4(b)

FIN:

CIN:

Run 1	Run 2	Run 3	Averag...
0.5 *	0.5 *	0.5 *	0.5
0.2 *	0.2 *	0.2 *	0.2
43.1	44.3	36.5	41.3
1.3	0.0	0.0	0.4
1.6	1.6	1.3	1.5
2.9%	0.0%	0.0%	1.0%
64.6	75.3	64.6	68.2
2.3	2.7	2.3	2.4

...ion limit.

WESTON

SECTION 1.3 VOC QUALITY CONTROL RESULTS

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

BROWN STOCK WASHER VENT A (CL-BSWA)

THC Quality Control
(Concentrations in ppm)

Calibration

	4/22/92		4/24/92	
Theoretical	Found	% Error	Found	% Error
0	1	0.7	0	0.0
36	35	-0.7	36	0.0
91	88	2.1	91	-0.8
150	151	0.7	150	0.0
Correlation coefficient	0.9995		0.9999	

Line Study

Bag sample

4/22/92			4/24/92		
Analyzer	Line	% Rec	Analyzer	Line	% Rec
142	140	98.6	36	36	100.0

Nitrogen Blank Not Performed

BROWN STOCK WASHER VENT B (CL-BSWB)
THC Quality Control
(Concentrations in ppm)

Calibration

	4/22/92		4/24/92	
Theoretical	Found	% error	Found	% error
0	0	0.0	0	0.0
36	35	-0.7	36	0.0
91	94	1.9	90	-0.8
150	148	-1.3	150	0.0
Correlation coefficient	0.9996		>0.9999	

Line Study

Bag sample

4/22/92			4/24/92		
Analyzer	Line	%Rec	Analyzer	Line	%Rec
147	139	94.6	36	36	100.0

Nitrogen Blank Not Performed

BROWN STOCK WASHER VENT A (CL-BSWA)
VOC Quality Control
(Concentrations in ppm)

Calibration

Analyte	Theoretical	4/22/92 Check Std	% Rec	4/24/92 Check Std	% Rec
Acetone	87.7	141.2	161.1	112.7	128.5
Isopropanol	84.1	77.6	92.2	62.0	73.8
Benzene	72.0	87.4	121.3	74.2	103.0
Bromodichloromethane	77.8	85.8	110.3	86.9	111.7
Toluene	60.6	66.3	109.4	60.2	99.3
Ethyl Benzene	52.6	57.0	108.3	51.5	98.0
p-Xylene	52.5	56.0	106.6	50.4	95.9
o-Xylene	52.8	56.0	106.1	46.8	88.8
Cumene	46.3	49.5	106.9	45.9	99.1
alpha-Pinene	40.4	43.2	106.9	40.5	100.3
beta-Pinene	40.6	51.4	126.7	19.1	47.1
3-Carene	40.6	42.9	105.6	37.8	93.1
p-Cymene	41.3	41.2	99.9	31.3	76.0

Nitrogen blank 4/23/92 No peaks detected with retention time less than 37 minutes

Line Study		GC	Line	%Rec
Methanol (100 ppm)				
	4/22/92	85.8	69.7	81.2
	4/24/92	72.6	80.2	110.5

BROWN STOCK WASHER VENT B (CL-BSWB)
VOC Quality Control
(Concentrations in ppm)

Calibration

Analyte	Theoretical	4/22/92 Check Std	% Rec	4/24/92 Check Std	% Rec
Acetone	87.7	94.0	107.2	86.9	99.1
Isopropanol	84.1	87.0	103.4	78.4	93.3
Benzene	72.0	87.7	121.7	88.2	122.4
Bromodichloromethane	77.8	90.3	116.0	86.4	111.1
Toluene	60.6	59.9	98.9	60.0	99.0
Ethyl Benzene	52.6	50.7	96.4	50.8	96.7
p-Xylene	52.5	50.4	96.1	50.5	96.2
o-Xylene	52.8	48.2	91.3	47.5	90.1
Cumene	46.3	45.1	97.4	45.2	97.7
alpha-Pinene	40.4	39.1	96.7	39.4	97.5
beta-Pinene	40.6	39.7	97.9	39.0	96.0
3-Carene	40.6	39.8	97.8	39.7	97.6
p-Cymene	41.3	37.2	90.2	37.4	90.6

Nitrogen blank 4/23/92 No peaks detected with retention times less than 37 minutes

Line Study		GC	Line	% Rec
Methanol (100 ppm)				
	4/22/92	102.8	49.0	• 47.7
	4/24/92	87.9	71.1	80.9

• Low recovery possibly due to puncture in bag.

BROWN STOCK WASHER VENT A (CL-BSWA)
TRS Quality Control
(Concentrations in ppm)

Calibration

4/22/92	Lo	Med	Hi	Correlation coefficient
Hydrogen Sulfide	5.4	9.4	14.5	0.9971
Methyl Mercaptan	5.1	8.9	13.8	0.9988
Dimethyl Sulfide	7.6	13.2	20.4	0.9997
Carbon Disulfide	2.5	4.4	6.8	0.9978
Dimethyl Disulfide	3.9	6.8	10.5	0.9995

4/24/92	Lo	Med	Hi	Correlation coefficient
Hydrogen Sulfide	5.4	9.4	13.6	0.9862
Methyl Mercaptan	5.1	9.0	13.0	0.9908
Dimethyl Sulfide	7.6	13.3	19.2	0.9958
Carbon Disulfide	2.5	4.4	6.3	0.9933
Dimethyl Disulfide	3.9	6.8	9.9	0.9920

Line Study

	GC	Line	%Rec
4/22/92	13.6	12.9	94.9
4/24/92	Not Performed		

BROWN STOCK WASHER VENT B (CL-BSWB)
TRS Quality Control
(Concentrations in ppm)

Calibration

4/22/92	Lo	Med	Hi	Correlation coefficient
Hydrogen Sulfide	5.4	9.4	14.5	0.9971
Methyl Mercaptan	5.1	8.9	13.8	0.9988
Dimethyl Sulfide	7.6	13.2	20.4	0.9997
Carbon Disulfide	2.5	4.4	6.8	0.9978
Dimethyl Disulfide	3.9	6.8	10.5	0.9995

4/24/92	Lo	Med	Hi	Correlation coefficient
Hydrogen Sulfide	5.4	9.4	13.6	0.9862
Methyl Mercaptan	5.1	9.0	13.0	0.9908
Dimethyl Sulfide	7.6	13.3	19.2	0.9958
Carbon Disulfide	2.5	4.4	6.3	0.9933
Dimethyl Disulfide	3.9	6.8	9.9	0.9920

Line Study

	GC	Line	%Rec
4/22/92	13.6	12.9	95
4/24/92	Not Performed		

SECTION 1.4 PROCESS DESCRIPTION AND OPERATING CONDITIONS

BROWNSTOCK WASHER

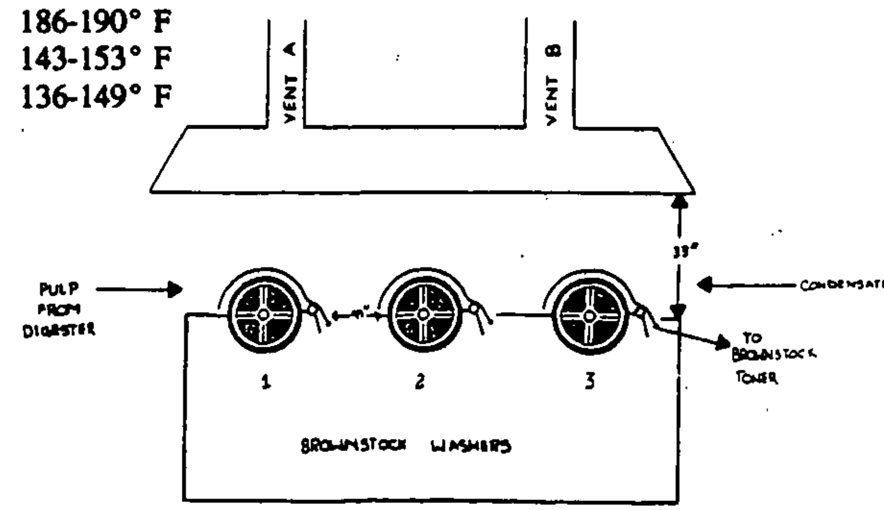
Seven batch digesters produce 550 ton/day of kraft pulp. Information on process parameters during the tests is provided below.

Wood Species Pulped:	Southern Pine
Production Rate:	550 Tons/Day
Active Alkali:	6.8 lb/cubic feet
Sulfidity:	28% on Total Alkali Basis
Cooking Temperature:	340° F
Digester Pressure:	100° PSIG
Kappa No. of Pulp:	30
Chip Charge:	73,000 lbs
Liquor Charge:	6,000 lbs Active Alkali/Cook

The mill utilizes a three-stage countercurrent vacuum drum system for brownstock washing. Each set of three drum washers is covered with a hood. Each hood has two vents that are individually vented to the atmosphere. Each hood is equipped with a fan rated at 38300 ACFM at 102° F. Number 1 filtrate tank is individually vented to the sewer. Number 2 consists of two filtrate tanks connected with one vent. Number 3 filtrate tank is vented individually to the atmosphere.

Clean condensates consisting of combined condensate from the primary condenser of the blowheat system, evaporators, and stripped condensate are used as shower water on the washer. Some of the process parameters during the test were as follows:

Pulp Kappa No.:	30
Pulp Flow Rate:	550 Tons/day
Shower Water Temp.:	142-160° F
Shower Water Flow Rate:	300-500 GPM
Vat temperatures, 1st:	186-190° F
2nd:	143-153° F
3rd:	136-149° F



SHOWER WATER SOURCE: CONDENSATES - EVAPORATOR, STRIPPER, BLOWHEAT

PARAMETERS	UNITS	RUN 1	RUN 2	RUN 3	RUN 4	RUN 5	RUN 6	RUN 7
DATE		4/22	4/22	4/22	4/22	4/24	4/24	4/24
START TIME		1703	1808	1907	2007	1008	1117	1216
STOP TIME		1748	1853	1953	2053	1053	1202	1301
PULP FLOW *	ADT/D	481.4	481.4	481.4	481.4	522.9	522.9	522.9
ACTIV ALKALI	%	17	17	17	17	16.8	16.8	16.8
SULFIDITY	%	14.5	14.5	14.5	14.5	14.1	14.1	14.1
SHOW TEMP SET 2 #1	F	142	142	144	143	144	145	146
SHOW TEMP SET 2 #2	F	142	142	142	138	147	148	148
SHOW TEMP SET 2 #3	F	155	155	142	150	156	160	160
SHOW FLOW SET 2 #1	GPM	400	400	450	480	500	500	500
SHOW FLOW SET 2 #2	GPM	400	350	400	440	480	500	500
SHOW FLOW SET 2 #3	GPM	330	300	300	300	320	330	320
VAT TEMP SET 2 #1	F	186.8	190.4	190.4	190.4	190.4	190.4	190.4
VAT TEMP SET 2 #2	F	143.6	143.6	145.4	145.4	149.0	152.6	152.6
VAT TEMP SET 2 #3	F	140.0	140.0	136.4	136.4	145.4	147.2	149.0

DEFOAMER USE: 4/22 =2 1/2" IN 8 HOURS, 4/24 = 2" IN 6 HOURS

COMMENTS: WASHERS WERE DOWN 15 MINUTES PRIOR TO TESTING; PN 20.0 TO 20.4 for 10 minutes

*Pulp Flow is for 2 washer systems. only one was tested.

4/22/92 There was a slower cooking rate

Flows at 8:10 #1 480, #2 440, #3 300.

PN 5:00 20.4, 7:00 20.0

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SECTION 2
LIME KILN WITH NCGs
(CL-LK/1)

SECTION 2
LIME KILN WITH NCGs
(CL-LK/1)

The Lime Kiln was sampled while burning noncondensible gases (NCGs). Only one three-hour period was sampled because of the lack of identifiable peaks on the Method 18 GC.

Total Hydrocarbons (M25A)

Figure 2.1 presents the THC trend for the test period on 30 April 1992. Total hydrocarbon concentrations (THC) varied generally over the 20 to 35 ppm range with several spikes in the 50 ppm range. The THC is suspected to result from unburned natural gas (methane) and the kiln exhaust.

Volatile Organic Compounds (M16 and M18)

Table 2.1 summarizes the results for the Method 16 and Method 18 target compounds, and Section 2.1 is a tabulation of the data. No target compounds were identified in the M18 analysis on 30 April 1992 and all were reported as nondetectable (ND). Only hydrogen sulfide and dimethyl disulfide were identified in the M16 analyses.

Volatile Organic Sampling Train (VOST)

Table 2.2 summarizes the result of the VOST sample collected on 30 April 1992. Section 2.2 tabulates the results for target compounds and tentatively identified compounds (TIC).

The VOST analysis is extremely sensitive and is used here to confirm the identity of target compounds identified in Method 18 as well as attempt identification of other extraneous organic components which may be present, the Tentatively Identified Compounds (TICs). Of the target compounds, chloromethane, benzene, acetone, and carbon disulfide dominated, ranging from 0.02 to 0.08 ppm, respectively. As 0.08 ppm corresponds to approximately 0.015 lb/hr, all identified compounds are well below the detection limit reported by Method 18.

Miscellaneous Parameters

Tables 2.3 and 2.4 summarize the results of testing for aldehydes and hydrogen chloride. Section 2.3 tabulates the results for each compound.

No aldehydes and ketones were measured during the testing. A retest for hydrogen chloride was performed on 16 September 1992. Hydrogen chloride emission rates were less than 1 lb/hr.

Metals

Table 2.5 summarizes the result of the samples collected for metals analyses. Section 2.4 tabulates the results for each compound. Only trace amounts of copper, lead, manganese, and nickel were observed in the emissions.

VOC Quality Control Results

The VOC quality control data is tabulated in Section 2.5. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 2.6 includes the process operating data as recorded and provided by mill personnel. The kiln was stable throughout testing. Process operating data for hydrogen chloride retest was taken from 01 May 92 conditions.

FIGURE 2.1
THC TREND ANALYSIS (4/30/92)
LIME KILN WITH NCGs (CL-LK/1)

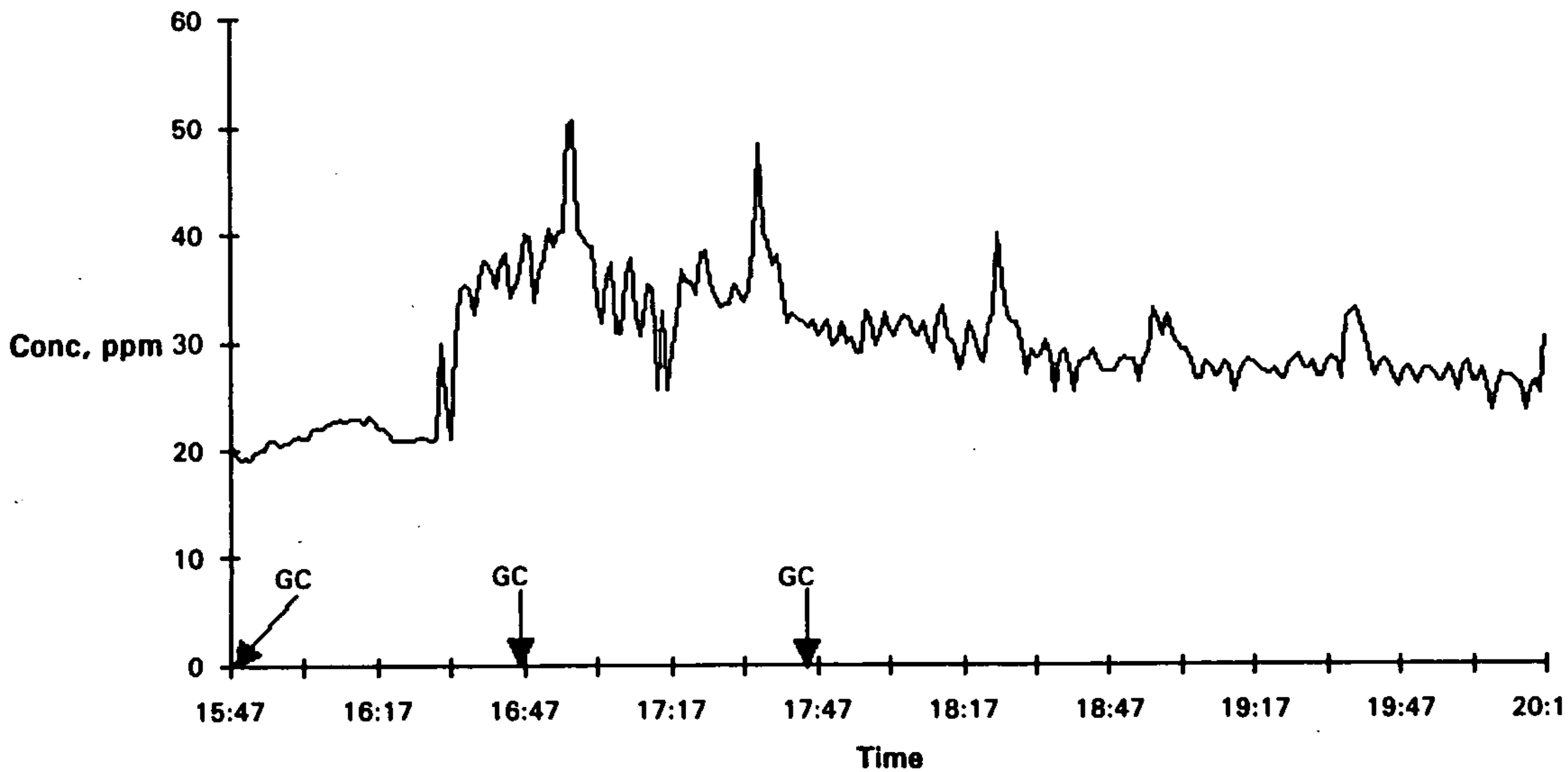

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TABLE 2.1
SUMMARY OF VOC RESULTS

Mill: CHAMPION - LUFKIN
Source Code: CL-LK/1
FIN: 79-1 CIN: 260012

Source: Lime Kiln With NCGs
Test Dates: 4/30/92
EPN: 79-1

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	158	160	159	
Volumetric Flow Rate, x10^3 DSCFM	10.9	13.4	12.1	
Process Operating Conditions				
Production Rate, T CaO/hr	6.3	6.4	6.4	
Method 16 Data, lb/hr				
Hydrogen sulfide	0.4	0.5	0.4	0.1
Methyl mercaptan	ND	ND	ND	0.1
Dimethyl sulfide	ND	ND	ND	0.1
Carbon disulfide	ND	ND	ND	0.1
Dimethyl disulfide	0.2	0.2	0.2	0.1
Method 18 Data, lb/hr				
Methanol	ND	ND	ND	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	ND	ND	ND	0.3
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.4
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.2
beta-Pinene	ND	ND	ND	0.2
3-Carene	ND	ND	ND	0.2
Terpenes (Unspecified)	ND	ND	ND	0.2
p-Cymene	ND	ND	ND	0.2
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	ND	ND	ND	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	ND	ND	ND	0.1

ND=Not Detected
DL=Detection Limit

TABLE 2.2 SUMMARY OF VOST RESULTS

Mill: CHAMPION-LUFKIN
Source Code: CL-LK/1
FIN: 79-1 EPN: 79-1

Source: Lime Kiln With NCGs
Test Dates: 5/2/92
CIN: 260012

TIME	0810
Volumetric Flow Data	
Stack Temperature, °F	156
Volumetric Flow Rate, x 10^3 DSCFM	12.1
Process Operating Conditions	
Production Rate, T CaO/hr	6.4
Target Compounds, ppm	
Chloromethane	0.027
Bromomethane	0.001
Methylene Chloride	0.011
Acetone	0.032
Carbon Disulfide	0.079
Chloroform	0.005
Dimethyl disulfide	0.076
Dimethyl sulfide	0.003
n-Hexane	0.003
2-Butanone	0.005
Bromodichloromethane	0.001
Benzene	0.020
Dibromomethane	0.001
Toluene	0.002
Ethylbenzene	0.000
A-Pinene	0.004
B-Pinene	0.002
p-Cymene	0.000

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TABLE 2.3 SUMMARY OF MISCELLANEOUS RESULTS

Mill: CHAMPION-LUFKIN
Source Code: CL-LK/1
FIN: 79-1 EPN: 79-1

Source: Lime Kiln With NCGs
Test Dates: 4/30/92 5/1/92
CIN: 260012

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	156	160	158	
Volumetric Flow Rate, x 10^3 DSCFM	10.9	13.4	12.1	
Process Operating Conditions				
Production Rate, T CaO/hr	5.7	6.4	6.2	
Emission Rate, lb/hr				
Formaldehyde	ND	ND	ND	0.1
Acetaldehyde	<0.1	<0.1	0.1	0.1
Acetone	ND	ND	ND	0.1
Acetophenone	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Methyl Isobutyl Ketone	ND	ND	ND	
Acrolein	ND	ND	ND	0.1
Benzaldehyde	ND	ND	ND	0.1

ND = Not Detected
DL = Detection Limit

TABLE 2.4 SUMMARY OF MISCELLANEOUS RESULTS

Mill: CHAMPION-LUFKIN
Source Code: CL-LK/1
FIN: 79-1 EPN: 79-1

Source: Lime Kiln With NCGs
Test Dates: 9/16/92
CIN: 260012

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	161	163	162	
Volumetric Flow Rate, x 10^3 DSCFM	10.0	10.1	10.1	
Process Operating Conditions				
Production Rate, T CaO/hr	5.7	5.7	5.7	
Emission Rate, lb/hr				
Hydrogen Chloride	<0.1	<0.1	0.1	

ND = Not Detected
DL = Detection Limit

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TABLE 2.5 SUMMARY OF METALS EMISSIONS

Mill: CHAMPION-LUFKIN
Source Code: CL-LK/1
FIN: 79-1   EPN: 79-1

Source: Lime Kiln With NCGs
Test Dates: 5/03/92
CIN: 260012

	RUN 1	RUN 2	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	160	160	160	
Volumetric Flow Rate, x 10^3 DSCFM	11.4	11.2	11.3	
Process Operating Conditions				
Production Rate, T CaO/hr	5.1	5.1	5.1	
Metals Emission Rate, x10^{-4}lb/hr				
Antimony (Sb)	ND	ND	ND	2.4
Arsenic (As)	ND	2.9	2.1	2.4
Barium (Ba)	ND	ND	ND	2000
Beryllium (Be)	ND	ND	ND	2.4
Cadmium (Cd)	ND	ND	ND	2.4
Chromium (Cr)	ND	ND	ND	4.9
Copper (Cu)	6.4	ND	3.8	2.4
Lead (Pb)	620.0	830.0	725.0	4.9
Manganese (Mn)	15.0	25.0	20.0	4.9
Mercury (Hg)	ND	ND	ND	2.4
Nickel (Ni)	4.9	2.4	3.7	2.4
Phosphorus (P)	ND	ND	ND	49
Silver (Ag)	ND	ND	ND	2.4
Selenium (Se)	ND	ND	ND	2.4
Thallium (Tl)	ND	ND	ND	2.4

ND = Not Detected
DL = Detection Limit

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SECTION 2.1 EMISSION TEST RESULTS - VOC

EMISSION TEST RESULTS - VOC

Mill:	CHAMPION - LUFKIN	Source:	Lime Kiln With NCGs			FIN:	79-1
Source Code:	CL-LK/1	Date:	4/30/92	EPN:	79-1	CIN:	260012

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1546	1646	1846	
Flow Data				
Stack Temperature, °F		158	160	159
Moisture Content, %		18.4	16.8	17.6
Oxygen Concentration, %		8.0	8.0	8.0
Carbon Dioxide Concentration, %		16.0	16.0	16.0
Volumetric Flow Rate, x10^3 ACFM		19.5	15.5	17.5
Volumetric Flow Rate, x10^3 DSCFM		13.4	10.9	12.1
Process Operating Conditions				
Production Rate, T CaO/hr	6.4	6.4	6.3	6.4
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	6.1	7.3	7.4	6.9
Emission Rate, lb/hr	0.4	0.5	0.5	0.4
Methyl mercaptan				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	1.1	1.3	1.3	1.2
Emission Rate, lb/hr	0.2	0.2	0.2	0.2
Method 18 Data				
Methanol				
Concentration, ppmvd	2.4 *	2.4 *	2.4 *	2.4 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN	Source:	Lime Kiln With NCGs		FIN:	79-1
Source Code: CL-LK/1	Date:	4/30/92	EPN: 79-1	CIN:	26001^

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.2 *	1.2 *	1.2 *	1.2 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.2 *	1.2 *	1.2 *	1.2 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN		Source: Lime Kiln With NCGs		FIN:	79-1
Source Code:	CL-LK/1	Date: 4/30/92	EPN: 79-1	CIN:	260012

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Knowns as Carbon				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	30.3	43.7	36.4	36.8
Emission Rate, lb/hr as C	0.7	1.0	0.8	0.8

COMMENTS

Moisture was used from field data.

* One or more values were less than the detection limit.

WESTON
MANAGERS DESIGNERS/CONSULTANTS

SECTION 2.2 EMISSION TEST RESULTS - VOST

EMISSION TEST RESULTS - VOST

Mill CHAMPION - LUFKIN Source: Lime Kiln With NCGs Condition 1
Source Code: CL-LK/1 EPN: 79-1 FIN: 79-1 CIN: 260012

Date: 5/2/92

Compound	LK/1-T (µg)	LK/1-TC (µg)	LK/1-C (µg/L)	Total µg	CL-LK/1 (µg/m3)	Conc. (ppm)
TARGET COMPOUNDS						
Chloromethane		1.137		1.14	57.05	0.027
Bromomethane		0.045		0.05	2.26	0.001
Methylene Chloride	0.622	0.019	3.24	0.78	39.15	0.011
Acetone	0.644	0.075	18.88	1.53	76.81	0.032
Carbon Disulfide	3.467	1.471	0.50	4.96	248.85	0.079
Chloroform	0.231	0.019	4.67	0.45	22.62	0.005
Trichlorofluoromethane						
Dimethyl disulfide	5.882	0.059	0.61	5.97	299.41	0.076
Dimethyl sulfide	0.154			0.15	7.73	0.003
n-Hexane	0.207	0.038		0.25	12.29	0.003
2-Butanone (MEK)	0.289	0.010		0.30	15.00	0.005
Bromodichloromethane	0.071			0.07	3.56	0.001
Trichloroethene						
Benzene	1.271			1.27	63.77	0.020
Dibromomethane	0.073			0.07	3.66	0.001
Toluene	0.134	0.017	0.48	0.17	8.61	0.002
Ethylbenzene	0.022			0.02	1.10	0.000
A-Pinene	0.398			0.40	19.97	0.004
B-Pinene	0.195			0.20	9.78	0.002
p-Cymene			0.43	0.02	0.93	0.000
TENTATIVELY IDENTIFIED CMPDS.						
unsat'd HC (C4H8)		0.118		0.12	5.92	
Siloxane	0.207	0.023		0.23	11.54	
Furan		0.011		0.01	0.55	
Hydrocarbon	4.146		1.49	4.21	211.24	
subst'd HC	2.177		1.45	2.24	112.36	
Aromatic HC			0.55	0.02	1.19	
Aromatic HC			0.43	0.02	0.93	
Hydrocarbon	0.334		0.39	0.35	17.60	
Thiophene	1.977			1.98	99.20	
subst'd cyclic HC (C10H16)						
Dimethyl Trisulfide	1.866			1.87	93.63	
Cyclic HC						
subst'd HC	1.083			1.08		
Octane		0.004		0.00	0.20	
Butanal	0.178			0.18	8.93	
Branched cyclic HC	0.154			0.15	7.73	
subst'd HC	0.236			0.24	11.84	
Ketone, unknown						

EMISSION TEST RESULTS - VOST

Mill CHAMPION - LUFKIN Source: Lime Kiln With NCGs Condition 1
Source Code: CL-LK/1 EPN: 79-1 FIN: 79-1 CIN: 260012

Date: 5/2/92

Compound	LK/1-T (μg)	LK/1-TC (μg)	LK/1-C (μg/L)	Total μg	CL-LK/1 (μg/m3)	Conc. (ppm)
SURROGATE STDS						
(% Recovery)						
Toluene-d8	99.4	107.4	107.0			
1,2-Dichloroethane-d4	90.6	87.0	86.8			
Benzene-d6	87.8	100.0	105.3			

NOTES:
-T=Tenax
-TC=Tenax/Charcoal
-C = Condensate

Air Volume = 0.01993 cu.m.
Condensate Vol. 43.0 mL

Triangle Laboratories of RTP, Inc.	FILE NAME: HH639	SAMPLE ID:	CL-LK/1 VOST/0502
801 Capitola Drive	RF FILE: ICAL 051092		/1C T
Durham, NC 27713	DATE: 06/01/92	TLI ID:	56.027.9
Telephone: (919) 544-5729	TLI PROJ #: 20802	ANALYSIS DATE:	05/13/92

M E T H O D 8 2 4 0 Q U A N T I T A T I O N R E P O R T

	NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	6692		776	1		IS HIGH	
2	Chloromethane	0	1.289	0	1	.001	ND	.05
3	Bromomethane	0	.864	0	1	.001	ND	.05
4	Vinyl Chloride	0	1.838	0	1	.001	ND	.05
5	Chloroethane	0	1.221	0	1	.001	ND	.05
6	Methylene Chloride	21278	1.279	585	1	.822	D	.05
7	Acetone	5191	.301	527	1	.644	D	.05
8	Carbon Disulfide	420300	4.529	505	1	3.467	E	.05
9	1,1-Dichloroethene	0	1.227	0	1	.001	ND	.05
10	1,1-Dichloroethane	0	4.568	0	1	.001	ND	.05
11	trans-1,2-Dichloroethene	0	1.387	0	1	.001	ND	.05
12	Chloroform	18761	3.032	797	1	.231	D	.05
13	1,2-Dichloroethane	0	3.016	0	1	.001	ND	.05
43	Trichlorofluoromethane	0	1.724	0	1	.001	ND	.05
47	cis-1,2-Dichloroethene	0	1.525	0	1	.001	ND	.05
57	Allyl chloride	0	.832	0	1	.001	ND	.05
62	Dimethyl disulfide	496084	3.151	1087	1	5.882	E	.05
63	Dimethyl sulfide	9298	2.250	515	1	.154	D	.05
65	Iodomethane	0	2.478	0	1	.001	ND	.05
66	Isooctane	0	14.667	0	1	.001	ND	.05
68	Tert-Butyl methyl ether	0	3.759	0	1	.001	ND	.05
69	Vinyl Bromide	0	1.077	0	1	.001	ND	.05
70	n-Hexane	25723	4.652	666	1	.207	D	.05
14	1,4-Difluorobenzene	32073		911	14		IS	
15	2-Butanone	885	.024	763	14	.289	D	.05
16	1,1,1-Trichloroethane	0	.509	0	14	.001	ND	.05
17	Carbon Tetrachloride	0	.538	0	14	.001	ND	.05
18	Vinyl Acetate	0	.555	0	14	.001	ND	.05
19	Bromodichloromethane	5010	.549	1011	14	.071	D	.05
20	1,2-Dichloropropane	0	.703	0	14	.001	ND	.05
21	cis-1,3-Dichloropropene	0	.750	0	14	.001	ND	.05
22	Trichloroethene	0	.577	0	14	.001	ND	.05
23	Dibromochloromethane	0	.557	0	14	.001	ND	.05
24	1,1,2-Trichloroethane	0	.292	0	14	.001	ND	.05
25	Benzene	193415	1.186	850	14	1.271	E	.05
26	trans-1,3-Dichloropropene	0	.616	0	14	.001	ND	.05
27	Bromoform	0	.354	0	14	.001	ND	.05
54	1,4-Dichloro-2-butene	0	.118	0	14	.001	ND	.05
60	Dibromomethane	1777	.190	981	14	.073	D	.05
28	Chlorobenzene-d5	41568		1354	28		IS	
29	4-Methyl-2-Pentanone	0	.185	0	28	.001	ND	.05
30	2-Hexanone	0	.114	0	28	.001	ND	.05
31	Tetrachloroethene	0	.425	0	28	.001	ND	.05
32	1,1,2,2-Tetrachloroethane	0	.259	0	28	.001	ND	.05
33	Toluene	14159	.635	1124	28	.134	D	.05
34	Chlorobenzene	0	.931	0	28	.001	ND	.05
35	Ethylbenzene	1756	.477	1388	28	.022	E	.05
36	Styrene	0	.913	0	28	.001	ND	.05

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HH639
RF FILE: ICAL 051092
DATE: 06/01/92
TLI PROJ #: 20802

SAMPLE ID: CL-LK/1 VOST/0502 /1C T
TLI ID: 56.027.9
ANALYSIS DATE: 05/13/92

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
37 o-Xylene	0	.559	0	28	.001	ND	.05
38 m-/p-Xylene	0	.581	0	28	.001	ND	.05
49 1,2 Dichlorobenzene	0	.832	0	28	.001	ND	.05
50 1,2,3-Trichloropropane	0	.235	0	28	.001	ND	.05
51 1,3 Dichlorobenzene	0	1.043	0	28	.001	ND	.05
53 1,4 Dichlorobenzene	0	.897	0	28	.001	ND	.05
56 A-Pinene	64607	.976	1556	28	.398	D	.05
58 B-Pinene	31694	.979	1702	28	.195	D	.05
59 Cumene (isopropylbenzene)	0	1.513	0	28	.001	ND	.05
64 Ethyl methacrylate	0	.457	0	28	.001	ND	.05
67 P-Cymene	0	2.177	0	28	.001	ND	.05

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	16040	2.647	849	1	.23	D	90.6
48 Benzene-d6	33838	1.201	846	14	.22	D	87.8
39 Toluene-d8	43054	1.042	1114	28	.25	D	99.4

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HH639
DATE: 06/02/92
TLI PROJ #: 20802

SAMPLE ID: CL-LK/1 VOST/0502 /1C T
TLI ID: 56.027.9
ANALYSIS DATE: 05/13/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

	NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
1	BRANCHED HYDROCARBON	1924	2119122	1354	.25	4.146
2	BRANCHED HYDROCARBON	1850	1113019	1354	.25	2.177
3	THIOPHENE	876	999118	911	.25	1.977
4	DIMETHYL TRISULFIDE	1747	954108	1354	.25	1.866
5	SUBSTITUTED HYDROCARBON	1712	553675	1354	.25	1.083
6	HYDROCARBON	653	66996	779	.25	.334
7	BUTANAL	736	36783	779	.25	.178
8	BRANCHED CYCLIC HYDROCARBON	1148	78644	1354	.25	.154
9	SILOXANE	1239	105811	1354	.25	.207
10	SUBSTITUTED HYDROCARBON	1264	120578	1354	.25	.236

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	779	51705	1
1,4-Difluorobenzene	911	126321	14
Chlorobenzene-d5	1354	127795	28

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HH637
RF FILE: ICAL 051092
DATE: 06/01/92
TLI PROJ #: 20802

SAMPLE ID: CL-LK/1 VOST/0502 /1C TC
TLI ID: 56.027.9
ANALYSIS DATE: 05/13/92

2

METHOD 8240 QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	3910		771	1		IS	
2	Chloromethane	22919	1.289	163	1	1.137	E	.05
3	Bromomethane	607	.864	295	1	.045	E	.05
4	Vinyl Chloride	0	1.838	0	1	.001	ND	.05
5	Chloroethane	0	1.221	0	1	.001	ND	.05
6	Methylene Chloride	389	1.279	578	1	.019	E	.05
7	Acetone	355	.301	518	1	.075	D	.05
8	Carbon Disulfide	104228	4.529	497	1	1.471	E	.05
9	1,1-Dichloroethene	0	1.227	0	1	.001	ND	.05
10	1,1-Dichloroethane	0	4.568	0	1	.001	ND	.05
11	trans-1,2-Dichloroethene	0	1.367	0	1	.001	ND	.05
12	Chloroform	921	3.032	789	1	.019	E	.05
13	1,2-Dichloroethane	0	3.016	0	1	.001	ND	.05
43	Trichlorofluoromethane	0	1.724	0	1	.001	ND	.05
47	cis-1,2-Dichloroethene	0	1.525	0	1	.001	ND	.05
57	Allyl chloride	0	.832	0	1	.002	ND	.05
62	Dimethyl disulfide	2903	3.151	1064	1	.059	D	.05
63	Dimethyl sulfide	0	2.250	0	1	.001	ND	.05
65	Iodomethane	0	2.478	0	1	.001	ND	.05
66	Isooctane	0	14.667	0	1	.001	ND	.05
68	Tert-Butyl methyl ether	0	3.759	0	1	.001	ND	.05
69	Vinyl Bromide	0	1.077	0	1	.001	ND	.05
70	n-Hexane	2746	4.652	660	1	.038	E	.05
14	1,4-Difluorobenzene	19682		901	14		IS	
15	2-Butanone	18	.024	755	14	.010	E	.05
16	1,1,1-Trichloroethane	0	.509	0	14	.001	ND	.05
17	Carbon Tetrachloride	0	.538	0	14	.001	ND	.05
18	Vinyl Acetate	0	.555	0	14	.001	ND	.05
19	Bromodichloromethane	0	.549	0	14	.001	ND	.05
20	1,2-Dichloropropane	0	.703	0	14	.001	ND	.05
21	cis-1,3-Dichloropropene	0	.750	0	14	.001	ND	.05
22	Trichloroethene	0	.577	0	14	.001	ND	.05
23	Dibromochloromethane	0	.557	0	14	.001	ND	.05
24	1,1,2-Trichloroethane	0	.292	0	14	.001	ND	.05
25	Benzene	0	1.186	0	14	.001	ND	.05
26	trans-1,3-Dichloropropene	0	.616	0	14	.001	ND	.05
27	Bromoform	0	.354	0	14	.001	ND	.05
54	1,4-Dichloro-2-butene	0	.118	0	14	.002	ND	.05
60	Dibromomethane	0	.190	0	14	.001	ND	.05
28	Chlorobenzene-d5	26002		1341	28		IS	
29	4-Methyl-2-Pentanone	0	.185	0	28	.001	ND	.05
30	2-Hexanone	0	.114	0	28	.002	ND	.05
31	Tetrachloroethene	0	.425	0	28	.001	ND	.05
32	1,1,2,2-Tetrachloroethane	0	.259	0	28	.001	ND	.05
33	Toluene	1136	.635	1109	28	.017	E	.05
34	Chlorobenzene	0	.931	0	28	.001	ND	.05
35	Ethylbenzene	0	.477	0	28	.001	ND	.05
36	Styrene	0	.913	0	28	.001	ND	.05

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HH637
RF FILE: ICAL 051092
DATE: 06/01/92
TLI PROJ #: 20802

SAMPLE ID: CL-LK/1 VOST/0502 /1C TC
TLI ID: 58.027.9
ANALYSIS DATE: 05/13/92

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
37 o-Xylene	0	.559	0	28	.001	ND	.05
38 m-/p-Xylene	0	.561	0	28	.001	ND	.05
49 1,2 Dichlorobenzene	0	.832	0	28	.001	ND	.05
50 1,2,3-Trichloropropane	0	.235	0	28	.001	ND	.05
51 1,3 Dichlorobenzene	0	1.043	0	28	.001	ND	.05
53 1,4 Dichlorobenzene	0	.897	0	28	.001	ND	.05
56 A-Pinene	0	.976	0	28	.001	ND	.05
58 B-Pinene	0	.979	0	28	.001	ND	.05
59 Cumene (isopropylbenzene)	0	1.513	0	28	.001	ND	.05
64 Ethyl methacrylate	0	.457	0	28	.001	ND	.05
67 P-Cymene	0	2.177	0	28	.001	ND	.05

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	9003	2.647	839	1	.22	D	87.0
48 Benzene-d6	23657	1.201	837	14	.25	D	100.1
39 Toluene-d8	29099	1.042	1099	28	.27	D	107.4

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

TRIANGLE LABORATORIES OF RTP, INC.	FILE NAME: HH637	SAMPLE ID: CL-LK/1 VOST/0502
801 Capitola Drive	DATE: 06/02/92	/1C TC
Durham, NC 27713	TLI PROJ #: 20802	TLI ID: 56.027.9
Telephone: (919) 544-5729		ANALYSIS DATE: 05/13/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

	NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
1	MONOUNSATURATED HYDROCARBON C4H8	203	15437	771	.25	.118
2	FURAN	466	1401	771	.25	.011
3	OCTANE	1150	1374	1341	.25	.004
4	SILOXANE	1220	3024	771	.25	.023

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	771	32670	1
Chlorobenzene-d5	1341	81990	28

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: AC593
RF FILE: AC585
DATE: 06/01/92
TLI PROJ #: 20624

SAMPLE ID: CL-LK/1 VOST/0502 /1C CONDENSATE
TLI ID: 56.027.9
SAMPLE VOL: .005 L
ANALYSIS DATE: 05/14/92
DILUTION FACTOR: 1

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	CONC, ug/L	CODE	QUAN LIMIT
1 Bromochloromethane	2082		778	1		IS	
2 Chloromethane	0	1.713	0	1	.28	ND	10
3 Bromomethane	0	1.602	0	1	.30	ND	10
4 Vinyl Chloride	0	2.198	0	1	.22	ND	10
5 Chloroethane	0	1.340	0	1	.36	ND	10
6 Methylene Chloride	276	2.065	585	1	3.24	E	10
7 Acetone	860	1.093	528	1	18.88	D	10
8 Carbon Disulfide	122	5.894	503	1	.50	E	10
9 1,1-Dichloroethene	0	1.786	0	1	.27	ND	10
10 1,1-Dichloroethane	0	4.085	0	1	.12	ND	10
11 trans-1,2-Dichloroethene	0	1.980	0	1	.24	ND	10
12 Chloroform	724	3.725	797	1	4.87	E	10
13 1,2-Dichloroethane	0	3.169	0	1	.15	ND	10
43 Trichlorofluoromethane	0	.905	0	1	.53	ND	10
46 Acrylonitrile	0	.666	0	1	.72	ND	10
47 cis-1,2-Dichloroethene	0	2.212	0	1	.22	ND	10
52 1,3-butadiene	0	1.235	0	1	.39	ND	10
57 Allyl chloride	0	.941	0	1	.51	ND	10
62 Dimethyl disulfide	129	5.055	1080	1	.61	E	10
63 Dimethyl sulfide	0	2.505	0	1	.19	ND	10
65 Iodomethane	0	2.365	0	1	.20	ND	10
66 Isooctane	0	12.174	0	1	.04	ND	10
68 Tert-Butyl methyl ether	0	5.208	0	1	.09	ND	10
69 Vinyl Bromide	0	1.559	0	1	.31	ND	10
70 n-Hexane	0	4.075	0	1	.12	ND	10
14 1,4-Difluorobenzene	8992		912	14		IS	
15 2-Butanone	0	.064	0	14	1.73	ND	10
16 1,1,1-Trichloroethane	0	.347	0	14	.32	ND	10
17 Carbon Tetrachloride	0	.420	0	14	.27	ND	10
18 Vinyl Acetate	0	1.429	0	14	.08	ND	10
19 Bromodichloromethane	0	.490	0	14	.23	ND	10
20 1,2-Dichloropropane	0	.804	0	14	.14	ND	10
21 cis-1,3-Dichloropropene	0	.937	0	14	.12	ND	10
22 Trichloroethene	0	.500	0	14	.22	ND	10
23 Dibromochloromethane	0	.614	0	14	.18	ND	10
24 1,1,2-Trichloroethane	0	.547	0	14	.20	ND	10
25 Benzene	0	1.486	0	14	.07	ND	10
26 trans-1,3-Dichloropropene	0	.975	0	14	.11	ND	10
27 Bromoform	0	.429	0	14	.26	ND	10
54 1,4-Dichloro-2-butene	0	.302	0	14	.37	ND	10
60 Dibromomethane	0	.350	0	14	.32	ND	10
28 Chlorobenzene-d5	11057		1356	28		IS	
29 4-Methyl-2-Pentanone	0	.737	0	28	.12	ND	10
30 2-Hexanone	0	.509	0	28	.18	ND	10
31 Tetrachloroethene	0	.341	0	28	.27	ND	10
32 1,1,2,2-Tetrachloroethane	0	.741	0	28	.12	ND	10
33 Toluene	93	.870	1126	28	.48	E	10
34 Chlorobenzene	0	1.000	0	28	.09	ND	10

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

Triangle Laboratories of RTP, Inc.	FILE NAME: AC593	SAMPLE ID:	CL-LK/1 VOST/0502
801 Capitola Drive	RF FILE: AC585		/1C CONDENSATE
Durham, NC 27713	DATE: 06/01/92	TLI ID:	56.027.9
Telephone: (919) 544-5729	TLI PROJ #: 20624	SAMPLE VOL:	.005 L
		ANALYSIS DATE:	05/14/92
METHOD 8240 QUANTITATION REPORT		DILUTION FACTOR:	1

NAME	AREA	RF	SCAN	ISID	CONC, ug/L	CODE	QUAN LIMIT
35 Ethylbenzene	0	.571	0	28	.16	ND	10
36 Styrene	0	1.109	0	28	.08	ND	10
37 o-Xylene	0	.677	0	28	.13	ND	10
38 m-/p-Xylene	0	.655	0	28	.14	ND	10
49 1,2 Dichlorobenzene	0	.777	0	28	.12	ND	10
50 1,2,3-Trichloropropane	0	.543	0	28	.17	ND	10
51 1,3 Dichlorobenzene	0	.909	0	28	.10	ND	10
53 1,4 Dichlorobenzene	0	.772	0	28	.12	ND	10
56 A-Pinene	0	1.184	0	28	.08	ND	10
58 B-Pinene	0	1.255	0	28	.07	ND	10
59 Cumene (isopropylbenzene)	0	1.624	0	28	.06	ND	10
64 Ethyl methacrylate	0	.761	0	28	.12	ND	10
67 P-Cymene	165	1.721	1952	28	.43	E	10

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT,ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	5229	2.895	848	1	.22	D	88.8
48 Benzene-d6	15340	1.621	845	14	.26	D	105.3
39 Toluene-d8	15545	1.306	1115	28	.27	D	107.7

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: AC593
DATE: 06/02/92
TLI PROJ #: 20802
ANALYSIS DATE: 05/14/92

SAMPLE ID: CL-LK/1 VOST/0502 /1C CONDENSATE
TLI ID: 56.027.9
SAMPLE VOL: .005 L
DILN FACTOR: 1

TENTATIVELY IDENTIFIED COMPOUND REPORT

	NAME	SCAN	AREA	IS SCAN #	IS AMT	CONC, ug/L
1	HYDROCARBON	737	608	778	.25	1.49
2	SUBSTITUTED HYDROCARBON	1554	1211	1356	.25	1.45
3	UNKNOWN	1193	678	1356	.25	.81
4	UNKNOWN	505	277	778	.25	.68
5	AROMATIC HYDROCARBON	1042	224	778	.25	.55
6	AROMATIC HYDROCARBON	1400	362	1356	.25	.43
7	HYDROCARBON	567	159	778	.25	.39

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	778	20459	1
Chlorobenzene-d5	1356	41678	28

SECTION 2.3 EMISSION TEST RESULTS - MISCELLANEOUS

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - LUFKIN	Source:	Lime Kiln With NCGs		FIN:	79-1
Source Code: CL-LK/1	Date:	4/30/92	EPN: 79-1	CIN:	260012

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1506	1816		
Flow Data				
Stack Temperature, °F	158	160		159
Moisture Content, %	18.4	16.8		17.6
Oxygen Concentration, %	8.0	8.0		8.0
Carbon Dioxide Concentration, %	16.0	16.0		16.0
Volumetric Flow Rate, x10^3 ACFM	19.5	15.5		17.5
Volumetric Flow Rate, x10^3 DSCFM	13.4	10.9		12.1
Process Operating Conditions				
Production Rate, T CaO/hr	6.4	6.4		6.4
Miscellaneous Parameters				
Formaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acetaldehyde				
Concentration, ppmvd	0.6			0.6
Emission Rate, lb/hr	0.1 *			0.1 *
Acetone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acetophenone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
2-Butanone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Methyl isobutyl ketone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acrolein				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Benzaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - LUFKIN | Source: Lime Kiln With NCGs | FIN: 79-1
Source Code: CL-LK/1 | Date: 5/1/92 | EPN: 79-1 | CIN: 260012

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	2207			
Flow Data				
Stack Temperature, °F	156			156
Moisture Content, %	25.0			25.0
Oxygen Concentration, %	8.0			8.0
Carbon Dioxide Concentration, %	16.0			16.0
Volumetric Flow Rate, x10^3 ACFM	19.1			19.1
Volumetric Flow Rate, x10^3 DSCFM	12.1			12.1
Process Operating Conditions				
Production Rate, T CaO/hr	5.7			5.7
Miscellaneous Parameters				
Formaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acetaldehyde				
Concentration, ppmvd	0.5			0.5
Emission Rate, lb/hr	0.1 *			0.1 *
Acetone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acetophenone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
2-Butanone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Methyl isobutyl ketone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acrolein				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Benzaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - LUFKIN | Source: Lime Kiln With NCGs | FIN: 79-1
Source Code: CL-LK/1 | Date: 9/16/92 | EPN: 79-1 | CIN: 260012

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	921	1025		
Flow Data				
Stack Temperature, °F	163	161		162
Moisture Content, %	34.6	33.0		33.8
Oxygen Concentration, %	9.6	9.8		9.7
Carbon Dioxide Concentration, %	15.0	15.0		15.0
Volumetric Flow Rate, x10^3 ACFM	18.2	17.6		17.9
Volumetric Flow Rate, x10^3 DSCFM	10.1	10.0		10.1
Process Operating Conditions				
Production Rate, T CaO/hr	5.7	5.7	5.7	5.7
Miscellaneous Parameters				
Hydrogen chloride				
Concentration, ppmvd	0.4	0.3	0.3	0.4
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

WESTON
MANAGERS DESIGNERS/CONSULTANTS

SECTION 2.4 EMISSION TEST RESULTS - METALS

Champion-Lufkin
Lime kiln

Run 1

Sample volume (DSCF)--------- 30.86
Source Vol Flow (DSCFM)------ 11400

		FH+BH Amt (ug)	Conc (lb/DSCF)	Mass Rt. (lb/hr)	Detection Limit(ug)	Det Limit (lb/DSCF)	Det Limit (lb/hr)
Antimony	Sb	*	0.0E+00	0.0E+00	5	3.6E-10	2.4E-04
Arsenic	As	*	0.0E+00	0.0E+00	5	3.6E-10	2.4E-04
Barium	Ba	*	0.0E+00	0.0E+00	4000	2.9E-07	2.0E-01
Beryllium	Be	*	0.0E+00	0.0E+00	5	3.6E-10	2.4E-04
Cadmium	Cd	*	0.0E+00	0.0E+00	5	3.6E-10	2.4E-04
Chromium	Cr	*	0.0E+00	0.0E+00	10	7.1E-10	4.9E-04
Copper	Cu	13	9.3E-10	6.4E-04	5	3.6E-10	2.4E-04
Lead	Pb	1269	9.1E-08	6.2E-02	10	7.1E-10	4.9E-04
Manganese	Mn	31	2.2E-09	1.5E-03	10	7.1E-10	4.9E-04
Mercury	Hg	*	0.0E+00	0.0E+00	5	3.6E-10	2.4E-04
Nickel	Ni	10	7.1E-10	4.9E-04	5	3.6E-10	2.4E-04
Phosphorus	P	*	0.0E+00	0.0E+00	100	7.1E-09	4.9E-03
Silver	Ag	*	0.0E+00	0.0E+00	5	3.6E-10	2.4E-04
Selenium	Se	*	0.0E+00	0.0E+00	5	3.6E-10	2.4E-04
Thallium	Tl	*	0.0E+00	0.0E+00	5	3.6E-10	2.4E-04

Run 2

Sample volume (DSCF)--------- 30.41
Source Vol Flow (DSCFM)------ 11200

		FH+BH Amt (ug)	Conc (lb/DSCF)	Mass Rt. (lb/hr)	Detection Limit(ug)	Det Limit (lb/DSCF)	Det Limit (lb/hr)
Antimony	Sb	*	0.0E+00	0.0E+00	5	3.6E-10	2.4E-04
Arsenic	As	6	4.3E-10	2.9E-04	5	3.6E-10	2.4E-04
Barium	Ba	*	0.0E+00	0.0E+00	4000	2.9E-07	1.9E-01
Beryllium	Be	*	0.0E+00	0.0E+00	5	3.6E-10	2.4E-04
Cadmium	Cd	*	0.0E+00	0.0E+00	5	3.6E-10	2.4E-04
Chromium	Cr	*	0.0E+00	0.0E+00	10	7.2E-10	4.9E-04
Copper	Cu	*	0.0E+00	0.0E+00	5	3.6E-10	2.4E-04
Lead	Pb	1708	1.2E-07	8.3E-02	10	7.2E-10	4.9E-04
Manganese	Mn	50.3	3.6E-09	2.5E-03	10	7.2E-10	4.9E-04
Mercury	Hg	*	0.0E+00	0.0E+00	5	3.6E-10	2.4E-04
Nickel	Ni	5	3.6E-10	2.4E-04	5	3.6E-10	2.4E-04
Phosphorus	P	*	0.0E+00	0.0E+00	100	7.2E-09	4.9E-03
Silver	Ag	*	0.0E+00	0.0E+00	5	3.6E-10	2.4E-04
Selenium	Se	*	0.0E+00	0.0E+00	5	3.6E-10	2.4E-04
Thallium	Tl	*	0.0E+00	0.0E+00	5	3.6E-10	2.4E-04

BMF 9/1/92

METALS CALCULATIONS

Client: TPIEC
Location: Champion-Lufkin
WESTON Project No.: 6848-01-01
Source: LK

INPUT DATA

Run Number		1	2	3	Mean
Date		5/3/92	5/3/92		---
Time Began		1000	1150		---
Time Ended		1110	1255		---
Sampling Time, min	(Theta)	60	60		60
Stack Diameter, in.	(Dia)	56	56	56	56
Barometric Pressure, in. Hg	(Pb)	30.03	30.03		30.03
Static Pressure, in. H2O	(Pg)	-0.12	-0.12		-0.12
Pitot Tube Coefficient	(Cp)	0.84	0.84		0.84
Meter Correction Factor	(Y)	1.010	1.010		1.010
Nozzle Diameter, in.	(Dn)	0.375	0.375		0.375
Meter Volume, ft^3	(Vm)	31.370	31.091		31.231
Meter Temperature, °F	(tm)	85	88		87
Meter Orifice Pressure, in. H2O	(Delta H)	0.941	0.908		0.925
Volume H2O Collected, mL	(Vlc)	225.4	216.3		220.9
CO2 Concentration, %	(CO2)	15.5	17.2		16.4
O2 Concentration, %	(O2)	12.0	12.0		12.0
Average Sq Rt Velo Head, (in. H2O)^½	((Delta P)^½)avg	0.2856	0.2803		0.2830
Stack Temperature, °F	(ts)	160	160		160
Total Metals Collected, ug		2.3	2.2		2.3
Moisture Fraction (at Saturation)	(Bws)	NA	NA	NA	

CALCULATED DATA

Stack Area, ft^2	(As)	16.80	16.80	16.80	16.80
Stack Pressure, in. Hg	(Ps)	30.02	30.02	0.00	20.01
Standard Meter Volume, ft^3	(Vmstd)	30.856	30.411	0.000	20.422
Standard Water Volume, ft^3	(Vwstd)	10.610	10.181	0.000	6.930
Moisture Fraction (Measured)	(Bws)	0.256	0.251	ERR	ERR
Moisture Fraction (lower sat/meas)	(Bws)	0.256	0.251	ERR	ERR
Mol. Wt. of Stack Gas, lb/lb-mole	(Ms)	27.6	27.9	ERR	ERR
Average Stack Gas Velocity, ft/sec	(Vs)	17.7	17.3	ERR	ERR
Stack Gas Flow @ Stack Cond, ft^3/min	(Qa)	1.79E+04	1.75E+04	ERR	ERR
Stack Gas Fl[illegible] Cond, ft^3/min	(Qs)	1.14E+04	1.12E+04	ERR	ERR
Isokinetic Sampling Rate, %	(%I)	99	99	ERR	ERR
Metals Concentration, lb/ft^3		1.64E-10	1.59E-10	ERR	ERR

j:\a503\standard\metals.wk1

Blanks for the Multimetals Train. Three blanks were collected during the study. One was collected at Champion-Lufkin and two at Champion-Sheldon. These blanks were used to correct all samples.

		CL Blank Front(ug)	CS Blk 1 Front(ug)	CS Blk 2 Front(ug)	Front Blk(ug)
Antimony	Sb	0.7	0.5 *	0.5 *	0 *
Arsenic	As	3.9	0.8	0.8	1
Barium	Ba	2476	2 *	3742	2073
Beryllium	Be	0.2	0.2 *	0.3	0 *
Cadmium	Cd	0.5	0.4 *	1.4	0 *
Chromium	Cr	9.4	1.2 *	9.3	6.4
Copper	Cu	1.6	1.5 *	1.5 *	0 *
Lead	Pb	10.8	0.3	5.2	5.4
Manganese	Mn	4.4	1 *	4.5	3.1
Mercury	Hg	0.4 *	0.4 *	0.4 *	0 *
Nickel	Ni	2 *	2 *	2 *	0 *
Phosphorus	P	22.6	50 *	53.4	34.7
Silver	Ag	8.3	0.7 *	0.7 *	0 *
Selenium	Se	0.5	0.4 *	0.4 *	0 *
Thallium	Tl	1	0.5	0.7	0 *

*The * beside a value means that the analytical value was less than the detection limit for the analysis. The front and the back blank (right column) was developed from the average for most metals. The 8.3 ug from the CL blank was not used because it was unexplainably high.*

		CL Blank Back(ug)	CS Blk 1 Back(ug)	CS Blk 2 Back(ug)	Back Blk(ug)
Antimony	Sb	1 *	1 *	0.7 *	0 *
Arsenic	As	1 *	0.5	0.3 *	0 *
Barium	Ba	3.8 *	0.4 *	2.6 *	0 *
Beryllium	Be	0.4 *	0.4 *	0.3 *	0 *
Cadmium	Cd	0.8	1.4	1	1
Chromium	Cr	2.3 *	2.4 *	1.6 *	0 *
Copper	Cu	2.9 *	3 *	2 *	0 *
Lead	Pb	1.5	0.4 *	0.6	0.8
Manganese	Mn	1.9 *	2 *	1.3 *	0 *
Mercury	Hg	0.8 *	0.8 *	1.1	0 *
Nickel	Ni	3.8 *	4 *	2.6 *	0 *
Phosphorus	P	188	100 *	26 *	100 *
Silver	Ag	1.3 *	1.4 *	0.9 *	0 *
Selenium	Se	1 *	0.8 *	0.5 *	0 *
Thallium	Tl	1.9 *	0.4 *	0.3 *	0 *

BAF
9/7/92

TRIANGLE LABORATORIES of RTP, INC.

PO BOX 13485
RTP, NC 27709

Project: 20793 Date in: 05-May-92
Weston Date out: 04-Jun-92

CASE NARRATIVE

Overview

This project involves the analysis of 7 Multi-Metals Trains, of which one is a Blank Train, for Ag, As, Ba, Be, Cd, Cr, Cu, Hg, Mn, Na, Ni, P, Pb, Sb, Se, and Tl. The Multi-Metal analysis was conducted according to the protocol described in sections 5-7 of the EPA Draft Document *"Methodology for the Determination of Metals Emissions in Exhaust Gases from Hazardous Waste Incineration and Similar Combustion Processes."* In addition to the Multi-Metal Trains one liquid (DI H2O) sample was submitted to be analyzed with the Blank MMTL Train, but did not require any digestion.

Preparation

Samples were prepared by microwave and hotplate digestion, as required by the contract. A detailed flow chart of the procedure is included in the report showing the volumes received and used for all analyses.

Analysis

Ba, Be, Cd, Cr, Cu, Mn, Ni, P, and Ag were determined by Inductively Coupled Plasma (ICP) Emission Spectroscopy. Sb was determined by Graphite Furnace Atomic Absorption (GFAA). As, Se, Pb and Tl were analyzed by Methods of Addition(MSA) on the GFAA. Na was determined by Flame Atomic Absorption(FLAA). Hg was determined by Cold Vapor AA.

Results

The Sb post digestion spikes for the FH and BH samples on the GFAA were the only %recoveries that were within control limits. As, Pb, Se, and Tl were reanalyzed by Method of Standard Addition on the GFAA per method requirements due to the fact that the post digestion spikes for these analytes were not within control limits. Only Pb was detected in the PBW, but the amount detected is not significant in comparison to the amount of Pb detected in the samples. The Pb Train Blank results may be biased slightly high due to the Pb detected in the PBW.

The FH As and Ba results can be mostly attibuted to the amounts detected in the Train Blank. It is possible that the Ba results in the FH samples and Train Blank may be due to the amount of Ba indigenous to the glass fiber filters.

The %RPD for the duplicates were within control limits for all samples in which Hg was detected, except LK/2 FH and RF/2 E. In these cases, as well as when Hg was detected in the sample and not in the duplicate or in the duplicate and not in the sample, the %RPD is not considered to be a signifcant QC parameter, because the

concentration is less than four times the detection limit.

Hg was detected in the blank for the FH/BH Hg analysis and may bias the Hg detected in the FH/BH samples slightly high.

TRIANGLE LABORATORIES of RTP, INC.
TLI PROJECT #20793

CLIENT SAMPLE IDENTIFICATION:

MMTL TRAIN #1
1.CL-SDTV/1METL/0429/1 FH
2.CL-SDTV/1METL/0429/1 BH
3.CL-SDTV/1METL/0429/1 D
4.CL-SDTV/1METL/0429/1 E
5.CL-SDTV/1METL/0429/1 F

MMTL TRAIN #2
1.CL-SDTV/1METL/0429/2 FH
2.CL-SDTV/1METL/0429/2 BH
3.CL-SDTV/1METL/0429/2 D
4.CL-SDTV/1METL/0429/2 E
5.CL-SDTV/1METL/0429/2 F

MMTL TRAIN #3
1.CL-LK/1METL/0503/1 FH
2.CL-LK/1METL/0503/1 BH
3.CL-LK/1METL/0503/1 D
4.CL-LK/1METL/0503/1 E
5.CL-LK/1METL/0503/1 F

MMTL TRAIN #4
1.CL-LK/1METL/0503/2 FH
2.CL-LK/1METL/0503/2 BH
3.CL-LK/1METL/0503/2 D
4.CL-LK/1METL/0503/2 E
5.CL-LK/1METL/0503/2 F

MMTL TRAIN #5
1.CL-RF/1METL/0430/1 FH
2.CL-RF/1METL/0430/1 BH
3.CL-RF/1METL/0430/1 D
4.CL-RF/1METL/0430/1 E
5.CL-RF/1METL/0430/1 F

MMTL TRAIN #6
1.CL-RF/1METL/0430/2 FH
2.CL-RF/1METL/0430/2 BH
3.CL-RF/1METL/0430/2 D
4.CL-RF/1METL/0430/2 E
5.CL-RF/1METL/0430/2 F

BLANK TRAIN
1.CL-BLANK FH
2.CL-BLANK BH
3.CL-BLANK DI H2O
4.CL-BLANK E

TRIANGLE LABORATORIES of RTP, INC.

INORGANICS ANALYSIS REPORT

TLI PROJECT #: 20793
CLIENT: WESTON
DATE RECIEVED: 05/05/92
DATE REPORTED: 06/04/92

RESULTS REPORTED IN TOTAL ug
**=MSA

CLIENT SAMPLE ID	Ag	As**	Ba	Be	Cd	Cr	Cu	Mn
SDTV/1 FH	< .700	3.79	2231	< .200	1.20	8.34	5.89	11.1
SDTV/1 BH	< .906	1.07	3.88	< .259	< .518	< 1.55	9.61	11.5
SDTV/2 FH	< .700	3.37	2759	< .200	.737	6.18	6.89	13.3
SDTV/2 BH	< .863	1.04	3.78	< .247	< .493	< 1.48	< 1.85	2.20
LK/1 FH	4.00	2.63	2071	< .200	1.03	15.2	3.19	32.5
LK/1 BH	< .875	1.93	3.32	< .250	< .500	< 1.50	9.74	1.36
LK/2 FH	.768	4.14	2809	< .200	1.16	9.46	3.56	45.9
LK/2 BH	< .875	3.16	< 2.50	< .250	< .500	< 1.50	< 1.88	7.46
RF/1 FH	< .700	4.49	3273	.234	.440	12.0	2.43	6.91
RF/1 BH	< .863	.690	< 2.47	< .247	2.38	2.30	53.7	2.65
RF/2 FH	< .700	4.86	2629	< .200	.553	7.36	< 1.50	7.36
RF/2 BH	< .863	.740	2.96	< .247	1.28	3.25	3.34	7.25
BLANK FH	8.34	3.86	2476	.206	.480	9.42	1.59	4.43
BLANK BH	< 1.34	< .955	< 3.82	< .382	.795	< 2.29	< 2.86	< 1.91
BLANK DI H2O	< 3.22	< 1.15	< 9.20	< .920	< 1.84	< 5.52	< 6.90	< 4.60
PBW ug/L	<7.00	<5.00	<20.0	<2.00	<4.00	<12.0	<15.0	<10.0

CLIENT SAMPLE ID	Na	Ni	P	Pb**	Sb	Se**	Tl**
SDTV/1 FH	46,100	2.04	74.8	36.9	9.85	< .500	< 1.00
SDTV/1 BH	435	< 2.59	140	3.12	< .647	< .647	< 1.29
SDTV/2 FH	74,700	< 2.00	28.7	34.3	.920	< .500	2.29
SDTV/2 BH	226	< 2.47	130	2.55	< .616	< .616	< 1.23
LK/1 FH	54,800	9.61	43.6	1270	1.62	< .500	< 1.00
LK/1 BH	245	< 2.50	129	5.05	< .625	< .625	< 1.25
LK/2 FH	61,100	5.10	38.9	1712	1.21	< .500	2.79
LK/2 BH	303	< 2.50	141	2.23	< .625	< .625	< 1.25
RF/1 FH	55,800	< 2.00	30.5	38.2	.660	< .500	< 1.00
RF/1 BH	293	< 2.47	159	2.50	< .616	< .616	< 1.23
RF/2 FH	48,800	< 2.00	31.4	11.2	.890	< .500	< 1.00
RF/2 BH	356	< 2.47	124	1.82	< .616	< .616	< 1.23
BLANK FH	37,600	< 2.00	22.6	10.8	.720	< .500	< 1.00
BLANK BH	304	< 3.82	188	1.53	< .955	< .955	< 1.91
BLANK DI H2O	168	< 9.20	127	1.50	< 1.15	< 1.15	< 2.30
PBW ug/L	<500	<20.0	<200	2.8	<5.00	<5.00	<10.0

Hg RESULTS

	SDTV/1 FH	SDTV/1 BH	SDTV/1 D	SDTV/1 E	SDTV/1 F
AVG TOTAL ug	1.37	<1.76	<.480	<1.56	<.920
%RPD	4.38%	N/A	N/A	N/A	N/A

	SDTV/2 FH	SDTV/2 BH	SDTV/2 D	SDTV/2 E	SDTV/2 F
AVG TOTAL ug	1.13	<2.12	<.400	<1.48	.943
%RPD	8.85%	N/A	N/A	N/A	4.88%

	LK/1 FH	LK/1 BH	LK/1 D	LK/1 E	LK/1 F
AVG TOTAL ug	1.01	<2.00	<.336	<1.49	<.920
%RPD	1.98%	N/A	N/A	N/A	N/A

	LK/2 FH	LK/2 BH	LK/2 D	LK/2 E	LK/2 F
AVG TOTAL ug	1.12	<2.00	<.320	<1.48	<.920
%RPD	53.57%	N/A	N/A	N/A	N/A

	RF/1 FH	RF/1 BH	RF/1 D	RF/1 E	RF/1 F
AVG TOTAL ug	.980	4.51	<.360	6.70	<.920
%RPD	8.16%	7.06%	N/A	20.69%	N/A

	RF/2 FH	RF/2 BH	RF/2 D	RF/2 E	RF/2 F
AVG TOTAL ug	.400	<2.12	<.380	4.22	<.920
%RPD	N/A	N/A	N/A	34.23%	N/A

	BLANK FH	BLANK BH	BLANK DI H2O	BLANK E
AVG TOTAL ug	<.400	<.840	<.440	<.920
%RPD	N/A	N/A	N/A	N/A

Hg QC SUMMARY

	%REC
SDTV/1 FH(S)	107%
SDTV/1 FH(SD)	108%

	ug/L
FH/BH PBW	.230
IMPINGER PBW	<.200
5-4 RECHECK PBW	

Sb GFAA POST DIGESTION SPK SUMMARY

	%REC
RF/1 FH(S)	84.6%
RF/1 BH(S)	87.2%

DESCRIPTION OF ABBREVIATIONS

ICV=Initial Calibration Verification
ICB=Initial Calibration Blank
CCV=Continuing Calibration Verification
CCB=Continuing Calibration Blank
PBW=Preparation Blank Water
PBS=Preparation Blank Soil
LCS=Laboratory Control Sample
ICSA=Interference Check Sample(Solution A)   I=Initial F=Final
ICSAB=Interference Check Sample(Solution AB) I=Initial F=Final
Solution A contains common interferents, while Solution AB contains the interferents plus the analyte in question.
CRDL=Contract Required Detection Limit (for CLP)
IDL=Instrument Detection Limit
CRI=CRDL Standard for ICP I=Initial F=Final
CRA=CRDL Standard for AA   I=Initial F=Final
%RPD=Relative Percent Difference
%REC=% Recovery
SPK=Spike
AMT=Amount
BLK=Blank
MSA=Method of Standard Additions

CALCULATIONS

MMTL TRAINS(ICP & GFAA):

$$\text{TOTAL ug} = \frac{[\text{ug/L}] * (\text{mL TV/mL USED}) * (\text{mL FV} * \text{DF})}{1000}$$

MMTL TRAINS(FLAA):

$$\text{TOTAL ug} = \underline{[\text{ug/L}] * (\text{mL TV/mL USED}) * (\text{mL FV} * \text{DF})}$$

FV=FINAL VOLUME   DF=DILUTION FACTOR
WT=WEIGHT   TV=TOTAL VOLUME
BV=BEGINNING VOLUME

Hg

MMTL Trains:

$$\text{TOTAL ug} = \underline{[\text{ug/L}] * (\text{ml FV/ml aliquot}) * .1\text{L} * (\text{DF})}$$

MMTL Impingers:

$$\text{TOTAL ug} = \underline{[\text{ug/L}] * (\text{ml TV/ml aliquot}) * .1\text{L} * (\text{DF})}$$

$$\%\text{RPD} = \frac{|\text{SR} - \text{DR}|}{(\text{SR} + \text{DR})/2} * 100$$

$$\%\text{REC} = \frac{\text{SSR} - \text{SR}}{\text{SA}} * 100$$

SR=SAMPLE RESULT   DR=DUPLICATE RESULT
SSR=SPIKE SAMPLE RESULT   SA=SPIKE ADDED

CL- LK/1 metals sampled 5/3/92

Sample Volume = 30.86 DSCF
Stack Flow Rate = 11,400 DSCFM

		MEAS FH (µg)	FH Blk Corr (µg)	FH Corr Amt (µg)	meas BH (µg)	BH Blk corr (µg)	BH Corr Amt (µg)	FH + BH Amt (µg)	Detection Limit (µg)
Antimony	Sb	1.6	0	1.6	0.6	0	0.6	2.2	5
Arsenic	As	2.6	1.0	1.6	1.9	0	1.9	3.5	5
Barium	Ba	2071	2073	<2000	3.3	0	3	<4000	4000
Beryllium	Be	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	5
Cadmium	Cd	1.0	1.4	<1	<0.5	1.0	<1	<1	5
Chromium	Cr	15.2	6.4	8.8	<1.5	0	<1.5	9	10
Chromium, Hex	Cr^{+6}								
Copper	Cu	3.2	0	3.2	9.7	0	9.7	13	5
Lead	Pb	1270	5.4	1265	5.0	0.8	4.2	1269	10
Manganese	Mn	32.5	3.1	29.4	1.4	0	1.4	31	10
Mercury	Hg	1.0	0	1.0	<2.0	0	<2.0	1	5
Nickel	Ni	9.6	0	9.6	<2.5	0	<2.5	10	5
Phosphorus	P	43.6	34.7	8.9	129	100	29	38	100
Silver	Ag	4.0	0	4	<0.9	0	<0.9	4	5
Selenium	Se	<0.5	0	<0.5	<0.6	0	<0.6	<1	5
Sodium	Na	54,800	32800	22,000	245	162	83	23,000	
Thallium	Tl	<1.0	0	<1.0	<1.25	0	<1.2	<1	5

Blank is a mean of 3 blanks for project
See notes by Bruce dated 9/3/92

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Metals CL-Lime kiln Run 2 5/3/92

vol = 30.41 ft3
stack flow = 11,200 DSCFM

		MEAS FH (ug)	FH Blk Corr (ug)	FH Corr Amt (ug)	Meas BH (ug)	BH Blk corr (ug)	BH Corr Amt (ug)	FH + BH Amt (ug)	Detection Limit (ug)
Antimony	Sb	1.2	0	1.2	<0.6	0	<0.6	1	5
Arsenic	As	4.1	1.0	3.1	3.2	0	3.2	6	5
Barium	Ba	2809	2073	736	< 2.5	0	<2.5	736	4000
Beryllium	Be	<0.2	0	<0.2	<0.25	0	<0.2	<0.2	5
Cadmium	Cd	1.2	1.4	<1	<0.5	1.0	<1	<1	5
Chromium	Cr	9.5	6.4	3.1	<1.5	0	<1.5	3	10
Chromium, Hex	Cr^{+6}								
Copper	Cu	3.6	0	3.6	<1.9	0	<1.9	4	5
Lead	Pb	1712	5.4	1707	2.2	0.8	1.4	1708	10
Manganese	Mn	45.9	3.1	42.8	7.5	0	7.5	50.3	10
Mercury	Hg	1.1	0	1.1	<2	0	<2	1	5
Nickel	Ni	5.6	0	5.1	<2.5	0	<2	5	5
Phosphorus	P	38.9	34.7	4.2	141	100	41	45	100
Silver	Ag	0.8	0	0.8	<0.9	0	<0.9	1	5
Selenium	Se	<0.5	0	<0.5	<0.6	0	<0.6	<1	5
Sodium	Na	61,100	32800		303	162			
Thallium	Tl	2.8	0	2.8	<1.2	0	<1.2	3	5

Blank is a mean of 3 blanks for project
See notes by Bruce dated 9/3/92.

2.4 12

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SECTION 2.5 VOC QUALITY CONTROL RESULTS

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

LIME KILN WITH NCGs (CL-LK/1)
THC Quality Control
(Concentrations in ppm)

Calibration

Theoretical	4/30/92 Found	% Error
0	0	0.0
36	36	0.0
91	87	-2.7
150	151	0.7

Correlation coefficient 0.9994

Line Study

Bag sample

4/30/92 Analyzer	Line	%Rec
150	144	96.0

Nitrogen Blank

4/30/92 Analyzer	Line
--	0a

a = Ambient air down the line.

LIME KILN WITH NCGs (CL-LK/1)
VOC Quality Control
(Concentrations in ppm)

Calibration

Analyte	Theoretical	4/30/92 Check Std	% Rec
Acetone	175.4	158.8	90.5
Isopropanol	168.2	166.2	98.8
Benzene	144.1	164.5	114.2
Bromodichloromethane	155.6	197.5	126.9
Toluene	121.2	152.1	125.5
Ethyl Benzene	105.2	92.7	88.1
p-Xylene	105.0	93.3	88.9
o-Xylene	105.5	94.9	90.0
Cumene	92.6	89.0	96.1
alpha-Pinene	80.8	77.8	96.3
beta-Pinene	81.2	79.3	97.7
3-Carene	81.3	78.8	96.9
p-Cymene	82.5	73.5	89.1

Nitrogen Blank Not performed

Line Study	GC	Line	% Rec
Methanol (100 ppm)			
4/30/92	--	81	81 a

a = % recovery based on 100 ppm theoretical value for methanol,

LIME KILN WITH NCGs (CL-LK/1)
TRS Quality Control
(Concentrations in ppm)

Calibration

4/30/92	Lo	Med	Hi	Correlation coefficient
Hydrogen Sulfide	6.6	10.6	15.0	0.9991
Methyl Mercaptan	6.1	9.8	13.9	0.9995
Dimethyl Sulfide	8.4	13.6	19.3	0.9998
Carbon Disulfide	2.7	4.3	6.1	0.9994
Dimethyl Disulfide	3.6	5.9	8.3	0.9991

Line Study

	GC	Line	%Rec
4/30/92	Not Performed		

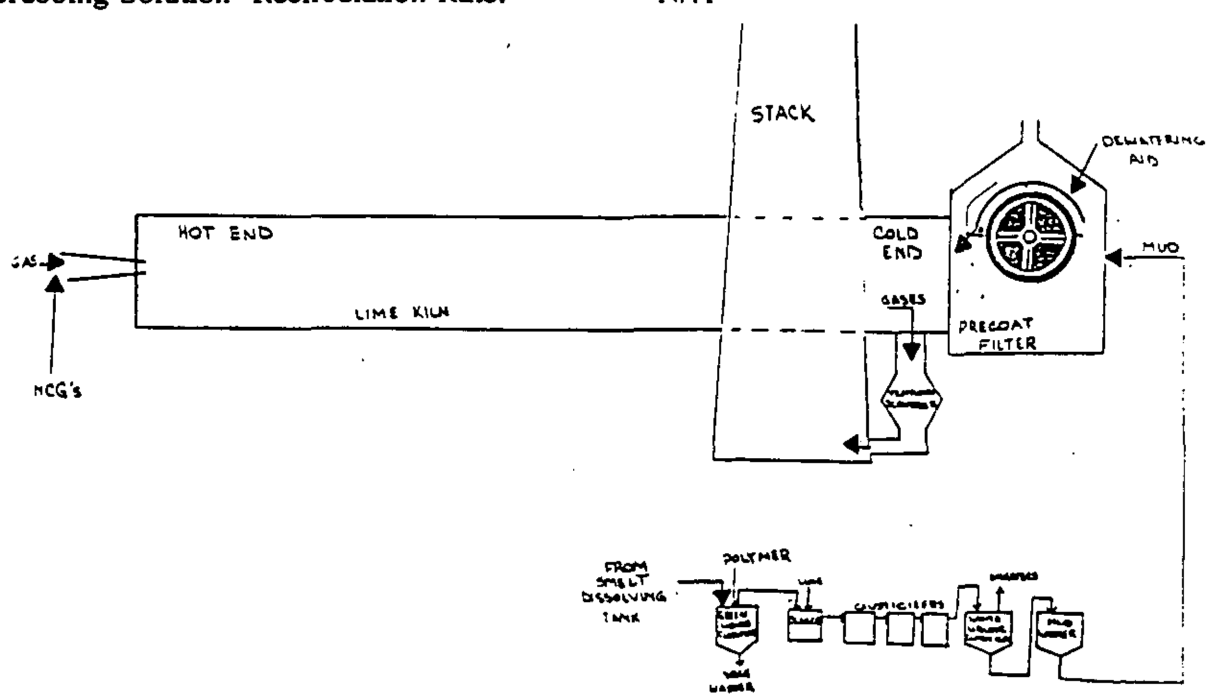
SECTION 2.6 PROCESS DESCRIPTION AND OPERATING CONDITIONS

LIME KILN

Kiln 1 is a rotary kiln manufactured by Fuller and began operation in 1981. The kiln is 10.5 ft in diameter and 275 ft long. The chain section in the kiln is 37.5 ft long and the kiln is fired on gas. Noncondensible gases from the blowheat recovery, evaporators and stripper system are burned in the kiln. The kiln produces 125-140 ton/day CaO. Fresh water is used throughout the causticizing system. Particulate emissions are controlled with a venturi type scrubber, which uses fresh water for makeup. A precoat drum washer, which is 14 feet long and has a diameter of 10 feet, is used for mud washing. Fresh water is used in showers.

<u>Representative Process Conditions</u>

Production Rate (Tons Lime (CaO)/hr):	5.2-5.8
Fuel Type and Firing Rate:	Natural Gas @ 30000-36000 SCFH
BTU/Ton Product:	5.5-7.5
Hot and Cold End Temperatures:	1550-1700° F & 400-530° F
Oxygen and CO Content in the Kiln:	2.4-5.0 Oxygen, CO N/A
NO_x Levels in Vent Gases at 8% O_2:	N/A
Solids Content of Mud:	63-80%
Na_2S and Soda Content of Mud:	Na2O 0.5-1.5%
Particulate Control Device:	Venturi Scrubber
Scrubber Pressure Drop:	10-14" Generally; Up to 19" Water
Scrubber Makeup Solution Source, Volume:	Fresh Water, Vol N/A
Scrubbing Solution Recirculation Rate:	N/A



LIME KILN - BURNING NCG'S

MANUFACTURER: FULLER
TYPE OF SCRUBBER: VENTURRI
SOURCE OF SCRUBBING LIQUID: FRESH WATER RECYCLED
KILN DIMENSIONS: 275 FEET LONG, 10.5 FEET DIAMETER
CHAIN SECTION LENGTH: 37.5 FEET, HIGH DENSITY CURTAIN STYLE

PARAMETER	UNITS	RUN 1	RUN 2	RUN 3	RUN 4	RUN 5	RUN 6	RUN 7
DATE		4/30	4/30	4/30	4/30	5/2	5/2	5/2
START TIME		1545	1645	1745	1845	0730	0830	0930
STOP TIME		1630	1730	1830	1930	0815	0915	1015
BTU/TON PROD	MM BTU/T	6.27	6.88	6.28	7.22	6.06	6.59	6.84
FIRING RATE	SCFH	40800	43800	40200	46200	39000	42000	43800
PROD RATE CAO	TN/DY	153	153	154	154	154	153	153
SOLIDS IN MUD	%	73.2	77.8	75.3	76.7	71.9	71.1	69.3
SODA *	%	1.01	1.11	1.16	1.30	0.82	0.82	0.92
HOT TEMP **	F	1550	1570	1575	1550	1620	1610	1610
COLD TEMP	F	480	470	460	460	460	455	450
O2 STACK	%	8.0	6.3	—	—	—	—	—
CO STACK	PPM	30.4	22.8	—	—	—	—	—
TRS STACK	PPM	2.9	3.9	—	—	—	—	—
BH BURN RATE	SCFM	91	89	114	170	88	86	87
SCRUB LIQ VOL	%	85	85	85	84	84	86	85
SHOWER TEMP	F	140	148	148	142	140	144	142
SHOWER FLOW	GPM	45	43	43	43	43	43	43
EXCESS O2 IN KILN	%	3.1	2.4	2.9	2.7	3.5	3.4	3.0
DIGESTER PROD	ADT/D	561	561	561	561	561	561	561
PRESSURE DROP	IN H20	19	19	19	19	17	17	18

RUN 1-4: METHOD 18, 16, 25A
RUN 5-7: VOST

* Soda is tested using an acid soluble test which gives a higher result than the more common water soluble test.

** The front end temperature is not an accurate reading, actually 2000F

LIME KILN - BURNING NCG'S

MANUFACTURER: FULLER
TYPE OF SCRUBBER: VENTURRI
SOURCE OF SCRUBBING LIQUID: FRESH WATER RECYCLED
KILN DIMENSIONS: 275 FEET LONG, 10.5 FEET DIAMETER
CHAIN SECTION LENGTH: 37.5 FEET, HIGH DENSITY CURTAIN STYLE

PARAMETER	UNITS	RUN 8	RUN 9	RUN 10	RUN 11	RUN 12
DATE		5-2	5-3	5-3	5-3	9-16
START TIME		1600	1030	1130	1230	0920
STOP TIME		1645	1115	1215	1315	1220
BTU/T PROD	MM BTU/T	6.06	6.06	7.07	7.07	
FIRING RT	SCFH	36000	31200	36000	36000	42000
PROD RATE CAO	TN/DY	140	123	122	122	155
MUD SOLID	%	74.6	---	---	---	66.5
SODA	%	0.82	---	---	---	
HOT TEMP	F	1515	1560	1570	1565	1650
COLD TEMP	F	500	460	455	455	455
O2 STACK	%	---	7.5	7.5	9.9	
CO STACK	PPM	---	109.2	112.8	20.7	
TRS STACK	PPM	---	7.1	7.3	2.6	
BH BURN RATE	SCFM	88	88	88	88	96
SCRUB LIQ	%	85	83	84	85	21
SHOW TEM	F	138	138	140	141	173
SHOW FLW	GPM	43	42	43	43	35
EXCESS O2 IN KILN	%	4.5	3.9	3.8	3.9	3.6
DIG PROD	ADT/D	561	56i	561	561	
PRESS DROP	IN H20	17.9	15	15	15	20

RUN 8: PARTICULATE AND SO_2
RUN 9-11: METALS

SECTION 3

LIME KILN WITHOUT NCGS

(CL-LK/2)

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SECTION 3
LIME KILN WITHOUT NCGs
(CL-LK/2)

The Lime Kiln was sampled without burning NCGs on two different days. The source was sampled for volatile organic compounds using Methods 25A, 16, and 18. A VOST sample was collected; aldehydes and hydrogen chloride were also sampled.

Total Hydrocarbons (M25A)

Figures 3.1 and 3.2 present the THC trends for the test periods on 30 April and 01 May 1992, respectively. On the first day, the total hydrocarbon concentrations varied from 20 to 30 ppm. On the second day, they ranged from 50 to 80 ppm. The unburned natural gas (methane) is expected to contribute to the high total hydrocarbon concentrations.

Volatile Organic Compounds (M16 and M18)

Table 3.1 summarizes the results for the Method 16 and Method 18 target compounds, and Section 3.1 is a tabulation of the data. No target compounds were identified by the M18 analyses, and all were reported as nondetectable. A small amount of hydrogen sulfide and dimethyl disulfide were identified in the M16 analysis.

Volatile Organic Sampling Train (VOST)

Table 3.2 summarizes the result of the VOST sample collected on 01 May 1992. Section 3.2 tabulates the results for target compounds and tentatively identified compounds (TICs).

The VOST analysis was used here to confirm the identity of target compounds identified in Method 18 as well as attempt identification of other organic components which may be present, the TICs. Hydrocarbon emissions for the Lime Kiln without NCGs were elevated over those with NCGs. These emissions were dominated by carbon disulfide, dimethyl disulfide, and chloromethane, ranging from 0.20 to 0.10 ppm, respectively. As 0.20 ppm corresponds to approximately 0.03 lb/hr, all identified compounds are well below the limit reported by Method 18.

Miscellaneous Parameters

Table 3.4 summarizes the results of testing for aldehydes. Section 3.4 tabulates the results for each compound. Hydrogen chloride was not retested for this condition.

VOC Quality Control Results

The VOC quality control data is tabulated in Section 3.4. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 3.5 includes the process operating data as recorded and provided by mill personnel. The production of CaO was slightly lower on 01 May 1992.

FIGURE 3.1
THC TREND ANALYSIS (4/30/92)
LIME KILN WITHOUT NCGs (CL-LK/2)

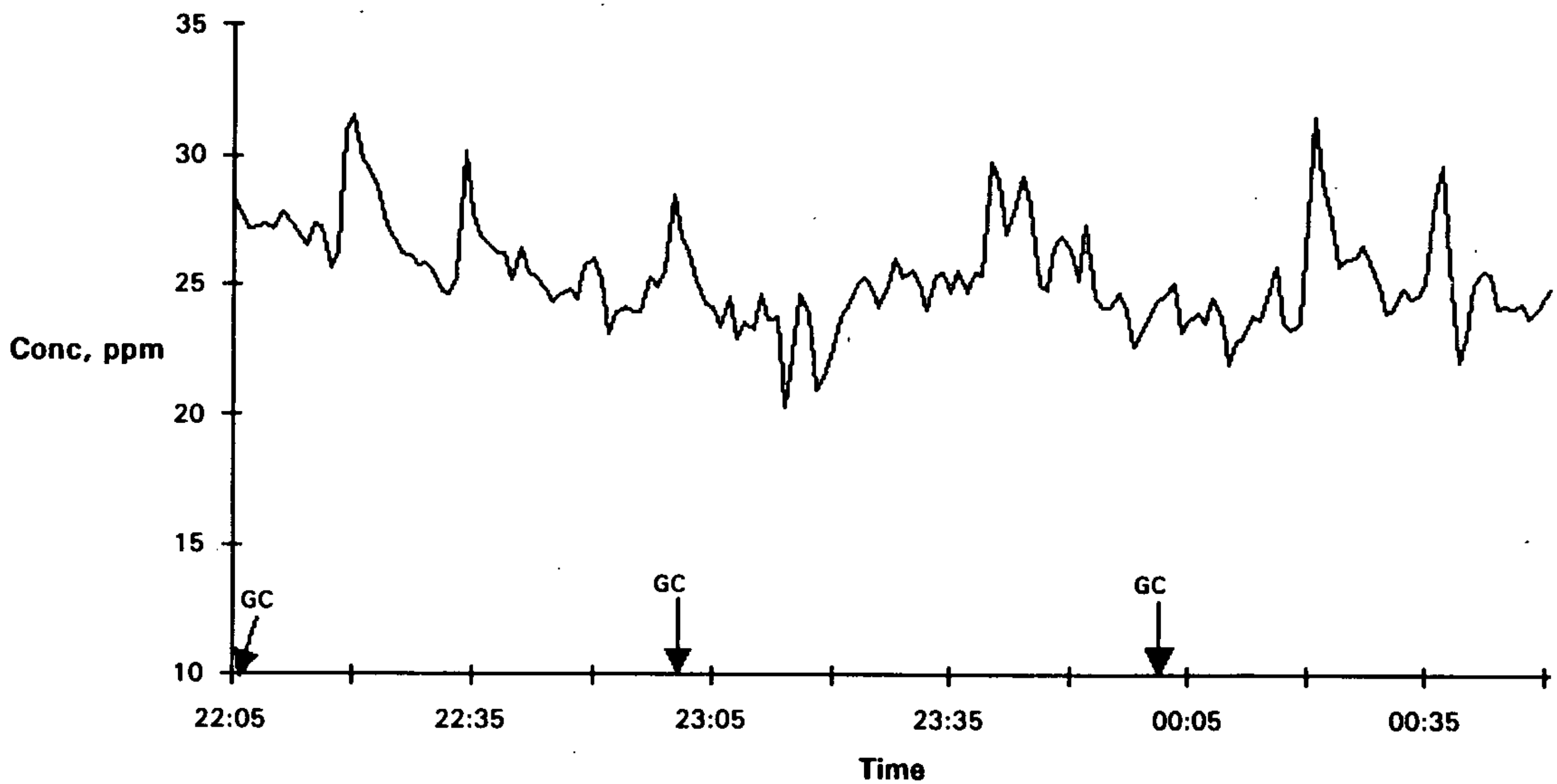
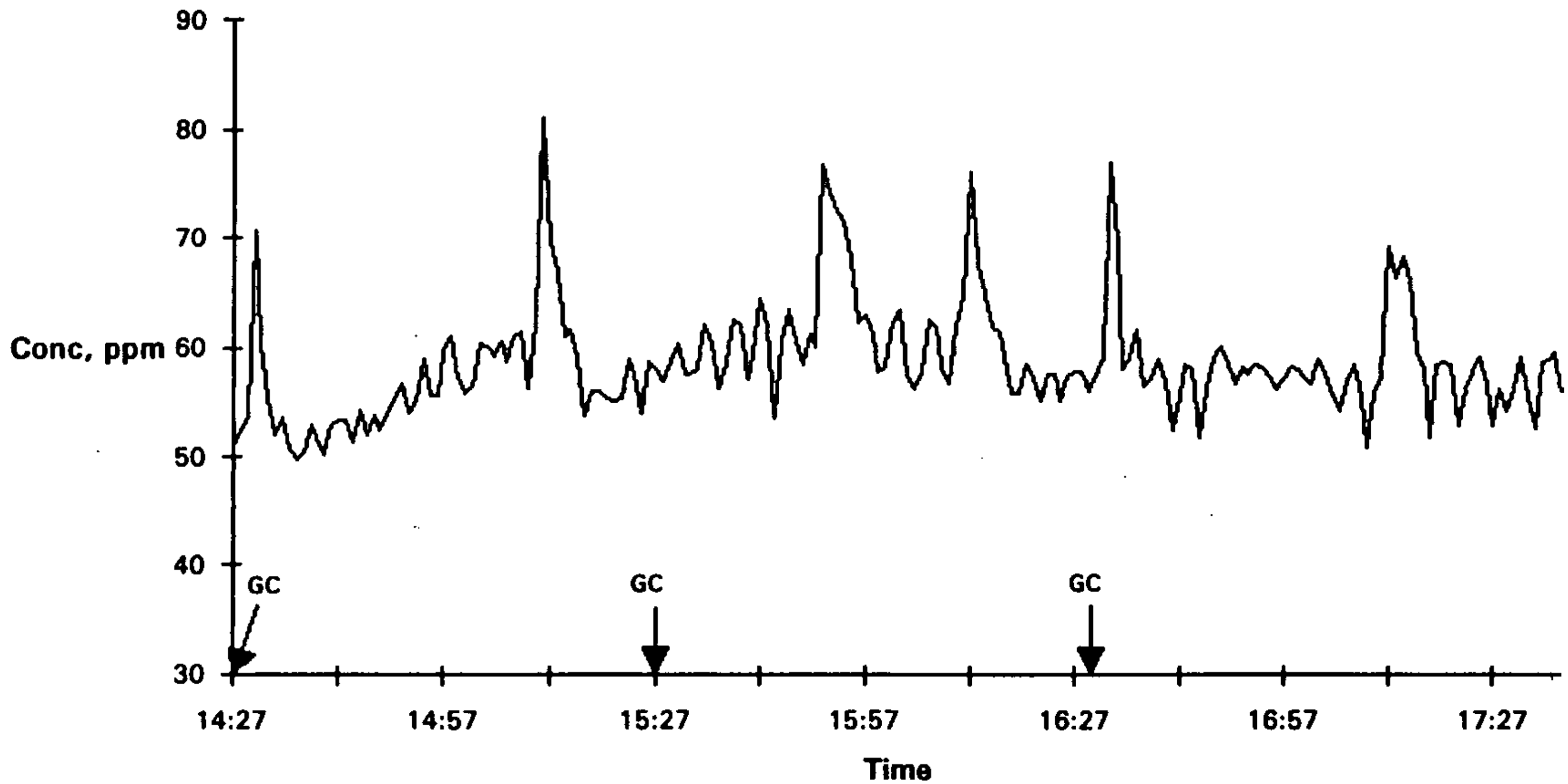


FIGURE 3.2
THC TREND ANALYSIS (5/1/92)
LIME KILN WITHOUT NCGs (CL-LK/2)



WESTON

TABLE 3.1
SUMMARY OF VOC RESULTS

Mill: CHAMPION - LUFKIN | Source: Lime Kiln Without NCGs
Source Code: CL-LK/2 | Test Dates: 4/30/92 5/1/92
FIN: 79-1 CIN: 260012 | EPN: 79-1

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	154	158	156	
Volumetric Flow Rate, x10^3 DSCFM	12.5	13.2	12.8	
Process Operating Conditions				
Production Rate, T CaO/hr	5.6	6.4	6.0	
Method 16 Data, lb/hr				
Hydrogen sulfide	0.3	0.4	0.4	0.1
Methyl mercaptan	ND	ND	ND	0.1
Dimethyl sulfide	ND	ND	ND	0.1
Carbon disulfide	ND	ND	ND	0.1
Dimethyl disulfide	ND	0.2	0.1	0.1
Method 18 Data, lb/hr				
Methanol	ND	ND	ND	0.2
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	ND	ND	ND	0.3
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.4
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.2
beta-Pinene	ND	ND	ND	0.2
3-Carene	ND	ND	ND	0.2
Terpenes (Unspecified)	ND	ND	ND	0.2
p-Cymene	ND	ND	ND	0.2
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	ND	ND	ND	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	ND	ND	ND	0.1

ND=Not Detected
DL=Detection Limit

WESTON

TABLE 3.2 SUMMARY OF VOST RESULTS

Mill: CHAMPION-LUFKIN
Source Code: CL-LK/2
FIN: 79-1 EPN: 79-1

Source: Lime Kiln Without NCGs
Test Dates: 5/1/92
CIN: 260012

TIME	1734
Volumetric Flow Data	
Stack Temperature, °F	154
Volumetric Flow Rate, x 10^3 DSCFM	12.7
Process Operating Conditions	
Production Rate, T CaO/hr	5.7
Target Compounds, ppm	
Chloromethane	0.187
Bromomethane	0.009
Methylene Chloride	0.006
Acetone	0.027
Carbon Disulfide	0.207
Chloroform	0.006
Trichlorofluoromethane	0.001
Dimethyl disulfide	0.103
Dimethyl sulfide	0.002
n-Hexane	0.031
2-Butanone	0.005
Bromodichloromethane	0.001
Trichloroethene	0.000
Benzene	0.028
Toluene	0.003
Ethylbenzene	0.000
A-Pinene	0.005
B-Pinene	0.002
p-Cymene	0.002

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MANAGERS DESIGNERS CONSULTANTS

TABLE 3.3 SUMMARY OF MISCELLANEOUS RESULTS

Mill: CHAMPION-LUFKIN
Source Code: CL-LK/2
FIN: 79-1   EPN: 79-1

Source: Lime Kiln Without NCGs
Test Dates: 4/30/92 5/1/92
CIN: 260012

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	154	158	156	
Volumetric Flow Rate, x 10^3 DSCFM	12.5	13.2	12.8	
Process Operating Conditions				
Production Rate, T CaO/hr	5.7	6.4	6.1	
Emission Rate, lb/hr				
Formaldehyde	ND	ND	ND	0.1
Acetaldehyde	ND	<0.1	0.1	0.1
Acetone	ND	ND	ND	0.1
Acetophenone	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Methyl isobutyl ketone	ND	ND	ND	0.1
Acrolein	ND	ND	ND	0.1
Benzaldehyde	ND	ND	ND	0.1

ND = Not Detected
DL = Detection Limit

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SECTION 3.1 EMISSION TEST RESULTS - VOC

EMISSION TEST RESULTS - VOC

Mill:	CHAMPION - LUFKIN	Source:	Lime Kiln Without NCGs		FIN:	79-1
Source Code:	CL-LK/2	Date:	4/30/92	EPN: 79-1	CIN:	260012

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	2205	2305	0005	
Flow Data				
Stack Temperature, °F		156	158	157
Moisture Content, %		15.2	15.2	15.2
Oxygen Concentration, %		7.5	8.0	7.8
Carbon Dioxide Concentration, %		18.0	8.0	13.0
Volumetric Flow Rate, x10^3 ACFM		17.3	18.4	17.8
Volumetric Flow Rate, x10^3 DSCFM		12.5	13.2	12.8
Process Operating Conditions				
Production Rate, T CaO/hr	6.3	6.4	6.3	6.3
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	4.0	5.6	6.2	5.3
Emission Rate, lb/hr	0.3	0.4	0.4	0.4
Methyl mercaptan				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	1.3	1.3	1.2	1.3
Emission Rate, lb/hr	0.2	0.2	0.2	0.2
Method 18 Data				
Methanol				
Concentration, ppmvd	2.4 *	2.4 *	2.4 *	2.4 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Lime Kiln Without NCGs | FIN: 79-1
Source Code: CL-LK/2 | Date: 4/30/92 | EPN: 79-1 | CIN: 260012

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.2 *	1.2 *	1.2 *	1.2 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.2 *	1.2 *	1.2 *	1.2 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Lime Kiln Without NCGs | FIN: 79-1
Source Code: CL-LK/2 | Date: 4/30/92 | EPN: 79-1 | CIN: 260012

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Knowns as Carbon				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	30.7	29.5	29.5	29.9
Emission Rate, lb/hr as C	0.7	0.7	0.7	0.7

COMMENTS

Moisture was used from field data sheets.

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN	Source:	Lime Kiln Without NCGs		FIN:	79-1
Source Code: CL-LK/2	Date:	5/1/92	EPN: 79-1	CIN:	260012

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1426	1526	1626	
Flow Data				
Stack Temperature, °F	154			154
Moisture Content, %	14.5			14.5
Oxygen Concentration, %	10.5			10.5
Carbon Dioxide Concentration, %	11.0			11.0
Volumetric Flow Rate, x10^3 ACFM	17.5			17.5
Volumetric Flow Rate, x10^3 DSCFM	12.7			12.7
Process Operating Conditions				
Production Rate, T CaO/hr	5.9	5.6	5.7	5.7
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	5.2	5.9	6.1	5.7
Emission Rate, lb/hr	0.4	0.4	0.4	0.4
Methyl mercaptan				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Method 18 Data				
Methanol				
Concentration, ppmvd	2.3 *	2.3 *	2.3 *	2.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Lime Kiln Without NCGs | FIN: 79-1
Source Code: CL-LK/2 | Date: 5/1/92 | EPN: 79-1 | CIN: 260012

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.2 *	1.2 *	1.2 *	1.2 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.2 *	1.2 *	1.2 *	1.2 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN	Source:	Lime Kiln Without NCGs		FIN:	79-1
Source Code: CL-LK/2	Date:	5/1/92	EPN: 79-1	CIN:	260012

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Knowns as Carbon				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	66.7	71.3	67.8	68.6
Emission Rate, lb/hr as C	1.6	1.7	1.6	1.6

COMMENTS

Moisture was used from field data sheets.

* One or more values were less than the detection limit.

SECTION 3.2 EMISSION TEST RESULTS - VOST

EMISSION TEST RESULTS - VOST

Mill CHAMPION - LUFKIN | Source: Lime Kiln Without NCGs | Condition 2

Source Code: CL-LK/2 | EPN: 79-1 | FIN: 79-1 | CIN: 260012

Date: 5/1/92

Compound	LK/2-T (μg)	LK/2-TC (μg)	LK/2-C (μg/L)	Total μg	CL-LK/2 (μg/m3)	Conc. (ppm)
TARGET COMPOUNDS						
Chloromethane		7.632		7.63	393.81	0.187
Bromomethane		0.665		0.67	34.31	0.009
Methylene Chloride	0.039	0.172	4.10	0.39	19.98	0.006
Acetone	0.534	0.204	12.25	1.26	65.26	0.027
Carbon Disulfide	4.194	8.495	0.37	12.70	655.57	0.207
Chloroform	0.347	0.027	5.60	0.61	31.72	0.006
Trichlorofluoromethane	0.035	0.102		0.14	7.07	0.001
Dimethyl disulfide	7.760	0.011	1.14	7.82	403.51	0.103
Dimethyl sulfide			1.94	0.08	4.30	0.002
n-Hexane	2.007	0.172		2.18	112.44	0.031
2-Butanone (MEK)	0.281			0.28	14.50	0.005
Bromodichloromethane	0.103			0.10	5.31	0.001
Trichloroethene	0.007			0.01	0.36	0.000
Benzene	1.755			1.76	90.56	0.028
Dibromomethane						
Toluene	0.162	0.094		0.26	13.21	0.003
Ethylbenzene	0.034			0.03	1.75	0.000
A-Pinene	0.461		2.44	0.57	29.20	0.005
B-Pinene	0.215		0.74	0.25	12.74	0.002
p-Cymene			5.33	0.23	11.83	0.002
TENTATIVELY IDENTIFIED CMPDS.						
unsat'd HC (C4H8)		0.289		0.29	14.91	
Siloxane	2.685	0.296		2.98	153.82	
Furan		0.059		0.06	3.04	
Hydrocarbon						
subst'd HC	1.049	0.590	0.61	1.67	85.93	
Aromatic HC						
Aromatic HC	0.480		0.39	0.50	25.63	
Hydrocarbon		0.016		0.02	0.83	
Thiophene	3.917			3.92	202.12	
subst'd cyclic HC (C10H16)		0.314		0.31	16.20	
Dimethyl Trisulfide	3.839			3.84	198.09	
Cyclic HC		0.025		0.03	1.29	
subst'd HC	0.296			0.30	15.27	
Octane		0.015		0.02	0.77	
Butanal						
Branched cyclic HC	2.024			2.02	104.44	
subst'd HC	3.650			3.65	188.34	
Ketone, unknown		0.163		0.16	8.41	

EMISSION TEST RESULTS - VOST

Mill CHAMPION - LUFKIN Source: Lime Kiln Without NCGs Condition 2

Source Code: CL-LK/2 EPN: 79-1 FIN: 79-1 CIN: 260012

Date: 5/1/92

Compound	LK/2-T (μg)	LK/2-TC (μg)	LK/2-C (μg/L)	Total μg	CL-LK/2 (μg/m3)	Conc. (ppm)
SURROGATE STDS						
(% Recovery)						
Toluene-d8	94.0	109.1	104.5			
1,2-Dichloroethane-d4	97.6	83.8	94.1			
Benzene-d6	84.0	106.4	107.3			

NOTES:

-T=Tenax Air Volume = 0.01938 cu.m.

-TC=Tenax/Charcoal

-C = Condensate Condensate Vol. 43.0 mL

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HH638
RF FILE: ICAL 051092
DATE: 06/01/92
TLI PROJ #: 20802

SAMPLE ID: CL-LK/2 VOST/0501 /1C T
TLI ID: 56.027.3
ANALYSIS DATE: 05/13/92

METHOD 8240 QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	4344		776	1		IS	
2	Chloromethane	0	1.289	0	1	.001	ND	.05
3	Bromomethane	0	.864	0	1	.001	ND	.05
4	Vinyl Chloride	0	1.838	0	1	.001	ND	.05
5	Chloroethane	0	1.221	0	1	.001	ND	.05
6	Methylene Chloride	877	1.279	583	1	.039	E	.05
7	Acetone	2798	.301	526	1	.534	D	.05
8	Carbon Disulfide	330083	4.529	503	1	4.194	E	.05
9	1,1-Dichloroethene	0	1.227	0	1	.001	ND	.05
10	1,1-Dichloroethane	0	4.568	0	1	.001	ND	.05
11	trans-1,2-Dichloroethene	0	1.367	0	1	.001	ND	.05
12	Chloroform	18274	3.032	794	1	.347	D	.05
13	1,2-Dichloroethane	0	3.016	0	1	.001	ND	.05
43	Trichlorofluoromethane	1045	1.724	399	1	.035	E	.05
47	cis-1,2-Dichloroethene	0	1.525	0	1	.001	ND	.05
57	Allyl chloride	0	.832	0	1	.001	ND	.05
62	Dimethyl disulfide	424897	3.151	1082	1	7.760	E	.05
63	Dimethyl sulfide	0	2.250	0	1	.001	ND	.05
65	Iodomethane	0	2.478	0	1	.001	ND	.05
66	Isooctane	0	14.667	0	1	.001	ND	.05
68	Tert-Butyl methyl ether	0	3.759	0	1	.001	ND	.05
69	Vinyl Bromide	0	1.077	0	1	.001	ND	.05
70	n-Hexane	162221	4.652	664	1	2.007	E	.05
14	1,4-Difluorobenzene	23477		909	14		IS	
15	2-Butanone	631	.024	762	14	.281	D	.05
16	1,1,1-Trichloroethane	0	.508	0	14	.001	ND	.05
17	Carbon Tetrachloride	0	.538	0	14	.001	ND	.05
18	Vinyl Acetate	0	.555	0	14	.001	ND	.05
19	Bromodichloromethane	5337	.549	1008	14	.103	D	.05
20	1,2-Dichloropropane	0	.703	0	14	.001	ND	.05
21	cis-1,3-Dichloropropene	0	.750	0	14	.001	ND	.05
22	Trichloroethene	381	.577	935	14	.007	E	.05
23	Dibromochloromethane	0	.557	0	14	.001	ND	.05
24	1,1,2-Trichloroethane	0	.292	0	14	.001	ND	.05
25	Benzene	195500	1.186	850	14	1.755	E	.05
26	trans-1,3-Dichloropropene	0	.616	0	14	.001	ND	.05
27	Bromoform	0	.354	0	14	.001	ND	.05
54	1,4-Dichloro-2-butene	0	.118	0	14	.002	ND	.05
60	Dibromomethane	0	.190	0	14	.001	ND	.05
28	Chlorobenzene-d5	37099		1351	28		IS	
29	4-Methyl-2-Pentanone	0	.185	0	28	.001	ND	.05
30	2-Hexanone	0	.114	0	28	.001	ND	.05
31	Tetrachloroethene	0	.425	0	28	.001	ND	.05
32	1,1,2,2-Tetrachloroethane	0	.259	0	28	.001	ND	.05
33	Toluene	15251	.635	1120	28	.162	D	.05
34	Chlorobenzene	0	.931	0	28	.001	ND	.05
35	Ethylbenzene	2438	.477	1385	28	.034	E	.05
36	Styrene	0	.913	0	28	.001	ND	.05

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HH638
RF FILE: ICAL 051092
DATE: 06/01/92
TLI PROJ #: 20802

SAMPLE ID: CL-LK/2 VOST/0501 /1C T
TLI ID: 56.027.3
ANALYSIS DATE: 05/13/92

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
37 o-Xylene	0	.559	0	28	.001	ND	.05
38 m-/p-Xylene	0	.561	0	28	.001	ND	.05
49 1,2 Dichlorobenzene	0	.832	0	28	.001	ND	.05
50 1,2,3-Trichloropropane	0	.235	0	28	.001	ND	.05
51 1,3 Dichlorobenzene	0	1.043	0	28	.001	ND	.05
53 1,4 Dichlorobenzene	0	.897	0	28	.001	ND	.05
56 A-Pinene	66760	.976	1553	28	.461	D	.05
58 B-Pinene	31199	.979	1697	28	.215	D	.05
59 Cumene (isopropylbenzene)	0	1.513	0	28	.001	ND	.05
64 Ethyl methacrylate	0	.457	0	28	.001	ND	.05
67 P-Cymene	0	2.177	0	28	.001	ND	.05

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	11219	2.647	846	1	.24	D	97.6
48 Benzene-d6	23692	1.201	843	14	.21	D	84.0
39 Toluene-d8	36371	1.042	1111	28	.24	D	94.0

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

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FILE NAME: HH638
DATE: 06/02/92
TLI PROJ #: 20802

SAMPLE ID: CL-LK/2 VOST/0501
1C T
TLI ID: 56.027.3
ANALYSIS DATE: 05/13/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

	NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
1	THIOPHENE	677	1483334	909	.25	3.917
2	DIMETHYL TRISULFIDE	1740	2105447	1351	.25	3.839
3	BRANCHED HYDROCARBON	1922	2002021	1351	.25	3.650
4	BRANCHED HYDROCARBON	1843	1110149	1351	.25	2.024
5	SILOXANE	1236	946208	1351	.25	1.725
6	SUBSTITUTED HYDROCARBON	1708	575349	1351	.25	1.049
7	SILOXANE	1400	526509	1351	.25	.960
8	UNKNOWN	984	76582	909	.25	.202
9	SUBSTITUTED HYDROCARBON	1262	162525	1351	.25	.296
10	SUBSTITUTED AROMATIC HYDROCARBON	1336	263167	1351	.25	.480

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	776	36279	1
1,4-Difluorobenzene	909	94669	14
Chlorobenzene-d5	1351	137111	28

1.725
.960
35

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FILE NAME: HH636
RF FILE: ICAL 051092
DATE: 06/01/92
TLI PROJ #: 20802

SAMPLE ID: CL-LK/2 VOST/0501 /1C TC
TLI ID: 56.027.3
ANALYSIS DATE: 05/13/92

2

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1 Bromochloromethane	2085		767	1		IS	
2 Chloromethane	82037	1.289	161	1	7.632	E	.05
3 Bromomethane	4791	.884	292	1	.665	D	.05
4 Vinyl Chloride	0	1.838	0	1	.001	ND	.05
5 Chloroethane	0	1.221	0	1	.002	ND	.05
6 Methylene Chloride	1831	1.279	574	1	.172	D	.05
7 Acetone	514	.301	518	1	.204	D	.05
8 Carbon Disulfide	320823	4.529	495	1	8.495	E	.05
9 1,1-Dichloroethene	0	1.227	0	1	.002	ND	.05
10 1,1-Dichloroethane	0	4.568	0	1	.001	ND	.05
11 trans-1,2-Dichloroethene	0	1.367	0	1	.002	ND	.05
12 Chloroform	681	3.032	786	1	.027	E	.05
13 1,2-Dichloroethane	0	3.016	0	1	.001	ND	.05
43 Trichlorofluoromethane	1461	1.724	391	1	.102	D	.05
47 cis-1,2-Dichloroethene	0	1.525	0	1	.002	ND	.05
57 Allyl chloride	0	.832	0	1	.003	ND	.05
62 Dimethyl disulfide	292	3.151	1059	1	.011	E	.05
63 Dimethyl sulfide	0	2.250	0	1	.001	ND	.05
65 Iodomethane	0	2.478	0	1	.001	ND	.05
66 Isooctane	0	14.667	0	1	.001	ND	.05
68 Tert-Butyl methyl ether	0	3.759	0	1	.001	ND	.05
69 Vinyl Bromide	0	1.077	0	1	.002	ND	.05
70 n-Hexane	6666	4.652	655	1	.172	D	.05
14 1,4-Difluorobenzene	9188		897	14		IS	
15 2-Butanone	0	.024	0	14	.023	ND	.05
16 1,1,1-Trichloroethane	0	.509	0	14	.001	ND	.05
17 Carbon Tetrachloride	0	.538	0	14	.001	ND	.05
18 Vinyl Acetate	0	.555	0	14	.001	ND	.05
19 Bromodichloromethane	0	.549	0	14	.001	ND	.05
20 1,2-Dichloropropane	0	.703	0	14	.001	ND	.05
21 cis-1,3-Dichloropropene	0	.750	0	14	.001	ND	.05
22 Trichloroethene	0	.577	0	14	.001	ND	.05
23 Dibromochloromethane	0	.557	0	14	.001	ND	.05
24 1,1,2-Trichloroethane	0	.292	0	14	.002	ND	.05
25 Benzene	0	1.186	0	14	.001	ND	.05
26 trans-1,3-Dichloropropene	0	.616	0	14	.001	ND	.05
27 Bromoform	0	.354	0	14	.002	ND	.05
54 1,4-Dichloro-2-butene	0	.118	0	14	.005	ND	.05
60 Dibromomethane	0	.190	0	14	.003	ND	.05
28 Chlorobenzene-d5	11940		1336	28		IS	
29 4-Methyl-2-Pentanone	0	.185	0	28	.002	ND	.05
30 2-Hexanone	0	.114	0	28	.004	ND	.05
31 Tetrachloroethene	0	.425	0	28	.001	ND	.05
32 1,1,2,2-Tetrachloroethane	0	.259	0	28	.002	ND	.05
33 Toluene	2841	.635	1106	28	.094	D	.05
34 Chlorobenzene	0	.931	0	28	.001	ND	.05
35 Ethylbenzene	0	.477	0	28	.001	ND	.05
36 Styrene	0	.913	0	28	.001	ND	.05

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

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FILE NAME: HH636
RF FILE: ICAL 051092
DATE: 06/01/92
TLI PROJ #: 20602

SAMPLE ID: CL-LK/2 VOST/0501 /1C TC
TLI ID: 56.027.3
ANALYSIS DATE: 05/13/92

METHOD 8240 QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
37	o-Xylene	0	.559	0	28	.001	ND	.05
38	m-/p-Xylene	0	.561	0	28	.001	ND	.05
49	1,2 Dichlorobenzene	0	.832	0	28	.001	ND	.05
50	1,2,3-Trichloropropane	0	.235	0	28	.002	ND	.05
51	1,3 Dichlorobenzene	0	1.043	0	28	.001	ND	.05
53	1,4 Dichlorobenzene	0	.897	0	28	.001	ND	.05
56	A-Pinene	0	.976	0	28	.001	ND	.05
58	B-Pinene	0	.979	0	28	.001	ND	.05
59	Cumene (isopropylbenzene)	0	1.513	0	28	.001	ND	.05
64	Ethyl methacrylate	0	.457	0	28	.001	ND	.05
67	P-Cymene	0	2.177	0	28	.001	ND	.05

	SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
41	1,2-Dichloroethane-d4	4628	2.647	834	1	.21	D	83.8
48	Benzene-d6	11747	1.201	833	14	.27	D	106.4
39	Toluene-d8	13580	1.042	1096	28	.27	D	109.1

CODES: ND = Non Detected; D = Detected; S = Saturated; IS = Internal Standard

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FILE NAME: HH636
DATE: 06/02/92
TLI PROJ #: 20802

SAMPLE ID: CL-LK/2 VOST/0501 /1C TC
TLI ID: 56.027.3
ANALYSIS DATE: 05/13/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

	NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
1	MONOUNSATURATED HYDROCARBON C4H8	201	21153	767	.25	.289
2	SILOXANE	862	18287	767	.25	.250
3	UNKNOWN KETONE	810	11932	767	.25	.163
4	FURAN	462	4280	767	.25	.059
5	SILOXANE	1222	6950	1336	.25	.046
6	CYCLIC HYDROCARBON C7H14	972	1831	767	.25	.025
7	BRANCHED HYDROCARBON	887	43131	767	.25	.590
8	BRANCHED CYCLIC HYDROCARBON	942	22961	767	.25	.314
9	OCTANE	1147	2191	1336	.25	.015
10	HYDROCARBON	1429	2480	1336	.25	.016

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	767	18287	1
Chlorobenzene-d5	1336	37660	28

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FILE NAME: AC591
RF FILE: AC585
DATE: 06/01/92
TLI PROJ #: 20624

SAMPLE ID: CL-LK/2 VOST/0501 /1C CONDENSATE
TLI ID: 56.027.3
SAMPLE VOL: .005 L
ANALYSIS DATE: 05/14/92
DILUTION FACTOR: 1

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	CONC, ug/L	CODE	QUAN LIMIT
1 Bromochloromethane	2133		779	1		IS	
2 Chloromethane	0	1.713	0	1	.27	ND	10
3 Bromomethane	0	1.602	0	1	.29	ND	10
4 Vinyl Chloride	0	2.198	0	1	.21	ND	10
5 Chloroethane	0	1.340	0	1	.35	ND	10
6 Methylene Chloride	361	2.065	584	1	4.10	E	10
7 Acetone	571	1.093	528	1	12.25	D	10
8 Carbon Disulfide	92	5.894	503	1	.37	E	10
9 1,1-Dichloroethene	0	1.788	0	1	.26	ND	10
10 1,1-Dichloroethane	0	4.085	0	1	.11	ND	10
11 trans-1,2-Dichloroethene	0	1.980	0	1	.24	ND	10
12 Chloroform	889	3.725	798	1	5.60	E	10
13 1,2-Dichloroethane	0	3.189	0	1	.15	ND	10
43 Trichlorofluoromethane	0	.905	0	1	.52	ND	10
46 Acrylonitrile	0	.686	0	1	.70	ND	10
47 cis-1,2-Dichloroethene	0	2.212	0	1	.21	ND	10
52 1,3-butadiene	0	1.235	0	1	.38	ND	10
57 Allyl chloride	0	.941	0	1	.50	ND	10
62 Dimethyl disulfide	247	5.055	1079	1	1.14	E	10
63 Dimethyl sulfide	207	2.505	521	1	1.94	E	10
65 Iodomethane	0	2.365	0	1	.20	ND	10
66 Isooctane	0	12.174	0	1	.04	ND	10
68 Tert-Butyl methyl ether	0	5.208	0	1	.09	ND	10
69 Vinyl Bromide	0	1.559	0	1	.30	ND	10
70 n-Hexane	0	4.075	0	1	.12	ND	10
14 1,4-Difluorobenzene	9293		913	14		IS	
15 2-Butanone	0	.064	0	14	1.67	ND	10
16 1,1,1-Trichloroethane	0	.347	0	14	.31	ND	10
17 Carbon Tetrachloride	0	.420	0	14	.26	ND	10
18 Vinyl Acetate	0	1.429	0	14	.08	ND	10
19 Bromodichloromethane	0	.490	0	14	.22	ND	10
20 1,2-Dichloropropane	0	.804	0	14	.13	ND	10
21 cis-1,3-Dichloropropene	0	.937	0	14	.11	ND	10
22 Trichloroethene	0	.500	0	14	.22	ND	10
23 Dibromochloromethane	0	.614	0	14	.18	ND	10
24 1,1,2-Trichloroethane	0	.547	0	14	.20	ND	10
25 Benzene	0	1.486	0	14	.07	ND	10
26 trans-1,3-Dichloropropene	0	.975	0	14	.11	ND	10
27 Bromoform	0	.429	0	14	.25	ND	10
54 1,4-Dichloro-2-butene	0	.302	0	14	.36	ND	10
60 Dibromomethane	0	.350	0	14	.31	ND	10
28 Chlorobenzene-d5	11629		1358	28		IS	
29 4-Methyl-2-Pentanone	0	.737	0	28	.12	ND	10
30 2-Hexanone	0	.509	0	28	.17	ND	10
31 Tetrachloroethene	0	.341	0	28	.25	ND	10
32 1,1,2,2-Tetrachloroethane	0	.741	0	28	.12	ND	10
33 Toluene	0	.870	0	28	.10	ND	10
34 Chlorobenzene	0	1.000	0	28	.09	ND	10

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FILE NAME: AC591
RF FILE: AC585
DATE: 06/01/92
TLI PROJ #: 20624

SAMPLE ID: CL-LK/2 VOST/0501 /1C CONDENSATE
TLI ID: 56.027.3
SAMPLE VOL: .005 L
ANALYSIS DATE: 05/14/92
DILUTION FACTOR: 1

M E T H O D 8 2 4 0 Q U A N T I T A T I O N R E P O R T

NAME	AREA	RF	SCAN	ISID	CONC, ug/L	CODE	QUAN LIMIT
35 Ethylbenzene	0	.571	0	28	.15	ND	10
36 Styrene	0	1.109	0	28	.08	ND	10
37 o-Xylene	0	.677	0	28	.13	ND	10
38 m-/p-Xylene	0	.655	0	28	.13	ND	10
49 1,2 Dichlorobenzene	0	.777	0	28	.11	ND	10
50 1,2,3-Trichloropropane	0	.543	0	28	.16	ND	10
51 1,3 Dichlorobenzene	0	.909	0	28	.09	ND	10
53 1,4 Dichlorobenzene	0	.772	0	28	.11	ND	10
56 A-Pinene	671	1.184	1558	28	2.44	E	10
58 B-Pinene	217	1.255	1707	28	.74	E	10
59 Cumene (isopropylbenzene)	0	1.624	0	28	.05	ND	10
64 Ethyl methacrylate	0	.761	0	28	.11	ND	10
67 P-Cymene	2134	1.721	1948	28	5.33	E	10

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT,ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	5810	2.895	849	1	.24	D	94.1
48 Benzene-d6	16161	1.621	847	14	.27	D	107.3
39 Toluene-d8	15865	1.306	1116	28	.26	D	104.5

TRIANGLE LABORATORIES OF RTP, INC.	FILE NAME: AC591	SAMPLE ID:	CL-LK/2 VOST/0501
801 Capitola Drive	DATE: 06/02/92		/1C CONDENSATE
Durham, NC 27713	TLI PROJ #: 20802	TLI ID:	56.027.3
Telephone: (919) 544-5729	ANALYSIS DATE:05/14/92	SAMPLE VOL:	.005 L
		DILN FACTOR:	1

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	SCAN	AREA	IS SCAN #	IS AMT	CONC, ug/L
1 SUBSTITUTED HYDROCARBON	870	334	913	.25	.61
2 AROMATIC HYDROCARBON	1400	344	1356	.25	.39

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	779	20557	1
1,4-Difluorobenzene	913	27275	14
Chlorobenzene-d5	1356	43674	28

SECTION 3.3 EMISSION TEST RESULTS - MISCELLANEOUS

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill:	CHAMPION - LUFKIN	Source:	Lime Kiln Without NCGs			FIN:	79-1
Source Code:	CL-LK/2	Date:	4/30/92	EPN:	79-1	CIN:	260012

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	2200	2400		
Flow Data				
Stack Temperature, °F	156	158		157
Moisture Content, %	15.2	15.2		15.2
Oxygen Concentration, %	7.5	8.0		7.8
Carbon Dioxide Concentration, %	18.0	8.0		13.0
Volumetric Flow Rate, x10^3 ACFM	17.3	18.4		17.8
Volumetric Flow Rate, x10^3 DSCFM	12.5	13.2		12.8
Process Operating Conditions				
Production Rate, T CaO/hr	6.3	6.4		6.4
Miscellaneous Parameters				
Formaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acetaldehyde				
Concentration, ppmvd	0.5			0.5
Emission Rate, lb/hr	0.1 *			0.1 *
Acetone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acetophenone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
2-Butanone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Methyl isobutyl ketone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acrolein				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Benzaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

*One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - LUFKIN | Source: Lime Kiln Without NCGs | FIN: 79-1
Source Code: CL-LK/2 | Date: 5/1/92 | EPN: 79-1 | CIN: 260012

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1641			
Flow Data				
Stack Temperature, °F	154			154
Moisture Content, %	14.5			14.5
Oxygen Concentration, %	10.5			10.5
Carbon Dioxide Concentration, %	11.0			11.0
Volumetric Flow Rate, x10^3 ACFM	17.5			17.5
Volumetric Flow Rate, x10^3 DSCFM	12.7			12.7
Process Operating Conditions				
Production Rate, T CaO/hr	5.7			5.7
Miscellaneous Parameters				
Formaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acetaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acetone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acetophenone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
2-Butanone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Methyl isobutyl ketone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acrolein				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Benzaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

*One or more values were less than the detection limit.

SECTION 3.4 VOC QUALITY CONTROL RESULTS

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

LIME KILN WITHOUT NCGs (CL-LK/2)
THC Quality Control
(Concentrations in ppm)

Calibration

Theoretical	4/30/92 Found	4/30/92 % Error	5/1/92 Found	5/1/92 % Error
0	0	0.0	0	0.0
36	36	0.0	36	0.0
91	87	-2.7	91	0.0
150	151	0.7	149	-0.7
Correlation coefficient	0.9994		>0.9999	

Line Study

Bag sample
4/30/92

Analyzer	Line	%Rec
150	144	96.0

Bag sample
5/1/92

Analyzer	Line	%Rec
38	35	92.1

Nitrogen Blank

4/30/92

Analyzer	Line
--	0a

Nitrogen Blank

5/1/92

Analyzer	Line
1	2

a = Ambient air down the line.

LIME KILN WITHOUT NCGs (CL-LK/2)
VOC Quality Control
(Concentrations in ppm)

Calibration

4/30/92

Analyte	Theoretical	Check Std	% Rec
Acetone	175.4	158.8	90.5
Isopropanol	168.2	166.2	98.8
Benzene	144.1	164.5	114.2
Bromodichloromethane	155.6	197.5	126.9
Toluene	121.2	152.1	125.5
Ethyl Benzene	105.2	92.7	88.1
p-Xylene	105.0	93.3	88.9
o-Xylene	105.5	94.9	90.0
Cumene	92.6	89.0	96.1
alpha-Pinene	80.8	77.8	96.3
beta-Pinene	81.2	79.3	97.7
3-Carene	81.3	78.8	96.9
p-Cymene	82.5	73.5	89.1

5/1/92

Analyte	Theoretical	Check Std	% Rec
Acetone	175.4	182.6	104.1
Isopropanol	168.2	155.8	92.6
Benzene	144.1	133.1	92.4
Bromodichloromethane	155.6	137.2	88.2
Toluene	121.2	107.5	88.7
Ethyl Benzene	105.2	85.8	81.6
p-Xylene	105.5	89.0	84.4
o-Xylene	105.0	88.4	84.2
Cumene	92.6	74.9	80.9
alpha-Pinene	80.8	20.3	25.1
beta-Pinene	81.2	65.7	80.9
3-Carene	81.3	45.8	56.3
p-Cymene	82.5	74.5	90.3

Nitrogen Blank Not performed

Line Study	GC	Line	% Rec
Methanol (100 ppm)			
4/30/92	--	81	81 a
5/1/92	83.8	76.7	91.5

a = % recovery based on 100 ppm theoretical value for methanol.

LIME KILN WITHOUT NCGs (CL-LK/2)
TRS Quality Control
(Concentrations in ppm)

Calibration

4/30/92	Lo	Med	Hi	Correlation coefficient
Hydrogen Sulfide	6.6	10.6	15.0	0.9991
Methyl Mercaptan	6.1	9.8	13.9	0.9995
Dimethyl Sulfide	8.4	13.6	19.3	0.9998
Carbon Disulfide	2.7	4.3	6.1	0.9994
Dimethyl Disulfide	3.6	5.9	8.3	0.9991

5/1/92	Lo	Med	Hi	Correlation coefficient
Hydrogen Sulfide	4.9	6.4	8.6	0.9991
Methyl Mercaptan	4.5	5.9	8.0	0.9990
Dimethyl Sulfide	6.3	8.2	11.1	0.9998
Carbon Disulfide	2.0	2.6	3.5	1.0000
Dimethyl Disulfide	2.7	3.5	4.8	0.9992

Line Study

	GC	Line	%Recovery
4/30/92	Not Performed		

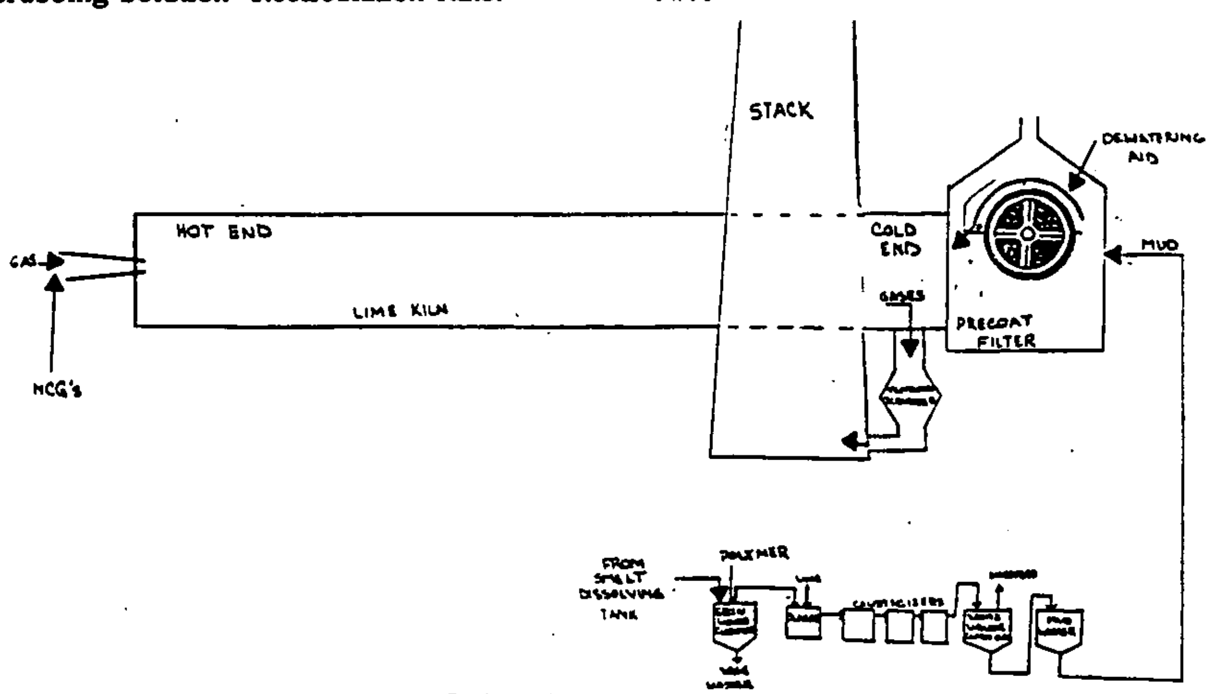
SECTION 3.5 PROCESS DESCRIPTION AND OPERATING CONDITIONS

LIME KILN

Kiln 1 is a rotary kiln manufactured by Fuller and began operation in 1981. The kiln is 10.5 ft in diameter and 275 ft long. The chain section in the kiln is 37.5 ft long and the kiln is fired on gas. Noncondensible gases from the blowheat recovery, evaporators and stripper system are burned in the kiln. The kiln produces 125-140 ton/day CaO. Fresh water is used throughout the causticizing system. Particulate emissions are controlled with a venturi type scrubber, which uses fresh water for makeup. A precoat drum washer, which is 14 feet long and has a diameter of 10 feet, is used for mud washing. Fresh water is used in showers.

Representative Process Conditions

Production Rate (Tons Lime (CaO)/hr):	5.2-5.8
Fuel Type and Firing Rate:	Natural Gas @ 30000-36000 SCFH
BTU/Ton Product:	5.5-7.5
Hot and Cold End Temperatures:	1550-1700° F & 400-530° F
Oxygen and CO Content in the Kiln:	2.4-5.0 Oxygen, CO N/A
NO_x Levels in Vent Gases at 8% O_2:	N/A
Solids Content of Mud:	63-80%
Na_2S and Soda Content of Mud:	Na2O 0.5-1.5%
Particulate Control Device:	Venturi Scrubber
Scrubber Pressure Drop:	10-14" Generally; Up to 19" Water
Scrubber Makeup Solution Source, Volume:	Fresh Water, Vol N/A
Scrubbing Solution Recirculation Rate:	N/A



LIME KILN - VENTING NCG'S

MANUFACTURER: FULLER
TYPE OF SCRUBBER: VENTURRI
SOURCE OF SCRUBBING LIQUID: FRESH WATER RECYCLED
KILN DIMENSIONS: 275 FEET LONG, 10.5 FEET DIAMETER
CHAIN SECTION LENGTH: 37.5 FEET, HIGH DENSITY CURTAIN STYLE

PARAMETER	UNITS	RUN 1	RUN 2	RUN 3	RUN 4	RUN 5	RUN 6
DATE		4/30	4/30	4/30	5/01	5/01	5/01
START TIME		2230	2330	0030	1445	1545	1645
STOP TIME		2315	2415	0115	1530	1630	1730
BTU/T PROD	MM BTU/T	8.80	8.67	8.80	6.03	7.34	6.89
FIRING RT	SCFH	55200	55200	55200	38400	41400	39000
PROD CAO	TN/DY	151	153	151	153	135	136
MUD SOLID	%	77.7	80.2	79.7	78.1	76.0	78.1
SODA *	%	1.21	1.21	1.21	0.72	0.72	0.77
HOT TEMP **	F	1580	1740	1740	1730	1700	1695
COLD TEMP	F	450	450	460	480	480	465
O2 STACK	%	—	—	—	9.6	9.0	9.0
CO STACK	PPM	—	—	—	19.6	24.3	18.5
TRS STACK	PPM	—	—	—	1.3	1.7	1.7
BH BURN RT	SCFM	91	164	165	164	87	110
SCRUB LIQ	%	88	88	88	77	77	77
SHOW TEM	F	140	145	145	145	144	138
SHOW FLW	GPM	43.5	44.0	43.5	42.0	42.0	42.0
EXCESS O2 IN KILN	%	2.4	2.3	2.4	4.7	3.9	4.5
DIG PROD	ADT/D	561	561	561	561	561	561
PRESS DROP	IN H2O	19.6	19.7	19.6	15.0	16.1	16.1

For both days 4/30 and 5/1 venting was initiated 2 hours prior to testing.

* Soda is tested using an acid soluble test which gives a higher result than the more common water soluble test.

** The front end temperature is not an accurate reading, actually 2000F

MANUFACTURER: FULLER
TYPE OF SCRUBBER: VENTURRI
SOURCE OF SCRUBBING LIQUID: FRESH WATER RECYCLED
KILN DIMENSIONS: 275 FEET LONG, 10.5 FEET DIAMETER
CHAIN SECTION LENGTH: 37.5 FEET, HIGH DENSITY CURTAIN STYLE

PARAMETER	UNITS	RUN 7	RUN 8
DATE		5/01	5/01
START TIME		1800	1900
STOP TIME		1845	1945
BTU/T PROD	MM BTU/T	6.76	6.93
FIRING RT	SCFH	38400	39600
PROD RATE CAO	TN/DY	136	137
MUD SOLID	%	75.9	75.0
SODA	%	0.77	0.82
HOT TEMP	F	1680	1700
COLD TEMP	F	460	450
O2 STACK	%	9.3	7.3
CO STACK	PPM	20.5	24.1
TRS STACK	PPM	1.6	1.9
BH BURN RATE	SCFM	213	201
SCRUB LIQ	%	83	78
SHOW TEM	F	143	139
SHOW FLW	GPM	41.5	42.0
EXCESS O2 IN KILN	%	5.0	4.3
DIG PROD	ADT/D	561	561
PRESS DROP	IN H20	16.1	16.1

SECTION 4

GAS TURBINE EXHAUST

(CL-GT)

SECTION 4
GAS TURBINE EXHAUST
(GL-GT)

The Gas Turbine Exhaust was sampled for aldehydes only on 30 April 1992. All of the target aldehydes were nondetectable for the one sample run. Table 4.1 summarizes the results of the testing.

Process operating data follows the results tables.

TABLE 4.1 SUMMARY OF MISCELLANEOUS RESULTS

Mill: CHAMPION-LUFKIN
Source Code: CL-GT
FIN: G-6 EPN: G-6

Source: Gas Turbine Exhaust
Test Dates: 4/30/92
CIN: -

	RUN 1	DL
Volumetric Flow Data		
Stack Temperature, °F	331	
Volumetric Flow Rate, x 10^3 DSCFM	167.1	
Process Operating Conditions		
Production Rate, x 10^6 BTU/hr	131.7	
Emission Rate, lb/hr		
Formaldehyde	ND	0.4
Acetaldehyde	ND	0.6
Acetone	ND	0.8
Acetophenone	ND	1.6
2-Butanone	ND	0.9
Methyl isobutyl ketone	ND	1.3
Acrolein	ND	0.7
Benzaldehyde	ND	1.4

ND = Not Detected
DL = Detection Limit

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - LUFKIN Source: Gas Turbine Exhaust FIN: G-6
Source Code: CL-GT Date: 4/30/92 EPN: G-6 CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1026			
Flow Data				
Stack Temperature, °F	331			331
Moisture Content, %	3.6			3.6
Oxygen Concentration, %	18.0			18.0
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	261.4			261.4
Volumetric Flow Rate, x10^3 DSCFM	167.1			167.1
Process Operating Conditions				
Production Rate, x 10E+6 BTU/hr	131.7			131.7
Miscellaneous Parameters				
Formaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.4 *			0.4 *
Acetaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.6 *			0.6 *
Acetone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.8 *			0.8 *
Acetophenone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.6 *			1.6 *
2-Butanone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.9 *			0.9 *
Methyl isobutyl ketone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.3 *			1.3 *
Acrolein				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.7 *			0.7 *
Benzaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.4 *			1.4 *

* One or more values were less than the detection limit.

GAS TURBINE AND WASTE HEAT BOILER

PARAMETER	UNITS	RUN 1
DATE		4/30
TURBINE GAS	MMBTU/D	3160
WASTE HEAT BOILER GAS	MMBTU/D	3160
TURBINE GAS	MCF/D	3038
WASTE HEAT BOILER GAS	MCF/D	3038

SECTION 5
RECOVERY FURNACE
(CL-RF)

5. CL-RF

SECTION 5
RECOVERY FURNACE
(CL-RF)

The Recovery Furnace was sampled for metals, sulfuric acid mists, and hydrogen chloride. The results are summarized in the following paragraphs.

Metals

Table 5.1 summarizes the result of the samples collected for metals analyses. Section 5.1 tabulates the results for each compound.

The only metals found above the detection limit were copper, lead, and mercury.

Miscellaneous Parameters

Tables 5.2 and 5.3 summarize the results of testing for sulfuric acid mists and hydrogen chloride. Section 5.2 tabulates the results for each compound.

The sulfuric acid mists were all less than the detection limit. A retest was conducted on 16 September 92 for hydrogen chloride. Process operating data for the retest was taken from 01 May 92 conditions. Hydrogen chloride emission rates were consistent, 0.7 to 1.2 lb/hr.

WESTON
MANAGERS DESIGNERS/CONSULTANTS

TABLE 5.1 SUMMARY OF METALS EMISSIONS

Mill: CHAMPION-LUFKIN
Source Code: CL-RF
FIN: 81-1 EPN: 81-1

Source: Recovery Furnace
Test Dates: 4/30/92
CIN: 351019

	RUN 1	RUN 2	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	386	388	387	
Volumetric Flow Rate, x 10^3 DSCFM	131	129	130	
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	82.5	82.5	82.5	
Metals Emission Rate, x10^{-5}lb/hr				
Antimony (Sb)	ND	ND	ND	2.2
Arsenic (As)	ND	2.1	1.6	2.2
Barium (Ba)	ND	ND	ND	1800
Beryllium (Be)	ND	ND	ND	2.2
Cadmium (Cd)	ND	ND	ND	2.2
Chromium (Cr)	ND	ND	ND	4.4
Copper (Cu)	25.0	ND	13.1	2.2
Lead (Pb)	15.0	ND	8.6	4.4
Manganese (Mn)	ND	5.1	3.7	4.4
Mercury (Hg)	5.3	2.1	3.7	2.2
Nickel (Ni)	ND	ND	ND	2.2
Phosphorus (P)	ND	ND	ND	44
Silver (Ag)	ND	ND	ND	2.2
Selenium (Se)	ND	ND	ND	2.2
Thallium (Tl)	ND	ND	ND	2.2

ND = Not Detected
DL = Detection Limit

WESTON — MANAGERS DESIGNERS CONSULTANTS

TABLE 5.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: CHAMPION-LUFKIN
Source Code: CL-RF
FIN: 81-1   EPN: 81-1

Source: Recovery Furnace
Test Dates: 5/1/92
CIN: 351019

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	386	388	387	
Volumetric Flow Rate, x 10^3 DSCFM	129	131	130	
Process Operating Conditions				
Production Rate, 1000 BLS/hr	77.0	77.0	77.0	
Emission Rate, lb/hr				
Sulfuric Acid Mist	ND	ND	ND	<0.6

ND = Not Detected
DL = Detection Limit

WESTON

TABLE 5.3 SUMMARY OF MISCELLANEOUS RESULTS

Mill: CHAMPION-LUFKIN
Source Code: CL-RF
FIN: 81-1 EPN: 81-1

Source: Recovery Furnace
Test Dates: 9/16/92
CIN: 351019

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	371	371	371	
Volumetric Flow Rate, x 10^3 DSCFM	97.3	97.3	97.3	
Process Operating Conditions				
Production Rate, 1000 BLS/hr	77.0	77.0	77.0	
Emission Rate, lb/hr				
Hydrogen Chloride	0.7	1.2	1.0	0.3

ND = Not Detected
DL = Detection Limit

SECTION 5.1 EMISSION TEST RESULTS - METALS

Mill: Champion-Lufkin
Source: Recovery Furnace

Run 1
Sample volume (DSCF)--------- 39.49
Source Vol Flow (DSCFM)------ 131000

		FH+BH Amt (ug)	Conc (lb/DSCF)	Mass Rt. (lb/hr)	Detection Limit(ug)	Det Limit (lb/DSCF)	Det Limit (lb/hr)
Antimony	Sb	*	0.0E+00	0.0E+00	5	2.8E-10	2.2E-03
Arsenic	As	*	0.0E+00	0.0E+00	5	2.8E-10	2.2E-03
Barium	Ba	*	0.0E+00	0.0E+00	4000	2.2E-07	1.8E+00
Beryllium	Be	*	0.0E+00	0.0E+00	5	2.8E-10	2.2E-03
Cadmium	Cd	*	0.0E+00	0.0E+00	5	2.8E-10	2.2E-03
Chromium	Cr	*	0.0E+00	0.0E+00	10	5.6E-10	4.4E-03
Copper	Cu	56	3.1E-09	2.5E-02	5	2.8E-10	2.2E-03
Lead	Pb	35	2.0E-09	1.5E-02	10	5.6E-10	4.4E-03
Manganese	Mn	*	0.0E+00	0.0E+00	10	5.6E-10	4.4E-03
Mercury	Hg	12	6.7E-10	5.3E-03	5	2.8E-10	2.2E-03
Nickel	Ni	*	0.0E+00	0.0E+00	5	2.8E-10	2.2E-03
Phosphorus	P	*	0.0E+00	0.0E+00	100	5.6E-09	4.4E-02
Silver	Ag	*	0.0E+00	0.0E+00	5	2.8E-10	2.2E-03
Selenium	Se	*	0.0E+00	0.0E+00	5	2.8E-10	2.2E-03
Thallium	Tl	*	0.0E+00	0.0E+00	5	2.8E-10	2.2E-03

Run 2
Sample volume (DSCF)--------- 40.28
Source Vol Flow (DSCFM)------ 129000

		FH+BH Amt (ug)	Conc (lb/DSCF)	Mass Rt. (lb/hr)	Detection Limit(ug)	Det Limit (lb/DSCF)	Det Limit (lb/hr)
Antimony	Sb	*	0.0E+00	0.0E+00	5	2.7E-10	2.1E-03
Arsenic	As	5	2.7E-10	2.1E-03	5	2.7E-10	2.1E-03
Barium	Ba	*	0.0E+00	0.0E+00	4000	2.2E-07	1.7E+00
Beryllium	Be	*	0.0E+00	0.0E+00	5	2.7E-10	2.1E-03
Cadmium	Cd	*	0.0E+00	0.0E+00	5	2.7E-10	2.1E-03
Chromium	Cr	*	0.0E+00	0.0E+00	10	5.5E-10	4.2E-03
Copper	Cu	*	0.0E+00	0.0E+00	5	2.7E-10	2.1E-03
Lead	Pb	*	0.0E+00	0.0E+00	10	5.5E-10	4.2E-03
Manganese	Mn	12	6.6E-10	5.1E-03	10	5.5E-10	4.2E-03
Mercury	Hg	5	2.7E-10	2.1E-03	5	2.7E-10	2.1E-03
Nickel	Ni	*	0.0E+00	0.0E+00	5	2.7E-10	2.1E-03
Phosphorus	P	*	0.0E+00	0.0E+00	100	5.5E-09	4.2E-02
Silver	Ag	*	0.0E+00	0.0E+00	5	2.7E-10	2.1E-03
Selenium	Se	*	0.0E+00	0.0E+00	5	2.7E-10	2.1E-03
Thallium	Tl	*	0.0E+00	0.0E+00	5	2.7E-10	2.1E-03

MF 9/1/92

METALS CALCULATIONS

Client: TPIEC
Location: Champion-Lufkin
WESTON Project No.: 6848-01-01
Source: RF

INPUT DATA

		1	2	3	Mean
Run Number		1	2	3	Mean
Date		4/30/92	4/30/92		---
Time Began		1444	1657		---
Time Ended		1555	1803		---
Sampling Time, min	(Theta)	60	60		60
Stack Diameter, in.	(Dia)	132	132	132	132
Barometric Pressure, in. Hg	(Pb)	30.03	30.03		30.03
Static Pressure, in. H2O	(Pg)	-0.81	-0.81		-0.81
Pitot Tube Coefficient	(Cp)	0.84	0.84		0.84
Meter Correction Factor	(Y)	1.010	1.010		1.010
Nozzle Diameter, in.	(Dn)	0.300	0.300		0.300
Meter Volume, ft^3	(Vm)	40.072	41.074		40.573
Meter Temperature, °F	(tm)	85	88		86
Meter Orifice Pressure, in. H2O	(Delta H)	1.660	1.630		1.645
Volume H2O Collected, mL	(Vlc)	250.4	245.4		247.9
CO2 Concentration, %	(CO2)	16.0	16.5		16.3
O2 Concentration, %	(O2)	8.0	8.0		8.0
Average Sq Rt Velo Head, (in. H2O)^½	((Delta P)^½)avg	0.6600	0.6500		0.6550
Stack Temperature, °F	(ts)	386	388		387
Total Metals Collected, ug		2.3	2.2		2.3
Moisture Fraction (at Saturation)	(Bws)	NA	NA	NA	

CALCULATED DATA

		1	2	3	Mean
Stack Area, ft^2	(As)	95.03	95.03	95.03	95.03
Stack Pressure, in. Hg	(Ps)	29.97	29.97	0.00	19.98
Standard Meter Volume, ft^3	(Vmstd)	39.486	40.280	0.000	26.589
Standard Water Volume, ft^3	(Vwstd)	11.786	11.551	0.000	7.779
Moisture Fraction (Measured)	(Bws)	0.230	0.223	ERR	ERR
Moisture Fraction (lower sat/meas)	(Bws)	0.230	0.223	ERR	ERR
Mol. Wt. of Stack Gas, lb/lb-mole	(Ms)	27.9	28.1	ERR	ERR
Average Stack Gas Velocity, ft/sec	(Vs)	47.7	46.9	ERR	ERR
Stack Gas Flow @ Stack Cond, ft^3/min	(Qa)	2.72E+05	2.67E+05	ERR	ERR
Stack Gas Flow @ Std Cond, ft^3/min	(Qs)	1.31E+05	1.29E+05	ERR	ERR
Isokinetic Sampling Rate, %	(%I)	97	100	ERR	ERR
Metals Concentration, lb/ft^3		1.28E-10	1.20E-10	ERR	ERR

Blanks for the Multimetals Train. Three blanks were collected during the study. One was collected at Champion-Lufkin and two at Champion-Sheldon. These blanks were used to correct all samples.

		CL Blank Front(ug)	CS Blk 1 Front(ug)	CS Blk 2 Front(ug)	Front Blk(ug)
Antimony	Sb	0.7	0.5 *	0.5 *	0 *
Arsenic	As	3.9	0.8	0.8	1
Barium	Ba	2476	2 *	3742	2073
Beryllium	Be	0.2	0.2 *	0.3	0 *
Cadmium	Cd	0.5	0.4 *	1.4	0 *
Chromium	Cr	9.4	1.2 *	9.3	6.4
Copper	Cu	1.6	1.5 *	1.5 *	0 *
Lead	Pb	10.8	0.3	5.2	5.4
Manganese	Mn	4.4	1 *	4.5	3.1
Mercury	Hg	0.4 *	0.4 *	0.4 *	0 *
Nickel	Ni	2 *	2 *	2 *	0 *
Phosphorus	P	22.6	50 *	53.4	34.7
Silver	Ag	8.3	0.7 *	0.7 *	0 *
Selenium	Se	0.5	0.4 *	0.4 *	0 *
Thallium	Tl	1	0.5	0.7	0 *

The * beside a value means that the analytical value was less than the detection limit for the analysis. The front and the back blank (right column) was developed from the average for most metals. The 8.3 ug from the CL blank was not used because it was unexplainably high.

		CL Blank Back(ug)	CS Blk 1 Back(ug)	CS Blk 2 Back(ug)	Back Blk(ug)
Antimony	Sb	1 *	1 *	0.7 *	0 *
Arsenic	As	1 *	0.5	0.3 *	0 *
Barium	Ba	3.8 *	0.4 *	2.6 *	0 *
Beryllium	Be	0.4 *	0.4 *	0.3 *	0 *
Cadmium	Cd	0.8	1.4	1	1
Chromium	Cr	2.3 *	2.4 *	1.6 *	0 *
Copper	Cu	2.9 *	3 *	2 *	0 *
Lead	Pb	1.5	0.4 *	0.6	0.8
Manganese	Mn	1.9 *	2 *	1.3 *	0 *
Mercury	Hg	0.8 *	0.8 *	1.1	0 *
Nickel	Ni	3.8 *	4 *	2.6 *	0 *
Phosphorus	P	188	100 *	26 *	100 *
Silver	Ag	1.3 *	1.4 *	0.9 *	0 *
Selenium	Se	1 *	0.8 *	0.5 *	0 *
Thallium	Tl	1.9 *	0.4 *	0.3 *	0 *

BAF 9/7/92

TRIANGLE LABORATORIES of RTP, INC.

PO BOX 13485
RTP, NC 27709

Project: 20793
Weston

Date in: 05-May-92
Date out: 04-Jun-92

CASE NARRATIVE

Overview

This project involves the analysis of 7 Multi-Metals Trains, of which one is a Blank Train, for Ag, As, Ba, Be, Cd, Cr, Cu, Hg, Mn, Na, Ni, P, Pb, Sb, Se, and Tl. The Multi-Metal analysis was conducted according to the protocol described in sections 5-7 of the EPA Draft Document *"Methodology for the Determination of Metals Emissions in Exhaust Gases from Hazardous Waste Incineration and Similar Combustion Processes."* In addition to the Multi-Metal Trains one liquid (DI H2O) sample was submitted to be analyzed with the Blank MMTL Train, but did not require any digestion.

Preparation

Samples were prepared by microwave and hotplate digestion, as required by the contract. A detailed flow chart of the procedure is included in the report showing the volumes received and used for all analyses.

Analysis

Ba, Be, Cd, Cr, Cu, Mn, Ni, P, and Ag were determined by Inductively Coupled Plasma (ICP) Emission Spectroscopy. Sb was determined by Graphite Furnace Atomic Absorption (GFAA). As, Se, Pb and Tl were analyzed by Methods of Addition(MSA) on the GFAA. Na was determined by Flame Atomic Absorption(FLAA). Hg was determined by Cold Vapor AA.

Results

The Sb post digestion spikes for the FH and BH samples on the GFAA were the only %recoveries that were within control limits. As, Pb, Se, and Tl were reanalyzed by Method of Standard Addition on the GFAA per method requirements due to the fact that the post digestion spikes for these analytes were not within control limits. Only Pb was detected in the PBW, but the amount detected is not significant in comparison to the amount of Pb detected in the samples. The Pb Train Blank results may be biased slightly high due to the Pb detected in the PBW.

The FH As and Ba results can be mostly attibuted to the amounts detected in the Train Blank. It is possible that the Ba results in the FH samples and Train Blank may be due to the amount of Ba indigenous to the glass fiber filters.

The %RPD for the duplicates were within control limits for all samples in which Hg was detected, except LK/2 FH and RF/2 E. In these cases, as well as when Hg was detected in the sample and not in the duplicate or in the duplicate and not in the sample, the %RPD is not considered to be a signifcant QC parameter, because the

concentration is less than four times the detection limit.

Hg was detected in the blank for the FH/BH Hg analysis and may bias the Hg detected in the FH/BH samples slightly high.

TRIANGLE LABORATORIES of RTP, INC.
TLI PROJECT #20793

CLIENT SAMPLE IDENTIFICATION:

MMTL TRAIN #1
1.CL-SDTV/1METL/0429/1 FH
2.CL-SDTV/1METL/0429/1 BH
3.CL-SDTV/1METL/0429/1 D
4.CL-SDTV/1METL/0429/1 E
5.CL-SDTV/1METL/0429/1 F

MMTL TRAIN #2
1.CL-SDTV/1METL/0429/2 FH
2.CL-SDTV/1METL/0429/2 BH
3.CL-SDTV/1METL/0429/2 D
4.CL-SDTV/1METL/0429/2 E
5.CL-SDTV/1METL/0429/2 F

MMTL TRAIN #3
1.CL-LK/1METL/0503/1 FH
2.CL-LK/1METL/0503/1 BH
3.CL-LK/1METL/0503/1 D
4.CL-LK/1METL/0503/1 E
5.CL-LK/1METL/0503/1 F

MMTL TRAIN #4
1.CL-LK/1METL/0503/2 FH
2.CL-LK/1METL/0503/2 BH
3.CL-LK/1METL/0503/2 D
4.CL-LK/1METL/0503/2 E
5.CL-LK/1METL/0503/2 F

MMTL TRAIN #5
1.CL-RF/1METL/0430/1 FH
2.CL-RF/1METL/0430/1 BH
3.CL-RF/1METL/0430/1 D
4.CL-RF/1METL/0430/1 E
5.CL-RF/1METL/0430/1 F

MMTL TRAIN #6
1.CL-RF/1METL/0430/2 FH
2.CL-RF/1METL/0430/2 BH
3.CL-RF/1METL/0430/2 D
4.CL-RF/1METL/0430/2 E
5.CL-RF/1METL/0430/2 F

BLANK TRAIN
1.CL-BLANK FH
2.CL-BLANK BH
3.CL-BLANK DI H2O
4.CL-BLANK E

TRIANGLE LABORATORIES of RTP, INC.

INORGANICS ANALYSIS REPORT

TLI PROJECT #: 20793
CLIENT: WESTON
DATE RECIEVED: 05/05/92
DATE REPORTED: 06/04/92

RESULTS REPORTED IN TOTAL ug
**=MSA

CLIENT SAMPLE ID	Ag	As**	Ba	Be	Cd	Cr	Cu	Mn
SDTV/1 FH	< .700	3.79	2231	< .200	1.20	8.34	5.89	11.1
SDTV/1 BH	< .906	1.07	3.88	< .259	< .518	< 1.55	9.61	11.5
SDTV/2 FH	< .700	3.37	2759	< .200	.737	6.18	6.89	13.3
SDTV/2 BH	< .863	1.04	3.78	< .247	< .493	< 1.48	< 1.85	2.20
LK/1 FH	4.00	2.63	2071	< .200	1.03	15.2	3.19	32.5
LK/1 BH	< .875	1.93	3.32	< .250	< .500	< 1.50	9.74	1.36
LK/2 FH	.768	4.14	2809	< .200	1.16	9.46	3.56	45.9
LK/2 BH	< .875	3.16	< 2.50	< .250	< .500	< 1.50	< 1.88	7.46
RF/1 FH	< .700	4.49	3273	.234	.440	12.0	2.43	6.91
RF/1 BH	< .863	.690	< 2.47	< .247	2.38	2.30	53.7	2.65
RF/2 FH	< .700	4.86	2629	< .200	.553	7.36	< 1.50	7.36
RF/2 BH	< .863	.740	2.96	< .247	1.28	3.25	3.34	7.25
BLANK FH	8.34	3.86	2476	.206	.480	9.42	1.59	4.43
BLANK BH	< 1.34	< .955	< 3.82	< .382	.795	< 2.29	< 2.86	< 1.91
BLANK DI H20	< 3.22	< 1.15	< 9.20	< .920	< 1.84	< 5.52	< 6.90	< 4.60
PBW ug/L	<7.00	<5.00	<20.0	<2.00	<4.00	<12.0	<15.0	<10.0

CLIENT SAMPLE ID	Na	Ni	P	Pb**	Sb	Se**	Tl**
SDTV/1 FH	46,100	2.04	74.8	36.9	9.85	< .500	< 1.00
SDTV/1 BH	435	< 2.59	140	3.12	< .647	< .647	< 1.29
SDTV/2 FH	74,700	< 2.00	28.7	34.3	.920	< .500	2.29
SDTV/2 BH	226	< 2.47	130	2.55	< .616	< .616	< 1.23
LK/1 FH	54,800	9.61	43.6	1270	1.62	< .500	< 1.00
LK/1 BH	245	< 2.50	129	5.05	< .625	< .625	< 1.25
LK/2 FH	61,100	5.10	38.9	1712	1.21	< .500	2.79
LK/2 BH	303	< 2.50	141	2.23	< .625	< .625	< 1.25
RF/1 FH	55,800	< 2.00	30.5	38.2	.660	< .500	< 1.00
RF/1 BH	293	< 2.47	159	2.50	< .616	< .616	< 1.23
RF/2 FH	48,800	< 2.00	31.4	11.2	.890	< .500	< 1.00
RF/2 BH	356	< 2.47	124	1.82	< .616	< .616	< 1.23
BLANK FH	37,600	< 2.00	22.6	10.8	.720	< .500	< 1.00
BLANK BH	304	< 3.82	188	1.53	< .955	< .955	< 1.91
BLANK DI H2O	168	< 9.20	127	1.50	< 1.15	< 1.15	< 2.30
PBW ug/L	<500	<20.0	<200	2.8	<5.00	<5.00	<10.0

TRIANGLE LABORATORIES of RTP, INC.

INORGANICS ANALYSIS REPORT

Hg RESULTS

	SDTV/1 FH	SDTV/1 BH	SDTV/1 D	SDTV/1 E	SDTV/1 F
AVG TOTAL ug	1.37	<1.76	<.480	<1.56	<.920
%RPD	4.38%	N/A	N/A	N/A	N/A

	SDTV/2 FH	SDTV/2 BH	SDTV/2 D	SDTV/2 E	SDTV/2 F
AVG TOTAL ug	1.13	<2.12	<.400	<1.48	.943
%RPD	8.85%	N/A	N/A	N/A	4.88%

	LK/1 FH	LK/1 BH	LK/1 D	LK/1 E	LK/1 F
AVG TOTAL ug	1.01	<2.00	<.336	<1.49	<.920
%RPD	1.98%	N/A	N/A	N/A	N/A

	LK/2 FH	LK/2 BH	LK/2 D	LK/2 E	LK/2 F
AVG TOTAL ug	1.12	<2.00	<.320	<1.48	<.920
%RPD	53.57%	N/A	N/A	N/A	N/A

	RF/1 FH	RF/1 BH	RF/1 D	RF/1 E	RF/1 F
AVG TOTAL ug	.980	4.51	<.360	6.70	<.920
%RPD	8.16%	7.06%	N/A	20.69%	N/A

	RF/2 FH	RF/2 BH	RF/2 D	RF/2 E	RF/2 F
AVG TOTAL ug	.400	<2.12	<.380	4.22	<.920
%RPD	N/A	N/A	N/A	34.23%	N/A

	BLANK FH	BLANK BH	BLANK DI H2O	BLANK E
AVG TOTAL ug	<.400	<.840	<.440	<.920
%RPD	N/A	N/A	N/A	N/A

Hg QC SUMMARY

	%REC
SDTV/1 FH(S)	107%
SDTV/1 FH(SD)	108%

	ug/L
FH/BH PBW	.230
IMPINGER PBW	<.200
5-4 RECHECK PBW	

Sb GFAA POST DIGESTION SPK SUMMARY

	%REC
RF/1 FH(S)	84.6%
RF/1 BH(S)	87.2%

DESCRIPTION OF ABBREVIATIONS

ICV=Initial Calibration Verification
ICB=Initial Calibration Blank
CCV=Continuing Calibration Verification
CCB=Continuing Calibration Blank
PBW=Preparation Blank Water
PBS=Preparation Blank Soil
LCS=Laboratory Control Sample
ICSA=Interference Check Sample(Solution A)   I=Initial F=Final
ICSAB=Interference Check Sample(Solution AB) I=Initial F=Final
Solution A contains common interferents, while Solution AB contains the interferents plus the analyte in question.
CRDL=Contract Required Detection Limit (for CLP)
IDL=Instrument Detection Limit
CRI=CRDL Standard for ICP I=Initial F=Final
CRA=CRDL Standard for AA   I=Initial F=Final
%RPD=Relative Percent Difference
%REC=% Recovery
SPK=Spike
AMT=Amount
BLK=Blank
MSA=Method of Standard Additions

CALCULATIONS

MMTL TRAINS(ICP & GFAA):

$$\text{TOTAL ug} = \frac{[\text{ug/L}] * (\text{mL TV/mL USED}) * (\text{mL FV} * \text{DF})}{1000}$$

MMTL TRAINS(FLAA):

$$\text{TOTAL ug} = \underline{[\text{ug/L}] * (\text{mL TV/mL USED}) * (\text{mL FV} * \text{DF})}$$

FV=FINAL VOLUME DF=DILUTION FACTOR
WT=WEIGHT TV=TOTAL VOLUME
BV=BEGINNING VOLUME

Hg

MMTL Trains:

$$\text{TOTAL ug} = \underline{[\text{ug/L}] * (\text{ml FV/ml aliquot}) * .1\text{L} * (\text{DF})}$$

MMTL Impingers:

$$\text{TOTAL ug} = \underline{[\text{ug/L}] * (\text{ml TV/ml aliquot}) * .1\text{L} * (\text{DF})}$$

$$\%\text{RPD} = \frac{|\text{SR} - \text{DR}|}{(\text{SR} + \text{DR})/2} * 100$$

$$\%\text{REC} = \frac{\text{SSR} - \text{SR}}{\text{SA}} * 100$$

SR=SAMPLE RESULT DR=DUPLICATE RESULT
SSR=SPIKE SAMPLE RESULT SA=SPIKE ADDED

Metals Data

Mill CL Run no 1 Sample Volume (DSCF) 39.49

Source RF Run Date 4/30/92 Source Vol Flow (DSCFM) 131,000

		MEAS FH (ug)	FH Blk Corr (ug)	FH Corr Amt (ug)		Meas BH (ug)	BH Blk Corr (ug)	BH Corr Amt (ug)		FH + BH Amt (ug)	Detection Limit (ug)
Antimony	Sb	0.7	0	0.7		<0.6	0	<0.6		1	5
Arsenic	As	4.5	1.0	3.5		0.7	0	0.7		4	5
Barium	Ba	3273	2073	1200		<2.5	0	<2.5		1200	4000
Beryllium	Be	0.2	0	0.2		<0.2	0	<0.2		<1	5
Cadmium	Cd	0.4	1.4	<1		2.4	1.0	1.4		2	5
Chromium	Cr	12	6.4	5.6		2.3	0	2.3		8	10
	+6										
Copper	Cu	2.4	0	2.4		53.7	0	53.7		56	5
Lead	Pb	38.2	5.4	32.8		2.5	0.8	1.7		35	10
Manganese	Mn	6.9	3.1	3.8		2.6	0	2.6		6	10
Mercury	Hg	1.0	0	1.0		11.2	0	11.2		12	5
Nickel	Ni	<2.0	0	<2.0		<2.5	0	<2.5		<2	5
Phosphorus	P	30.5	34.7	<35		159	100	59		80	100
Silver	Ag	<0.7	0	<0.7		<0.9	0	<0.9		<1	5
Selenium	Se	<0.5	0	<0.5		<0.6	0	<0.6		<1	5
Thallium	Tl	<1.0	0	<1		<1.2	0	<1.2		<1	5

Blank is ~ mean of 3 blanks for project
See notes by Bruce dated 9/3/92.

Metals Data

Mill: CL   Run no: 2   Sample Volume (DSCF): 40.28

Source: RF   Run Date: 4/30/92   Source Vol Flow (DSCFM): 129,000

		MEAS FH (ug)	FH Blk Corr (ug)	FH Corr Amt (ug)	Meas BH (ug)	BH Blk Corr (ug)	BH Corr Amt (ug)	FH + BH Amt (ug)	Detection Limit (ug)
Antimony	Sb	0.9	0	0.9	0.6	0	0.6	1.5	5
Arsenic	As	4.9	1.0	3.9	0.7	0	0.7	[redacted]	5
Barium	Ba	2629	2073	556	3.0	0	3	559	4000
Beryllium	Be	<0.2	0	<0.2	< 0.2	0	<0.2	<1	5
Cadmium	Cd	0.6	1.4	<1.4	1.3	1.0	0.3	<1	5
Chromium	Cr	7.4	6.4	1.0	3.2	0	3.2	4	10
	+6								
Copper	Cu	<1.5	0	<1.5	3.3	0	3.3	4	5
Lead	Pb	11.2	5.4	5.8	1.8	0.8	1.0	6	10
Manganese	Mn	7.4	3.1	4.3	7.2	0	7.2	12	10
Mercury	Hg	0.4	0	0.4	4.2	0	4.2	5	5
Nickel	Ni	< 2.0	0	<0.2	<2.5	0	<2.5	<2	5
Phosphorus	P	31.4	34.7	<35	124	100	24	<100	100
Silver	Ag	< 0.7	0	< 0.7	<0.9	0	<0.9	<1	5
Selenium	Se	<0.5	0	<0.5	<0.6	0	< 0.6	<1	5
Thallium	Tl	<1.0	0	<1.0	<1.2	0	<1.2	<1	5

Blank is ~ mean of 3 blanks for project
See notes by Bruce dated 9/3/92

SECTION 5.2 EMISSION TEST RESULTS - MISCELLANEOUS

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - LUFKIN	Source:	Recovery Furnace			FIN:	81-1
Source Code: CL-RF	Date:	5/1/92	EPN:	81-1	CIN:	351019

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1444	1657		
Flow Data				
Stack Temperature, °F	386	388		387
Moisture Content, %	23.0	22.3		22.7
Oxygen Concentration, %	8.0	8.0		8.0
Carbon Dioxide Concentration, %	16.0	16.5		16.3
Volumetric Flow Rate, x10^3 ACFM	271.7	267.1		269.4
Volumetric Flow Rate, x10^3 DSCFM	130.8	129.5		130.2
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	77.0	77.0		77.0
Miscellaneous Parameters				
Sulfuric Acid Mist (Impinger)				
Concentration, lb/dscf	7.40E-08 *	7.40E-08 *	7.40E-08 *	7.40E-08 *
Emission Rate, lb/hr	5.78E-01 *	5.78E-01 *	5.78E-01 *	5.78E-01 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - LUFKIN	Source:	Recovery Furnace			FIN:	81-1
Source Code: CL-RF	Date:	9/16/92	EPN:	81-1	CIN:	351019

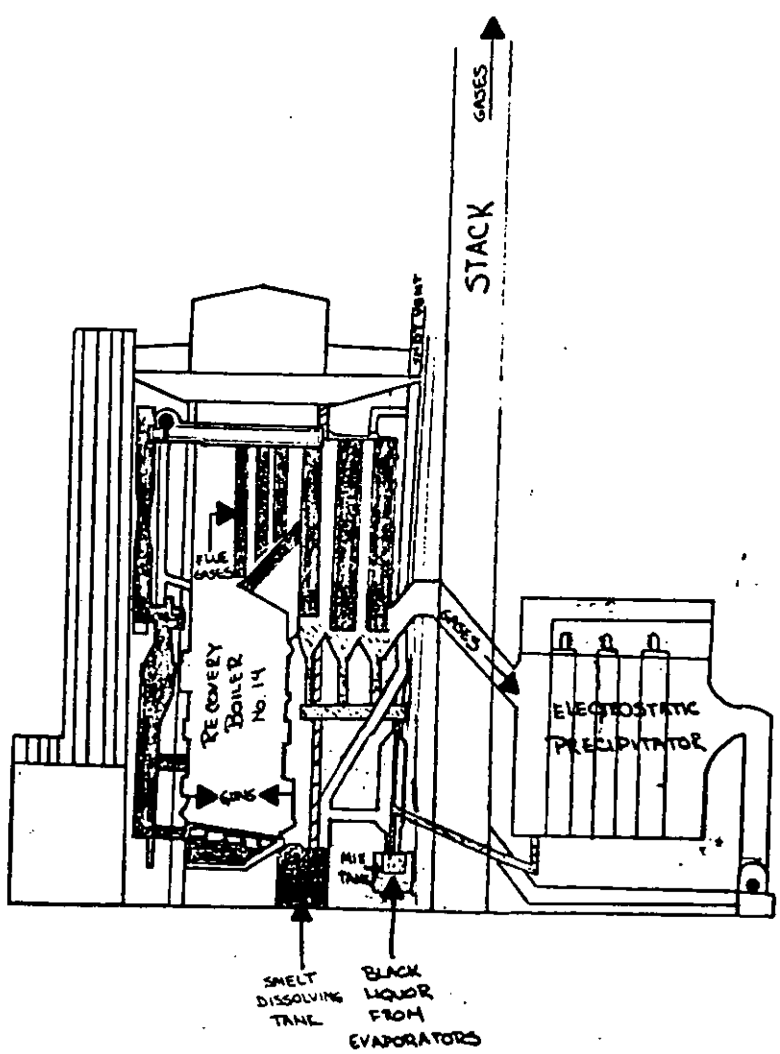
	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1045			
Flow Data				
Stack Temperature, °F	371			371
Moisture Content, %	22.3			22.3
Oxygen Concentration, %	7.5			7.5
Carbon Dioxide Concentration, %	13.0			13.0
Volumetric Flow Rate, x10^3 ACFM	197.1			197.1
Volumetric Flow Rate, x10^3 DSCFM	97.3			97.3
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	77.0	77.0	77.0	77.0
Miscellaneous Parameters				
Hydrogen chloride				
Concentration, ppmvd	2.2	1.2	2.3	1.9
Emission Rate, lb/hr	1.2	0.7	1.2	1.0

* One or more values were less than the detection limit.

SECTION 5.3 PROCESS DESCRIPTION AND OPERATING CONDITIONS

RECOVERY BOILER
Number 14.

Approximately two million pounds of black liquor from the evaporators enters the black liquor mix tank where the black liquor, ash from the precipitators, and 720 lb/hr of salt cake are all added. The mixture then proceeds to the retention tank, through heaters and is fed to the 2 guns. The liquor mixture is then sprayed into the boiler at 68% solids and burned. The organics are destroyed with the inorganics dropping to the bed. The inorganics are fed into the smelt dissolving tank, mixed with weak wash forming green liquor. The flue gases flow up the furnace through superheaters, a generating bank and economizers and proceed to a dry bottom Flakt electrostatic precipitator. The precipitator removes ash which is fed to the mix tank and the remaining gas is emitted through the stack.



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NO. 14 RECOVERY FURNACE

TYPE: LOW ODOR, NON-CONTACT
MANUFACTURER: GOTAVERKEN
CONSTRUCTED: 1985

PARAMETER	UNITS	RUN 1	RUN 2	RUN 3	RUN 4
DATE		4/30	4/30	5/01	5/01
START TIME		1440	1700	1130	1130
STOP TIME		1550	1805	1250	1250
FIRING RATE	GPM	178	177	176	177
SULFIDITY(GL)	%	28.7	29.0	28.1	28.1
PRIMARY AIR	MACFM	49.7	49.1	48.1	48.4
SECONDARY AIR	MACFM	48.3	48.3	46.1	46.0
TERTIARY AIR	MACFM	12.0	12.1	10.5	10.5
O2 IN FURNACE	%	1.1	1.0	0.8	0.9
SALTCAKE RATE	LB/HR	720	720	720	720
CO STACK	PPM	117	108	283	331
TRS STACK	PPM	0.403	0.372	0.329	0.568
NOX STACK	PPM	71	74	61	61
SO2 STACK	PPM	45	24	20	40
O2 STACK	%	4.9	5.1	4.4	4.2
FIRING RATE	#/day	1.98 M	1.98 M	1846915	1847614
LIQUOR SOLIDS	%	69.7,66.9	69.7,67.6	61.7,67.3	61.5,67.4
CHLORIDE(LIQ)	%	0.3	0.27	0.27	0.27
BTU (LIQUOR)	BTU/lb black liq solids	7,111	7,132	6,786	6,786

6. CL-SDTV

SECTION 6

SMELT DISSOLVING TANK VENT

(CL-SDTV)

SECTION 6
SMELT DISSOLVING TANK VENT
(SDTV)

The Smelt Dissolving Tank Vent was only tested for metals on 29 April 1992. Table 6.1 summarizes the results of the samples collected for analysis. Only trace amounts of antimony, copper, lead, and manganese were detected.

Section 6.1 tabulates the results for each compound analyzed. Section 6.2 includes the process operating data as recorded and provided by mill personnel.

TABLE 6.1 SUMMARY OF METALS EMISSIONS

Mill: CHAMPION-LUFKIN
Source Code: CL-SDTV
FIN: 81-2 EPN: 81-2

Source: Smelt Dissolving Tank Vent
Test Dates: 4/29/92
CIN: 351020

	RUN 1	RUN 2	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	157	157	157	
Volumetric Flow Rate, x 10^3 DSCFM	13.4	13.3	13.4	
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	71.1	71.1	71.1	
Metals Emission Rate, x10^{-4}lb/hr				
Antimony (Sb)	5.0	ND	3.1	2.5
Arsenic (As)	ND	ND	ND	2.5
Barium (Ba)	ND	ND	ND	2000
Beryllium (Be)	ND	ND	ND	2.5
Cadmium (Cd)	ND	ND	ND	2.5
Chromium (Cr)	ND	ND	ND	5.0
Copper (Cu)	8.0	3.5	5.8	2.5
Lead (Pb)	17.0	15.0	16.0	5.0
Manganese (Mn)	10.0	5.9	8.0	5.0
Mercury (Hg)	ND	ND	ND	2.5
Nickel (Ni)	ND	ND	ND	2.5
Phosphorus (P)	ND	ND	ND	5.0
Silver (Ag)	ND	ND	ND	2.5
Selenium (Se)	ND	ND	ND	2.5
Thallium (Tl)	ND	ND	ND	2.5

ND = Not Detected
DL = Detection Limit

SECTION 6.1 EMISSION TEST RESULTS - METALS

Mill: Champion-Lufkin
Source: Smelt Dissolving Tank Vent

Run 1
Sample volume (DSCF)--------- 35.48
Source Vol Flow (DSCFM)------ 13400

		FH+BH Amt (ug)	Conc (lb/DSCF)	Mass Rt. (lb/hr)	Detection Limit(ug)	Det Limit (lb/DSCF)	Det Limit (lb/hr)
Antimony	Sb	10	6.2E-10	5.0E-04	5	3.1E-10	2.5E-04
Arsenic	As	*	0.0E+00	0.0E+00	5	3.1E-10	2.5E-04
Barium	Ba	*	0.0E+00	0.0E+00	4000	2.5E-07	2.0E-01
Beryllium	Be	*	0.0E+00	0.0E+00	5	3.1E-10	2.5E-04
Cadmium	Cd	*	0.0E+00	0.0E+00	5	3.1E-10	2.5E-04
Chromium	Cr	*	0.0E+00	0.0E+00	10	6.2E-10	5.0E-04
Copper	Cu	16	9.9E-10	8.0E-04	5	3.1E-10	2.5E-04
Lead	Pb	34	2.1E-09	1.7E-03	10	6.2E-10	5.0E-04
Manganese	Mn	20	1.2E-09	1.0E-03	10	6.2E-10	5.0E-04
Mercury	Hg	*	0.0E+00	0.0E+00	5	3.1E-10	2.5E-04
Nickel	Ni	*	0.0E+00	0.0E+00	5	3.1E-10	2.5E-04
Phosphorus	P	*	0.0E+00	0.0E+00	100	6.2E-09	5.0E-03
Silver	Ag	*	0.0E+00	0.0E+00	5	3.1E-10	2.5E-04
Selenium	Se	*	0.0E+00	0.0E+00	5	3.1E-10	2.5E-04
Thallium	Tl	*	0.0E+00	0.0E+00	5	3.1E-10	2.5E-04

Run 2
Sample volume (DSCF)--------- 35.53
Source Vol Flow (DSCFM)------ 13300

		FH+BH Amt (ug)	Conc (lb/DSCF)	Mass Rt. (lb/hr)	Detection Limit(ug)	Det Limit (lb/DSCF)	Det Limit (lb/hr)
Antimony	Sb	*	0.0E+00	0.0E+00	5	3.1E-10	2.5E-04
Arsenic	As	*	0.0E+00	0.0E+00	5	3.1E-10	2.5E-04
Barium	Ba	*	0.0E+00	0.0E+00	4000	2.5E-07	2.0E-01
Beryllium	Be	*	0.0E+00	0.0E+00	5	3.1E-10	2.5E-04
Cadmium	Cd	*	0.0E+00	0.0E+00	5	3.1E-10	2.5E-04
Chromium	Cr	*	0.0E+00	0.0E+00	10	6.2E-10	5.0E-04
Copper	Cu	7	4.3E-10	3.5E-04	5	3.1E-10	2.5E-04
Lead	Pb	31	1.9E-09	1.5E-03	10	6.2E-10	5.0E-04
Manganese	Mn	12	7.4E-10	5.9E-04	10	6.2E-10	5.0E-04
Mercury	Hg	*	0.0E+00	0.0E+00	5	3.1E-10	2.5E-04
Nickel	Ni	*	0.0E+00	0.0E+00	5	3.1E-10	2.5E-04
Phosphorus	P	*	0.0E+00	0.0E+00	100	6.2E-09	5.0E-03
Silver	Ag	*	0.0E+00	0.0E+00	5	3.1E-10	2.5E-04
Selenium	Se	*	0.0E+00	0.0E+00	5	3.1E-10	2.5E-04
Thallium	Tl	*	0.0E+00	0.0E+00	5	3.1E-10	2.5E-04

BMF 9/7/92

M E T A L S   C A L C U L A T I O N S

Client: TPIEC
Location: Champion-Lufkin
WESTON Project No.: 6848-01-01-0127
Source: CL-SDTV

INPUT DATA

Run Number		1	2	3.	Mean
Date		4/29/92	4/29/92		---
Time Began		1451	1623		---
Time Ended		1529	1738		---
Sampling Time, min	(Theta)	72	72		72
Stack Diameter, in.	(Dia)	48	48	48	48
Barometric Pressure, in. Hg	(Pb)	29.92	29.92		29.92
Static Pressure, in. H2O	(Pg)	-0.25	-0.25		-0.25
Pitot Tube Coefficient	(Cp)	0.84	0.84		0.84
Meter Correction Factor	(Y)	1.010	1.010		1.010
Nozzle Diameter, in.	(Dn)	0.300	0.300		0.300
Meter Volume, ft^3	(Vm)	36.610	36.555		36.583
Meter Temperature, °F	(tm)	91	90		90
Meter Orifice Pressure, in. H2O	(Delta H)	0.800	0.810		0.805
Volume H2O Collected, mL	(Vlc)	270.2	254.8		262.5
CO2 Concentration, %	(CO2)	0.0	0.0		0.0
O2 Concentration, %	(O2)	20.8	20.8		20.8
Average Sq Rt Velo Head, (in. H2O)^½	((Delta P)^½)avg	0.4500	0.4400		0.4450
Stack Temperature, °F	(ts)	157	157		157
Total Metals Collected, ug		3.7	4.1		3.9
Moisture Fraction (at Saturation)	(Bws)	NA	NA	NA	

CALCULATED DATA

Stack Area, ft^2	(As)	12.31	12.31	12.31	12.31
Stack Pressure, in. Hg	(Ps)	29.90	29.90	0.00	19.93
Standard Meter Volume, ft^3	(Vmstd)	35.483	35.527	0.000	23.670
Standard Water Volume, ft^3	(Vwstd)	12.718	11.993	0.000	8.237
Moisture Fraction (Measured)	(Bws)	0.264	0.252	ERR	ERR
Moisture Fraction (lower sat/meas)	(Bws)	0.264	0.252	ERR	ERR
Mol. Wt. of Stack Gas, lb/lb-mole	(Ms)	26.0	26.1	ERR	ERR
Average Stack Gas Velocity, ft/sec	(Vs)	28.8	28.1	ERR	ERR
Stack Gas Flow @ Stack Cond, ft^3/min	(Qa)	2.13E+04	2.07E+04	ERR	ERR
Stack Gas Flow @ Std Cond, ft^3/min	(Qs)	1.34E+04	1.33E+04	ERR	ERR
Isokinetic Sampling Rate, %	(%I)	92	93	ERR	ERR
Metals Concentration, lb/ft^3		2.30E-10	2.54E-10	ERR	ERR

Blanks for the Multimetals Train. Three blanks were collected during the study. One was collected at Champion-Lufkin and two at Champion-Sheldon. These blanks were used to correct all samples.

		CL Blank Front(ug)	CS Blk 1 Front(ug)	CS Blk 2 Front(ug)	Front Blk(ug)
Antimony	Sb	0.7	0.5 *	0.5 *	0 *
Arsenic	As	3.9	0.8	0.8	1
Barium	Ba	2476	2 *	3742	2073
Beryllium	Be	0.2	0.2 *	0.3	0 *
Cadmium	Cd	0.5	0.4 *	1.4	0 *
Chromium	Cr	9.4	1.2 *	9.3	6.4
Copper	Cu	1.6	1.5 *	1.5 *	0 *
Lead	Pb	10.8	0.3	5.2	5.4
Manganese	Mn	4.4	1 *	4.5	3.1
Mercury	Hg	0.4 *	0.4 *	0.4 *	0 *
Nickel	Ni	2 *	2 *	2 *	0 *
Phosphorus	P	22.6	50 *	53.4	34.7
Silver	Ag	8.3	0.7 *	0.7 *	0 *
Selenium	Se	0.5	0.4 *	0.4 *	0 *
Thallium	Tl	1	0.5	0.7	0 *

The * beside a value means that the analytical value was less than the detection limit for the analysis. The front and the back blank (right column) was developed from the average for most metals. The 8.3 ug from the CL blank was not used because it was unexplainably high.

		CL Blank Back(ug)	CS Blk 1 Back(ug)	CS Blk 2 Back(ug)	Back Blk(ug)
Antimony	Sb	1 *	1 *	0.7 *	0 *
Arsenic	As	1 *	0.5	0.3 *	0 *
Barium	Ba	3.8 *	0.4 *	2.6 *	0 *
Beryllium	Be	0.4 *	0.4 *	0.3 *	0 *
Cadmium	Cd	0.8	1.4	1	1
Chromium	Cr	2.3 *	2.4 *	1.6 *	0 *
Copper	Cu	2.9 *	3 *	2 *	0 *
Lead	Pb	1.5	0.4 *	0.6	0.8
Manganese	Mn	1.9 *	2 *	1.3 *	0 *
Mercury	Hg	0.8 *	0.8 *	1.1	0 *
Nickel	Ni	3.8 *	4 *	2.6 *	0 *
Phosphorus	P	188	100 *	26 *	100 *
Silver	Ag	1.3 *	1.4 *	0.9 *	0 *
Selenium	Se	1 *	0.8 *	0.5 *	0 *
Thallium	Tl	1.9 *	0.4 *	0.3 *	0 *

BAF 9/7/92

TRIANGLE LABORATORIES of RTP, INC.

PO BOX 13485
RTP, NC 27709

Project: 20793
Weston

Date in: 05-May-92
Date out: 04-Jun-92

CASE NARRATIVE

Overview

This project involves the analysis of 7 Multi-Metals Trains, of which one is a Blank Train, for Ag, As, Ba, Be, Cd, Cr, Cu, Hg, Mn, Na, Ni, P, Pb, Sb, Se, and Tl. The Multi-Metal analysis was conducted according to the protocol described in sections 5-7 of the EPA Draft Document *"Methodology for the Determination of Metals Emissions in Exhaust Gases from Hazardous Waste Incineration and Similar Combustion Processes."* In addition to the Multi-Metal Trains one liquid (DI H2O) sample was submitted to be analyzed with the Blank MMTL Train, but did not require any digestion.

Preparation

Samples were prepared by microwave and hotplate digestion, as required by the contract. A detailed flow chart of the procedure is included in the report showing the volumes received and used for all analyses.

Analysis

Ba, Be, Cd, Cr, Cu, Mn, Ni, P, and Ag were determined by Inductively Coupled Plasma (ICP) Emission Spectroscopy. Sb was determined by Graphite Furnace Atomic Absorption (GFAA). As, Se, Pb and Tl were analyzed by Methods of Addition(MSA) on the GFAA. Na was determined by Flame Atomic Absorption(FLAA). Hg was determined by Cold Vapor AA.

Results

The Sb post digestion spikes for the FH and BH samples on the GFAA were the only %recoveries that were within control limits. As, Pb, Se, and Tl were reanalyzed by Method of Standard Addition on the GFAA per method requirements due to the fact that the post digestion spikes for these analytes were not within control limits. Only Pb was detected in the PBW, but the amount detected is not significant in comparison to the amount of Pb detected in the samples. The Pb Train Blank results may be biased slightly high due to the Pb detected in the PBW.

The FH As and Ba results can be mostly attibuted to the amounts detected in the Train Blank. It is possible that the Ba results in the FH samples and Train Blank may be due to the amount of Ba indigenous to the glass fiber filters.

The %RPD for the duplicates were within control limits for all samples in which Hg was detected, except LK/2 FH and RF/2 E. In these cases, as well as when Hg was detected in the sample and not in the duplicate or in the duplicate and not in the sample, the %RPD is not considered to be a signifcant QC parameter, because the

concentration is less than four times the detection limit.

Hg was detected in the blank for the FH/BH Hg analysis and may bias the Hg detected in the FH/BH samples slightly high.

TRIANGLE LABORATORIES of RTP, INC.
TLI PROJECT #20793

CLIENT SAMPLE IDENTIFICATION:

MMTL TRAIN #1
1.CL-SDTV/1METL/0429/1 FH
2.CL-SDTV/1METL/0429/1 BH
3.CL-SDTV/1METL/0429/1 D
4.CL-SDTV/1METL/0429/1 E
5.CL-SDTV/1METL/0429/1 F

MMTL TRAIN #2
1.CL-SDTV/1METL/0429/2 FH
2.CL-SDTV/1METL/0429/2 BH
3.CL-SDTV/1METL/0429/2 D
4.CL-SDTV/1METL/0429/2 E
5.CL-SDTV/1METL/0429/2 F

MMTL TRAIN #3
1.CL-LK/1METL/0503/1 FH
2.CL-LK/1METL/0503/1 BH
3.CL-LK/1METL/0503/1 D
4.CL-LK/1METL/0503/1 E
5.CL-LK/1METL/0503/1 F

MMTL TRAIN #4
1.CL-LK/1METL/0503/2 FH
2.CL-LK/1METL/0503/2 BH
3.CL-LK/1METL/0503/2 D
4.CL-LK/1METL/0503/2 E
5.CL-LK/1METL/0503/2 F

MMTL TRAIN #5
1.CL-RF/1METL/0430/1 FH
2.CL-RF/1METL/0430/1 BH
3.CL-RF/1METL/0430/1 D
4.CL-RF/1METL/0430/1 E
5.CL-RF/1METL/0430/1 F

MMTL TRAIN #6
1.CL-RF/1METL/0430/2 FH
2.CL-RF/1METL/0430/2 BH
3.CL-RF/1METL/0430/2 D
4.CL-RF/1METL/0430/2 E
5.CL-RF/1METL/0430/2 F

BLANK TRAIN
1.CL-BLANK FH
2.CL-BLANK BH
3.CL-BLANK DI H2O
4.CL-BLANK E

TRIANGLE LABORATORIES of RTP, INC.

INORGANICS ANALYSIS REPORT

TLI PROJECT #: 20793
CLIENT: WESTON
DATE RECIEVED: 05/05/92
DATE REPORTED: 06/04/92

RESULTS REPORTED IN TOTAL ug
**=MSA

CLIENT SAMPLE ID	Ag	As**	Ba	Be	Cd	Cr	Cu	Mn
SDTV/1 FH	< .700	3.79	2231	< .200	1.20	8.34	5.89	11.1
SDTV/1 BH	< .906	1.07	3.88	< .259	< .518	< 1.55	9.61	11.5
SDTV/2 FH	< .700	3.37	2759	< .200	.737	6.18	6.89	13.3
SDTV/2 BH	< .863	1.04	3.78	< .247	< .493	< 1.48	< 1.85	2.20
LK/1 FH	4.00	2.63	2071	< .200	1.03	15.2	3.19	32.5
LK/1 BH	< .875	1.93	3.32	< .250	< .500	< 1.50	9.74	1.36
LK/2 FH	.768	4.14	2809	< .200	1.16	9.46	3.56	45.9
LK/2 BH	< .875	3.16	< 2.50	< .250	< .500	< 1.50	< 1.88	7.46
RF/1 FH	< .700	4.49	3273	.234	.440	12.0	2.43	6.91
RF/1 BH	< .863	.690	< 2.47	< .247	2.38	2.30	53.7	2.65
RF/2 FH	< .700	4.86	2629	< .200	.553	7.36	< 1.50	7.36
RF/2 BH	< .863	.740	2.96	< .247	1.28	3.25	3.34	7.25
BLANK FH	8.34	3.86	2476	.206	.480	9.42	1.59	4.43
BLANK BH	< 1.34	< .955	< 3.82	< .382	.795	< 2.29	< 2.86	< 1.91
BLANK DI H2O	< 3.22	< 1.15	< 9.20	< .920	< 1.84	< 5.52	< 6.90	< 4.60
PBW ug/L	<7.00	<5.00	<20.0	<2.00	<4.00	<12.0	<15.0	<10.0

CLIENT SAMPLE ID	Na	Ni	P	Pb**	Sb	Se**	Tl**
SDTV/1 FH	46,100	2.04	74.8	36.9	9.85	< .500	< 1.00
SDTV/1 BH	435	< 2.59	140	3.12	< .647	< .647	< 1.29
SDTV/2 FH	74,700	< 2.00	28.7	34.3	.920	< .500	2.29
SDTV/2 BH	226	< 2.47	130	2.55	< .616	< .616	< 1.23
LK/1 FH	54,800	9.61	43.6	1270	1.62	< .500	< 1.00
LK/1 BH	245	< 2.50	129	5.05	< .625	< .625	< 1.25
LK/2 FH	61,100	5.10	38.9	1712	1.21	< .500	2.79
LK/2 BH	303	< 2.50	141	2.23	< .625	< .625	< 1.25
RF/1 FH	55,800	< 2.00	30.5	38.2	.660	< .500	< 1.00
RF/1 BH	293	< 2.47	159	2.50	< .616	< .616	< 1.23
RF/2 FH	48,800	< 2.00	31.4	11.2	.890	< .500	< 1.00
RF/2 BH	356	< 2.47	124	1.82	< .616	< .616	< 1.23
BLANK FH	37,600	< 2.00	22.6	10.8	.720	< .500	< 1.00
BLANK BH	304	< 3.82	188	1.53	< .955	< .955	< 1.91
BLANK DI H2O	168	< 9.20	127	1.50	< 1.15	< 1.15	< 2.30
PBW ug/L	<500	<20.0	<200	2.8	<5.00	<5.00	<10.0

TRIANGLE LABORATORIES of RTP, INC.

INORGANICS ANALYSIS REPORT

Hg RESULTS

	SDTV/1 FH	SDTV/1 BH	SDTV/1 D	SDTV/1 E	SDTV/1 F
AVG TOTAL ug	1.37	<1.76	<.480	<1.56	<.920
%RPD	4.38%	N/A	N/A	N/A	N/A

	SDTV/2 FH	SDTV/2 BH	SDTV/2 D	SDTV/2 E	SDTV/2 F
AVG TOTAL ug	1.13	<2.12	<.400	<1.48	.943
%RPD	8.85%	N/A	N/A	N/A	4.88%

	LK/1 FH	LK/1 BH	LK/1 D	LK/1 E	LK/1 F
AVG TOTAL ug	1.01	<2.00	<.336	<1.49	<.920
%RPD	1.98%	N/A	N/A	N/A	N/A

	LK/2 FH	LK/2 BH	LK/2 D	LK/2 E	LK/2 F
AVG TOTAL ug	1.12	<2.00	<.320	<1.48	<.920
%RPD	53.57%	N/A	N/A	N/A	N/A

	RF/1 FH	RF/1 BH	RF/1 D	RF/1 E	RF/1 F
AVG TOTAL ug	.980	4.51	<.360	6.70	<.920
%RPD	8.16%	7.06%	N/A	20.69%	N/A

	RF/2 FH	RF/2 BH	RF/2 D	RF/2 E	RF/2 F
AVG TOTAL ug	.400	<2.12	<.380	4.22	<.920
%RPD	N/A	N/A	N/A	34.23%	N/A

	BLANK FH	BLANK BH	BLANK DI H2O	BLANK E
AVG TOTAL ug	<.400	<.840	<.440	<.920
%RPD	N/A	N/A	N/A	N/A

Hg QC SUMMARY

	%REC
SDTV/1 FH(S)	107%
SDTV/1 FH(SD)	108%

	ug/L
FH/BH PBW	.230
IMPINGER PBW	<.200
5-4 RECHECK PBW	

Sb GFAA POST DIGESTION SPK SUMMARY

	%REC
RF/1 FH(S)	84.6%
RF/1 BH(S)	87.2%

DESCRIPTION OF ABBREVIATIONS

ICV=Initial Calibration Verification
ICB=Initial Calibration Blank
CCV=Continuing Calibration Verification
CCB=Continuing Calibration Blank
PBW=Preparation Blank Water
PBS=Preparation Blank Soil
LCS=Laboratory Control Sample
ICSA=Interference Check Sample(Solution A) I=Initial F=Final
ICSAB=Interference Check Sample(Solution AB) I=Initial F=Final
Solution A contains common interferents, while Solution AB contains the interferents plus the analyte in question.
CRDL=Contract Required Detection Limit (for CLP)
IDL=Instrument Detection Limit
CRI=CRDL Standard for ICP I=Initial F=Final
CRA=CRDL Standard for AA I=Initial F=Final
%RPD=Relative Percent Difference
%REC=% Recovery
SPK=Spike
AMT=Amount
BLK=Blank
MSA=Method of Standard Additions

CALCULATIONS

MMTL TRAINS(ICP & GFAA):

$$\text{TOTAL ug} = \frac{[\text{ug/L}] * (\text{mL TV/mL USED}) * (\text{mL FV} * \text{DF})}{1000}$$

MMTL TRAINS(FLAA):

$$\text{TOTAL ug} = \underline{[\text{ug/L}] * (\text{mL TV/mL USED}) * (\text{mL FV} * \text{DF})}$$

FV=FINAL VOLUME DF=DILUTION FACTOR
WT=WEIGHT TV=TOTAL VOLUME
BV=BEGINNING VOLUME

Hg

MMTL Trains:

$$\text{TOTAL ug} = \underline{[\text{ug/L}] * (\text{ml FV/ml aliquot}) * .1\text{L} * (\text{DF})}$$

MMTL Impingers:

$$\text{TOTAL ug} = \underline{[\text{ug/L}] * (\text{ml TV/ml aliquot}) * .1\text{L} * (\text{DF})}$$

$$\%\text{RPD} = \frac{|\text{SR} - \text{DR}|}{(\text{SR} + \text{DR})/2} * 100$$

$$\%\text{REC} = \frac{\text{SSR} - \text{SR}}{\text{SA}} * 100$$

SR=SAMPLE RESULT DR=DUPLICATE RESULT
SSR=SPIKE SAMPLE RESULT SA=SPIKE ADDED

Metals Data

Mill Champion - Lufkin   Run no 2   Sample Volume (DSCF) 35.53

Source SDTV   Run Date 4/29/92   Source Vol Flow (DSCFM) 13,300

		MEAS FH (ug)	FH Blk Corr (ug)	FH Corr Amt (ug)	meas BH (ug)	BH Blk corr (ug)	BH Corr Amt (ug)	FH + BH Amt (ug)	Detection Limit (ug)
Antimony	Sb	0.9	0	0.9	<0.6	0	<0.6	1	5
Arsenic	As	3.4	1.0	2.4	1.0	0	1.0	3	5
Barium	Ba	2759	2073	686	3.8	0	4	690	4000
Beryllium	Be	<0.2	0	<0.2	<0.2	0	<0.2	<1	5
Cadmium	Cd	0.7	1.4	<1.4	<0.5	1.0	<1.0	<1	5
Chromium	Cr	6.8	6.4	0.4	<1.5	0	<1.5	<1	10
	+6								
Copper	Cu	6.9	0	6.9	<1.8	0	<1.8	7	5
Lead	Pb	34.3	5.4	28.9	2.6	0.8	1.8	31	10
Manganese	Mn	13.3	3.1	10.2	2.2	0	2.2	12.[illegible]	10
Mercury	Hg	1.1	0	1.1	<2	0	<2	1	5
Nickel	Ni	<2.0	0	<2.0	<2.5	0	<2.5	<2	5
Phosphorus	P	28.7	34.7	<34.7	130	100	30	40	100
Silver	Ag	<0.7	0	<0.7	<0.9	0	<0.9	<1	5
Selenium	Se	<0.5	0	<0.5	<0.6	0	<0.6	<1	5
Thallium	Tl	2.2	0	2.2	<1.2	0	<1.2	2	5

Blank is a mean of 3 blanks for project
see notes by Bruce dated 9/?/92.

Metals Data

Mill Champion Lufkin Run no 1 Sample Volume (DSCF) 35.98

Source SDTV Run Date 9/29/92 Source Vol Flow (DSCFM) 13,900

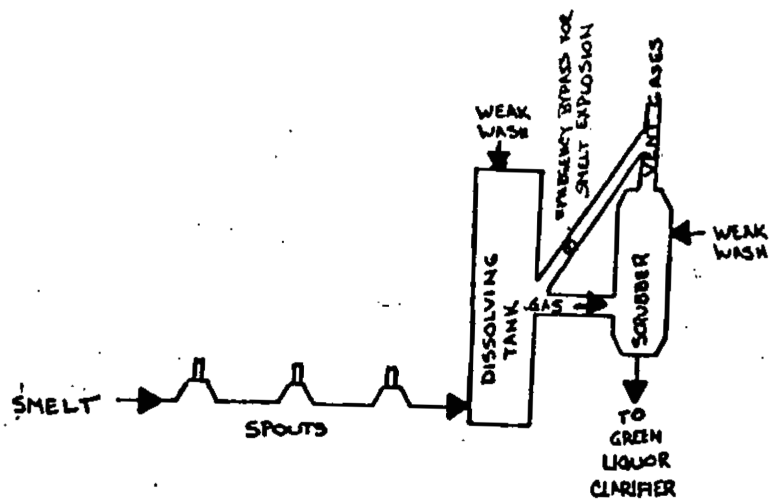
		MEAS FH (µg)	FH Blk Corr (µg)	FH Corr Amt (µg)	Meas BH (µg)	BH Blk Corr (µg)	BH Corr Amt (µg)	FH + BH Amt (µg)	Detection Limit (µg)
Antimony	Sb	9.8	0	9.8	<0.6	0	<0.6	10	5
Arsenic	As	3.8	1.0	2.8	1.1	0	1.1	4	5
Barium	Ba	2231	2073	158	3.9	0	4	162	4000
Beryllium	Be	<0.2	0	<0.2	<0.3	0	<0.3	<1	5
Cadmium	Cd	1.2	1.4	<1.4	<0.5	1.0	<1.0	<2	5
Chromium	Cr	8.3	6.4	1.9	<1.6	0	<0.6	2	10
	+6								
Copper	Cu	5.9	0	5.9	9.6	0	9.6	16	5
Lead	Pb	36.9	5.4	31.5	3.1	0.8	2.3	34	10
Manganese	Mn	11.1	3.1	8.0	11.5	0	11.5	20	10
Mercury	Hg	1.4	0	1.4	<2	0	<2	1	5
Nickel	Ni	2.0	0	2.0	<2.6	0	<2.6	2	5
Phosphorus	P	74.8	34.7	43.7	140	100	40	83	100
Silver	Ag	<0.7	0	<0.7	<0.9	0	<0.9	<1	5
Selenium	Se	<0.5	0	<0.5	<0.6	0	<0.6	<1	5
Thallium	Tl	<1.0	0		<1.2	0		<1	5

Blank is a mean of 3 blanks for project
See notes by Bruce dated 9/3/92

SECTION 6.2 PROCESS DESCRIPTION AND OPERATING CONDITIONS

SMELT DISSOLVING TANK

The smelt from the burned liquor flows through 3 spouts into the dissolving tank where weak wash is added to form green liquor. The green liquor is sent on to the green liquor clarifier to begin the causticizing process. The gases are scrubbed in a venturri scrubber using weak wash and then emitted through a stack.



SMELT DISSOLVING TANK

MANUFACTURER: FLAKT
TYPE SCRUBBER: VENTURRI
SOURCE OF SCRUBBING LIQUID:WEAK WASH FROM DREGS WASHER & MUD WASHER

PARAMETER	UNITS	RUN 1	RUN 2	RUN 3	RUN 4
DATE		4/29	4/29	4/29	4/29
START TIME		1000	1127	1446	1625
STOP TIME		1100	1230	1555	1730
BLS FIRING RT	GPM	187	180	155	156
BLS FIRING RT	LBS/D	1936880	1946858	1707105	1705705
BL SOLIDS	%	66.6	66.9	68.4,67.3	68.8,67.5
PRESSURE DROP	inches water	-0.8607	-0.8404	-0.8779	-0.8764
SCRUB LIQUOR FLOW RATE	GPM	200	200	200	200

RUN 1 & 2: PARTICULATE TEST
RUN 3 & 4: METALS TEST

SECTION 7

COMBINED EVAPORATOR AND STRIPPER NCG VENT

(CL-NCGESV)

7. CL-NCGESV

SECTION 7
COMBINED EVAPORATOR AND STRIPPER NCG VENT
(CL-NCGESV)

The Evaporator NCG Scrubber Vent was tested at both inlet and outlet areas simultaneously for VOC using Method 16 and Method 18 procedures modified for the wet source. Sampling was also conducted at the Stripper NCG Vent. Three bag samples were collected from each sampling location on 12/14/92. The Stripper NCG Vent had to be resampled on 12/15/92 because the condensate from Run 3 was lost to vacuum.

The six-inch diameter duct was sampled during normal operation. The Evaporator NCG Scrubber Outlet and Stripper NCG Vents were saturated at 85°F and 126°F, respectively. The flow was extremely low. The velocity was measured with a hot wire anemometer.

The sample was collected by condensing the moisture in an ice bath and collecting the remaining non-condensible gas in a Tedlar bag. The condensate was extracted with hexane. The condensate and condensate extract from the gas in the Tedlar bag were analyzed by M18 using gas chromatography. The gas was also analyzed for reduced sulfur compounds using the M16 GC. Tables 7.1, 7.2 and 7.3 summarize the results in lb/hr.

The volumetric flow rate was used to calculate the mass emission rate for each compound. The daily mass emission rate can be estimated from the number of blows each day and the duration of each.

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TABLE 7.1
SUMMARY OF VOC RESULTS

Mill: CHAMPION-LUFKIN
Source Code: CL-NCGESV
FIN: 79-10 EPN: B10

Source: Evap. NCG Scrubber Vent Outlet
Test Dates: 12/14/92
CIN: -

	MIN	MAX	MEAN
Volumetric Flow Data			
Stack Temperature, °F			85
Volumetric Flow Rate, x 10^3 DSCFM			0.4
Process Operating Conditions			
Production Rate, ________			

	MASS RATE (lb/hr)			
	RUN 1	RUN 2	RUN 3	MEAN
Method 16 Data				
Hydrogen Sulfide	<0.2	0.4	0.5	0.3
Methyl Mercaptan	4.5	7.9	18.6	10.3
Dimethyl Sulfide	30	100	47	59
Method 18 Data				
Methanol	2.8	6.8	10.5	6.7
Acetone	0.6	0.8	1.1	0.8
2-Propanol	0.3	0.4	0.1	0.3
2-Butanone	0.08	0.1	0.2	0.1
Toluene	<0.01	<0.01	<0.01	0.01
Cumene	0.02	0.02	0.02	0.02
alpha-Pinene	3.3	3.3	3.6	3.4
beta-Pinene	2.0	1.9	2.2	2.0
3-Carene	0.03	0.03	0.03	0.03
p-Cymene	0.2	0.2	0.2	0.2

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TABLE 7.2
SUMMARY OF VOC RESULTS

Mill: CHAMPION-LUFKIN
Source Code: CL-NCGESV
FIN: 79-10 EPN: B10

Source: Evap. NCG Scrubber Vent Inlet
Test Dates: 12/14/92
CIN: -

	MIN	MAX	MEAN
Volumetric Flow Data			
Stack Temperature, °F			85
Volumetric Flow Rate, x 10^3 DSCFM			0.4
Process Operating Conditions			
Production Rate, ________			

	MASS RATE (lb/hr)			
	RUN 1	RUN 2	RUN 3	MEAN
Method 16 Data				
Hydrogen Sulfide	614	467	793	625
Methyl Mercaptan	712	576	712	667
Dimethyl Sulfide	98	94	<28	69
Method 18 Data				
Methanol	16	16	22	18
Ethanol	<0.01	<0.01	<0.01	0.01
Acetone	0.9	1.1	0.3	0.8
2-Propanol	0.4	0.3	0.03	0.2
2-Butanone	0.08	0.1	0.05	0.08
Toluene	<0.01	<0.01	<0.01	0.01
Cumene	0.03	0.01	0.01	0.02
alpha-Pinene	3.9	1.9	1.7	2.5
beta-Pinene	2.5	1.1	1.2	1.6
3-Carene	0.04	0.02	0.02	0.03
p-Cymene	0.3	0.1	0.2	0.2

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TABLE 7.3
SUMMARY OF VOC RESULTS

Mill: CHAMPION-LUFKIN
Source Code: CL-NCGESV
FIN: 79-10 EPN: B10

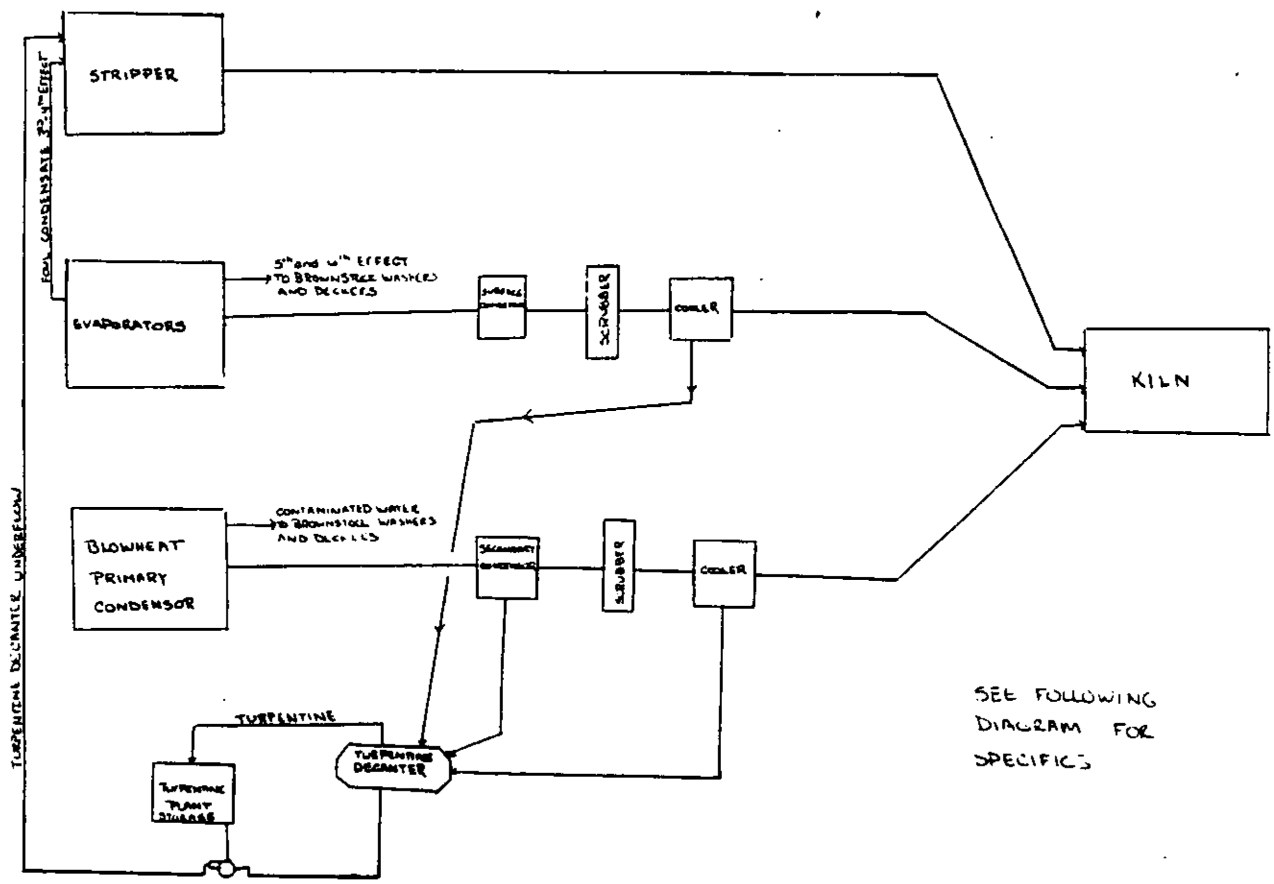
Source: Stripper NCG Vent
Test Dates: 12/14/92 12/15/92
CIN: -

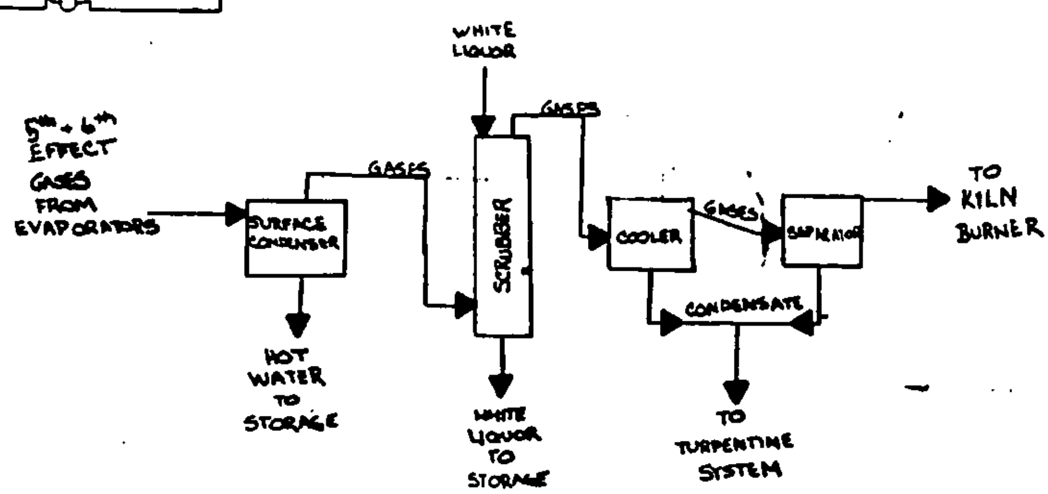
	MIN	MAX	MEAN
Volumetric Flow Data			
Stack Temperature, °F			126
Volumetric Flow Rate, x 10^3 DSCFM			0.1
Process Operating Conditions			
Production Rate, ________			

	MASS RATE (lb/hr)			
	RUN 1	RUN 2	RUN 3	MEAN
Method 16 Data				
Hydrogen Sulfide	4.3	5.8	5.1	5.1
Methyl Mercaptan	21.2	25.3	21.3	22.6
Dimethyl Sulfide	14.5	14.7	10.4	13.2
Method 18 Data				
Methanol	176	174	55	135
Ethanol	0.02	0.01	0.01	0.01
Acetone	10.9	2.9	0.4	4.7
2-Propanol	0.07	0.09	0.10	0.09
Bromodichloromethane	<0.01	<0.01	<0.01	0.01
Ethyl benzene	<0.01	<0.01	<0.01	0.01
o-Xylene	<0.01	<0.01	<0.01	0.01
Cumene	<0.01	<0.01	<0.01	0.01
alpha-Pinene	0.4	0.3	0.5	0.4
beta-Pinene	0.4	0.4	0.5	0.4
3-Carene	<0.01	0.01	0.02	0.01
p-Cymene	0.1	0.1	0.2	0.1

EVAPORATOR GASES

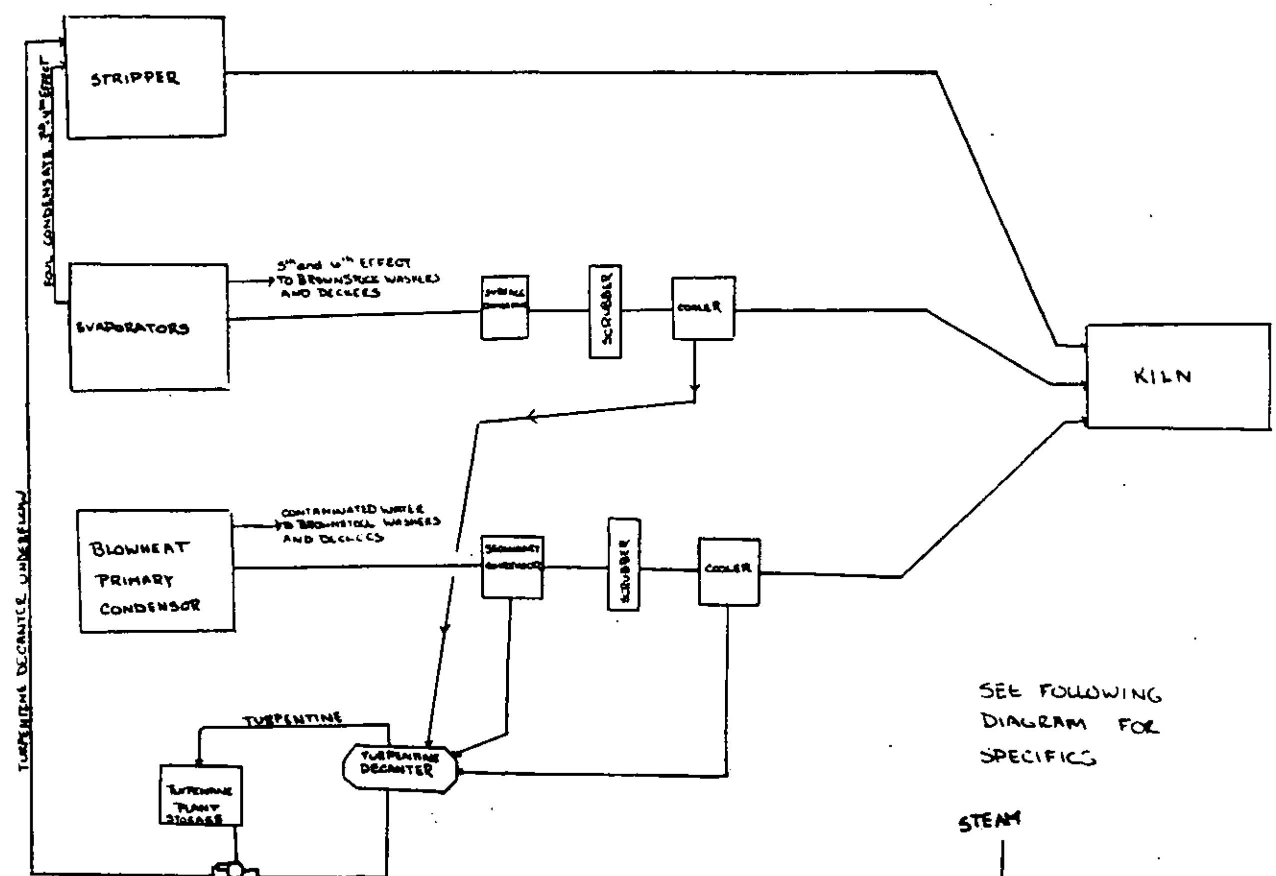
The gases from the evaporators enter the surface condenser for cooling. The gases are then scrubbed using a packed column with white liquor as the medium. They proceed to the gas cooler and entrainment separator for condensate removal, then to the kiln where they are injected in the burner. The gases are vented after the entrainment center during maintenance or when problems occur. The vent is a pipe located above the hot end of the lime kiln.



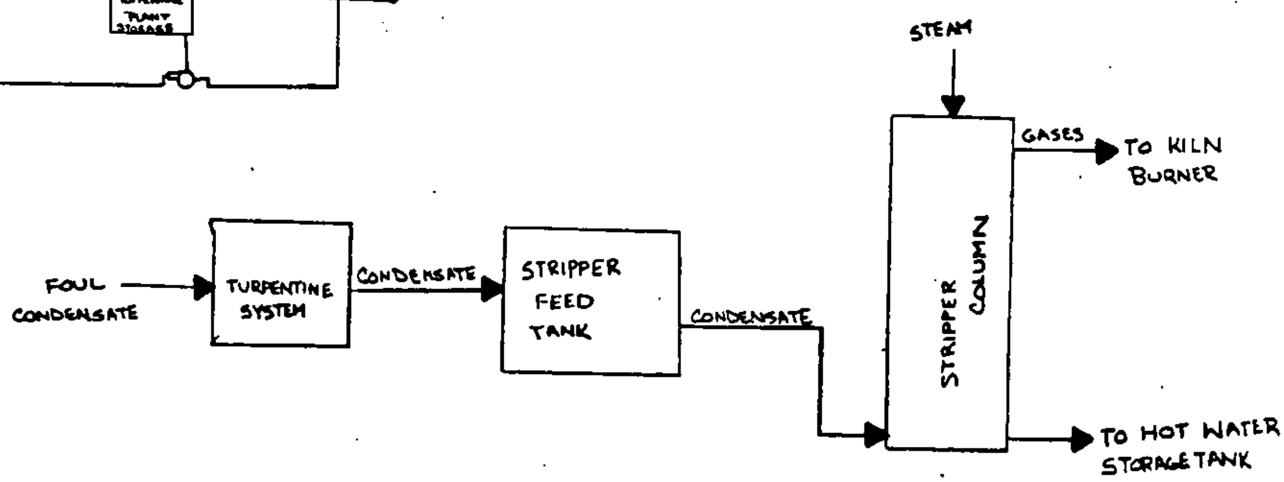


STRIPPER GASES

Foul condensate from the blowheat system, seal pot of the NCG scrubbers, and entrainment centers enters the turpentine system. The condensate enters the stripper feed tank and continues onto the steam stripper column. The gases from the stripper proceed to the kiln and are injected in the center of the burner. The gases are vented after the entrainment center during maintenance or when problems occur. The vent is a pipe located above the hot end of the lime kiln.



SEE FOLLOWING DIAGRAM FOR SPECIFICS



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SECTION 8

BLOW HEAT RECOVERY NCG VENT

(CL-NCGBHR)

8. CL-NCGBHR

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SECTION 8
BLOW HEAT RECOVERY SCRUBBER VENT
(CL-NCGBHR)

The Blow Heat Recovery Scrubber Vent was tested at both inlet and outlet areas simultaneously for VOC using Method 16 and Method 18 procedures modified for the wet source. Three bag samples were collected at both the inlet and outlet on 12/14/92. A fourth run was conducted on 12/15/92 to replace Run 1 from the previous day.

The sample was collected by condensing the moisture in an ice bath and collecting the remaining non-condensible gas in a Tedlar bag. The condensate was extracted with hexane. The condensate and condensate extract from the gas in the Tedlar bag was analyzed by M18 using gas chromatography. The gas was also analyzed for reduced sulfur compounds using the M16 GC. Tables 8.1 and 8.2 summarize the results in lb/hr.

Since it was not possible to obtain the volumetric flow rate, the measured concentration of each compound was calculated based on the average of the blows per day as determined by mill personnel. The daily mass emission rate can be estimated from the number of blows each day and the duration of each.

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TABLE 8.1
SUMMARY OF VOC RESULTS

Mill: CHAMPION-LUFKIN

Source: Blow Heat Recovery Scrubber Outlet Vent

Source Code: CL-NCGBHR
FIN: 79-10 EPN: B10

Test Dates: 12/14/92 12/15/92
CIN: -

	MIN	MAX	MEAN
Volumetric Flow Data			
Stack Temperature, °F			
Volumetric Flow Rate, ASCFM			20
Process Operating Conditions			
Production Rate, ________			

MASS RATE (lb/hr)				
Method 16 Data	Run 2	Run 3	Run 4	Mean
Dimethyl Sulfide	21.04	4.52	1.75	9.10
Method 18 Data				
Methanol	0.003	0.004	0.112	0.040
Acetone	0.022	0.005	0.012	0.013
2-Propanol	0.105	0.015	0.007	0.042
2-Butanone	0.002	<0.001	<0.001	0.001
Toluene	<0.001	<0.001	ND	0.001
Cumene	0.002	0.001	0.001	0.001
alpha-Pinene	0.21	0.17	0.13	0.17
beta-Pinene	0.07	0.07	0.07	0.07
3-Carene	0.002	0.001	0.001	0.001
p-Cymene	0.013	0.006	0.008	0.009

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TABLE 8.2
SUMMARY OF VOC RESULTS

Mill: CHAMPION-LUFKIN

Source: Blow Heat Recovery Scrubber Inlet Vent

Source Code: CL-NCGBHR

Test Dates: 12/14/92 12/15/92

FIN: 79-10 EPN: B10

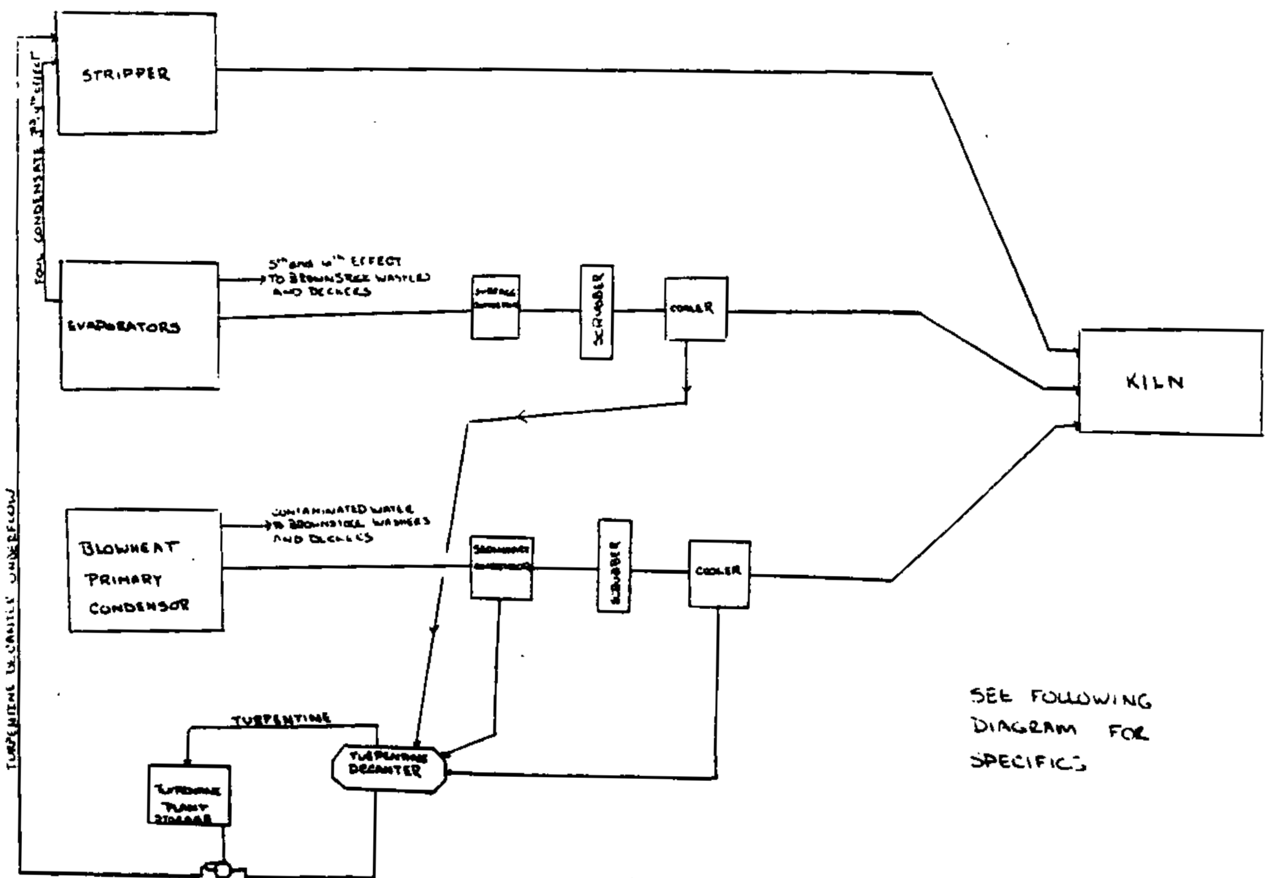
CIN: -

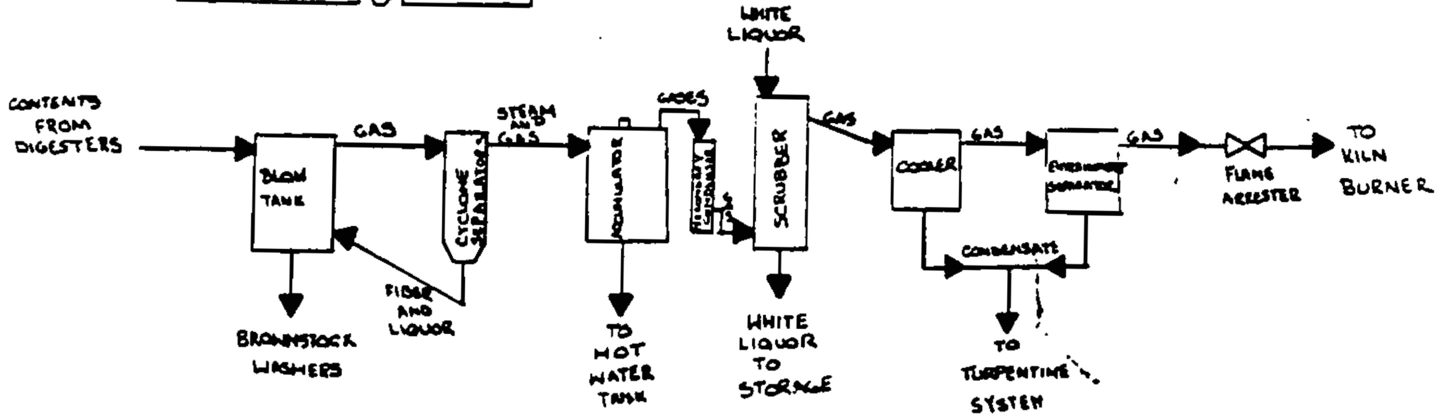
		MIN	MAX	MEAN
Volumetric Flow Data				
Stack Temperature, °F				
Volumetric Flow Rate, ASCFM				20
Process Operating Conditions				
Production Rate, ________				

	MASS RATE (lb/hr)			
Method 16 Data	Run 2	Run 3	Run 4	Mean
Hydrogen Sulfide	0.07	<0.05	<0.05	0.04
Methyl Mercaptan	10.04	1.32	0.31	3.89
Dimethyl Sulfide	9.50	4.71	3.20	5.80
Method 18 Data				
Methanol	0.19	0.09	0.02	0.10
Acetone	0.014	0.009	0.013	0.012
2-Propanol	0.08	0.02	0.01	0.04
2-Butanone	0.003	<0.001	0.009	0.004
Toluene	<0.001	<0.001	ND	0.001
Cumene	0.001	0.001	<0.001	0.001
alpha-Pinene	0.15	0.19	0.08	0.14
beta-Pinene	0.07	0.08	0.04	0.06
3-Carene	<0.001	<0.001	<0.001	0.001
p-Cymene	0.006	0.004	0.005	0.005

BLOWHEAT GASES

Steam is used to empty the digester with the contents entering the blowtank. The gases from the blowtank proceed to the cyclone separators and onto the accumulator. The gases enter the secondary condenser, and then become scrubbed using a packed column with white liquor as the medium. They proceed to the gas cooler and entrainment separator for condensate removal, through the flame arrestor, and then to the kiln where they are injected in the burner. The gases are vented after the entrainment center during maintenance or when problems occur. The vent is a pipe located above the hot end of the lime kiln.





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SECTION 9
CHLORINE TOWER VENT (A SIDE)
(CL-BPCLTV)

9. CL-BPCLTV

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SECTION 9
CHLORINE TOWER VENT (A SIDE)
(CL-BPCLTV)

The Chlorine Tower Vent was sampled on two different days for volatile organic compounds, chloroform, and hydrogen chloride. The adsorption tube sampling for chloroform was provided for comparison to the GC result.

Total Hydrocarbons (M25A)

Figures 9.1 and 9.2 present the THC trends for the test periods on 25 and 27 April 1992. The total hydrocarbon concentration varied between 50 and 60 ppm on the first day of sampling and between 40 and 45 ppm on the second day.

Volatile Organic Compounds (M18)

Table 9.1 summarizes the results for the Method 18 target compounds, and Section 9.1 is a tabulation of the data. TRS was not analyzed. The volumetric flow was measured with a standard pitot tube in the 16-inch diameter stack.

Methanol was the major VOC compound identified in the vent. Trace amounts of ethanol, acetone, chloroform, and terpenes were identified throughout the sampling period. Recurring unknown compounds were identified which eluted approximately 0.2 minutes before methanol, approximately five minutes before chloroform, and approximately five minutes before alpha-pinene. The concentration of each (as carbon) was one ppm or less.

Miscellaneous Parameters

Table 9.2 summarizes the results of testing for hydrogen chloride and chloroform. Section 9.2 tabulates the results for each compound.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 9.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 9.4 includes the process operating data as recorded and provided by mill personnel. The Chlorine Tower Vent represented the emissions from the A side bleaching only.

FIGURE 9.1
THC TREND ANALYSIS (4/25/92)

CHLORINE TOWER VENT (CL-BPCLTV)

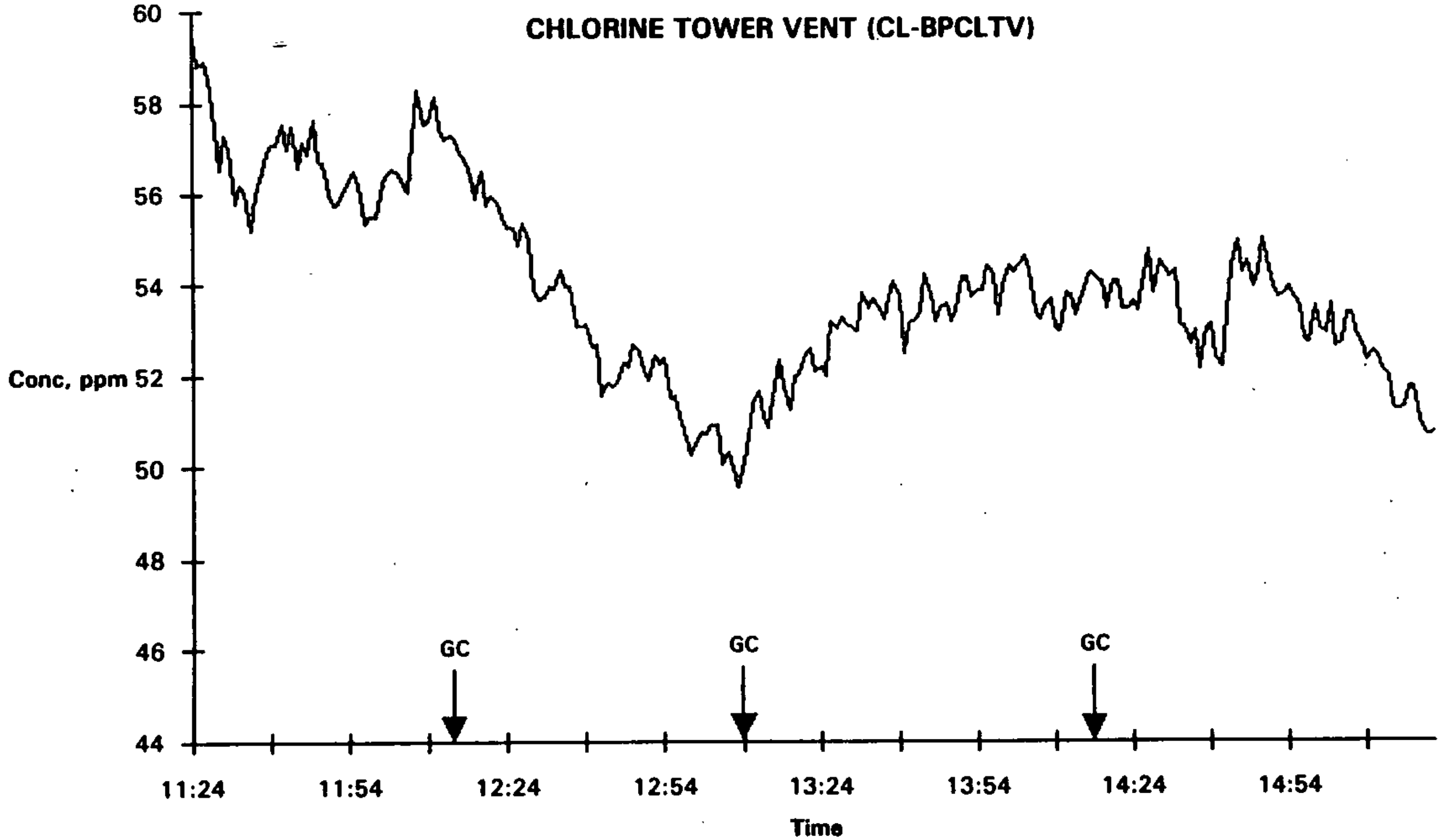

FIGURE 9.2
THC TREND ANALYSIS (4/27/92)
CHLORINE TOWER VENT(CL-BPCLTV)

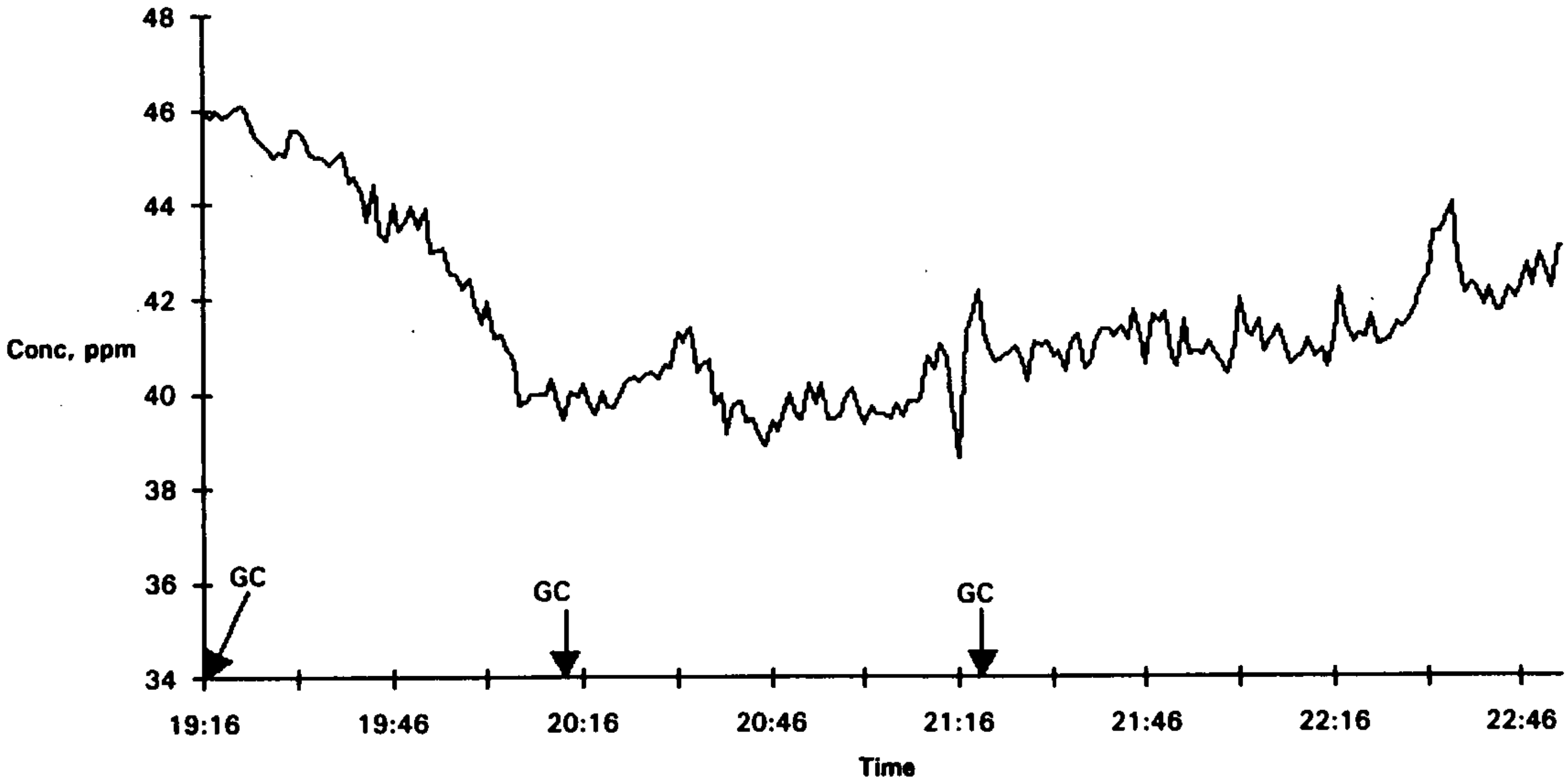

TABLE 9.1
SUMMARY OF VOC RESULTS

Mill: CHAMPION - LUFKIN
Source Code: CL-BPCLTV
FIN: BLPT-1 CIN:

Source: Chlorine Tower Vent
Test Dates: 4/25/92 4/27/92
EPN: 12-2

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	79	135	116	
Volumetric Flow Rate, x10^3 DSCFM	0.9	1.4	1.2	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	11.7	15.8	13.4	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	0.3	0.4	0.4	0.1
Ethanol	ND	<0.1	0.1	0.1
Acetone	<0.1	<0.1	0.1	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	<0.1	<0.1	0.1	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	ND	ND	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	0.1	0.1	0.1	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	0.1	0.1	0.1	0.1

ND=Not Detected
DL=Detection Limit

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TABLE 9.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: CHAMPION-LUFKIN
Source Code: CL-BPCLTV
FIN: BLPT-1 EPN: 12-2

Source: Chlorine Tower Vent
Test Dates: 4/25/92 4/27/92
CIN: -

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	79	135	116	
Volumetric Flow Rate, x 10^5 DSCFM	0.9	1.4	1.2	
Process Operating Conditions				
Production Rate, ADT pulp/hr	11.7	15.0	13.4	
Emission Rate, lb/hr				
Chloroform	<0.1	0.1	0.1	0.1
Hydrogen chloride	<0.1	<0.1	0.1	0.1

ND = Not Detected
DL = Detection Limit

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SECTION 9.1 EMISSION TEST RESULTS - VOC

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Chlorine Tower Vent | FIN: BLPT-1
Source Code: CL-BPCLTV | Date: 4/25/92 | EPN: 12-2 | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1123	1223	1423	
Flow Data				
Stack Temperature, °F	79		135	107
Moisture Content, %	3.4		17.4	10.4
Oxygen Concentration, %	20.8		20.8	20.8
Carbon Dioxide Concentration, %	0.0		0.0	0.0
Volumetric Flow Rate, x10^3 ACFM	1.5		1.3	1.4
Volumetric Flow Rate, x10^3 DSCFM	1.4		0.9	1.2
Process Operating Conditions				
Production Rate, ADT pulp/hr	15.0	15.0	15.0	15.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	59.9	75.2	64.8	66.7
Emission Rate, lb/hr	0.3	0.4	0.4	0.4
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.7	0.6 *	0.6 *	0.4
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	1.5	1.6	1.3	1.5
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Chlorine Tower Vent | FIN: BLPT-1
Source Code: CL-BPCLTV | Date: 4/25/92 | EPN: 12-2 | CIN:

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	2.5	2.7	2.5	2.5
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Chlorine Tower Vent | FIN: BLPT-1
Source Code: CL-BPCLTV | Date: 4/25/92 | EPN: 12-2 | CIN: -

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	51.2	61.5	51.9	54.9
Unknowns as Carbon				
Concentration, ppmvd	3.0	3.6	2.6	3.1
Sum M18 as Carbon, lb/hr	0.1	0.1	0.1	0.1
Unknown Compounds % of Total	5.6%	5.5%	4.7%	5.3%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	63.6	58.0	60.3	60.6
Emission Rate, lb/hr as C	0.1	0.1	0.1	0.1

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Chlorine Tower Vent | FIN: BLPT-1
Source Code: CL-BPCLTV | Date: 4/27/92 | EPN: 12-2 | CIN:

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1916	2016	2116	
Flow Data				
Stack Temperature, °F	134			134
Moisture Content, %	13.1			13.1
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	1.6			1.6
Volumetric Flow Rate, x10^3 DSCFM	1.2			1.2
Process Operating Conditions				
Production Rate, ADT pulp/hr	11.7	11.7	11.7	11.7
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	64.7	69.7	62.7	65.7
Emission Rate, lb/hr	0.4	0.4	0.4	0.4
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	1.2	1.2	1.3	1.2
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill:	CHAMPION - LUFKIN	Source:	Chlorine Tower Vent	FIN:	BLPT-1
Source Code:	CL-BPCLTV	Date:	4/27/92 EPN: 12-2	CIN:	-

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 •	0.6 •	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 •	0.1 •	0.1 •
Chloroform				
Concentration, ppmvd	2.6	3.5	3.5	3.2
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.2 •	1.2 *	1.2 •	1.2 *
Emission Rate, lb/hr	0.1 •	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 •	0.1 *	0.1 •
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 •	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.6 •	0.6 *	0.6 •	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 •	0.1 *	0.1 •
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 •	0.6 •
Emission Rate, lb/hr	0.1 •	0.1 *	0.1 *	0.1 •
Cumene				
Concentration, ppmvd	0.6 •	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.6 •	0.6 *	0.6 •	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 •	0.6 •	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 •	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.6 •	0.6 *	0.6 *	0.6 •
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 *	0.6 *	0.6 •	0.6 *
Emission Rate, lb/hr	0.1 •	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN	Source:	Chlorine Tower Vent			FIN:	BLPT-1
Source Code: CL-BPCLTV	Date:	4/27/92	EPN:	12-2	CIN:	

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	54.1	55.6	51.9	53.9
Unknowns as Carbon				
Concentration, ppmvd	4.9	2.2	1.8	3.0
Sum M18 as Carbon, lb/hr	0.1	0.1	0.1	0.1
Unknown Compounds % of Total	8.4%	3.8%	3.4%	5.2%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	49.5	46.0	47.2	47.6
Emission Rate, lb/hr as C	0.1	0.1	0.1	0.1

* One or more values were less than the detection limit.

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SECTION 9.2 EMISSION TEST RESULTS - MISCELLANEOUS

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - LUFKIN | Source: Chlorine Tower Vent | FIN: BLPT-1
Source Code: CL-BPCLTV | Date: 4/25/92 | EPN: 12-2 | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1456	1814	1814	
Flow Data				
Stack Temperature, °F	79	135		107
Moisture Content, %	3.4	17.4		10.4
Oxygen Concentration, %	20.8	20.8		20.8
Carbon Dioxide Concentration, %	0.0	0.0		0.0
Volumetric Flow Rate, x10^3 ACFM	1.5	1.3		1.4
Volumetric Flow Rate, x10^3 DSCFM	1.4	0.9		1.2
Process Operating Conditions				
Production Rate, ADT pulp/hr	15.0			15.0
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	5.2	3.2	4.9	4.4
Emission Rate, lb/hr	0.1	0.1 *	0.1	0.1
Hydrogen chloride				
Concentration, ppmvd	2.1			2.1
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - LUFKIN   Source: Chlorine Tower Vent   FIN: BLPT-1
Source Code: CL-BPCLTV   Date: 4/27/92   EPN: 12-2   CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1947	1947		
Flow Data				
Stack Temperature, °F	134			134
Moisture Content, %	13.0			13.0
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	1.6			1.6
Volumetric Flow Rate, x10^3 DSCFM	1.2			1.2
Process Operating Conditions				
Production Rate, ADT pulp/hr	11.7			11.7
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	4.6	3.7		4.2
Emission Rate, lb/hr	0.1	0.1 *		0.1
Hydrogen chloride				
Concentration, ppmvd	1.4			1.4
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

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SECTION 9.3 VOC QUALITY CONTROL RESULTS

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

CHLORINE TOWER VENT (CL-BPCLTV)
THC Quality Control
(Concentrations in ppm)

Calibration

Theoretical	4/25/92 Found	% Error	4/27/92 Found	% Error
0	0	0.0	0	0.0
36	36	0.0	36	0.0
91	89	-1.3	86	2.7
150	150	0.0	151	0.7
Correlation coefficient	0.9999		0.9993	

Line Study

Bag Sample

Analyzer	Line	%Rec
148	150	101.4

Nitrogen Blank

4/25/92 Analyzer	Line
0	1

CHLORINE TOWER VENT (CL-BPCLTV)
VOC Quality Control
(Concentrations in ppm)

Calibration

Analyte	Theoretical	4/25/92 Check Std	% Rec	Check Std	%Rec
Acetone	87.7	75.3	85.9	97.8	111.5
Isopropanol	84.1	74.1	88.1	60.0	71.4
Benzene	72.0	86.1	119.5	82.4	114.4
Bromodichloromethane	77.8	82.5	106.0	78.9	101.4
Toluene	60.6	54.3	89.6	61.4	101.4
Ethyl Benzene	52.6	46.5	88.5	54.2	103.1
p-Xylene	52.5	46.0	87.6	64.4	122.6
o-Xylene	52.8	43.7	82.8	57.5	109.0
Cumene	46.3	41.8	90.3	45.3	97.9
alpha-Pinene	40.4	36.4	90.1	36.7	90.8
beta-Pinene	40.6	38.2	94.1	4.8a	11.8
3-Carene	40.6	36.9	90.8	37.1	91.3
p-Cymene	41.3	34.2	82.9	29.3	71.0

a (Dirty transfer line caused degradation of B-pinene)

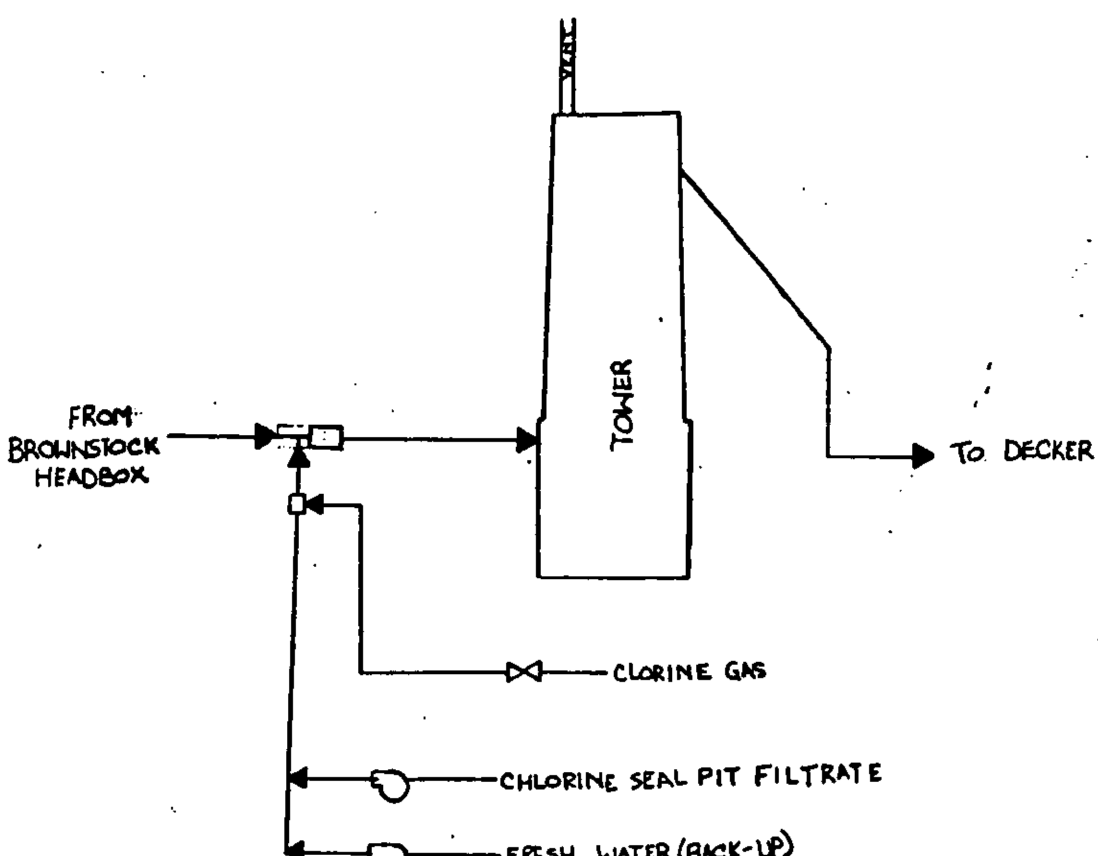
Nitrogen blank	4/25/92	Not performed
	4/27/92	Not performed

Line Study		GC	Line	% Rec
Methanol	(100 ppm)			
	4/25/92	Not performed		
	4/27/92	Not performed		

SECTION 9.4 PROCESS DESCRIPTION AND OPERATING CONDITIONS

CHLORINE TOWER VENT
A Side

The bleach plant is divided into sides A and B producing 360 tons/day and 180 tons/day of pulp respectively. Brownstock comes into the brownstock headbox where reclaim water and chlorine seal pit filtrate are added. The stock then splits into two sides and passes to an inlet pump, chlorine gas and chlorine seal pit filtrate are added, and proceeds to a mixer. The pulp is pumped to the chlorine tower and diluted with chlorine seal pit filtrate. The pulp is discharged from the tower and pumped with further dilution of chlorine seal pit filtrate to the decker. The system is vented through a pipe in the top of the covered tower.



CL2 DECKER HOOD VENT

BLEACHING SEQUENCE: CEH
WOOD SPECIES: SOFTWOOD - SOUTHERN PINE

PARAMETER	UNITS	RUN 1	RUN 2	RUN 3	RUN 4	RUN 5	RUN 6	RUN 7
DATE		4/25	4/25	4/25	4/25	4/27	4/27	4/27
START TIME		1111	1211	1309	1431	1902	2013	2119
STOP TIME		1156	1256	1354	1501	1947	2058	2204
BLEACHED PULP PROD RATE	ADT/D	A 360 B 180	A 360 B 180	A 360 B 180	A 360 B 180	A 280 B 120	A 280 B 120	A 28 B 12
PN NUMBER		21.8	21.8	21.6	21.6	20.5	18.5	21.7
CL2 USAGE A	LB/HR	1788	1851	2089	2046	1325	1387	1493
CL2 USAGE B	LB/HR	892	913	1034	1012	612.6	607.4	635.9
CAUS USAGE A	LB/HR	1170	1140	1140	1170	793	746	746
CAUS USAGE B	LB/HR	465	450	465	465	300	280	280
HYPO USAGE A	LB/HR	720	690	750	720	536	489	513
HYPO USAGE B	LB/HR	360	345	375	345	210	180	170
CL2 TEMP	F	84.0	81.8	79.0	80.9	86.9	75.5	74.3
CAU TOW TEMP	F	158.4	158.1	157.8	158.5	158.4	158.1	1.
HYP TOW TEMP	F	129.3	129.9	130.6	131.1	127.3	126.9	127.0
CL2 RET TIME	MIN	25	25	25	25	33	33	33
CAU TOW LEVL	%	58.0	60.0	58.7	56.7	45.5	46.9	47.6
CAU DUMP CT	%	44.0	45.0	44.0	43.2	44.7	43.7	46.5
CAU RET TIME	MIN	32	32	32	32	32	33	34
HYP TOW LEVL	%	60.0	60.0	60.0	60.0	60.0	60.0	60.0
HYP RET TIME	MIN	174	174	174	174	221	221	221
CE PN NO.		5.1	5.1	5.9	5.9	5.1	4.3	6.2

CL2 STOCK TEMP: 108 F

BLEACH PLANT DIAGRAMS AND PROCESS INFORMATION

A. Bleaching Practice

The mill has two parallel bleach lines with CEH sequences which produce 500 ton/day bleached kraft softwood pulp to a final G.E. brightness of 70. During the tests, bleach plant 1 operated at a rate of 15 ton/hour and bleach plant 2 operated at a rate of 8 ton/hour. Figure 1 is a diagram of the bleaching process for both of these lines.

Table 1 shows the bleaching conditions for the two bleach plants during the testing. There was little difference between the bleach plant configurations other than capacity. The kappa number of the brownstock was 30 during run 1 and was 30 during run 2. Other than that, all conditions were the same for both runs.

Representative Process Conditions

Bleaching Sequence:	CEH
Wood Species:	Southern Pine
Production Rate:	500-540 T/D Total; 1=360max, 2=180max
Kappa Number:	PN 18-24
Chemical Usage (Cl_2, ClO_2, NaOH, NaOCl, O_2 in E Stage, pH in towers, etc.):	Cl_2, NaOH, NaOCL
Percent ClO_2 Substitution:	N/A
Tower Temperatures & Retention Times:	Cl_2, 74-95° F, 25-35 min NaOH, 157-159° F, 32-39 min NaOCL, 126-131° F, 146-221 min
CE Kappa Number:	CE PN 4.5-6.5

B. Water Reuse

Fresh water was used on all of the showers.

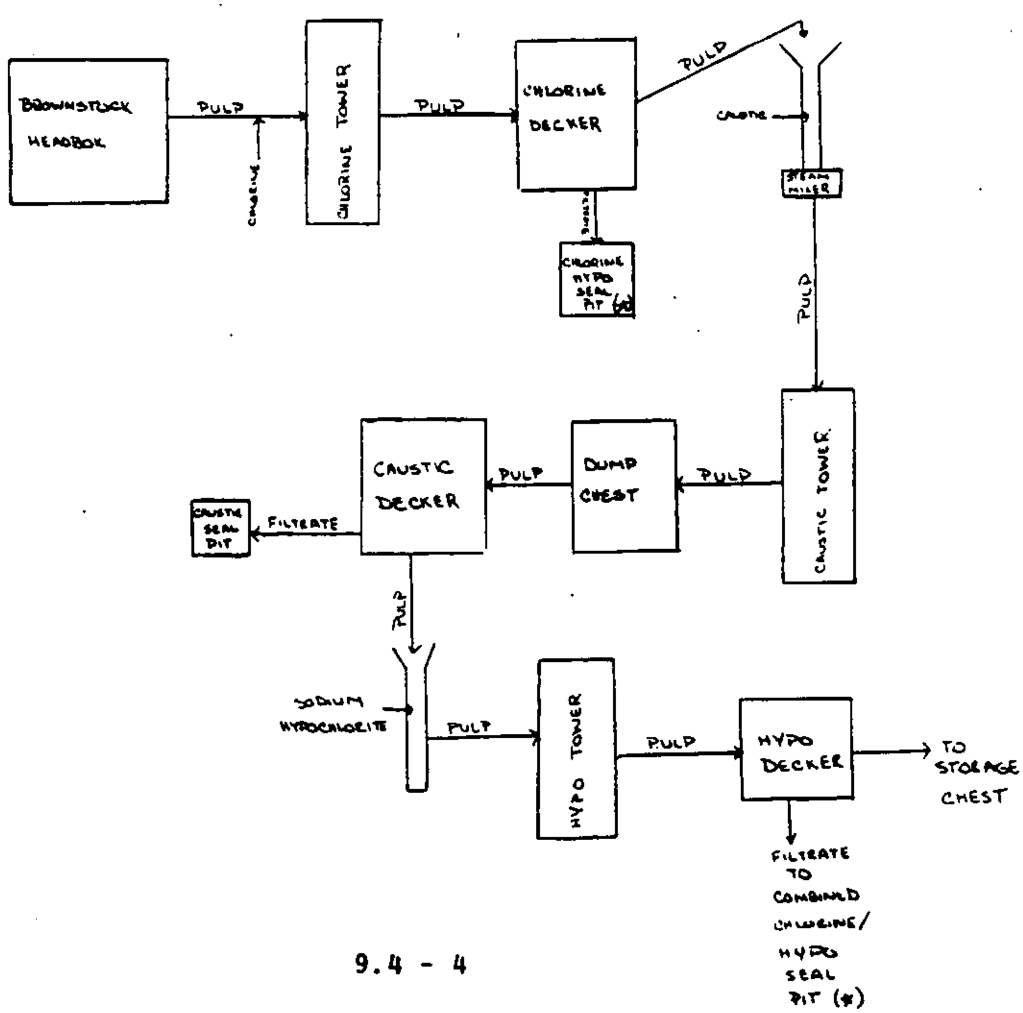
C. Bleach Plant Venting

Most of the vents from both bleach plants are vented to the atmosphere individually with no scrubbing. Figure 2 shows the location of various vents.

TABLE 2 BLEACHING CONDITIONS IN BLEACH PLANT 1

	C	E	H	D
Consistency, Percent	3.5	10	10	-
Temperature, °F	110	160	125	-
Time, Minutes	25	25	90	-
Chlorine, lb/ton odbs	130	-	-	-
Hypochlorite as Cl_2 lb/ton	-	-	44	-
Caustic, lb/ton	-	88	-	-
Peroxide, lb/ton	-	-	-	-
Chlorine Dioxide	-	-	-	-
Residual Chlorine, lb/ton	Trace	10.5	Trace	-
Vat pH	1.8	6.	9.5	-
K Number	-	-	-	-
Elrepho Brightness	-	-	70	-

Note: Bleach Plant 2 had the same conditions as Bleach Plant 1.



SECTION 10

CHLORINE DECKER HOOD VENT (A SIDE)

(CL-BPCDHV)

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SECTION 10
CHLORINE DECKER HOOD VENT (A SIDE)
(CL-BPCDHV)

The Chlorine Decker Hood Vent was sampled on two different days for volatile organic compounds, chloroform, and hydrogen chloride. The adsorption tube sampling for chloroform was provided for comparison to the GC result.

Total Hydrocarbons (M25A)

Figures 10.1 and 10.2 present the THC trends for the test periods on 25 and 27 April 1992. The total hydrocarbon concentration varied between 14 and 18 ppm on the first day, but it decreased during the run on the second day from 12 ppm to approximately 5 ppm.

Volatile Organic Compounds (M18)

Table 10.1 summarizes the results for the Method 18 target compounds, and Section 10.1 is a tabulation of the data. TRS was not analyzed. The volumetric flow was determined by measurement with a standard pitot tube.

Methanol and chloroform were the only compounds identified in the emission gas. No unknown compounds were observed.

Miscellaneous Parameters

Table 10.2 summarizes the results of testing for hydrogen chloride and chloroform. Section 10.2 tabulates the results for each compound. Hydrogen chloride was not detected during the sampling. Trace amounts of chloroform were found and compared favorably with the results determined by M18.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 10.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 10.4 includes the process operating data as recorded and provided by mill personnel. The Chlorine Decker Hood Vent represented the emission from A side bleaching only.

FIGURE 10.1
THC TREND ANALYSIS (4/25/92)

CHLORINE DECKER HOOD VENT (CL-BPCDHV)

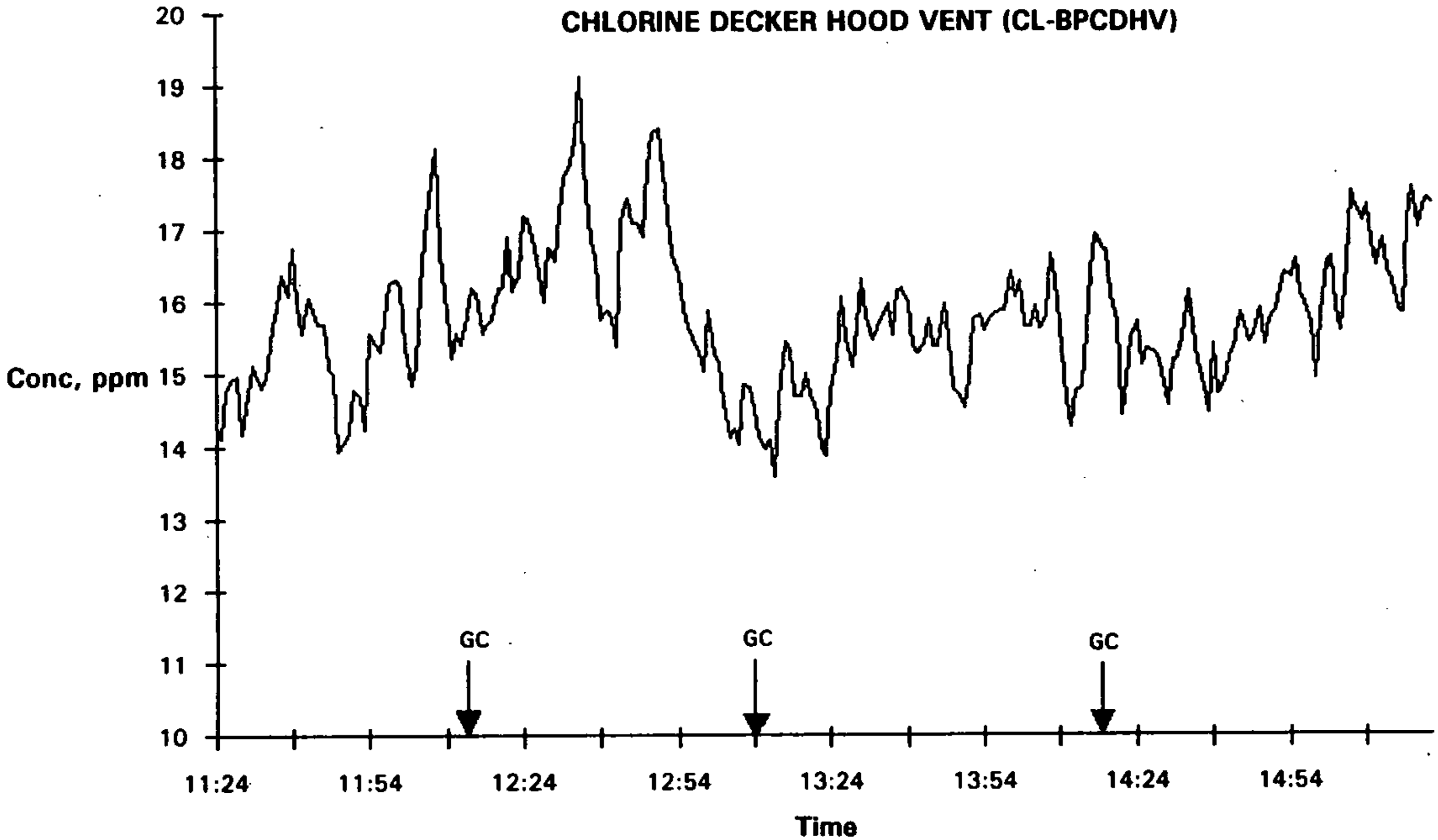

FIGURE 10.2
THC TREND ANALYSIS (4/27/92)

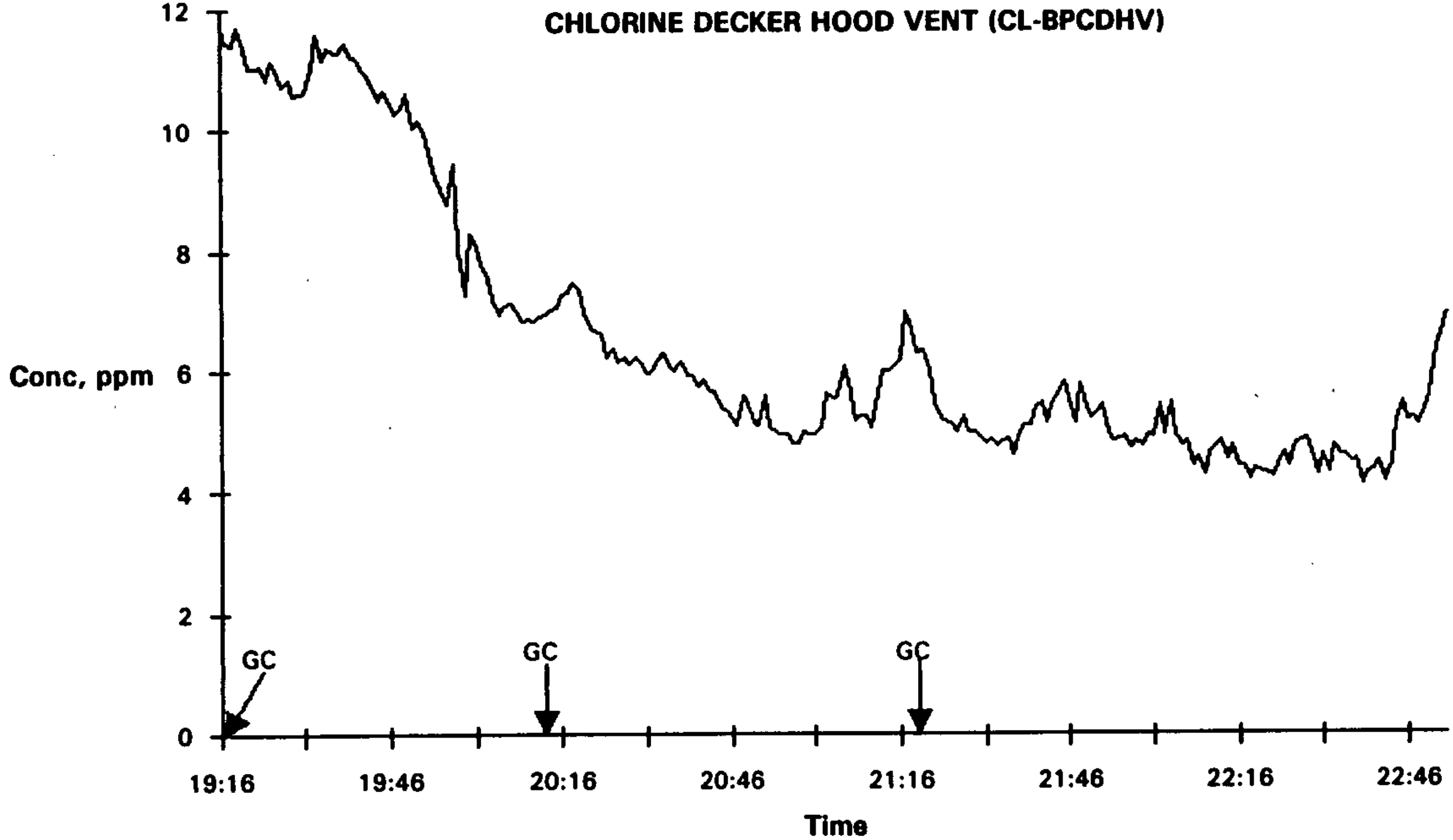

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TABLE 10.1
SUMMARY OF VOC RESULTS

Mill: CHAMPION - LUFKIN
Source Code: CL-BPCDHV
FIN: BLPT-1 CIN:

Source: Chlorine Decker Hood Vent(1)
Test Dates: 4/25/92 4/27/92
EPN: 12-8

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	83	88	86	
Volumetric Flow Rate, x10³ DSCFM	7.0	7.6	7.3	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	11.7	15.0	13.4	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	ND	0.2	0.1	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	ND	0.2	0.1	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.2
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	ND	ND	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	ND	0.1	0.1	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	<0.1	<0.1	0.1	0.1

ND=Not Detected
DL=Detection Limit

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TABLE 10.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: CHAMPION-LUFKIN
Source Code: CL-BPCDHV
FIN: BLPT-1 EPN: 12-8

Source: Chlorine Decker Hood Vent (1)
Test Dates: 4/25/92 4/27/92
CIN:

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	83	88	86	
Volumetric Flow Rate, x 10^3 DSCFM	7.0	7.6	7.3	
Process Operating Conditions				
Production Rate, ADT pulp/hr	11.7	15.0	12.8	
Emission Rate, lb/hr				
Chloroform	0.1	0.5	0.4	0.1
Hydrogen chloride	ND	ND	ND	0.1

ND = Not Detected
DL = Detection Limit

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SECTION 10.1 EMISSION TEST RESULTS - VOC

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Chlorine Decker Hood Vent(1) | FIN: BLPT-1
Source Code: CL-BPCDHV | Date: 4/25/92 | EPN: 12-8 | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1123	1223	1423	
Flow Data				
Stack Temperature, °F	83			83
Moisture Content, %	9.4			9.4
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	8.0			8.0
Volumetric Flow Rate, x10^3 DSCFM	7.0			7.0
Process Operating Conditions				
Production Rate, ADT pulp/hr	15.0	15.0	15.0	15.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	2.2 *	4.6	3.5	3.1
Emission Rate, lb/hr	0.1 *	0.2	0.1	0.1
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Chlorine Decker Hood Vent(1) | FIN: BLPT-1
Source Code: CL-BPCDHV | Date: 4/25/92 | EPN: 12-8 | CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.1	1.3	1.1	1.2
Emission Rate, lb/hr	0.1	0.2	0.1	0.2
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN	Source:	Chlorine Decker Hood Vent(1)		FIN:	BLPT-1
Source Code: CL-BPCDHV	Date:	4/25/92	EPN: 12-8	CIN:	-

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	5.8	6.2	6.3	6.1
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	17.7	17.7	17.7	17.7
Emission Rate, lb/hr as C	0.2	0.2	0.2	0.2

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Chlorine Decker Hood Vent(1) | FIN: BLPT-1
Source Code: CL-BPCDHV | Date: 4/27/92 | EPN: 12-8 | CIN:

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1916	2016	2116	
Flow Data				
Stack Temperature, °F			88	88
Moisture Content, %			1.5	1.5
Oxygen Concentration, %			20.8	20.8
Carbon Dioxide Concentration, %			0.0	0.0
Volumetric Flow Rate, x10^3 ACFM			8.0	8.0
Volumetric Flow Rate, x10^3 DSCFM			7.6	7.6
Process Operating Conditions				
Production Rate, ADT pulp/hr	11.7	11.7	11.7	11.7
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	2.4	2.1	1.8	2.1
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Chlorine Decker Hood Vent(1) | FIN: BLPT-1
Source Code: CL-BPCDHV | Date: 4/27/92 | EPN: 12-8 | CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.0 *	1.0 *	1.0 *	1.0 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.0 *	1.0 *	1.0 *	1.0 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN　　Source: Chlorine Decker Hood Vent(1)　　FIN: BLPT-1
Source Code: CL-BPCDHV　　Date: 4/27/92　　EPN: 12-8　　CIN:

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	6.7	1.3	1.2	3.1
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	10.2	6.1	5.1	7.1
Emission Rate, lb/hr as C	0.1	0.1 *	0.1 *	0.1

* One or more values were less than the detection limit.

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SECTION 10.2 VENT EMISSION TEST RESULTS -MISCELLANEOUS

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - LUFKIN | Source: Chlorine Decker Hood Vent(1) | FIN: BLPT-1

Source Code: CL-BPCDHV | Date: 4/25/92 | EPN: 12-8 | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1503	1823		
Flow Data				
Stack Temperature, °F	83			83
Moisture Content, %	9.4			9.4
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	8.0			8.0
Volumetric Flow Rate, x10^3 DSCFM	7.0			7.0
Process Operating Conditions				
Production Rate, ADT pulp/hr	15.0			15.0
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	1.1	3.9		2.5
Emission Rate, lb/hr	0.1	0.5		0.3
Hydrogen chloride				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill:	CHAMPION - LUFKIN	Source:	Chlorine Decker Hood Vent(1)		FIN:	BLPT-1
Source Code:	CL-BPCDHV	Date:	4/27/92	EPN: 12-8	CIN:	-

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1940	2159		
Flow Data				
Stack Temperature, °F		88		88
Moisture Content, %		1.5		1.5
Oxygen Concentration, %		20.8		20.8
Carbon Dioxide Concentration, %		0.0		0.0
Volumetric Flow Rate, x10^3 ACFM		8.0		8.0
Volumetric Flow Rate, x10^3 DSCFM		7.6		7.6
Process Operating Conditions				
Production Rate, ADT pulp/hr	11.7	11.7		11.7
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	2.2	3.7		3.0
Emission Rate, lb/hr	0.3	0.5		0.4
Hydrogen chloride				
Concentration, ppmvd		0.5 *		0.5 *
Emission Rate, lb/hr		0.1 *		0.1 *

*One or more values were less than the detection limit.

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SECTION 10.3 VOC QUALITY CONTROL RESULTS

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

CHLORINE DECKER HOOD VENT (CL-BP(

THC Quality Control

(Concentrations in ppm)

Calibration

Theoretical	4/25/92 Found	% Error	4/27/92 Found	% Err[illegible]
0	0	0.0	0	0.0
36	36	0.0	36	0.0
91	89	-1.3	86	2.7
150	151	0.7	151	0.7
Correlation coefficient	0.9998		0.9993	

Line Study

Bag sample
4/25/92

Analyzer	Line	% Rec
147	145	98.6

Nitrogen Blank

4/25/92

Analyzer	Line
0	1

CHLORINE DECKER HOOD VENT (CL-BPCDHV)
VOC Quality Control
(Concentrations in ppm)

Calibration

Analyte	Theoretical	4/25/92 Check Std	% Rec	4/27/92 Check Std	% Rec
Acetone	87.7	111.7	127.4	73.7	84.1
Isopropanol	84.1	64.8	77.1	67.6	80.4
Benzene	72.0	78.3	108.7	83.9	116.5
Bromodichloromethane	77.8	82.1	105.5	84.9	109.1
Toluene	60.6	53.8	88.8	58.5	96.6
Ethyl Benzene	52.6	52.3	99.5	51.5	98.0
p-Xylene	52.5	48.0	91.4	62.3	118.6
o-Xylene	52.8	52.1	98.7	55.7	105.6
Cumene	46.3	46.5	100.5	47.1	101.8
alpha-Pinene	40.4	18.4	45.5	38.7	95.8
beta-Pinene	40.6	a		35.5	87.5
3-Carene	40.6	32.8	80.7	39.2	96.5
p-Cymene	41.3	28.3	68.6	40.2	97.5

a (Dirty transfer line caused degradation of B-pinene)

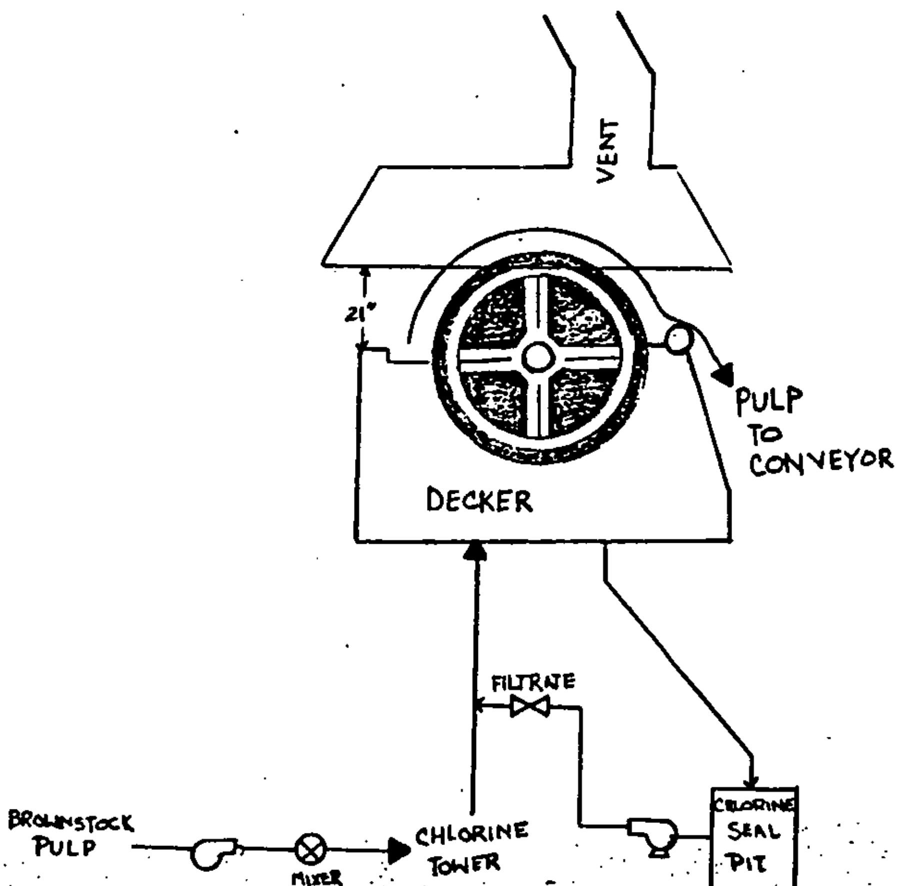
Nitrogen blank	
	4/25/92 Not performed
	4/27/92 Not performed

Line Study	GC	Line	% Rec
Methanol (100 ppm)			
4/25/92		Not performed	
4/27/92		Not performed	

SECTION 10.4 PROCESS DESCRIPTION AND OPERATING CONDITIONS

CHLORINE DECKER VENT
A Side

The bleach plant is divided into sides A and B producing 360 tons/day and 180 tons/day of pulp respectively. Brownstock pulp flows to an inlet pump, chlorine gas and chlorine seal pit filtrate are added, and proceeds to a mixer. The pulp is pumped to the chlorine tower and diluted with chlorine seal pit filtrate. The pulp is discharged from the tower and pumped with further dilution of chlorine seal pit filtrate to the decker. The decker's shower water is reclaimed hot water that was used on vacuum pumps and then passed through a heat exchanger. The system is vented through a pipe in the hood that overlaps the entire decker.



BLEACH PLANT
CL2 TOWER
CL2 DECKER HOOD VENT

BLEACHING SEQUENCE: CEH
WOOD SPECIES: SOFTWOOD - SOUTHERN PINE

PARAMETER	UNITS	RUN 1	RUN 2	RUN 3	RUN 4	RUN 5	RUN 6	RUN 7
DATE		4/25	4/25	4/25	4/25	4/27	4/27	4/27
START TIME		1111	1211	1309	1431	1902	2013	2119
STOP TIME		1156	1256	1354	1501	1947	2058	2204
BLEACHED PULP PROD RATE	ADT/D	A 360 B 180	A 360 B 180	A 360 B 180	A 360 B 180	A 280 B 120	A 280 B 120	A 28[illegible] B 120
PN NUMBER		21.8	21.8	21.6	21.6	20.5	18.5	21.7
CL2 USAGE A	LB/HR	1788	1851	2089	2046	1325	1387	1493
CL2 USAGE B	LB/HR	892	913	1034	1012	612.6	607.4	635.[illegible]
CAUS USAGE A	LB/HR	1170	1140	1140	1170	793	746	746
CAUS USAGE B	LB/HR	465	450	465	465	300	280	280
HYPO USAGE A	LB/HR	720	690	750	720	536	489	513
HYPO USAGE B	LB/HR	360	345	375	345	210	180	170
CL2 TEMP	F	84.0	81.8	79.0	80.9	86.9	75.5	7[illegible]
CAU TOW TEMP	F	158.4	158.1	157.8	158.5	158.4	158.1	157.[illegible]
HYP TOW TEMP	F	129.3	129.9	130.6	131.1	127.3	126.9	127.[illegible]
CL2 RET TIME	MIN	25	25	25	25	33	33	33
CAU TOW LEVL	%	58.0	60.0	58.7	56.7	45.5	46.9	47.6
CAU DUMP CT	%	44.0	45.0	44.0	43.2	44.7	43.7	46.5
CAU RET TIME	MIN	32	32	32	32	32	33	34
HYP TOW LEVL	%	60.0	60.0	60.0	60.0	60.0	60.0	60.0
HYP RET TIME	MIN	174	174	174	174	221	221	221
CE PN NO.		5.1	5.1	5.9	5.9	5.1	4.3	6.2

CL2 STOCK TEMP: 108 F

BLEACH PLANT DIAGRAMS AND PROCESS INFORMATION

A. Bleaching Practice

The mill has two parallel bleach lines with CEH sequences which produce 500 ton/day bleached kraft softwood pulp to a final G.E. brightness of 70. During the tests, bleach plant 1 operated at a rate of 15 ton/hour and bleach plant 2 operated at a rate of 8 ton/hour. Figure 1 is a diagram of the bleaching process for both of these lines.

Table 1 shows the bleaching conditions for the two bleach plants during the testing. There was little difference between the bleach plant configurations other than capacity. The kappa number of the brownstock was 30 during run 1 and was 30 during run 2. Other than that, all conditions were the same for both runs.

Representative Process Conditions

Bleaching Sequence:	CEH
Wood Species:	Southern Pine
Production Rate:	500-540 T/D Total; 1=360max, 2=180max
Kappa Number:	PN 18-24
Chemical Usage (Cl_2, ClO_2, NaOH, NaOCl, O_2 in E Stage, pH in towers, etc.):	Cl_2, NaOH, NaOCL
Percent ClO_2 Substitution:	N/A
Tower Temperatures & Retention Times:	Cl_2, 74-95° F, 25-35 min NaOH, 157-159° F, 32-39 min NaOCL, 126-131° F, 146-221 min
CE Kappa Number:	CE PN 4.5-6.5

B. Water Reuse

Fresh water was used on all of the showers.

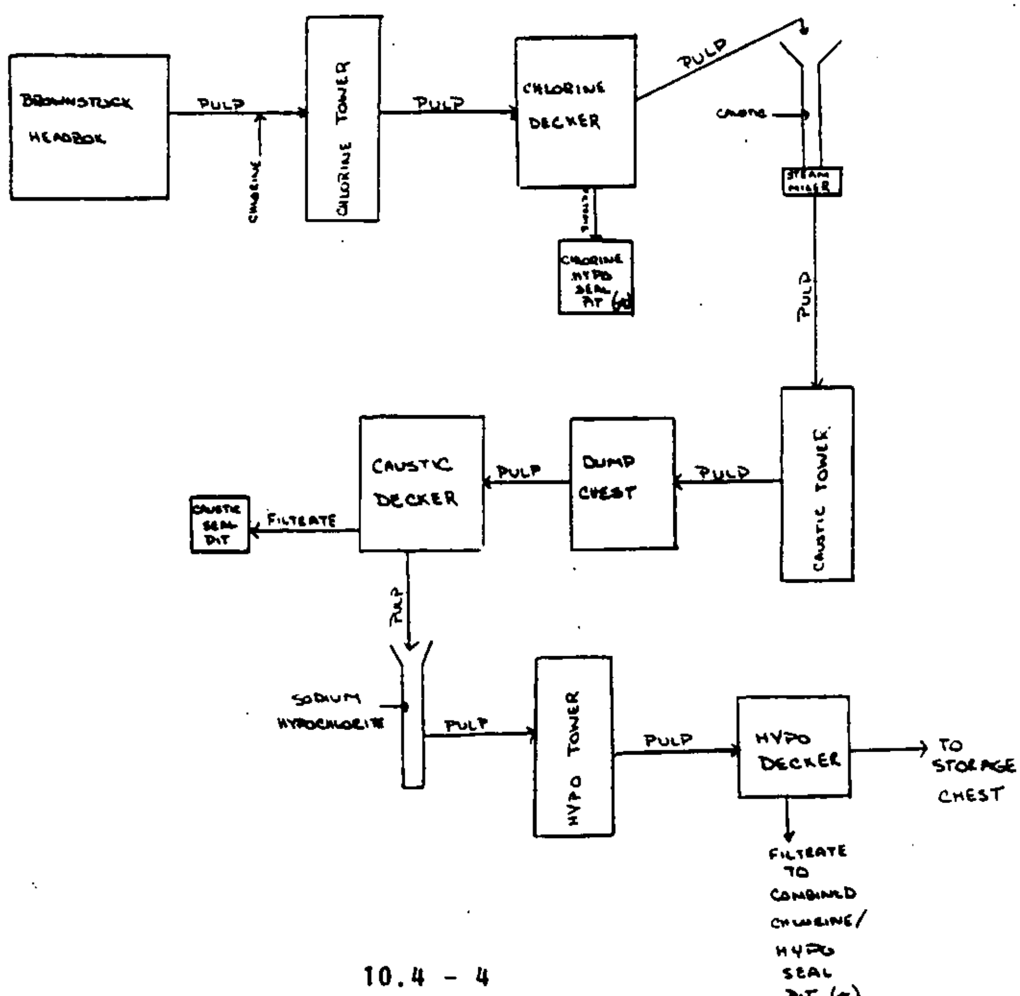
C. Bleach Plant Venting

Most of the vents from both bleach plants are vented to the atmosphere individually with no scrubbing. Figure 2 shows the location of various vents.

TABLE 2 BLEACHING CONDITIONS IN BLEACH PLANT 1

	C	E	H	D
Consistency, Percent	3.5	10	10	-
Temperature, °F	110	160	125	-
Time, Minutes	25	25	90	-
Chlorine, lb/ton odbs	130	-	-	-
Hypochlorite as Cl_2 lb/ton	-	-	44	-
Caustic, lb/ton	-	88	-	-
Peroxide, lb/ton	-	-	-	-
Chlorine Dioxide	-	-	-	-
Residual Chlorine, lb/ton	Trace	10.5	Trace	-
Vat pH	1.8	6.	9.5	-
K Number	-	-	-	-
Elrepho Brightness	-	-	70	-

Note: Bleach Plant 2 had the same conditions as Bleach Plant 1.



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SECTION 11
HYPO DECKER HOOD VENT (A SIDE)
(CL-BPHDHV)

11. CL-BPHDHV

SECTION 11
HYPO DECKER HOOD VENT (A SIDE)
(CL-BPHDHV)

The Hypo Decker Hood Vent was tested on two different days for volatile organic compounds and for chloroform and hydrogen chloride. The adsorption tube sampling was provided for comparison to the GC result.

Total Hydrocarbons (M25A)

Figures 11.1 and 11.2 present the THC trends for the test periods on 28 and 29 April 1992. The total hydrocarbon concentration was very stable at approximately 13 ppm on the first day and 11 - 12 ppm on the second day.

Volatile Organic Compounds (M18)

Table 11.1 summarizes the results for the Method 18 target compounds, and Section 11.1 is a tabulation of the data. TRS was not analyzed. Fan curve data were used to calculate the mass emission rate.

The only compound identified in the emission gas was chloroform. A trace of a heavy compound was present in a sample as an unknown.

A single unknown peak was observed in the third run on day one. This peak resulted in approximately a four ppm concentration as carbon. It was not present on any other run. Even though this peak appears to be real, it is anomaly and it is doubtful if it is truly an unknown compound in the gas stream.

Miscellaneous Parameters

Table 11.2 summarizes the results of testing for aldehydes, hydrogen chloride, chloroform, and sulfuric acid mists. Section 11.2 tabulates the results for each compound. With the exception of one sample, the chloroform concentration measured by the adsorption tube method was comparable to the GC. One sample was approximately ten times the concentration. The reason for the high result is not apparent. Even though a reason was not identified for the abnormally high result, the value should not be considered as valid.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 11.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 11.4 includes the process operating data as recorded and provided by mill personnel. The Hypo Decker Hood Vent represented the emissions from A Side bleaching only.

FIGURE 11.1
THC TREND ANALYSIS (4/28/92)

HYPO DECKER HOOD VENT (CL-BPHDHV)

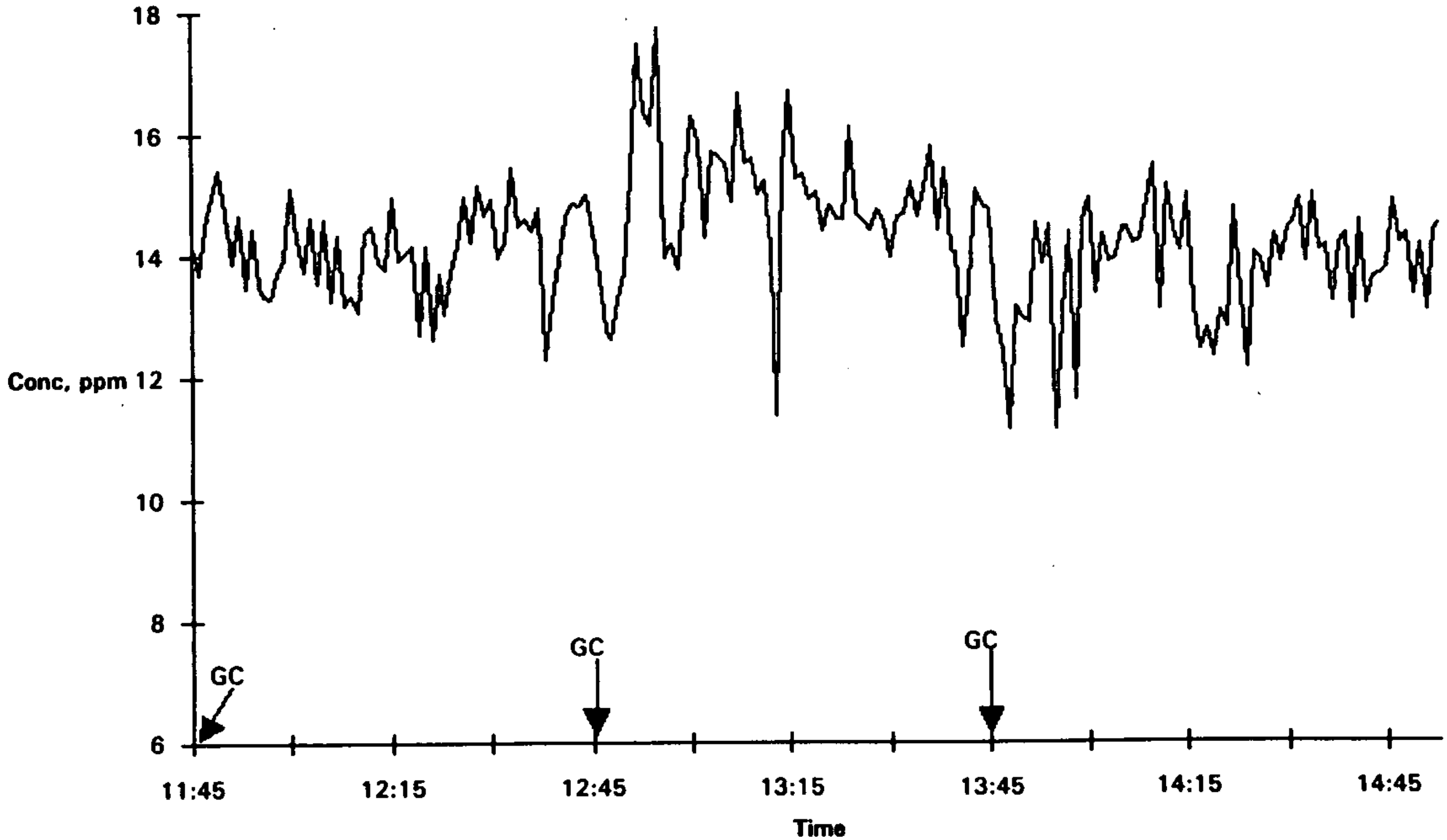

FIGURE 11.2
THC TREND ANALYSIS (4/29/92)
HYPO DECKER HOOD VENT (CL-BPHDHV)

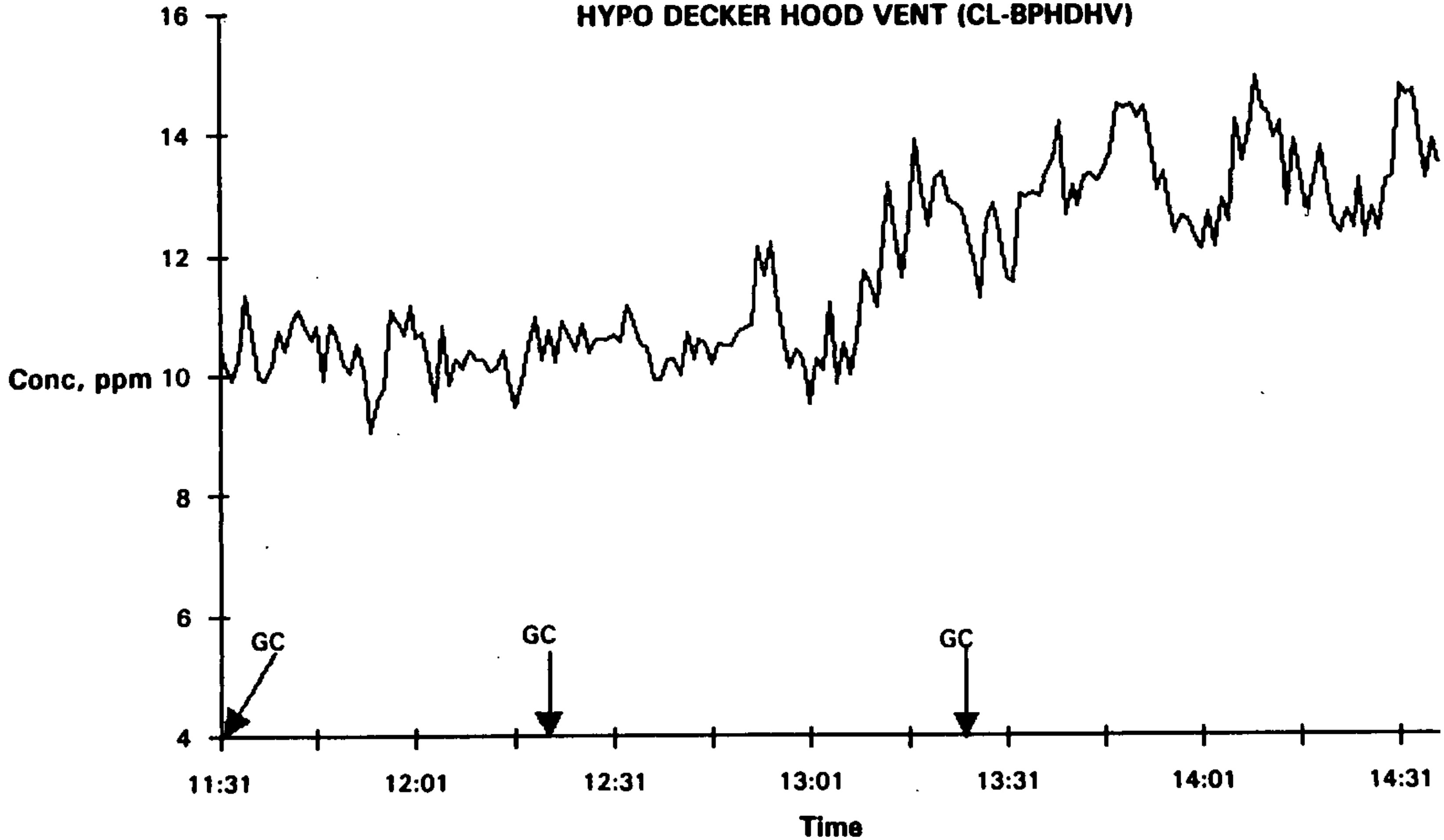

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TABLE 11.1
SUMMARY OF VOC RESULTS

Mill: CHAMPION - LUFKIN | Source: Hypo Decker Hood Vent (1)
Source Code: CL-BPHDHV | Test Dates: 4/28/92 4/29/92
FIN: BLPT-1 CIN: | EPN: 12-5

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	72	87	80	
Volumetric Flow Rate, $x10^3$ DSCFM	9.2	9.6	9.4	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	10.8	14.2	12.5	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	ND	ND	ND	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	1.2	1.9	1.7	0.2
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.2
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	ND	ND	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	0.1	0.2	0.1	0.1
Unknowns as C, lb/hr	ND	0.1	ND	0.1
Sum of Compounds as C, lb/hr	0.1	0.2	0.1	0.1

ND=Not Detected
DL=Detection Limit

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TABLE 11.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: CHAMPION-LUFKIN
Source Code: CL-BPHDHV
FIN: BLPT-1 EPN: 12-5

Source: Hypo Decker Hood Vent (1)
Test Dates: 4/28/92 4/29/92
CIN:

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	72	87	80	
Volumetric Flow Rate, x 10^3 DSCFM	9.2	9.6	9.4	
Process Operating Conditions				
Production Rate, ADT pulp/hr	10.8	14.2	13.1	
Emission Rate, lb/hr				
Chloroform	1.7	14.3	5.1	0.1
Hydrogen chloride	ND	<0.1	0.1	0.1

ND = Not Detected
DL = Detection Limit

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SECTION 11.1 EMISSION TEST RESULTS - VOC

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Hypo Decker Hood Vent (1) | FIN: BLPT-1

Source Code: CL-BPHDHV | Date: 4/28/92 | EPN: 12-5 | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1144	1244	1344	
Flow Data				
Stack Temperature, °F	87			87
Moisture Content, %	4.4			4.4
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	10.0			10.0
Volumetric Flow Rate, x10^3 DSCFM	9.2			9.2
Process Operating Conditions				
Production Rate, ADT pulp/hr	14.2	14.2	14.2	14.2
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd		2.1 *	2.1 *	2.1 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Hypo Decker Hood Vent (1) | FIN: BLPT-1
Source Code: CL-BPHDHV | Date: 4/28/92 | EPN: 12-5 | CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd		11.4	10.0	10.7
Emission Rate, lb/hr		1.9	1.7	1.8
Benzene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd		1.0 *	1.0 *	1.0 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Hypo Decker Hood Vent (1) | FIN: BLPT-1
Source Code: CL-BPHDHV | Date: 4/28/92 | EPN: 12-5 | CIN: -

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd		9.3	7.7	8.5
Unknowns as Carbon				
Concentration, ppmvd		0.0	4.0	2.0
Sum M18 as Carbon, lb/hr		0.2	0.2	0.2
Unknown Compounds % of Total		0.0%	33.9%	17.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	14.6	15.7	14.6	15.0
Emission Rate, lb/hr as C	0.3	0.3	0.3	0.3

COMMENTS

M18 run 1 was rejected for 4/28/92.

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Hypo Decker Hood Vent (1) | FIN: BLPT-1
Source Code: CL-BPHDHV | Date: 4/29/92 | EPN: 12-5 | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1131	1231	1331	
Flow Data				
Stack Temperature, °F	72			72
Moisture Content, %	2.7			2.7
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	10.0			10.0
Volumetric Flow Rate, x10^3 DSCFM	9.6			9.6
Process Operating Conditions				
Production Rate, ADT pulp/hr	10.8	10.8	10.8	10.8
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	2.1 *	2.1 *	2.1 *	2.1 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Hypo Decker Hood Vent (1) | FIN: BLPT-1
Source Code: CL-BPHDHV | Date: 4/29/92 | EPN: 12-5 | CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	9.7	10.0	7.0	8.9
Emission Rate, lb/hr	1.7	1.8	1.2	1.6
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.0 *	1.0 *	1.0 *	1.0 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Hypo Decker Hood Vent (1) | FIN: BLPT-1
Source Code: CL-BPHDHV | Date: 4/29/92 EPN: 12-5 | CIN: -

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	7.4	7.7	7.7	7.6
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.1	0.1	0.1	0.1
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	10.3	11.3	13.4	11.6
Emission Rate, lb/hr as C	0.2	0.2	0.2	0.2

COMMENTS

M18 run 1 was rejected for 4/28/92.

* One or more values were less than the detection limit.

SECTION 11.2 EMISSION TEST RESULTS - MISCELLANEOUS

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - LUFKIN | Source: Hypo Decker Hood Vent (1) | FIN: BLPT-1
Source Code: CL-BPHDHV | Date: 4/28/92 | EPN: 12-5 | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1243	1243	1330	
Flow Data				
Stack Temperature, °F	87			87
Moisture Content, %	4.4			4.4
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	10.0			10.0
Volumetric Flow Rate, x10^3 DSCFM	9.2			9.2
Process Operating Conditions				
Production Rate, ADT pulp/hr	14.2		14.2	14.2
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	18.9	20.8	17.0	18.9
Emission Rate, lb/hr	3.2	3.5	2.9	3.2
Hydrogen chloride				
Concentration, ppmvd	0.9			0.9
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - LUFKIN　　Source: Hypo Decker Hood Vent (1)　　FIN: BLPT-1

Source Code: CL-BPHDHV　　Date: 4/29/92　　EPN: 12-5　　CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1412	1450		
Flow Data				
Stack Temperature, °F	72			72
Moisture Content, %	2.7			2.7
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	10.0			10.0
Volumetric Flow Rate, x10^3 DSCFM	9.6			9.6
Process Operating Conditions				
Production Rate, ADT pulp/hr	10.8			10.8
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	80.7	9.6		45.2
Emission Rate, lb/hr	14.3	1.7		8.0
Hydrogen chloride				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

*One or more values were less than the detection limit.

SECTION 11.3 VOC QUALITY CONTROL RESULTS

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

HYPO DECKER HOOD VENT (CL-BPHDHV)

THC Quality Control

(Concentrations in ppm)

Calibration

	4/28/92		4/29/92	
Theoretical	Found	% Error	Found	% Error
0	1	0.7	0	0.0
36	37	0.7	37	0.7
91	84	4.8	86	3.5
150	153	2.0	152	1.3
Correlation coefficient	0.9978		0.9990	

Line Study

Bag sample

4/29/92 Analyzer	Line	% Rec
152	146	96.1

Nitrogen Blank

4/29/92 Analyzer	Line	
-	1	a

a = Ambient air pulled down line.

HYPO DECKER HOOD VENT (CL-BPHDHV)
VOC Quality Control
(Concentrations in ppm)

Calibration

	4/28/92			4/29/92		
Analyte	**Theor**	**Check Std**	**% Rec**	**Theor**	**Check Std**	**% Rec**
Acetone	87.7	49.4	56.3	175.4	154.8	88.3
Isopropanol	84.1	86.4	102.7	168.2	171.6	102.0
Benzene	72.0	86.0	119.4	144.1	168.1	116.7
Bromodichloromethane	77.8	74.2	95.4	155.6	160.4	103.1
Toluene	60.6	59.2	97.7	121.2	111.8	92.2
Ethyl Benzene	52.6	52.9	100.6	105.2	93.5	88.9
p-Xylene	52.5	62.5	119.0	105.0	94.6	90.1
o-Xylene	52.8	52.1	98.7	105.5	91.1	86.4
Cumene	46.3	46.5	100.5	92.6	86.3	93.2
alpha-Pinene	40.4	40.5	100.2	80.8	74.9	92.7
beta-Pinene	40.6	43.5	107.2	81.2	74.8	92.1
3-Carene	40.6	43.3	106.5	81.3	75.0	92.3
p-Cymene	41.3	36.4	88.2	82.5	69.4	84.1

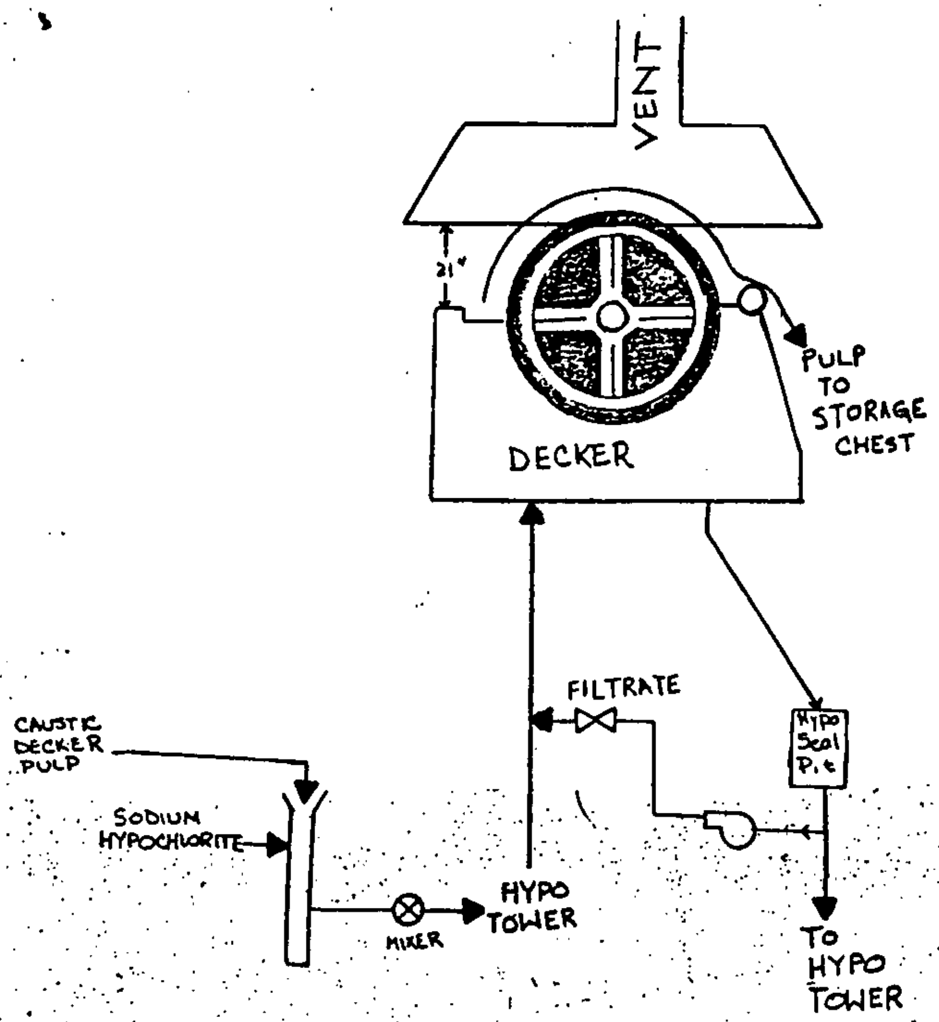
Nitrogen blank Not performed

Line Study		**GC**	**Line**	**% Rec**
Methanol	(100 ppm)			
	4/28/92	86.9	82.0	94.0
	(10 ppm)			
	4/29/92	7.9	7.1	89.9

SECTION 11.4 PROCESS DESCRIPTION AND OPERATING CONDITIONS

HYPO DECKER VENT
A Side

The bleach plant is divided into sides A and B producing 360 tons/day and 180 tons/day of pulp respectively. Pulp from the caustic stage decker flows to a standpipe where sodium hypochlorite is added. The pulp proceeds to a mixer then into the hypo tower. The pulp flows from the tower, is diluted with hypo seal pit filtrate, and proceeds to the decker. The decker's shower water is reclaimed cold water that was used on vacuum pumps. The system is vented through a pipe in the hood that overlaps the entire decker.



BLEACH PLANT
HYPO DECKER
BROWN STOCK HEADBOX

BLEACHING-SEQUENCE: CEH
WOOD SPECIES: SOFTWOOD - SOUTHERN PINE

PARAMETER	UNITS	RUN 1	RUN 2	RUN 3	RUN 4	RUN 5	RUN 6
DATE		4/28	4/28	4/28	4/29	4/29	4/29
START TIME		1144	1245	1345	1116	1218	1320
STOP TIME		1229	1330	1430	1201	1303	1405
PROD RATE	ADT/D	A 340 B 160	A 340 B 160	A 340 B 160	A 260 B 120	A 260 B 120	A 260 B 120
PN NUMBER		21.0	21.6	21.8	19.9	23.3	23.6
CL2 USAGE A	LB/HR	1826	1875	1929	1306	1350	1387
CL2 USAGE B	LB/HR	976	953	957	658	669	763.8
CAUS USAGE A	LB/HR	1077	1077	1077	671	671	650
CAUS USAGE B	LB/HR	427	427	427	280	280	280
HYPO USAGE A	LB/HR	712	679	718	476	476	520
HYPO USAGE B	LB/HR	248	255	235	160	160	170
CL2 TOW TEMP	F	89.4	82.8	81.9	80.0	86.0	85.0
CAU TOW TEMP	F	156.5	156.9	157.8	157.4	157.3	158.9
HYP TOW TEMP	F	129.7	129.4	130.2	126.7	126.7	127.6
CL2 RET TIME	MIN	27	27	27	35	35	35
CAU TOW LEVL	%	58.2	60.4	61.2	49.6	50.3	51.7
CAU DUMP CT	%	46.2	44.8	45.6	34.8	40.2	48.9
CAU RET TIME	MIN	35	36	36	38	38	39
HYP TOW LEVL	%	60.1	60.0	59.9	60.0	60.0	60.0
HYP RET TIME	MIN	146	146	146	191	191	191
CE PN NO.		5.4	5.6	5.4	5.1	5.4	5.8

NCASI: METHANOL, ACETONE, MEK, CHLOROFORM, ACETILE

BLEACH PLANT DIAGRAMS AND PROCESS INFORMATION

A. Bleaching Practice

The mill has two parallel bleach lines with CEH sequences which produce 500 ton/day bleached kraft softwood pulp to a final G.E. brightness of 70. During the tests, bleach plant 1 operated at a rate of 15 ton/hour and bleach plant 2 operated at a rate of 8 ton/hour. Figure 1 is a diagram of the bleaching process for both of these lines.

Table 1 shows the bleaching conditions for the two bleach plants during the testing. There was little difference between the bleach plant configurations other than capacity. The kappa number of the brownstock was 30 during run 1 and was 30 during run 2. Other than that, all conditions were the same for both runs.

Representative Process Conditions

Bleaching Sequence:	CEH
Wood Species:	Southern Pine
Production Rate:	500-540 T/D Total; 1=360max, 2=180max
Kappa Number:	PN 18-24
Chemical Usage (Cl_2, ClO_2, NaOH, NaOCl, O_2 in E Stage, pH in towers, etc.):	Cl_2, NaOH, NaOCL
Percent ClO_2 Substitution:	N/A
Tower Temperatures & Retention Times:	Cl_2, 74-95° F, 25-35 min NaOH, 157-159° F, 32-39 min NaOCL, 126-131° F, 146-221 min
CE Kappa Number:	CE PN 4.5-6.5

B. Water Reuse

Fresh water was used on all of the showers.

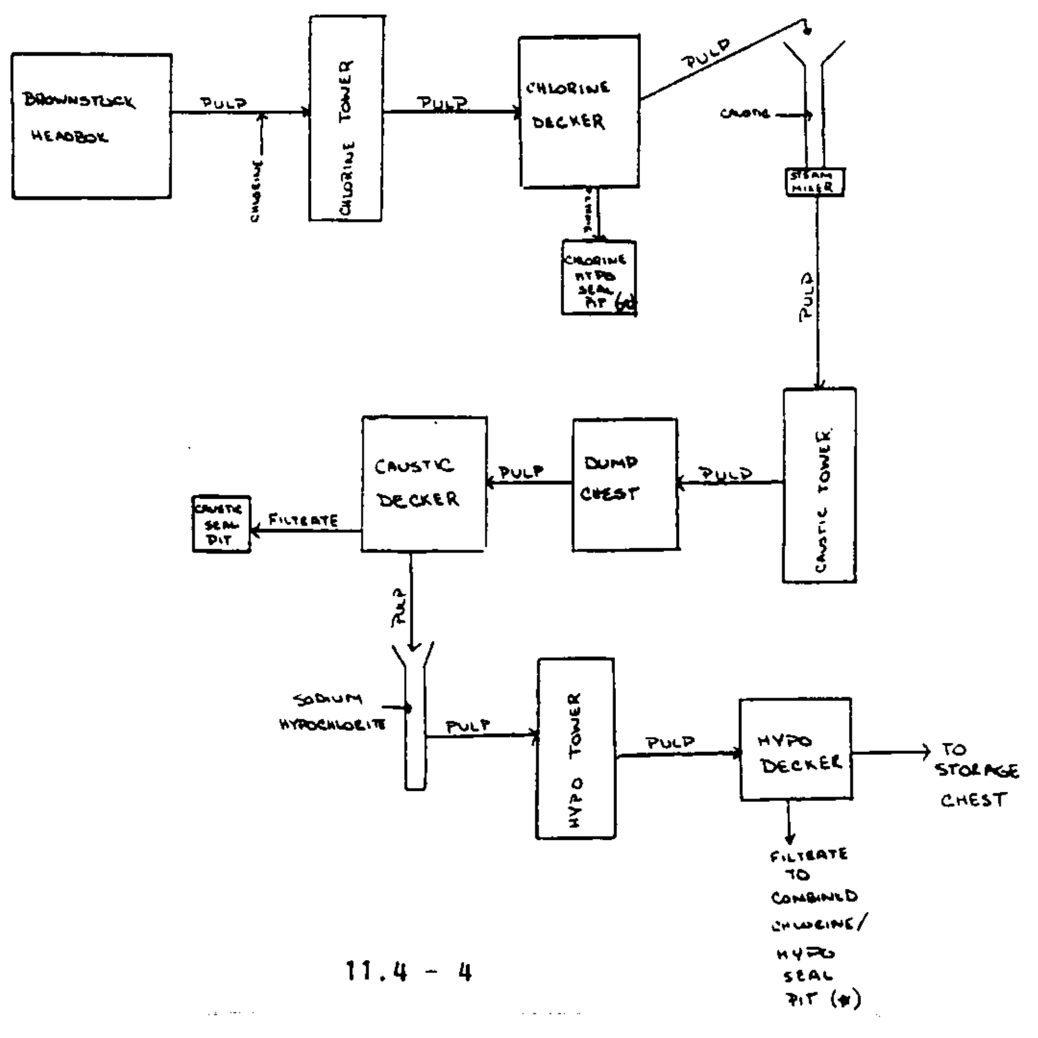
C. Bleach Plant Venting

Most of the vents from both bleach plants are vented to the atmosphere individually with no scrubbing. Figure 2 shows the location of various vents.

TABLE 2 BLEACHING CONDITIONS IN BLEACH PLANT 1

	C	E	H	D
Consistency, Percent	3.5	10	10	-
Temperature, °F	110	160	125	-
Time, Minutes	25	25	90	-
Chlorine, lb/ton odbs	130	-	-	-
Hypochlorite as Cl_2 lb/ton	-	-	44	-
Caustic, lb/ton	-	88	-	-
Peroxide, lb/ton	-	-	-	-
Chlorine Dioxide	-	-	-	-
Residual Chlorine, lb/ton	Trace	10.5	Trace	-
Vat pH	1.8	6.	9.5	-
K Number	-	-	-	-
Elrepho Brightness	-	-	70	-

Note: Bleach Plant 2 had the same conditions as Bleach Plant 1.



SECTION 12

CHLORINE/HYPO SEAL PIT VENT (A SIDE)

(CL-BPCLSP)

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SECTION 12
CHLORINE/HYPO SEAL PIT VENT (A SIDE)
(CL-BPCLSP)

The Chlorine/Hypo Seal Pit Vent (A Side) was tested on two different days for volatile organic compounds, chloroform, and hydrogen chloride. The adsorption tube sampling for chloroform was performed for comparison to the GC result.

Total Hydrocarbons (M25A)

Figures 12.1 and 12.2 present the THC trends for the test periods on 28 and 29 April 1992. The total hydrocarbon concentration was approximately 1100 ppm on the first day and 900 ppm on the second day. The concentration varied by as much as 30 percent over relatively short periods of time.

Volatile Organic Compounds (M18)

Table 12.1 summarizes the results for the Method 18 target compounds, and Section 12.1 is a tabulation of the data. TRS was not sampled. The volumetric flow was measured with a standard pitot tube.

Chloroform was the only volatile compound of significance that was detected in the sample. On the first day of sampling, it was necessary to change the M18 range in order to keep the chloroform in the linear range of the detector. This raised the detection limit of the other compounds by the same amount.

The measured volumetric flow associated with the Method 18 testing probably contributes to part of the variability. The velocity pressure varied between 0.01 and 0.02 inches of water (which is near the detection limit). The 23-inch diameter duct means that the volumetric flow measurement of 1200 cfm is almost at the detection limit.

Miscellaneous Parameters

Table 12.2 summarizes the results of testing for hydrogen chloride and chloroform. Section 12.2 tabulates the results for each compound. All chloroform results were comparable to the M18 data except one sample which was twice as high. The reason is unknown.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 12.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 12.4 includes the process operating data as recorded and provided by mill personnel. The Chlorine Seal Pit Vent represented the emissions from the A Side bleaching only.

FIGURE 12.1

THC TREND ANALYSIS (4/28/92)

CHLORINE/HYPO SEAL PIT VENT (CL-BPCLSP)

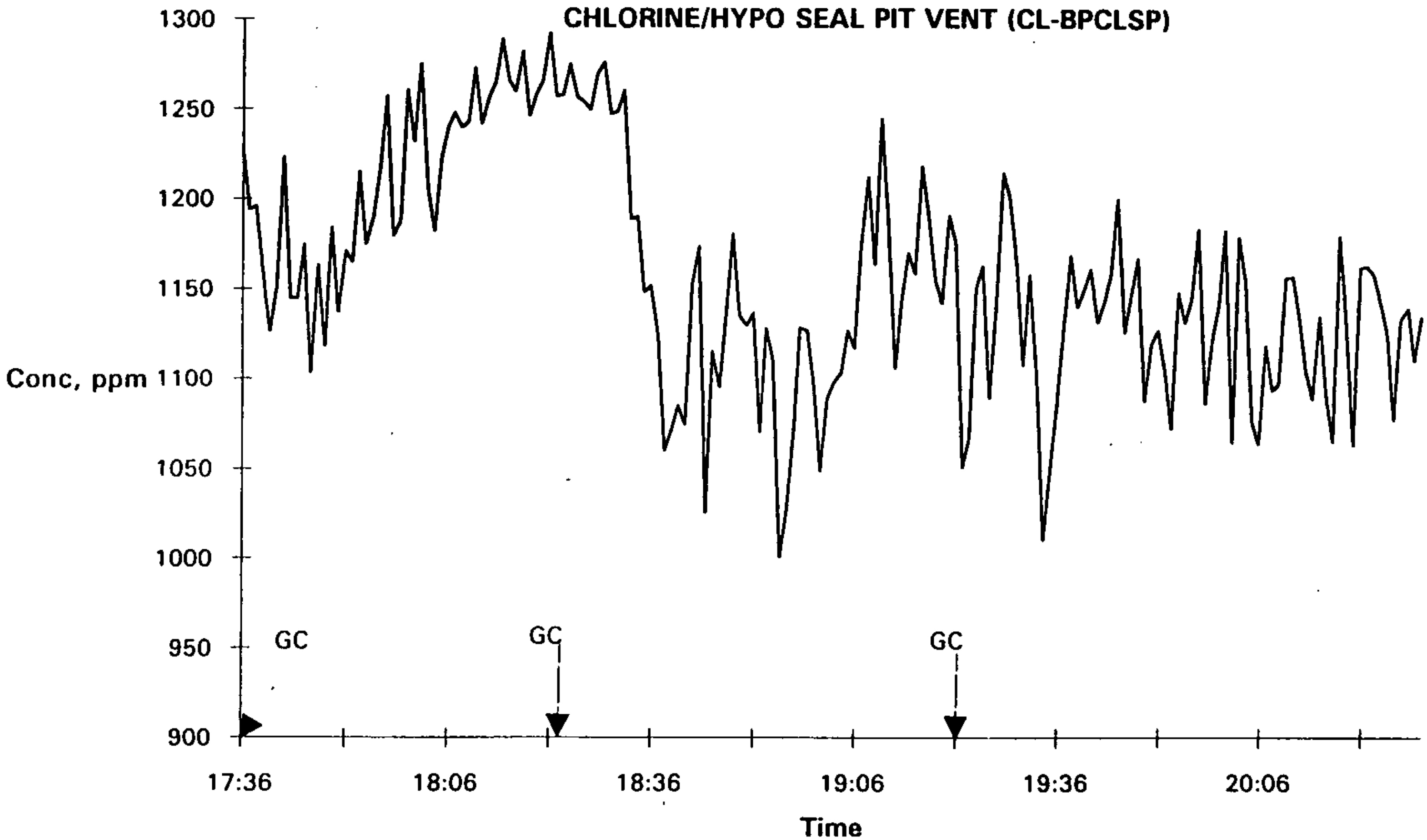

FIGURE 12.2

THC TREND ANALYSIS (4/29/92)

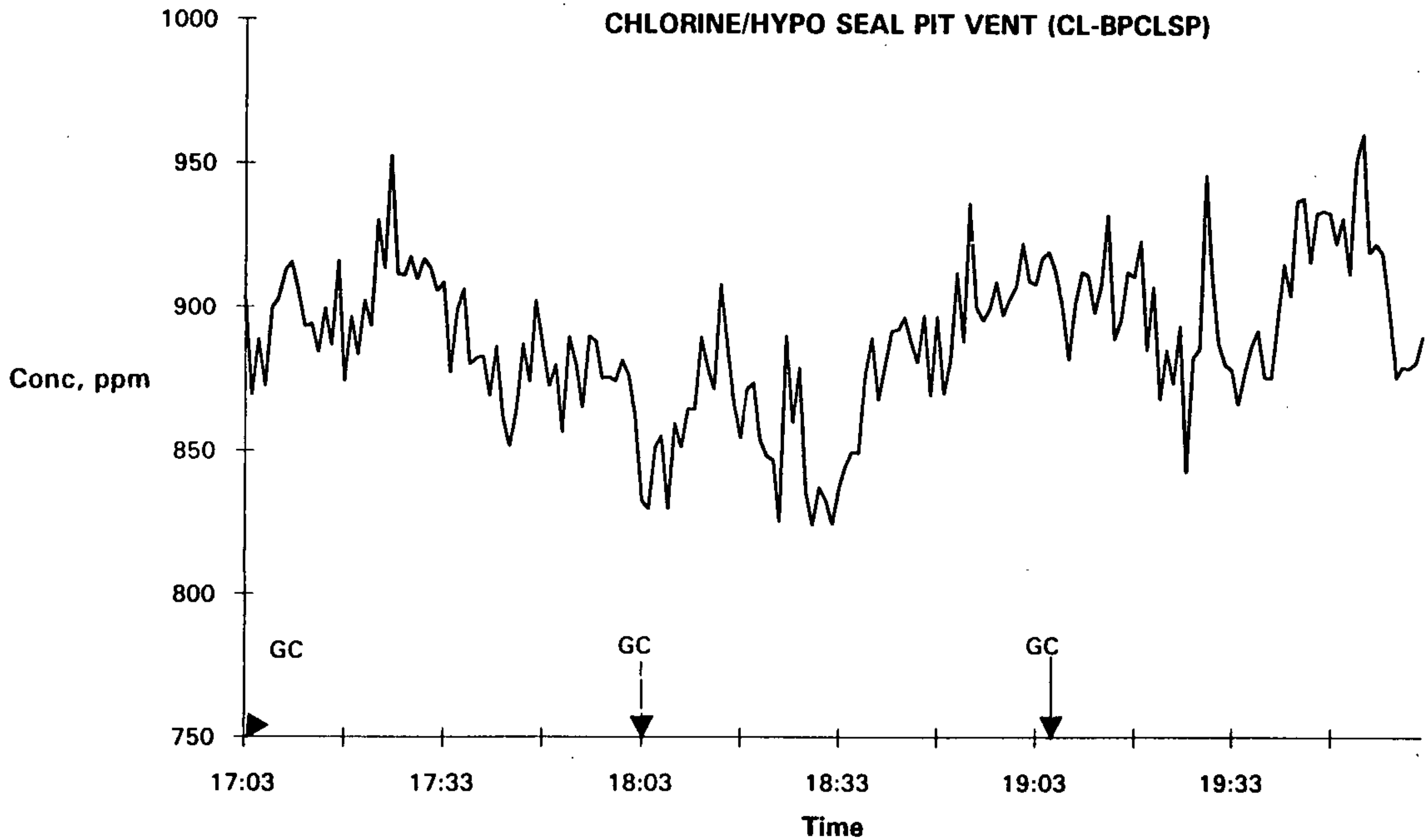

TABLE 12.1
SUMMARY OF VOC RESULTS

Mill: CHAMPION - LUFKIN | Source: Chlorine/Hypo Seal Pit Vent (1)
Source Code: CL-BPCLSP | Test Dates: 4/28/92 4/29/92
FIN: BLPT-1 CIN: | EPN: 12-7

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	107	107	107	
Volumetric Flow Rate, x10^3 DSCFM	1.2	1.2	1.2	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	10.8	14.2	12.5	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	ND	ND	ND	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	21.4	35.5	27.7	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	<0.1	0.1	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	0.3	0.1	0.1
Terpenes (Unspecified)	ND	ND	ND	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	1.7	3.0	2.2	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	1.7	3.0	2.2	0.1

ND=Not Detected
DL=Detection Limit

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TABLE 12.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: CHAMPION-LUFKIN
Source Code: CL-BPCLSP
FIN: BLPT-1 EPN: 12-7

Source: Chlorine/Hypo Seal Pit Vent (1)
Test Dates: 4/28/92 4/29/92
CIN: -

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	107	107	107	
Volumetric Flow Rate, x 10^3 DSCFM	1.2	1.2	1.2	
Process Operating Conditions				
Production Rate, ADT pulp/hr	10.8	14.2	12.5	
Emission Rate, lb/hr				
Chloroform	29.3	60.6	39.5	0.1
Hydrogen chloride	ND	<0.1	0.1	0.1

ND = Not Detected
DL = Detection Limit

SECTION 12.1 EMISSION TEST RESULTS - VOC

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Chlorine/Hypo Seal Pit Vent (1) | FIN: BLPT-1
Source Code: CL-BPCLSP | Date: 4/28/92 | EPN: 12-7 | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1735	1835	1935	
Flow Data				
Stack Temperature, °F	107			107
Moisture Content, %	8.0			8.0
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	1.4			1.4
Volumetric Flow Rate, x10^3 DSCFM	1.2			1.2
Process Operating Conditions				
Production Rate, ADT pulp/hr	14.2	14.2	14.2	14.2
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	17.4 *	17.4 *	17.4 *	17.4 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	4.3 *	4.3 *	4.3 *	4.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	4.3 *	4.3 *	4.3 *	4.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	4.3 *	4.3 *	4.3 *	4.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Chlorine/Hypo Seal Pit Vent (1) | FIN: BLPT-1
Source Code: CL-BPCLSP | Date: 4/28/92 | EPN: 12-7 | CIN:

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	4.3 *	4.3 *	4.3 *	4.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1561.5	1371.0	1330.7	1421.1
Emission Rate, lb/hr	35.5	31.1	30.2	32.3
Benzene				
Concentration, ppmvd	4.3 *	4.3 *	4.3 *	4.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	8.7 *	8.7 *	8.7 *	8.7 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	4.3 *	4.3 *	4.3 *	4.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	4.3 *	4.3 *	4.3 *	4.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	4.3 *	4.3 *	4.3 *	4.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	4.3 *	4.3 *	4.3 *	4.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	4.3 *	4.3 *	4.3 *	4.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	4.3 *	4.3 *	4.3 *	4.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	4.3 *	4.3 *	4.3 *	4.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	12.3	4.3	9.1	8.6
Emission Rate, lb/hr	0.3	0.1	0.2	0.2
Terpenes (Unspecified)				
Concentration, ppmvd	4.3 *	4.3 *	4.3 *	4.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN	Source:	Chlorine/Hypo Seal Pit Vent (1)		FIN:	BLPT-1
Source Code: CL-BPCLSP	Date:	4/28/92	EPN: 12-7	CIN:	-

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	4.3 *	4.3 *	4.3 *	4.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	1294.2	1087.8	1092.2	1158.1
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	3.0	2.5	2.5	2.7
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	1325.0	1222.8	1225.0	1257.6
Emission Rate, lb/hr as C	3.0	2.8	2.8	2.9

COMMENTS

Velocity data from 4/28/92 was used for 4/29/92.

Detection limits higher for 4/28/92 runs due to range change.

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill:	CHAMPION - LUFKIN	Source:	Chlorine/Hypo Seal Pit Vent (1)	FIN:	BLPT-1
Source Code:	CL-BPCLSP	Date:	4/29/92 EPN: 12-7	CIN:	

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1702	1802	1902	
Flow Data				
Stack Temperature, °F	107			107
Moisture Content, %	8.0			8.0
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	1.4			1.4
Volumetric Flow Rate, x10^3 DSCFM	1.2			1.2
Process Operating Conditions				
Production Rate, ADT pulp/hr	10.8	10.8	10.8	10.8
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	2.2 *	2.2 *	2.2 *	2.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN Source: Chlorine/Hypo Seal Pit Vent (1) FIN: BLPT-1
Source Code: CL-BPCLSP Date: 4/29/92 EPN: 12-7 CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 •
Chloroform				
Concentration, ppmvd	943.2	1033.8	1085.0	1020.7
Emission Rate, lb/hr	21.4	23.4	24.6	23.1
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.2	1.2	1.0
Emission Rate, lb/hr	0.1 •	0.1 *	0.1 •	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 •	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 •	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 •
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 •	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 •	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 •	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 •	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 •	0.5 •
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Chlorine/Hypo Seal Pit Vent (1) | FIN: BLPT-1
Source Code: CL-BPCLSP | Date: 4/29/92 EPN: 12-7 | CIN: -

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	734.9	805.4	840.5	793.6
Unknowns as Carbon				
Concentration, ppmvd	3.0	3.0	3.0	3.0
Sum M18 as Carbon, lb/hr	1.7	1.8	1.9	1.8
Unknown Compounds % of Total	0.4%	0.4%	0.4%	0.4%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	968.5	947.8	981.5	965.9
Emission Rate, lb/hr as C	2.2	2.2	2.2	2.2

COMMENTS

Velocity data from 4/28/92 was used for 4/29/92.

Detection limits higher for 4/28/92 runs due to range change.

* One or more values were less than the detection limit.

SECTION 12.2 EMISSION TEST RESULTS - MISCELLANEOUS

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - LUFKIN | Source: Chlorine/Hypo Seal Pit Vent (1) | FIN: BLPT-1
Source Code: CL-BPCLSP | Date: 4/28/92 | EPN: 12-7 | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1843	1929		
Flow Data				
Stack Temperature, °F	107			107
Moisture Content, %	8.0			8.0
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	1.4			1.4
Volumetric Flow Rate, x10^3 DSCFM	1.2			1.2
Process Operating Conditions				
Production Rate, ADT pulp/hr	14.2	14.2		14.2
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	2671.0	1289.0		1980.0
Emission Rate, lb/hr	60.6	29.3		45.0
Hydrogen chloride				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - LUFKIN   Source: Chlorine/Hypo Seal Pit Vent (1)   FIN: BLPT-1
Source Code: CL-BPCLSP   Date: 4/29/92   EPN: 12-7   CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1720	1816		
Flow Data				
Stack Temperature, °F	107			107
Moisture Content, %	8.0			8.0
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	1.4			1.4
Volumetric Flow Rate, x10^3 DSCFM	1.2			1.2
Process Operating Conditions				
Production Rate, ADT pulp/hr	10.8	10.8		10.8
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	1791.0	1589.0	1365.0	1581.7
Emission Rate, lb/hr	40.7	36.1	31.0	35.9
Hydrogen chloride				
Concentration, ppmvd	0.6			0.6
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

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SECTION 12.3 VOC QUALITY CONTROL RESULTS

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

CHLORINE/HYPO SEAL PIT VENT (CL-BPCLSP)
THC Quality Control
(Concentrations in ppm)

Calibration

Theoretical	4/28/92 Found	% Error	4/29/92 Found	% Error
0	0	0.0	-5	-0.2
150	155	0.2	144	-0.2
1506	1492	-0.6	1534	1.2
2433	2441	0.3	2415	-0.7
Correlation coefficient	>0.9999		0.9999	

Line Study

Bag sample
4/28/92

Analyzer	Line	% Rec
1499	1457	97.2

CHLORINE/HYPO SEAL PIT VENT (CL-BPCLSP)

VOC Quality Control

(Concentrations in ppm)

Calibration

Analyte	Theor	4/28/92 Check Std	% Rec
Acetone	87.7	72.8	83.0
Isopropanol	84.1	65.4	77.8
Benzene	72.0	73.2	101.6
Bromodichloromethane	77.8	56.8	73.0
Toluene	60.6	57.7	95.2
Ethyl Benzene	52.6	56.0	106.5
p-Xylene	52.5	65.7	125.1
o-Xylene	52.8	57.2	108.4
Cumene	46.3	48.4	104.6
alpha-Pinene	40.4	39.7	98.3
beta-Pinene	40.6	42.9	105.7
3-Carene	40.6	57.3	141.0
p-Cymene	41.3	43.5	105.5

Analyte	Theor	4/29/92 Check Std	% Rec
Acetone	175.4	152.9	87.2
Isopropanol	168.2	192.9	114.7
Benzene	144.1	179.2	124.4
Bromodichloromethane	155.6	171.0	109.9
Toluene	121.2	122.3	100.9
Ethyl Benzene	105.2	93.8	89.2
p-Xylene	105.0	93.2	88.8
o-Xylene	105.5	95.3	90.3
Cumene	92.6	94.2	101.7
alpha-Pinene	80.8	81.9	101.4
beta-Pinene	81.2	81.4	100.2
3-Carene	81.3	82.3	101.2
p-Cymene	82.5	77.1	93.5

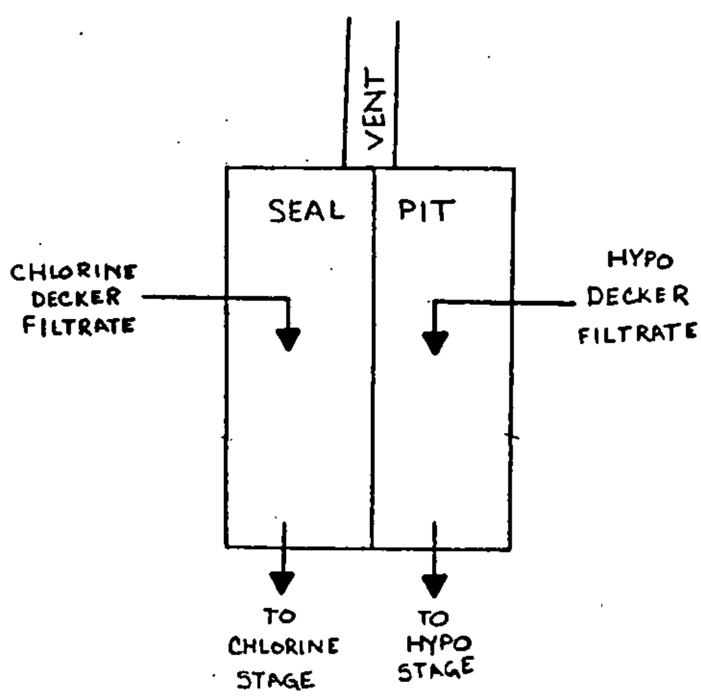
Nitrogen blank — Not performed

Line Study	GC	Line	% Rec
Methanol (100 ppm)			
4/28/92	86.9	82.0	94.4
Chloroform (300 ppm)			
4/28/92	256.0	215.9	84.3

SECTION 12.4 PROCESS DESCRIPTION AND OPERATING CONDITIONS

CHLORINE/HYPO SEAL PIT
A Side

The bleach plant is divided into sides A and B producing 360 tons/day and 180 tons/day of pulp respectively. The seal pit is divided into two sides sending the overflow to the sewer. The chlorine decker filtrate which includes the hot shower water and recycled chlorine seal pit filtrate, enters one side of the seal pit. The chlorine seal pit filtrate is used for dilution at the brownstock headbox, with the pulp and chlorine gas before the mixer, and for pulp discharged from the tower to the deckers. The hypo decker filtrate which includes cold shower water and the recycled hypo seal pit filtrate, enters the other side of the seal pit. The hypo seal pit filtrate is then used for dilution in the hypo tower and for the pulp discharged from the tower to the deckers. The system is vented through a pipe in the top of the covered pit.



BLEACH PLANT
CL2 SEAL PIT
CAUSTIC SEAL PIT

BLEACHING SEQUENCE: CEH
WOOD SPECIES: SOFTWOOD - SOUTHERN PINE

PARAMETER	UNITS	RUN 1	RUN 2	RUN 3	RUN 4	RUN 5	RUN 6
DATE		4/28	4/28	4/28	4/29	4/29	4/29
START TIME		1722	1822	1921	1652	1803	1905
STOP TIME		1807	1907	2006	1737	1848	1950
BLEACHED PULP PROD RATE	ADT/D	A 340 B 160	A 340 B 160	A 340 B 160	A 260 B 120	A 260 B 120	A 260 B 120
PN NUMBER		21.8	21.8	18.5	22.1	23.3	23.8
CL2 USAGE A	LB/HR	1833.5	1743.7	1684.0	1405.2	1434.6	1543.9
CL2 USAGE B	LB/HR	991.0	994.3	901.5	781.2	749.8	764.9
CAUS USAGE A	LB/HR	1077	1077	1077	693	715	715
CAUS USAGE B	LB/HR	427	427	455	300	300	300
HYPO USAGE A	LB/HR	679	679	679	520	498	498
HYPO USAGE B	LB/HR	240	254	227	160	160	150
CL2 TOW TEMP	F	86.3	83.8	81.2	80.0	77.6	78.3
CAU TOW TEMP	F	157.4	157.7	158.2	158.3	157.8	158.6
HYP TOW TEMP	F	130.7	130.3	130.2	126.6	126.4	126.6
CL2 RET TIME	MIN	27	27	27	35	35	35
CAU TOW LEVL	%	56.0	57.3	55.0	42.5	40.9	45.7
CAU DUMP CT	%	42.9	44.9	43.5	50.2	50.5	35.7
CAU RET TIME	MIN	34	34	33	34	33	35
HYP TOW LEVL	%	60.0	60.0	60.0	60.0	60.0	60.0
HYP RET TIME	MIN	146	146	146	191	191	191
CE PN NO.		5.9	5.8	6.1	4.7	5.5	4.6

NOTE: CHANGE CL2 TANK CAR IN RUN 2. SWING IN CHLORINE USAGE
CL2 STOCK TEMP: 108 F
NCASI: METHANOL, ACETONE, MEK, CHLOROFORM, ACETILE

BLEACH PLANT DIAGRAMS AND PROCESS INFORMATION

A. Bleaching Practice

The mill has two parallel bleach lines with CEH sequences which produce 500 ton/day bleached kraft softwood pulp to a final G.E. brightness of 70. During the tests, bleach plant 1 operated at a rate of 15 ton/hour and bleach plant 2 operated at a rate of 8 ton/hour. Figure 1 is a diagram of the bleaching process for both of these lines.

Table 1 shows the bleaching conditions for the two bleach plants during the testing. There was little difference between the bleach plant configurations other than capacity. The kappa number of the brownstock was 30 during run 1 and was 30 during run 2. Other than that, all conditions were the same for both runs.

Representative Process Conditions

Bleaching Sequence:	CEH
Wood Species:	Southern Pine
Production Rate:	500-540 T/D Total; 1=360max, 2=180max
Kappa Number:	PN 18-24
Chemical Usage (Cl_2, ClO_2, NaOH, NaOCl, O_2 in E Stage, pH in towers, etc.):	Cl_2, NaOH, NaOCL
Percent ClO_2 Substitution:	N/A
Tower Temperatures & Retention Times:	Cl_2, 74-95° F, 25-35 min NaOH, 157-159° F, 32-39 min NaOCL, 126-131° F, 146-221 min
CE Kappa Number:	CE PN 4.5-6.5

B. Water Reuse

Fresh water was used on all of the showers.

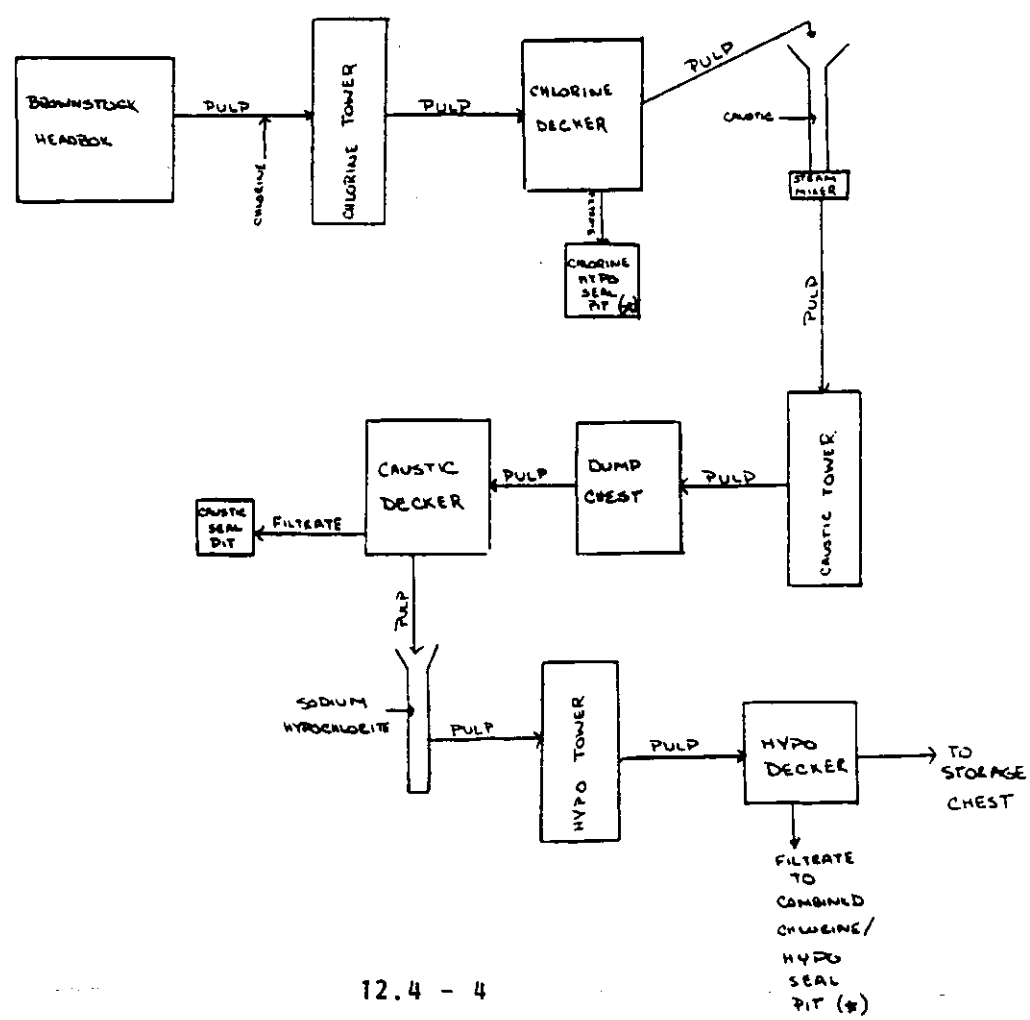
C. Bleach Plant Venting

Most of the vents from both bleach plants are vented to the atmosphere individually with no scrubbing. Figure 2 shows the location of various vents.

TABLE 2 BLEACHING CONDITIONS IN BLEACH PLANT 1

	C	E	H	D
Consistency, Percent	3.5	10	10	-
Temperature, °F	110	160	125	-
Time, Minutes	25	25	90	-
Chlorine, lb/ton odbs	130	-	-	-
Hypochlorite as Cl_2 lb/ton	-	-	44	-
Caustic, lb/ton	-	88	-	-
Peroxide, lb/ton	-	-	-	-
Chlorine Dioxide	-	-	-	-
Residual Chlorine, lb/ton	Trace	10.5	Trace	-
Vat pH	1.8	6.	9.5	-
K Number	-	-	-	-
Elrepho Brightness	-	-	70	-

Note: Bleach Plant 2 had the same conditions as Bleach Plant 1.



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SECTION 13
CAUSTIC TOWER VENT (A SIDE)
(CL-BPCTV)

13. CL-BPCTV

WESTON

SECTION 13
CAUSTIC TOWER VENT (A SIDE)
(CL-BPCTV)

The Caustic Tower Vent (A Side) was tested on two different days for volatile organic compounds, chloroform, and hydrogen chloride. The adsorption tube sampling for chloroform provided a comparison to the result obtained by the M18 GC.

Total Hydrocarbons (M25A)

Figures 13.1 and 13.2 present the THC trends for the test periods on 25 and 27 April 1992. The total hydrocarbon concentration fluctuated over a relatively short range during both days of sampling. A slight downward trend in concentration was noted on both days.

Volatile Organic Compounds (M18)

Table 13.1 summarizes the results for the Method 18 target compounds, and Section 13.1 is a tabulation of the data. TRS was not analyzed. The volumetric flow rate was measured using a standard pitot tube.

The major VOCs identified in the M18 sampling were methanol and chloroform. A trace of 2-propanol was observed in one of the samples. M18 samples two and three on 25 April were not valid. It appears that the injector malfunctioned and the retention times of the compounds were not consistent with the other runs.

Unknown compounds were consistently measured which eluded approximately 0.3 minutes before methanol and approximately 4 minutes before alpha-pinene. The sum of the unknown concentrations were less than five ppm as carbon.

The measured velocity pressure was near the detection limit (0.02 in. H_2O). The flow in the 18-inch duct was calculated based on values at the detection limit.

Miscellaneous Parameters

Table 13.2 summarizes the results of testing for hydrogen chloride and chloroform. Section 13.2 tabulates the results for each compound. Chloroform adsorption tube samples were analyzed on both days. The results were relatively constant at approximately 70 ppm chloroform.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 13.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 13.4 includes the process operating data as recorded and provided by mill personnel. The Caustic Tower Vent represented the emissions from the A Side bleaching only.

FIGURE 13.1

THC TREND ANALYSIS (4/25/92)

CAUSTIC TOWER VENT (CL-BPCTV)

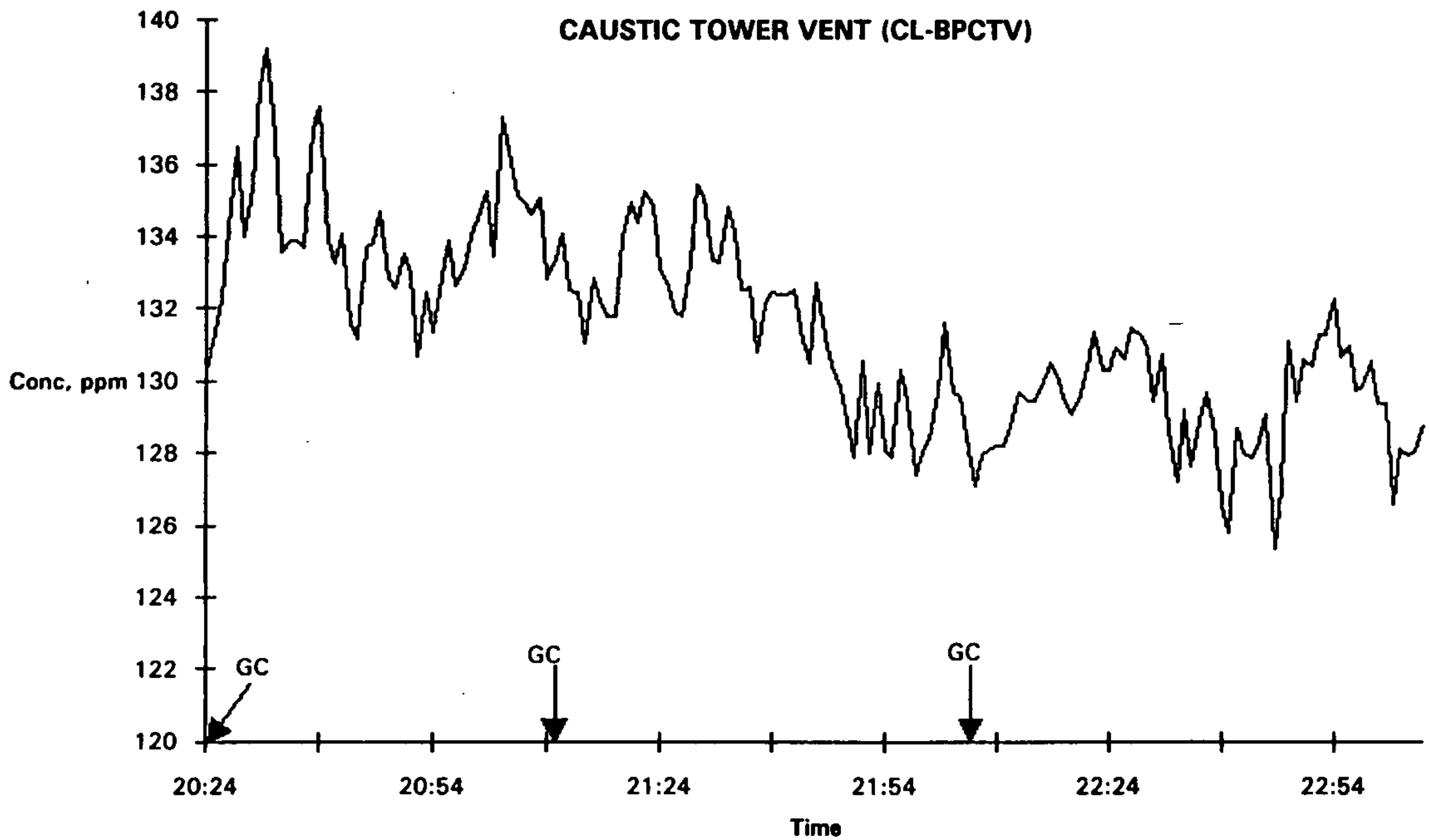

FIGURE 13.2
THC TREND ANALYSIS (4/27/92)
CAUSTIC TOWER VENT (CL-BPCTV)

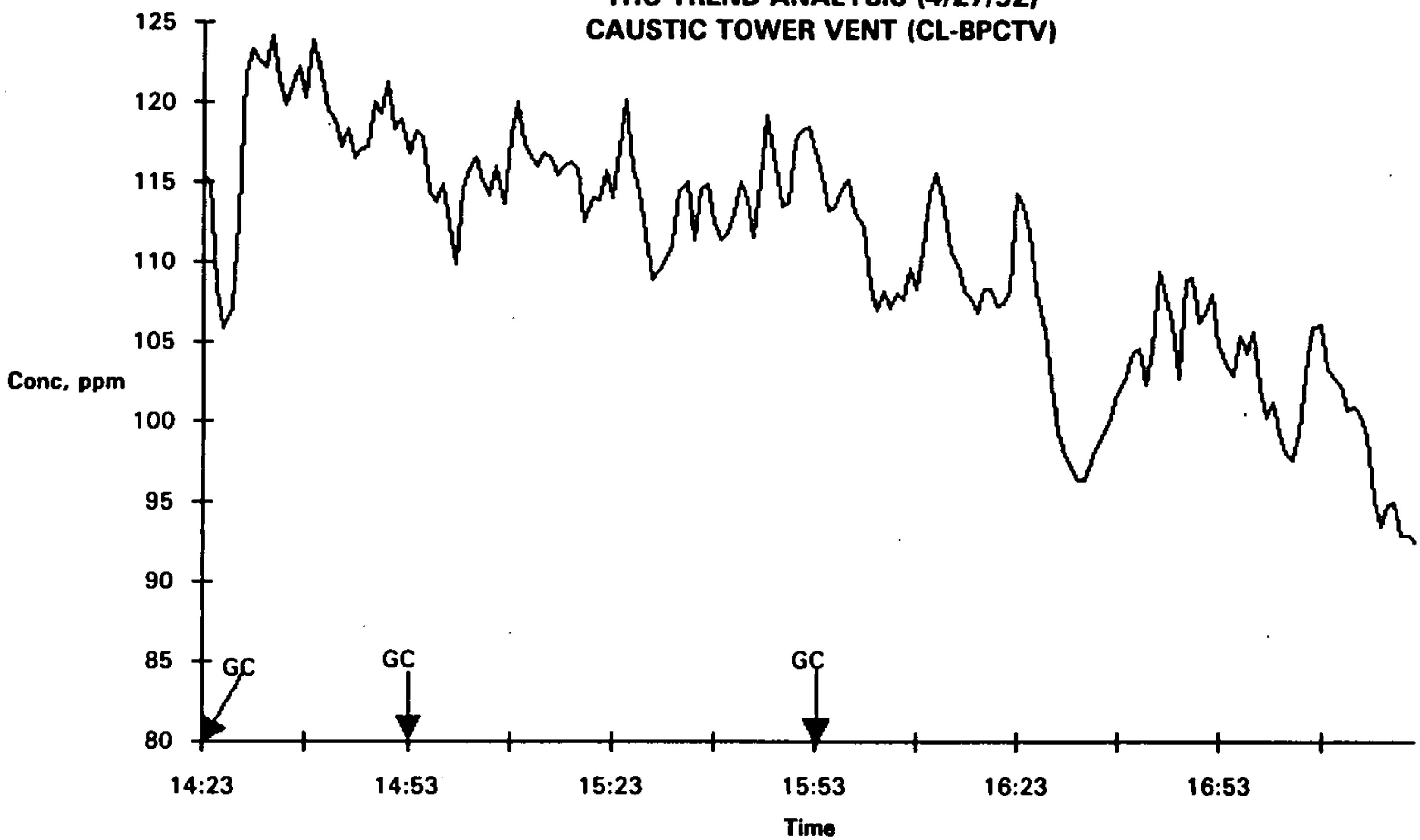

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TABLE 13.1
SUMMARY OF VOC RESULTS

Mill: CHAMPION - LUFKIN
Source Code: CL-BPCTV
FIN: BLPT-1 CIN:

Source: Caustic Tower Vent
Test Dates: 4/25/92 4/27/92
EPN: 12-1

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	138	145	142	
Volumetric Flow Rate, x10³ DSCFM	0.7	1.1	0.9	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	11.7	14.2	13.2	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	0.4	0.4	0.4	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	<0.1	<0.1	0.1	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	0.6	0.8	0.7	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	ND	ND	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	0.2	0.2	0.2	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	0.2	0.2	0.2	0.1

ND=Not Detected
DL=Detection Limit

TABLE 13.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: CHAMPION-LUFKIN
Source Code: CL-BPCTV
FIN: BLPT-1 EPN: 12-1

Source: Caustic Tower Vent
Test Dates: 4/25/92 4/27/92
CIN:

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	138	145	142	
Volumetric Flow Rate, x 10^3 DSCFM	0.7	1.1	0.9	
Process Operating Conditions				
Production Rate, ADT pulp/hr	11.7	14.2	13.0	
Emission Rate, lb/hr				
Chloroform	0.8	1.3	1.1	0.1
Hydrogen chloride	ND	<0.1	0.1	0.1

ND = Not Detected
DL = Detection Limit

SECTION 13.1 EMISSION TEST RESULTS - VOC

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN Source: Caustic Tower Vent FIN: BLPT-1
Source Code: CL-BPCTV Date: 4/25/92 EPN: 12-1 CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	2023	2123	2223	
Flow Data				
Stack Temperature, °F	145	142		144
Moisture Content, %	19.9	19.9		19.9
Oxygen Concentration, %	20.8	20.8		20.8
Carbon Dioxide Concentration, %	0.0	0.0		0.0
Volumetric Flow Rate, x10^3 ACFM	1.0	1.2		1.1
Volumetric Flow Rate, x10^3 DSCFM	0.7	0.8		0.8
Process Operating Conditions				
Production Rate, ADT pulp/hr	14.2	14.2	14.2	14.2
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	111.5			111.5
Emission Rate, lb/hr	0.4			0.4
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *			0.6 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acetone				
Concentration, ppmvd	0.6 *			0.6 *
Emission Rate, lb/hr	0.1 *			0.1 *
2-Propanol				
Concentration, ppmvd	2.1			2.1
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Caustic Tower Vent | FIN: BLPT-1
Source Code: CL-BPCTV | Date: 4/25/92 | EPN: 12-1 | CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *			0.6 *
Emission Rate, lb/hr	0.1 *			0.1 *
Chloroform				
Concentration, ppmvd	44.3			44.3
Emission Rate, lb/hr	0.6			0.6
Benzene				
Concentration, ppmvd	0.6 *			0.6 *
Emission Rate, lb/hr	0.1 •			0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.2 *			1.2 *
Emission Rate, lb/hr	0.1 *			0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *			0.6 *
Emission Rate, lb/hr	0.1 •			0.1 *
Ethyl benzene				
Concentration, ppmvd	0.6 *			0.6 *
Emission Rate, lb/hr	0.1 *			0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *			0.6 *
Emission Rate, lb/hr	0.1 *			0.1 *
o-Xylene				
Concentration, ppmvd	0.6 *			0.6 *
Emission Rate, lb/hr	0.1 •			0.1 *
Cumene				
Concentration, ppmvd	0.6 *			0.6 *
Emission Rate, lb/hr	0.1 *			0.1 *
alpha-Pinene				
Concentration, ppmvd	0.6 •			0.6 *
Emission Rate, lb/hr	0.1 *			0.1 *
beta-Pinene				
Concentration, ppmvd	0.6 *			0.6 *
Emission Rate, lb/hr	0.1 *			0.1 *
3-Carene				
Concentration, ppmvd	0.6 *			0.6 *
Emission Rate, lb/hr	0.1 *			0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 *			0.6 *
Emission Rate, lb/hr	0.1 •			0.1 *

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN	Source:	Caustic Tower Vent		FIN:	BLPT-1
Source Code: CL-BPCTV	Date:	4/25/92	EPN: 12-1	CIN:	-

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *			0.6 *
Emission Rate, lb/hr	0.1 *			0.1 *
Knowns as Carbon				
Concentration, ppmvd	114.0			114.0
Unknowns as Carbon				
Concentration, ppmvd	3.2			3.2
Sum M18 as Carbon, lb/hr	0.2			0.2
Unknown Compounds % of Total	2.8%			2.8%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	167.3	163.5	161.0	164.0
Emission Rate, lb/hr as C	0.2	0.2	0.2	0.2

COMMENTS

M18 data for runs 2 and 3 on 4/25/92 were rejected because not consistent with other GC injections.

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Caustic Tower Vent | FIN: BLPT-1
Source Code: CL-BPCTV | Date: 4/27/92 | EPN: 12-1 | CIN:

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1422	1522	1622	
Flow Data				
Stack Temperature, °F	138	142		140
Moisture Content, %	18.8	20.8		19.8
Oxygen Concentration, %	20.8	20.8		20.8
Carbon Dioxide Concentration, %	0.0	0.0		0.0
Volumetric Flow Rate, x10^3 ACFM	1.5	1.3		1.4
Volumetric Flow Rate, x10^3 DSCFM	1.1	0.9		1.0
Process Operating Conditions				
Production Rate, ADT pulp/hr	12.5	12.5	11.7	12.2
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	91.9	90.1	87.9	90.0
Emission Rate, lb/hr	0.4	0.4	0.4	0.4
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	2.4	0.6	0.7	1.2
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill:	CHAMPION - LUFKIN	Source:	Caustic Tower Vent		FIN:	BLPT-1
Source Code:	CL-BPCTV	Date:	4/27/92	EPN: 12-1	CIN:	-

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	39.7	42.1	39.5	40.4
Emission Rate, lb/hr	0.7	0.8	0.7	0.7
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.2 *	1.2 *	1.2 *	1.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Caustic Tower Vent | FIN: BLPT-1
Source Code: CL-BPCTV | Date: 4/27/92 EPN: 12-1 | CIN: -

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	94.3	93.5	88.8	92.2
Unknowns as Carbon				
Concentration, ppmvd	1.4	2.9	2.6	2.3
Sum M18 as Carbon, lb/hr	0.2	0.2	0.2	0.2
Unknown Compounds % of Total	1.4%	3.0%	2.9%	2.4%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	145.9	139.7	127.2	137.6
Emission Rate, lb/hr as C	0.3	0.3	0.2	0.2

COMMENTS

M18 data for runs 2 and 3 on 4/25/92 were rejected because not consistent with other GC injections.

* One or more values were less than the detection limit.

SECTION 13.2 EMISSION TEST RESULTS - MISCELLANEOUS

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - LUFKIN	Source:	Caustic Tower Vent		FIN:	BLPT-1
Source Code: CL-BPCTV	Date:	4/25/92	EPN: 12-1	CIN:	-

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	2023	2123		
Flow Data				
Stack Temperature, °F	145	142		144
Moisture Content, %	19.9	19.9		19.9
Oxygen Concentration, %	20.8	20.8		20.8
Carbon Dioxide Concentration, %	0.0	0.0		0.0
Volumetric Flow Rate, x10^3 ACFM	1.0	1.2		1.1
Volumetric Flow Rate, x10^3 DSCFM	0.7	0.8		0.8
Process Operating Conditions				
Production Rate, ADT pulp/hr	14.2	14.2		14.2
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	73.2	55.8		64.5
Emission Rate, lb/hr	1.0	0.8		0.9
Hydrogen chloride				
Concentration, ppmvd	3.2			3.2
Emission Rate, lb/hr	0.1 *			0.1 *

13.2 - 1

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - LUFKIN | Source: Caustic Tower Vent | FIN: BLPT-1
Source Code: CL-BPCTV | Date: 4/27/92 | EPN: 12-1 | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1422	1522	1622	
Flow Data				
Stack Temperature, °F	138	142		140
Moisture Content, %	18.8	20.8		19.8
Oxygen Concentration, %	20.8	20.8		20.8
Carbon Dioxide Concentration, %	0.0	0.0		0.0
Volumetric Flow Rate, x10^3 ACFM	1.5	1.3		1.4
Volumetric Flow Rate, x10^3 DSCFM	1.1	0.9		1.0
Process Operating Conditions				
Production Rate, ADT pulp/hr	12.5	12.5	11.7	12.2
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	73.1	71.7	72.9	72.6
Emission Rate, lb/hr	1.3	1.3	1.3	1.3
Hydrogen chloride				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

*One or more values were less than the detection limit.

SECTION 13.3 VOC QUALITY CONTROL RESULTS

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

CAUSTIC TOWER VENT (CL-BPCTV)

THC Quality Control
(Concentrations in ppm)

Calibration

Theoretical	4/25/92 Found	% Rec		4/27/92 Found	% Rec	
0	-4		a	0	0.0	
36	40	111.1	a	36	100.0	
91	94	103.3		86	94.5	a
150	146	97.3	a	151	100.7	
Correlation coefficient	0.9974			0.9993		

a = Calibration exceeded the 2% specification in EPA Method 25A

Blank See 0 ppm std

Line Study

Bag sample

Analyzer	Line	4/27/92 %Rec
150	147	98.0

CAUSTIC TOWER VENT (CL-BPCTV)
VOC Quality Control
(Concentrations in ppm)

Calibration

Analyte	Theoretical	4/25/92 Check Std	% Rec
Acetone	87.7	66.3	75.6
Isopropanol	84.1	69.6	82.8
Benzene	72.0	104.2	144.6
Bromodichloromethane	77.8	80.6	103.6
Toluene	60.6	96.6	159.5
Ethyl Benzene	52.6	46.5	88.5
p-Xylene	52.5	46.4	88.4
o-Xylene	52.8	45.7	86.6
Cumene	46.3	41.4	89.5
alpha-Pinene	40.4	36.8	91.1
beta-Pinene	40.6	37.8	93.1
3-Carene	40.6	36.6	90.1
p-Cymene	41.3	33.1	80.2

Nitrogen blank
4/25/92 Not performed
4/27/92 Not performed

Line Study		GC	Line	% Rec
Methanol	(100 ppm)			
	4/25/92	Not performed	Not performed	
	4/27/92	Not performed	Not performed	

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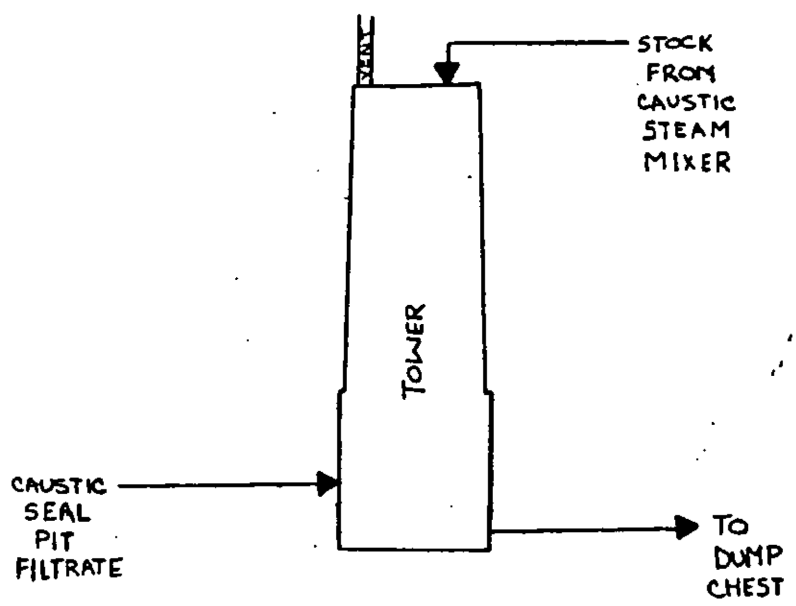
SECTION 13.4 PROCESS DESCRIPTION AND OPERATING CONDITIONS

CAUSTIC TOWER
A Side

The bleach plant is divided into sides A and B producing 360 tons/day and 180 tons/day of pulp respectively. Pulp moves from the caustic steam mixer where caustic and steam have been added. It empties into the caustic tower and becomes diluted with caustic seal pit filtrate. The pulp is discharged from the tower to a dump chest and then pumped and further diluted with caustic seal pit filtrate and proceeds to the decker. The decker's shower water is reclaimed hot water that was used on vacuum pumps and then passed through a heat exchanger. The system is vented through a pipe in the top of the covered tower.



BLEACH PLANT
CAUSTIC STEAM MIXER
CAUSTIC TOWER

BLEACHING SEQUENCE: CEH
WOOD SPECIES: SOFTWOOD - SOUTHERN PINE

PARAMETER	UNITS	RUN 1	RUN 2	RUN 3	RUN 4	RUN 5	RUN 6
DATE		4/25	4/25	4/25	4/27	4/27	4/27
START TIME		2013	2110	2205	1352	1453	1553
STOP TIME		2058	2155	2250	1437	1538	1638
BLEACHED PULP PROD RATE	ADT/D	A 340 B 180	A 340 B 180	A 340 B 180	A 300 B 120	A 300 B 120	A 280 B 120
PN NUMBER		20.9	20.9	21.8	22.1	22.2	21.5
CL2 USAGE A	LB/HR	1784	1733	1716	1742	1668	1560
CL2 USAGE B	LB/HR	959.1	907.3	916.0	801.0	776.5	684.7
CAUS USAGE A	LB/HR	1161	1161	1133	925	925	863
CAUS USAGE B	LB/HR	540	540	525	320	320	320
HYPO USAGE A	LB/HR	651	651	679	625	625	583
HYPO USAGE B	LB/HR	390	360	360	190	180	200
CL2 TEMP	F	78.2	75.7	73.6	80.2	81.8	94.9
CAU TOW TEMP	F	158.6	158.3	158.8	158.1	157.7	158.8
HYP TOW TEMP	F	130.6	130.4	130.2	128.6	128.5	128.7
CL2 RET TIME	MIN	27	27	27	31	31	33
CAU TOW LEVL	%	53	53	54	48.7	48.0	47.0
CAU DUMP CT	%	44	45	44	45.1	45.0	43.0
CAU RET TIME	MIN	32	32	32	32	32	33
HYP TOW LEVL	%	60.0	60.0	60.0	60.0	60.0	60.0
HYP RET TIME	MIN	184	184	184	207	207	221
CE PN NO.		5.2	4.8	5.5	6.3	5.7	5.4

CL2 STOCK TEMP : 108 F

BLEACH PLANT DIAGRAMS AND PROCESS INFORMATION

A. Bleaching Practice

The mill has two parallel bleach lines with CEH sequences which produce 500 ton/day bleached kraft softwood pulp to a final G.E. brightness of 70. During the tests, bleach plant 1 operated at a rate of 15 ton/hour and bleach plant 2 operated at a rate of 8 ton/hour. Figure 1 is a diagram of the bleaching process for both of these lines.

Table 1 shows the bleaching conditions for the two bleach plants during the testing. There was little difference between the bleach plant configurations other than capacity. The kappa number of the brownstock was 30 during run 1 and was 30 during run 2. Other than that, all conditions were the same for both runs.

Representative Process Conditions

Bleaching Sequence:	CEH
Wood Species:	Southern Pine
Production Rate:	500-540 T/D Total; 1=360max, 2=180max
Kappa Number:	PN 18-24
Chemical Usage (Cl_2, ClO_2, NaOH, NaOCl, O_2 in E Stage, pH in towers, etc.):	Cl_2, NaOH, NaOCL
Percent ClO_2 Substitution:	N/A
Tower Temperatures & Retention Times:	Cl_2, 74-95° F, 25-35 min NaOH, 157-159° F, 32-39 min NaOCL, 126-131° F, 146-221 min
CE Kappa Number:	CE PN 4.5-6.5

B. Water Reuse

Fresh water was used on all of the showers.

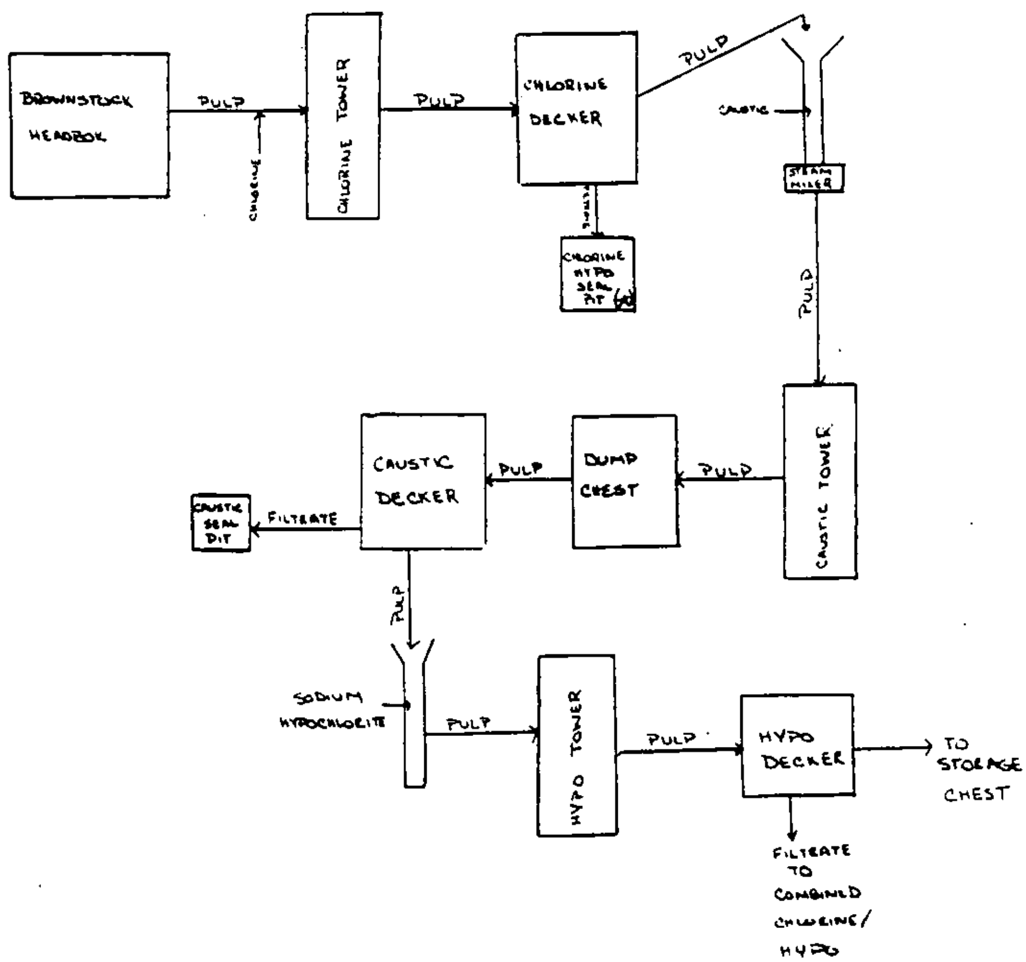
C. Bleach Plant Venting

Most of the vents from both bleach plants are vented to the atmosphere individually with no scrubbing. Figure 2 shows the location of various vents.

TABLE 2 BLEACHING CONDITIONS IN BLEACH PLANT 1

	C	E	H	D
Consistency, Percent	3.5	10	10	-
Temperature, °F	110	160	125	-
Time, Minutes	25	25	90	-
Chlorine, lb/ton odbs	130	-	-	-
Hypochlorite as Cl_2 lb/ton	-	-	44	-
Caustic, lb/ton	-	88	-	-
Peroxide, lb/ton	-	-	-	-
Chlorine Dioxide	-	-	-	-
Residual Chlorine, lb/ton	Trace	10.5	Trace	-
Vat pH	1.8	6.	9.5	-
K Number	-	-	-	-
Elrepho Brightness	-	-	70	-

Note: Bleach Plant 2 had the same conditions as Bleach Plant 1.



SECTION 14

CAUSTIC SEAL PIT VENT (A & B SIDES)

(CL-BPCSPV)

14. CL-BPCSPV

SECTION 14.1 EMISSION TEST RESULTS - VOC

FIGURE 14.1
THC TREND ANALYSIS (4/28/92)

CAUSTIC SEAL PIT VENT (CL-BPCSPV)

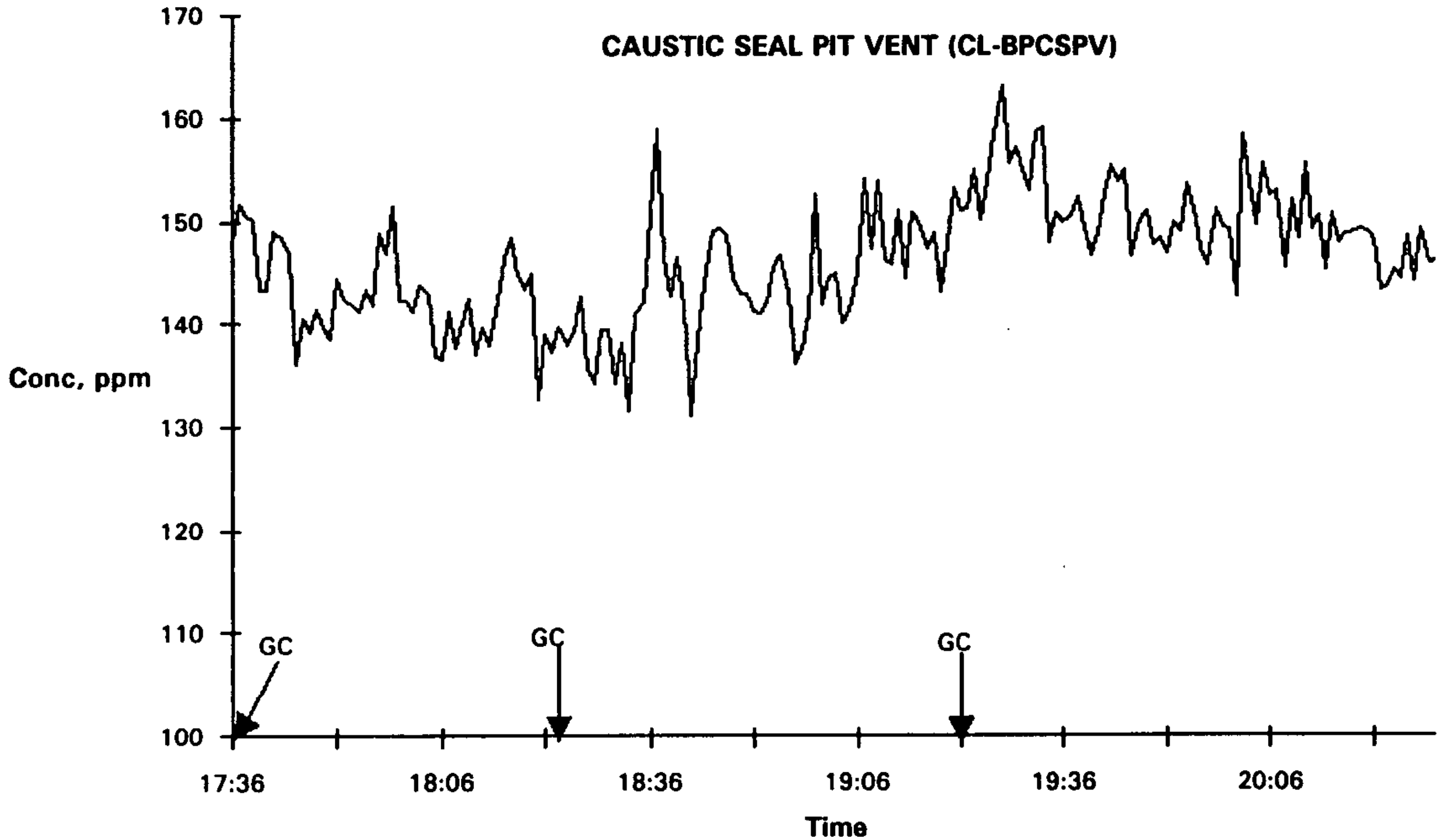


FIGURE 14.2

THC TREND ANALYSIS (4/29/92)

CAUSTIC SEAL PIT VENT (CL-BPCSPV)

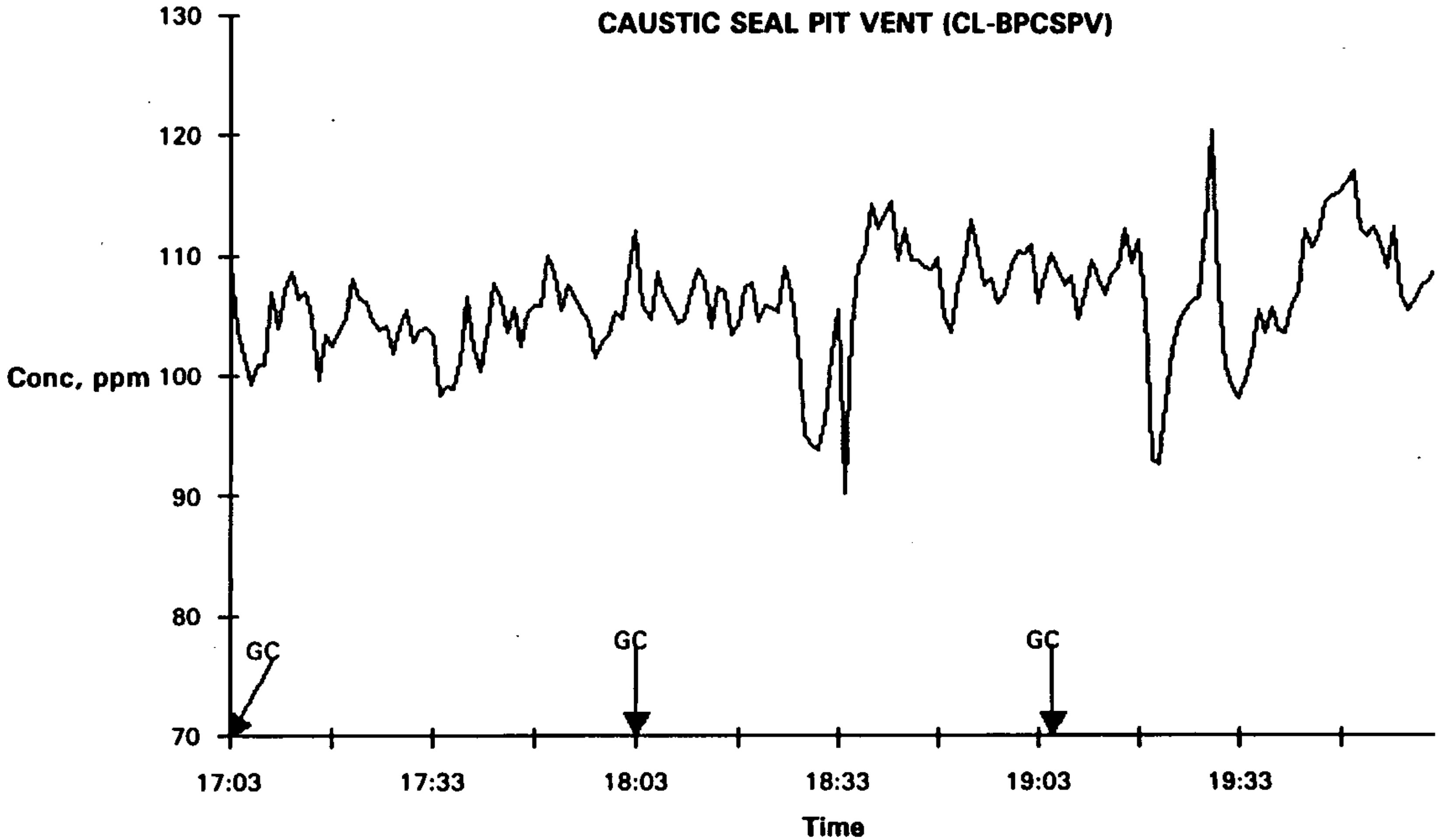


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TABLE 14.1
SUMMARY OF VOC RESULTS

Mill: CHAMPION - LUFKIN | Source: Caustic Seal Pit Vent
Source Code: CL-BPCSPV | Test Dates: 4/28/92 4/29/92
FIN: BLPT-1 CIN: | EPN: 12-11

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	130	136	133	
Volumetric Flow Rate, x10³ DSCFM	0.8	0.8	0.8	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	15.8	20.8	18.3	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	0.1	0.3	0.2	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	<0.1	0.1	0.1
2-Propanol	<0.1	<0.1	0.1	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	1.2	2.1	1.7	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	<0.1	0.1	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	<0.1	0.1	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	ND	ND	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	0.1	0.3	0.2	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	0.2	0.3	0.3	0.1

ND=Not Detected
DL=Detection Limit

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TABLE 14.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: CHAMPION-LUFKIN
Source Code: CL-BPCSPV
FIN: BLPT-1 EPN: 12-11

Source: Caustic Seal Pit Vent
Test Dates: 4/28/92 4/29/92
CIN:

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	130	136	133	
Volumetric Flow Rate, x 10^3 DSCFM	0.8	0.8	0.8	
Process Operating Conditions				
Production Rate, ADT pulp/hr	15.8	20.8	18.3	
Emission Rate, lb/hr				
Chloroform	1.7	3.1	2.4	0.1
Hydrogen chloride	ND	ND	ND	0.1

ND = Not Detected
DL = Detection Limit

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Caustic Seal Pit Vent | FIN: BLPT-1
Source Code: CL-BPCSPV | Date: 4/28/92 | EPN: 12-11 | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1735	1835	1935	
Flow Data				
Stack Temperature, °F	136			136
Moisture Content, %	8.0			8.0
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	1.0			1.0
Volumetric Flow Rate, x10^3 DSCFM	0.8			0.8
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8	20.8	20.8	20.8
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	59.3	76.6	66.5	67.5
Emission Rate, lb/hr	0.2	0.3	0.3	0.3
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.9	1.0	0.9	0.9
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN　　Source: Caustic Seal Pit Vent　　FIN: BLPT-1
Source Code: CL-BPCSPV　　Date: 4/28/92　　EPN: 12-11　　CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	125.5	131.7	138.6	132.0
Emission Rate, lb/hr	1.9	2.0	2.1	2.0
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1	1.1 *	0.7
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.7	0.5 *	0.5 *	0.4
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN		Source:	Caustic Seal Pit Vent		FIN:	BLPT-1
Source Code:	CL-BPCSPV	Date:	4/28/92	EPN: 12-11	CIN:	-

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	155.9	176.3	171.6	167.9
Unknowns as Carbon				
Concentration, ppmvd	13.0	8.2	6.2	9.1
Sum M18 as Carbon, lb/hr	0.3	0.3	0.3	0.3
Unknown Compounds % of Total	7.7%	4.4%	3.5%	5.2%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	154.3	160.9	162.0	159.1
Emission Rate, lb/hr as C	0.2	0.2	0.2	0.2

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill:	CHAMPION - LUFKIN	Source:	Caustic Seal Pit Vent	FIN:	BLPT-1
Source Code:	CL-BPCSPV	Date:	4/29/92 EPN: 12-11	CIN:	-

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1702	1802	1902	
Flow Data				
Stack Temperature, °F	130			130
Moisture Content, %	15.0			15.0
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	1.0			1.0
Volumetric Flow Rate, x10^3 DSCFM	0.8			0.8
Process Operating Conditions				
Production Rate, ADT pulp/hr	15.8	15.8	15.8	15.8
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	34.5	41.2	34.8	36.8
Emission Rate, lb/hr	0.1	0.2	0.1	0.1
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	1.3	0.6 *	0.6 *	0.6
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.6	0.7	0.6	0.6
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Caustic Seal Pit Vent | FIN: BLPT-1
Source Code: CL-BPCSPV | Date: 4/29/92 | EPN: 12-11 | CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 •
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	86.4	100.5	99.8	95.5
Emission Rate, lb/hr	1.2	1.4	1.4	1.3
Benzene				
Concentration, ppmvd	0.6 •	0.6 *	0.6 •	0.6 •
Emission Rate, lb/hr	0.1 *	0.1 •	0.1 *	0.1 •
Bromodichloromethane				
Concentration, ppmvd	1.2 *	1.2 •	1.2 *	1.2 •
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 •	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 •	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 •	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 •
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 •	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 •	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.6 •	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 •	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 •	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Caustic Seal Pit Vent | FIN: BLPT-1
Source Code: CL-BPCSPV | Date: 4/29/92 | EPN: 12-11 | CIN: -

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	102.9	122.9	115.8	113.9
Unknowns as Carbon				
Concentration, ppmvd	5.6	6.2	6.8	6.2
Sum M18 as Carbon, lb/hr	0.2	0.2	0.2	0.2
Unknown Compounds % of Total	5.2%	4.8%	5.6%	5.2%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	122.4	125.9	125.9	124.7
Emission Rate, lb/hr as C	0.2	0.2	0.2	0.2

* One or more values were less than the detection limit.

SECTION 14.2 EMISSION TEST RESULTS - MISCELLANEOUS

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - LUFKIN | Source: Caustic Seal Pit Vent | FIN: BLPT-1
Source Code: CL-BPCSPV | Date: 4/28/92 | EPN: 12-11 | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1852	1923		
Flow Data				
Stack Temperature, °F	136			136
Moisture Content, %	8.0			8.0
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	1.0			1.0
Volumetric Flow Rate, x10^3 DSCFM	0.8			0.8
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8	20.8		20.8
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	207.7	190.0		198.9
Emission Rate, lb/hr	3.1	2.8		3.0
Hydrogen chloride				
Concentration, ppmvd	0.5 *			0.5 •
Emission Rate, lb/hr	0.1 *			0.1 •

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - LUFKIN | Source: Caustic Seal Pit Vent | FIN: BLPT-1
Source Code: CL-BPCSPV | Date: 4/29/92 | EPN: 12-11 | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1710	1829		
Flow Data				
Stack Temperature, °F	130			130
Moisture Content, %	15.0			15.0
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	1.0			1.0
Volumetric Flow Rate, x10^3 DSCFM	0.8			0.8
Process Operating Conditions				
Production Rate, ADT pulp/hr	15.8	15.8		15.8
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	119.9	148.4		134.2
Emission Rate, lb/hr	1.7	2.1		1.9
Hydrogen chloride				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

SECTION 14.3 VOC QUALITY CONTROL RESULTS

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

CAUSTIC SEAL PIT VENT (CL-BPCSPV)
THC Quality Control
(Concentrations in ppm)

Calibration

Theoretical	4/28/92 Found	% Error	4/29/92 Found	% Error
0	0	0.0	0	0.0
36	37	0.7	40	2.7
91	88	2.1	85	4.1
150	151	0.7	152	1.3
Correlation coefficient	0.9995		0.9979	

Line Study

Bag sample
4/28/92

Analyzer	Line	%Rec
150	145	96.7

Nitrogen Blank Not Performed

CAUSTIC SEAL PIT VENT (CL-BPCSPV)
VOC Quality Control
(Concentrations in ppm)

Calibration

		4/28/92	
Analyte	**Theor**	**Check Std**	**% Rec**
Acetone	87.7	85.8	97.9
Isopropanol	84.1	61.5	73.1
Benzene	72.0	57.0	79.1
Bromodichloromethane	77.8	46.6	59.9
Toluene	60.6	51.8	85.5
Ethyl Benzene	52.6	45.5	86.6
p-Xylene	52.5	56.0	106.6
o-Xylene	52.8	49.4	93.6
Cumene	46.3	38.4	83.0
alpha-Pinene	40.4	34.3	84.9
beta-Pinene	40.6	41.0	101.0
3-Carene	40.6	37.7	92.8
p-Cymene	41.3	34.5	83.6

		4/29/92	
Analyte	**Theor**	**Check Std**	**% Rec**
Acetone	175.4	204.2	116.4
Isopropanol	168.2	158.7	94.4
Benzene	144.1	128.0	88.8
Bromodichloromethane	155.6	142.5	91.6
Toluene	121.2	106.1	87.5
Ethyl Benzene	105.2	88.1	83.7
p-Xylene	105.0	90.7	86.4
o-Xylene	105.5	87.6	83.0
Cumene	92.6	74.0	79.9
alpha-Pinene	80.8	75.1	92.9
beta-Pinene	81.2	78.3	96.4
3-Carene	81.3	67.7	83.3
p-Cymene	82.5	51.9	62.9

Nitrogen blank Not performed

Line Study	**GC**	**Line**	**% Recovery**
Methanol (100 ppm)			
4/28/92	77.4	73.7	95.2
4/29/92	71.0	81.2	114.4
Chloroform (300 ppm)			
4/28/92	218.9	247.5	113.1

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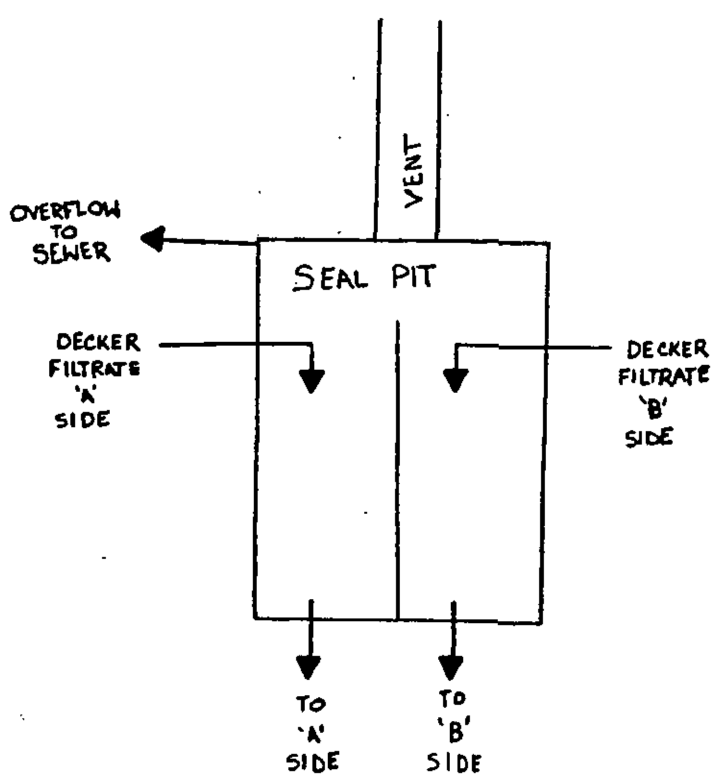
SECTION 14.4 PROCESS DESCRIPTION AND OPERATING CONDITIONS

CAUSTIC SEAL PIT
A & B Side

The bleach plant is divided into sides A and B producing 360 tons/day and 180 tons/day of pulp respectively. The seal pit is divided into two sides. The overflow from side B can join side A and overflow to the sewer. The decker filtrate consisting of hot shower water and the recycled caustic seal pit filtrate, enters it's respective side of the seal pit. The caustic seal pit filtrate is then pumped for use in the caustic tower and for pulp dilution from the tower to the deckers. The system is vented through a pipe in the top of the closed pit.



BLEACH PLANT
CL2 SEAL PIT
CAUSTIC SEAL PIT

BLEACHING SEQUENCE: CEH
WOOD SPECIES: SOFTWOOD - SOUTHERN PINE

PARAMETER	UNITS	RUN 1	RUN 2	RUN 3	RUN 4	RUN 5	RUN 6
DATE		4/28	4/28	4/28	4/29	4/29	4/29
START TIME		1722	1822	1921	1652	1803	1905
STOP TIME		1807	1907	2006	1737	1848	1950
BLEACHED PULP PROD RATE	ADT/D	A 340 B 160	A 340 B 160	A 340 B 160	A 260 B 120	A 260 B 120	A 260 B 120
PN NUMBER		21.8	21.8	18.5	22.1	23.3	23.8
CL2 USAGE A	LB/HR	1833.5	1743.7	1684.0	1405.2	1434.6	1543.9
CL2 USAGE B	LB/HR	991.0	994.3	901.5	781.2	749.8	764.9
CAUS USAGE A	LB/HR	1077	1077	1077	693	715	715
CAUS USAGE B	LB/HR	427	427	455	300	300	300
HYPO USAGE A	LB/HR	679	679	679	520	498	498
HYPO USAGE B	LB/HR	240	254	227	160	160	150
CL2 TOW TEMP	F	86.3	83.8	81.2	80.0	77.6	78.3
CAU TOW TEMP	F	157.4	157.7	158.2	158.3	157.8	158.6
HYP TOW TEMP	F	130.7	130.3	130.2	126.6	126.4	126.6
CL2 RET TIME	MIN	27	27	27	35	35	35
CAU TOW LEVL	%	56.0	57.3	55.0	42.5	40.9	45.7
CAU DUMP CT	%	42.9	44.9	43.5	50.2	50.5	35.7
CAU RET TIME	MIN	34	34	33	34	33	35
HYP TOW LEVL	%	60.0	60.0	60.0	60.0	60.0	60.0
HYP RET TIME	MIN	146	146	146	191	191	191
CE PN NO.		5.9	5.8	6.1	4.7	5.5	4.6

NOTE: CHANGE CL2 TANK CAR IN RUN 2, SWING IN CHLORINE USAGE
CL2 STOCK TEMP: 108 F
NCASI: METHANOL, ACETONE, MEK, CHLOROFORM, ACETILE

BLEACH PLANT DIAGRAMS AND PROCESS INFORMATION

A. Bleaching Practice

The mill has two parallel bleach lines with CEH sequences which produce 500 ton/day bleached kraft softwood pulp to a final G.E. brightness of 70. During the tests, bleach plant 1 operated at a rate of 15 ton/hour and bleach plant 2 operated at a rate of 8 ton/hour. Figure 1 is a diagram of the bleaching process for both of these lines.

Table 1 shows the bleaching conditions for the two bleach plants during the testing. There was little difference between the bleach plant configurations other than capacity. The kappa number of the brownstock was 30 during run 1 and was 30 during run 2. Other than that, all conditions were the same for both runs.

Representative Process Conditions

Bleaching Sequence:	CEH
Wood Species:	Southern Pine
Production Rate:	500-540 T/D Total; 1=360max, 2=180max
Kappa Number:	PN 18-24
Chemical Usage (Cl_2, ClO_2, NaOH, NaOCl, O_2 in E Stage, pH in towers, etc.):	Cl_2, NaOH, NaOCL
Percent ClO_2 Substitution:	N/A
Tower Temperatures & Retention Times:	Cl_2, 74-95° F, 25-35 min NaOH, 157-159° F, 32-39 min NaOCL, 126-131° F, 146-221 min
CE Kappa Number:	CE PN 4.5-6.5

B. Water Reuse

Fresh water was used on all of the showers.

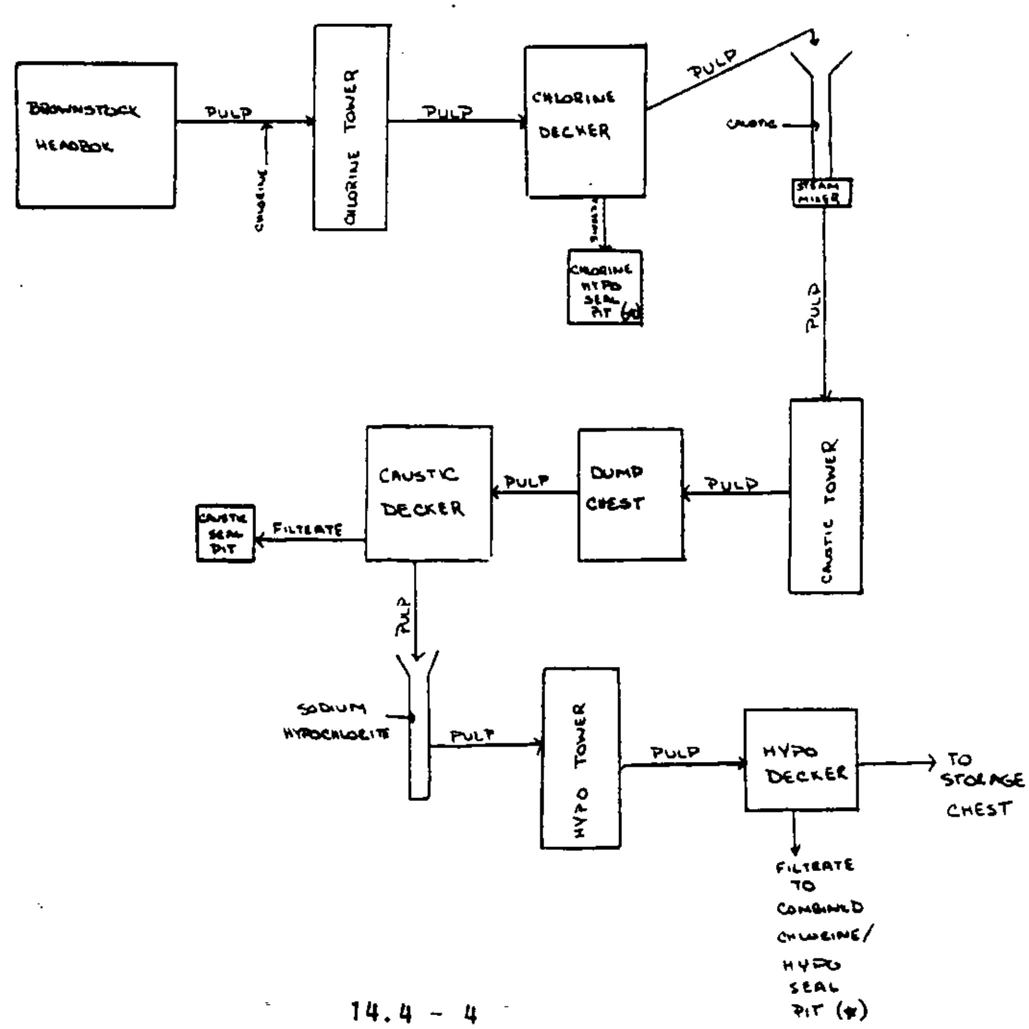
C. Bleach Plant Venting

Most of the vents from both bleach plants are vented to the atmosphere individually with no scrubbing. Figure 2 shows the location of various vents.

TABLE 2 BLEACHING CONDITIONS IN BLEACH PLANT 1

	C	E	H	D
Consistency, Percent	3.5	10	10	-
Temperature, °F	110	160	125	-
Time, Minutes	25	25	90	-
Chlorine, lb/ton odbs	130	-	-	-
Hypochlorite as Cl_2 lb/ton	-	-	44	-
Caustic, lb/ton	-	88	-	-
Peroxide, lb/ton	-	-	-	-
Chlorine Dioxide	-	-	-	-
Residual Chlorine, lb/ton	Trace	10.5	Trace	-
Vat pH	1.8	6.	9.5	-
K Number	-	-	-	-
Elrepho Brightness	-	-	70	-

Note: Bleach Plant 2 had the same conditions as Bleach Plant 1.



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SECTION 14
CAUSTIC SEAL PIT VENT (A & B SIDES)
(CL-BPCSPV)

The Caustic Seal Pit Vent was tested on two different days for volatile organic compounds, chloroform, and hydrogen chloride. The adsorption tube sampling for chloroform was provided for comparison to the GC result.

Total Hydrocarbons (M25A)

Figures 14.1 and 14.2 present the THC trends for the test periods on 28 and 29 April 1992. The THC concentration ranged between 140 and 160 ppm on 28 April 1992. The concentration was approximately 75 percent of that amount on 29 April 1992.

Volatile Organic Compounds (M18)

Table 14.1 summarizes the results for the Method 18 target compounds, and Section 14.1 is a tabulation of the data. TRS was not analyzed. The volumetric flow rate was measured with a hot wire anemometer. The measured velocity of 260 ft/min is near the detection limit of the instrument.

Methanol and chloroform were the only VOCs identified in the emissions. An unknown peak was noted consistently eluding approximately 0.3 minutes after chloroform.

Miscellaneous Parameters

Table 14.2 summarizes the results of testing for hydrogen chloride and chloroform. Section 14.2 tabulates the results for each compound. Hydrogen chloride was not detected in the gas stream for either sample. The chloroform measured by the adsorption technique on the first day was approximately 200 ppm and on the second day approximately 130 ppm. These amounts were approximately 50 percent more than those measured by M18.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 14.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 14.4 includes the process operating data as recorded and provided by mill personnel. The Caustic Seal Pit Vent represented the emissions from both A and B side bleaching.

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SECTION 15

CAUSTIC STEAM MIXER VENT (A SIDE)

(CL-BPCSMV)

15. CL-BPCSMV

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SECTION 15
CAUSTIC STEAM MIXER VENT (A SIDE)
(CL-BPCSMV)

The Caustic Steam Mixer Vent was tested on two different days for volatile organic compounds, chloroform, and hydrogen chloride. The adsorption tube sampling for chloroform was provided for comparison to the GC result.

Total Hydrocarbons (M25A)

Figures 15.1 and 15.2 present the THC trends for the test periods on 25 and 27 April 1992. The total hydrocarbon concentration the first day of sampling was all less than three ppm. On the second day, the concentration was slightly higher ranging from two - ten ppm.

Volatile Organic Compounds (M18)

Table 15.1 summarizes the results for the Method 18 target compounds, and Section 15.1 is a tabulation of the data. TRS was not analyzed. Fan curve data were used to determine the mass emission rate.

Approximately five ppm of methanol was identified on each analysis. Chloroform was detected at approximately one ppm one time. No unknown compounds were identified in the GC analyses.

Miscellaneous Parameters

Table 15.2 summarizes the results of testing for aldehydes, hydrogen chloride, chloroform, and sulfuric acid mists. Section 15.2 tabulates the results for each compound. Chloroform was detected by the adsorption tube technique at approximately one ppm which compared favorably with the M18 analyses. Hydrogen chloride was not detected in either of the samples.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 15.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 15.4 includes the process operating data as recorded and provided by mill personnel. The Caustic Steam Mixer Vent represents the emissions from A side bleaching.

FIGURE 15.1

THC TREND ANALYSIS (4/25/92)

CAUSTIC STEAM MIXER VENT (CL-BPCSMV)

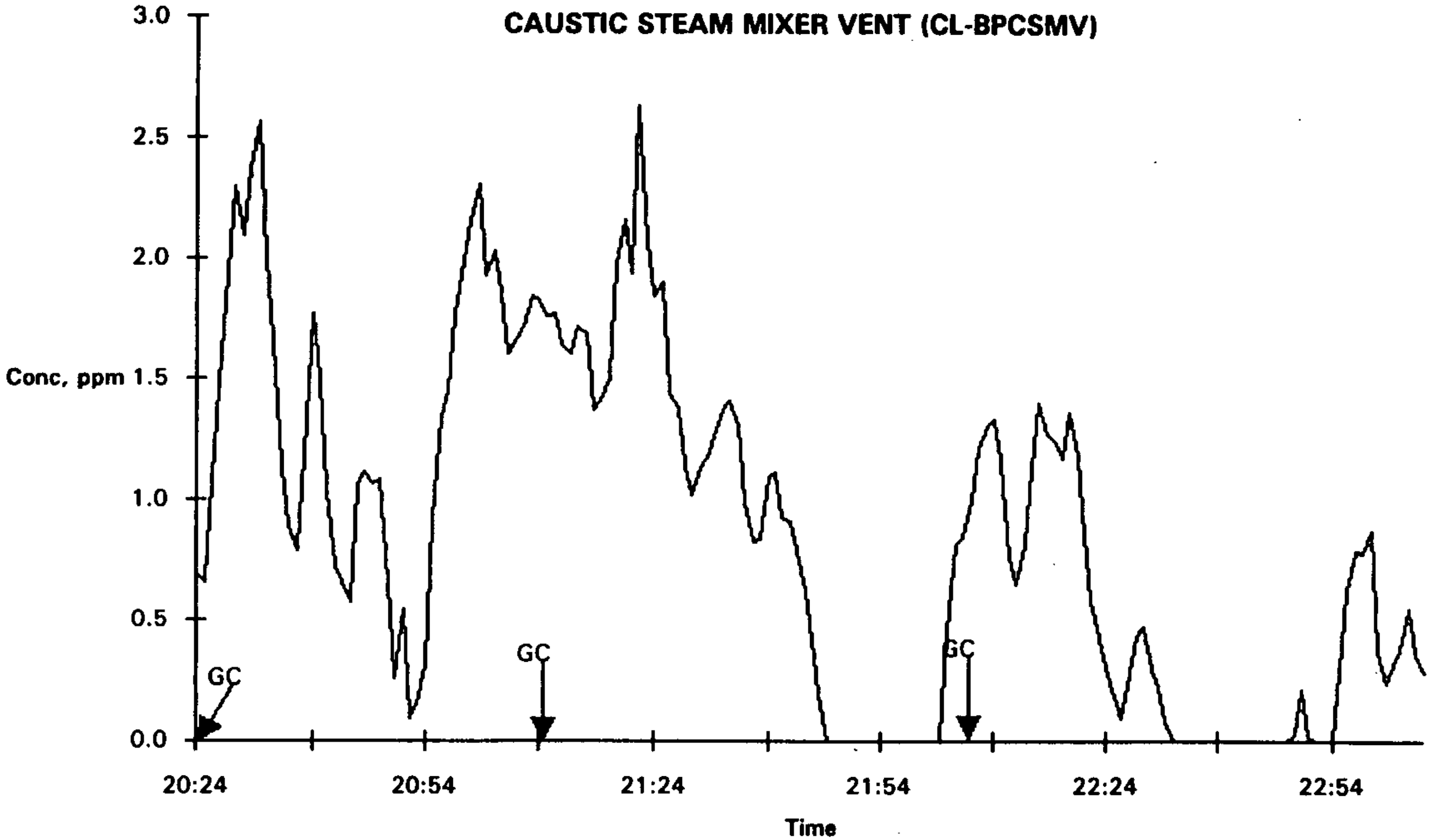

FIGURE 15.2
THC TREND ANALYSIS (4/27/92)
CAUSTIC STEAM MIXER VENT (CL-BPCSMV)

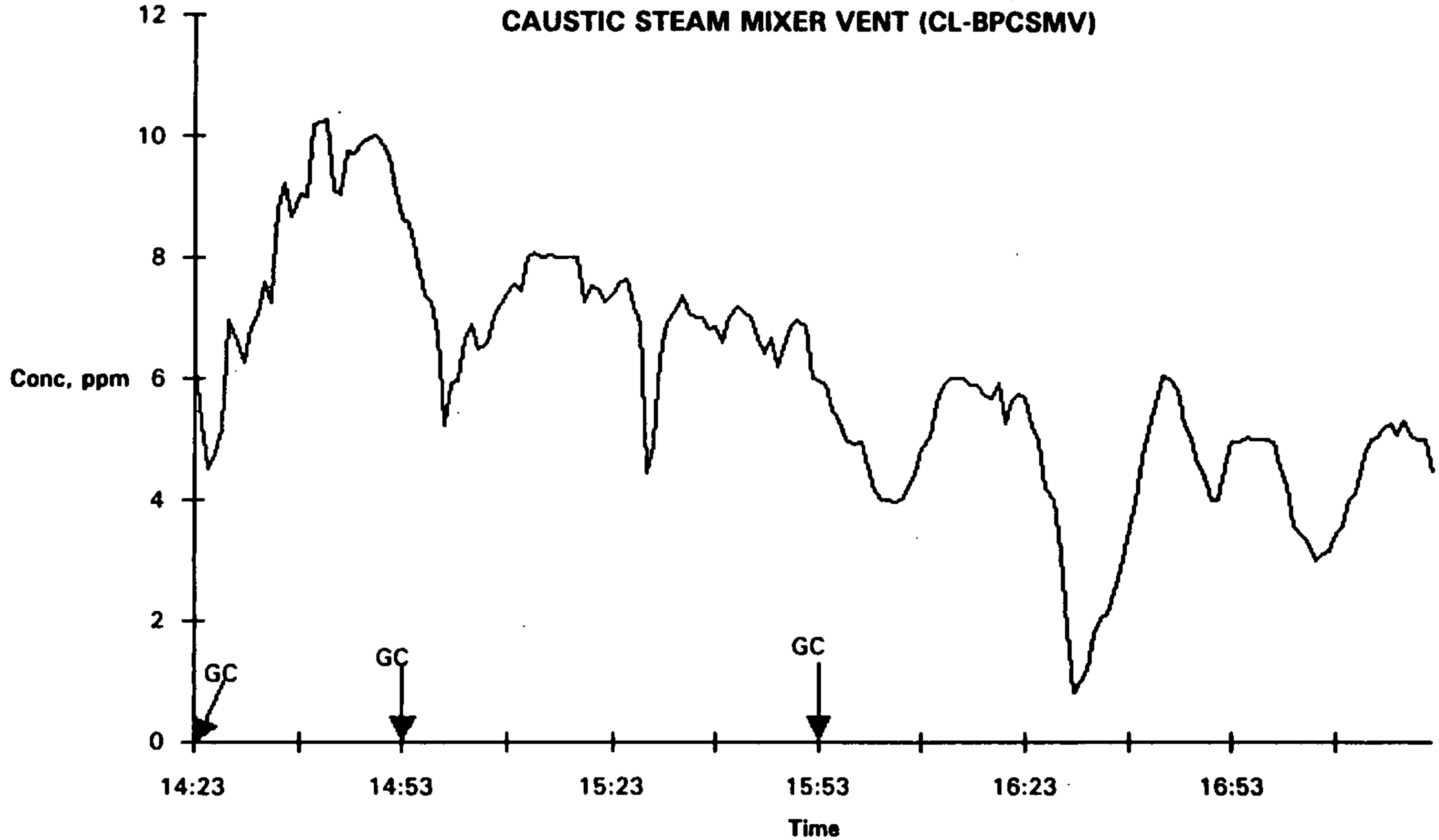

TABLE 15.1
SUMMARY OF VOC RESULTS

Mill: CHAMPION - LUFKIN
Source Code: CL-BPCSMV
FIN: BLPT-1 CIN:

Source: Caustic Steam Mixer Vent
Test Dates: 4/25/92 4/27/92
EPN: 12-12

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	90	103	97	
Volumetric Flow Rate, x10^3 DSCFM	4.0	4.0	4.0	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	11.7	14.2	13.2	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	<0.1	0.1	0.1	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	ND	<0.1	0.1	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	ND	ND	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	ND	<0.1	0.1	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	<0.1	<0.1	0.1	0.1

ND=Not Detected
DL=Detection Limit

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TABLE 15.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: CHAMPION-LUFKIN
Source Code: CL-BPCSMV
FIN: BLPT-1 EPN: 12-12

Source: Caustic Steam Mixer Vent
Test Dates: 4/25/92 4/27/92
CIN:

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	90	103	97	
Volumetric Flow Rate, x 10^3 DSCFM	4.0	4.0	4.0	
Process Operating Conditions				
Production Rate, ADT pulp/hr	17.5	21.7	20.0	
Emission Rate, lb/hr				
Chloroform	<0.1	<0.1	0.1	0.1
Hydrogen chloride	ND	ND	ND	0.1

ND = Not Detected
DL = Detection Limit

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SECTION 15.1 EMISSION TEST RESULTS - VOC

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Caustic Steam Mixer Vent | FIN: BLPT-1
Source Code: CL-BPCSMV | Date: 4/25/92 | EPN: 12-12 | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	2023	2123	2223	
Flow Data				
Stack Temperature, °F	103			103
Moisture Content, %	3.4			3.4
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	4.4			4.4
Volumetric Flow Rate, x10^3 DSCFM	4.0			4.0
Process Operating Conditions				
Production Rate, ADT pulp/hr	14.2	14.2	14.2	14.2
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	5.0	6.1	4.8	5.3
Emission Rate, lb/hr	0.1 *	0.1	0.1 *	0.1
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN
Source Code: CL-BPCSMV
Source: Caustic Steam Mixer Vent
Date: 4/25/92 EPN: 12-12
FIN: BLPT-1
CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.0 *	1.0	1.0 *	0.7
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.0 *	1.0 *	1.0 *	1.0 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Caustic Steam Mixer Vent | FIN: BLPT-1
Source Code: CL-BPCSMV | Date: 4/25/92 | EPN: 12-12 | CIN: -

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	7.6	9.4	7.6	8.2
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	1.0	1.0	0.5 *	0.8
Emission Rate, lb/hr as C	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Caustic Steam Mixer Vent | FIN: BLPT-1
Source Code: CL-BPCSMV | Date: 4/27/92 | EPN: 12-12 | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1422	1522	1622	
Flow Data				
Stack Temperature, °F	90			90
Moisture Content, %	4.8			4.8
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	4.4			4.4
Volumetric Flow Rate, x10^3 DSCFM	4.0			4.0
Process Operating Conditions				
Production Rate, ADT pulp/hr	12.5	12.5	11.7	12.2
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	3.3	3.0	3.0	3.1
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Caustic Steam Mixer Vent | FIN: BLPT-1

Source Code: CL-BPCSMV | Date: 4/27/92 | EPN: 12-12 | CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 •
Chloroform				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 •
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 •
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 •	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 •	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 •	0.5 *	0.5 •
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 •	0.1 *	0.1 •	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 •	0.1 •	0.1 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 •	0.1 *	0.1 •
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Caustic Steam Mixer Vent | FIN: BLPT-1
Source Code: CL-BPCSMV | Date: 4/27/92 | EPN: 12-12 | CIN: -

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	3.3	3.6	3.8	3.5
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	8.4	6.3	4.2	6.3
Emission Rate, lb/hr as C	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

SECTION 15.2 EMISSION TEST RESULTS - MISCELLANEOUS

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - LUFKIN | Source: Caustic Steam Mixer Vent | FIN: BLPT-1
Source Code: CL-BPCSMV | Date: 4/25/92 | EPN: 12-12 | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	2023	2123	2223	
Flow Data				
Stack Temperature, °F	103			103
Moisture Content, %	3.4			3.4
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	4.4			4.4
Volumetric Flow Rate, x10^3 DSCFM	4.0			4.0
Process Operating Conditions				
Production Rate, ADT pulp/hr	14.2	14.2	14.2	14.2
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	1.1	1.1	1.3	1.2
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Hydrogen chloride				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - LUFKIN | Source: Caustic Steam Mixer Vent | FIN: BLPT-1
Source Code: CL-BPCSMV | Date: 4/27/92 | EPN: 12-12 | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1422	1522		
Flow Data				
Stack Temperature, °F	90			90
Moisture Content, %	4.8			4.8
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	4.4			4.4
Volumetric Flow Rate, x10^3 DSCFM	4.0			4.0
Process Operating Conditions				
Production Rate, ADT pulp/hr	12.5	12.5		12.5
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	0.9	0.9		0.9
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Hydrogen chloride				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

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SECTION 15.3 VOC QUALITY CONTROL RESULTS

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

CAUSTIC STEAM MIXER VENT (CL-BPCSMV)

THC Quality Control

(Concentrations in ppm)

Calibration

Theoretical	4/25/92 Found	% Error	4/27/92 Found	% Error
0	-5	0.0	0	0.0
36	40	2.7	36	0.0
91	94	2.0	86	2.7
150	146	2.7	151	0.7
Correlation coefficient	0.9972		0.9993	

Line Study

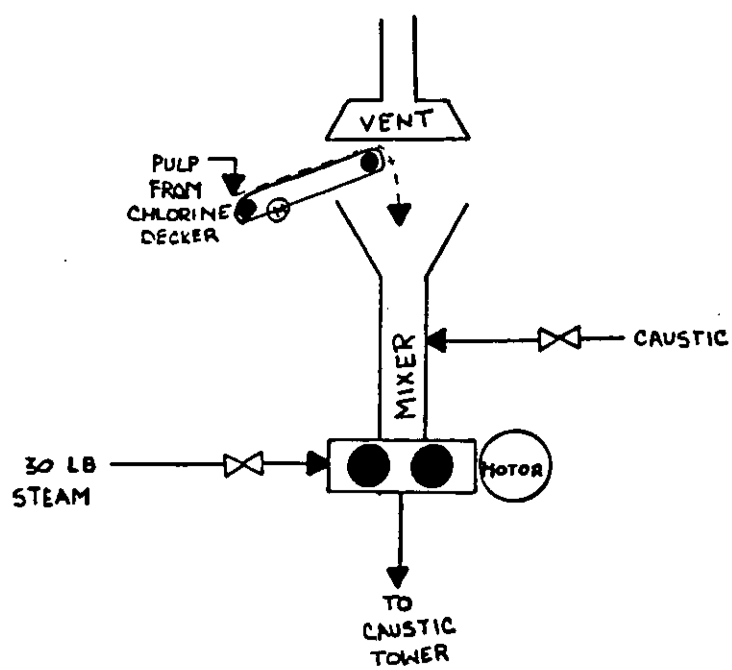
Bag sample
4/27/92

Analyzer	Line	% Recovery
150	147	98.0

SECTION 15.4 PROCESS DESCRIPTION AND OPERATING CONDITIONS

CAUSTIC STEAM MIXER
A Side

The bleach plant is divided into sides A and B producing 360 tons/day and 180 tons/day of pulp respectively. Pulp leaves the chlorine decker to a conveyor belt that unloads into the caustic steam mixer where the caustic and 30 lb steam are added. The pulp then continues on to the caustic tower where dilution with caustic seal pit filtrate occurs. The system is vented through a pipe in the hood that overlaps the open flume.



BLEACH PLANT
CAUSTIC STEAM MIXER
CAUSTIC TOWER

BLEACHING SEQUENCE: CEH
WOOD SPECIES: SOFTWOOD - SOUTHERN PINE

PARAMETER	UNITS	RUN 1	RUN 2	RUN 3	RUN 4	RUN 5	RUN 6
DATE		4/25	4/25	4/25	4/27	4/27	4/27
START TIME		2013	2110	2205	1352	1453	1553
STOP TIME		2058	2155	2250	1437	1538	1638
BLEACHED PULP PROD RATE	ADT/D	A 340 B 180	A 340 B 180	A 340 B 180	A 300 B 120	A 300 B 120	A 280 B 120
PN NUMBER		20.9	20.9	21.8	22.1	22.2	21.5
CL2 USAGE A	LB/HR	1784	1733	1716	1742	1668	1560
CL2 USAGE B	LB/HR	959.1	907.3	916.0	801.0	776.5	684.7
CAUS USAGE A	LB/HR	1161	1161	1133	925	925	863
CAUS USAGE B	LB/HR	540	540	525	320	320	320
HYPO USAGE A	LB/HR	651	651	679	625	625	583
HYPO USAGE B	LB/HR	390	360	360	190	180	200
CL2 TEMP	F	78.2	75.7	73.6	80.2	81.8	94.9
CAU TOW TEMP	F	158.6	158.3	158.8	158.1	157.7	158.8
HYP TOW TEMP	F	130.6	130.4	130.2	128.6	128.5	128.7
CL2 RET TIME	MIN	27	27	27	31	31	33
CAU TOW LEVL	%	53	53	54	48.7	48.0	47.0
CAU DUMP CT	%	44	45	44	45.1	45.0	43.0
CAU RET TIME	MIN	32	32	32	32	32	33
HYP TOW LEVL	%	60.0	60.0	60.0	60.0	60.0	60.0
HYP RET TIME	MIN	184	184	184	207	207	221
CE PN NO.		5.2	4.8	5.5	6.3	5.7	5.4

CL2 STOCK TEMP : 108 F

BLEACH PLANT DIAGRAMS AND PROCESS INFORMATION

A. Bleaching Practice

The mill has two parallel bleach lines with CEH sequences which produce 500 ton/day bleached kraft softwood pulp to a final G.E. brightness of 70. During the tests, bleach plant 1 operated at a rate of 15 ton/hour and bleach plant 2 operated at a rate of 8 ton/hour. Figure 1 is a diagram of the bleaching process for both of these lines.

Table 1 shows the bleaching conditions for the two bleach plants during the testing. There was little difference between the bleach plant configurations other than capacity. The kappa number of the brownstock was 30 during run 1 and was 30 during run 2. Other than that, all conditions were the same for both runs.

Representative Process Conditions

Bleaching Sequence:	CEH
Wood Species:	Southern Pine
Production Rate:	500-540 T/D Total; 1=360max, 2=180max
Kappa Number:	PN 18-24
Chemical Usage (Cl_2, ClO_2, NaOH, NaOCl, O_2 in E Stage, pH in towers, etc.):	Cl_2, NaOH, NaOCL
Percent ClO_2 Substitution:	N/A
Tower Temperatures & Retention Times:	Cl_2, 74-95° F, 25-35 min NaOH, 157-159° F, 32-39 min NaOCL, 126-131° F, 146-221 min
CE Kappa Number:	CE PN 4.5-6.5

B. Water Reuse

Fresh water was used on all of the showers.

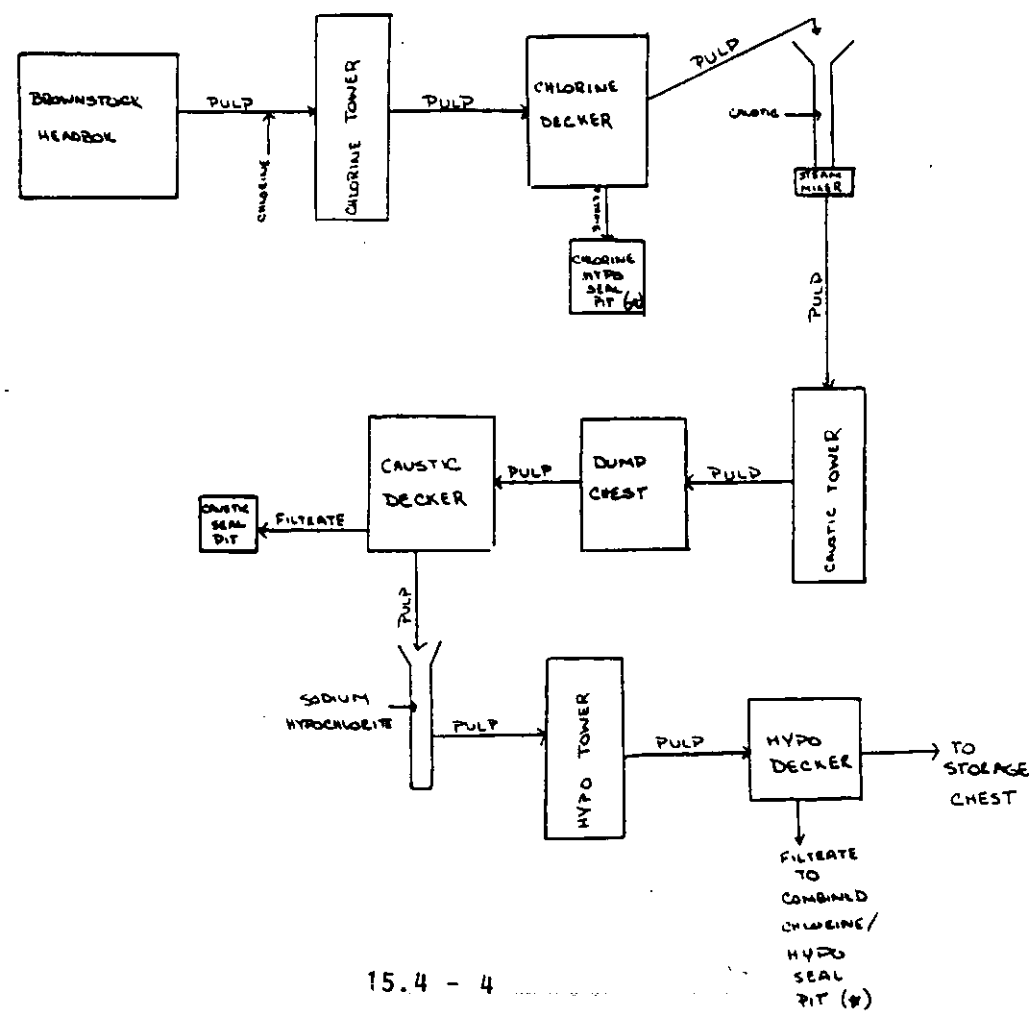
C. Bleach Plant Venting

Most of the vents from both bleach plants are vented to the atmosphere individually with no scrubbing. Figure 2 shows the location of various vents.

TABLE 2 BLEACHING CONDITIONS IN BLEACH PLANT 1

	C	E	H	D
Consistency, Percent	3.5	10	10	-
Temperature, °F	110	160	125	-
Time, Minutes	25	25	90	-
Chlorine, lb/ton odbs	130	-	-	-
Hypochlorite as Cl_2 lb/ton	-	-	44	-
Caustic, lb/ton	-	88	-	-
Peroxide, lb/ton	-	-	-	-
Chlorine Dioxide	-	-	-	-
Residual Chlorine, lb/ton	Trace	10.5	Trace	-
Vat pH	1.8	6.	9.5	-
K Number	-	-	-	-
Elrepho Brightness	-	-	70	-

Note: Bleach Plant 2 had the same conditions as Bleach Plant 1.



16. CL-BPBSHB

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SECTION 16

BROWN STOCK HEAD BOX VENT (A & B SIDES)

(CL-BPBSHB)

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SECTION 16
BROWN STOCK HEAD BOX VENT (A & B SIDES)
(CL-BPBSHB)

The Brown Stock Head Box Vent was tested on two different days for volatile organic compounds, chloroform, and hydrogen chloride. The adsorption tube sampling for chloroform was performed for comparison to the M18 GC result.

Total Hydrocarbons (M25A)

Figures 16.1 and 16.2 present the THC trends for the test periods on 28 and 29 April 1992. The total hydrocarbon readings varied from 9 to 14 ppm on 28 April and from 4 to 9 ppm on 29 April. A slight upward trend was noted on 29 April.

Volatile Organic Compounds (M18)

Table 16.1 summarizes the results for the Method 18 target compounds, and Section 16.1 is a tabulation of the data. TRS was not analyzed. Fan curve data were used to calculate the mass emission rate.

Trace amounts of methanol were observed in the M18 analyses. Periodically, low concentrations of terpenes and chloroform were also identified. No unknown compounds were detected in the source.

Miscellaneous Parameters

Table 16.2 summarizes the results of testing for hydrogen chloride and chloroform. Section 16.2 tabulates the results for each compound. Hydrogen chloride was not detected in either sample. Chloroform was found at approximately one ppm except for one sample which was approximately nine ppm. No reason is known for the high result.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 16.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 16.4 includes the process operating data as recorded and provided by mill personnel. The emissions from the Brown Stock Head Box Vent represent emissions from both the A and B Side bleaching.

FIGURE 16.1

THC TREND ANALYSIS (4/28/92)

BROWN STOCK HEAD BOX VENT (CL-BPBSHB)

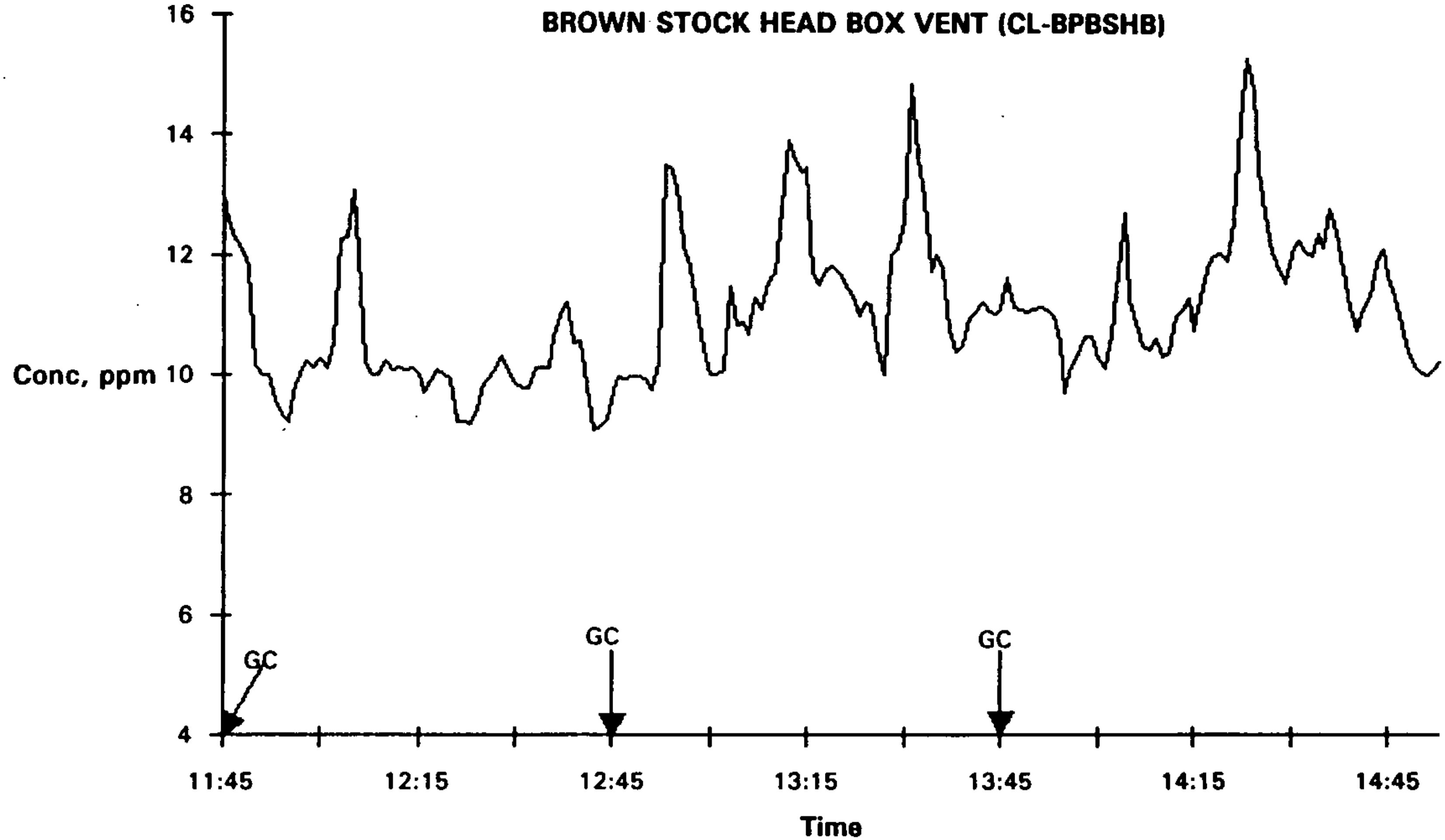

FIGURE 16.2

THC TREND ANALYSIS (4/29/92)

BROWN STOCK HEAD BOX VENT (CL-BPBSHB)

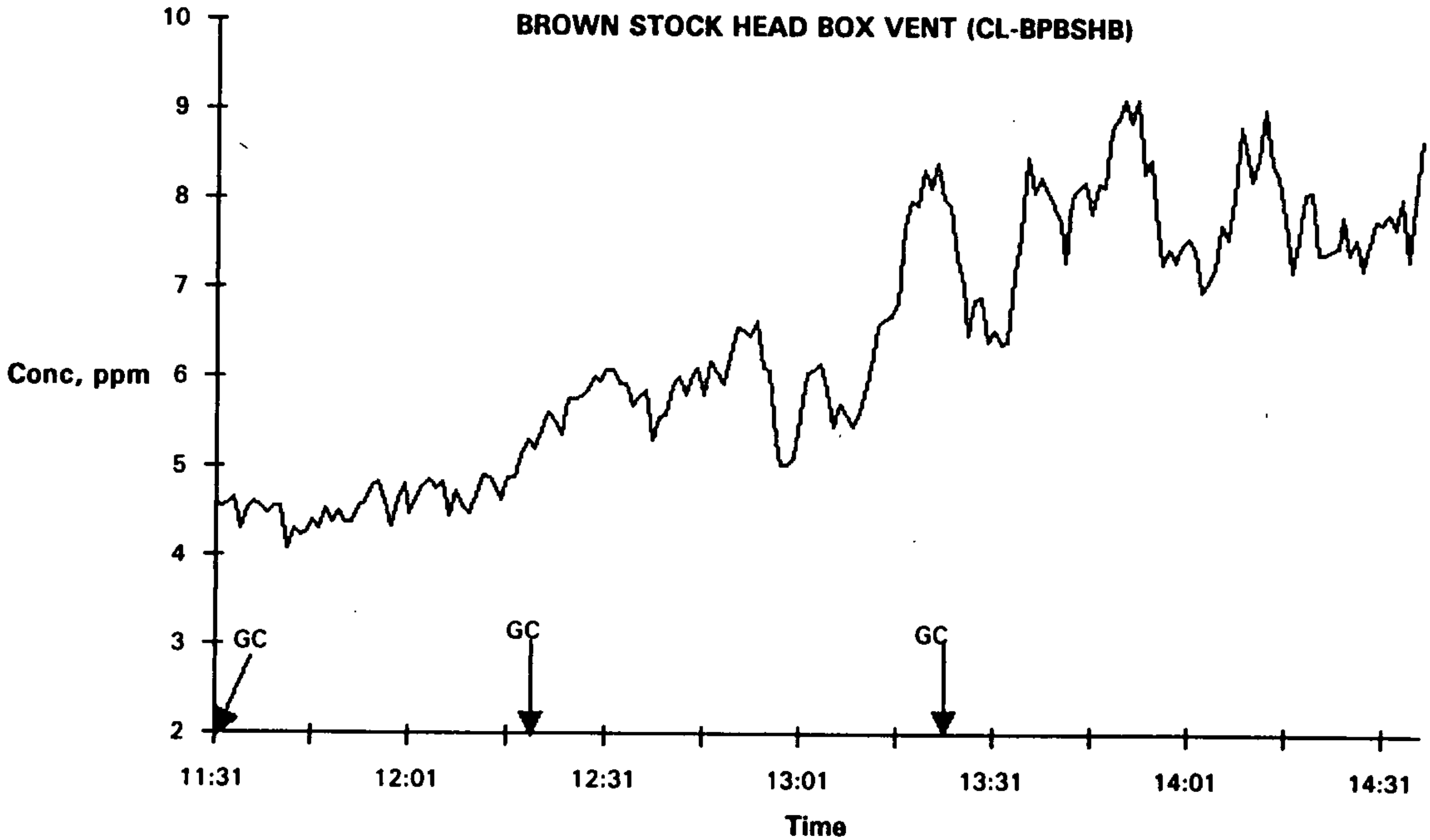

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TABLE 16.1
SUMMARY OF VOC RESULTS

Mill: CHAMPION - LUFKIN	Source: Brown Stock Head Box Vent
Source Code: CL-BPBSHB	Test Dates: 4/28/92 4/29/92
FIN: BLPT-1 CIN:	EPN: 12-13

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	77	94	86	
Volumetric Flow Rate, $x10^3$ DSCFM	8.3	8.5	8.4	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	15.8	20.8	18.3	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	<0.1	0.2	0.1	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	ND	0.2	0.1	0.2
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.2
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	0.1	0.1	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	0.1	0.1	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	ND	0.1	0.1	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	<0.1	0.2	0.1	0.1

ND=Not Detected
DL=Detection Limit

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TABLE 16.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: CHAMPION-LUFKIN
Source Code: CL-BPBSHB
FIN: BLPT-1 EPN: 12-13

Source: Brown Stock Head Box Vent
Test Dates: 4/28/92 4/29/92
CIN: -

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	77	94	86	
Volumetric Flow Rate, x 10^3 DSCFM	8.3	8.5	8.4	
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8	20.8	20.8	
Emission Rate, lb/hr				
Chloroform	ND	1.5	0.5	0.1
Hydrogen chloride	ND	ND	ND	0.1

ND = Not Detected
DL = Detection Limit

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SECTION 16.1 EMISSION TEST RESULTS - VOC

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN	Source:	Brown Stock Head Box Vent		FIN:	BLPT-1
Source Code: CL-BPBSHB	Date:	4/28/92	EPN: 12-13	CIN:	-

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1144	1244	1344	
Flow Data				
Stack Temperature, °F		94		94
Moisture Content, %		2.3		2.3
Oxygen Concentration, %		20.8		20.8
Carbon Dioxide Concentration, %		0.0		0.0
Volumetric Flow Rate, x10^3 ACFM		9.0		9.0
Volumetric Flow Rate, x10^3 DSCFM		8.3		8.3
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8	20.8	20.8	20.8
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd		4.5	4.1	4.3
Emission Rate, lb/hr		0.2	0.2	0.2
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *

16.1 - 1

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN　　Source: Brown Stock Head Box Vent　　FIN: BLPT-1
Source Code: CL-BPBSHB　　Date: 4/28/92　　EPN: 12-13　　CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd		1.0	1.0 *	0.8
Emission Rate, lb/hr		0.2	0.2 *	0.1
Benzene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd		1.0 *	1.0 *	1.0 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd		0.5 *	0.6	0.4
Emission Rate, lb/hr		0.1 *	0.1	0.1
beta-Pinene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd		0.6	0.5 *	0.4
Emission Rate, lb/hr		0.1	0.1 *	0.1

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN		Source: Brown Stock Head Box Vent		FIN:	BLPT-1
Source Code: CL-BPBSHB	Date: 4/28/92	EPN:	12-13	CIN:	-

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd		9.3	9.3	9.3
Unknowns as Carbon				
Concentration, ppmvd		0.7	0.8	0.8
Sum M18 as Carbon, lb/hr		0.2	0.2	0.2
Unknown Compounds % of Total		7.1%	8.1%	7.6%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	10.2	11.3	12.3	11.3
Emission Rate, lb/hr as C	0.2	0.2	0.2	0.2

COMMENTS

M18 data for run 1 on 4/28/92 was rejected due to dirty system.

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Brown Stock Head Box Vent | FIN: BLPT-1
Source Code: CL-BPBSHB | Date: 4/29/92 | EPN: 12-13 | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1131	1231	1331	
Flow Data				
Stack Temperature, °F	77			77
Moisture Content, %	3.2			3.2
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	9.0			9.0
Volumetric Flow Rate, x10^3 DSCFM	8.5			8.5
Process Operating Conditions				
Production Rate, ADT pulp/hr	15.8	15.8	15.8	15.8
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	2.5	2.2	2.5	2.4
Emission Rate, lb/hr	0.1	0.1 *	0.1	0.1
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Brown Stock Head Box Vent | FIN: BLPT-1
Source Code: CL-BPBSHB | Date: 4/29/92 EPN: 12-13 | CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.0 *	1.0 *	1.0 *	1.0 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.0 *	1.0 *	1.0 *	1.0 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - LUFKIN | Source: Brown Stock Head Box Vent | FIN: BLPT-1
Source Code: CL-BPBSHB | Date: 4/29/92 | EPN: 12-13 | CIN: -

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	1.9	2.2	3.5	2.5
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	5.2	6.2	8.3	6.5
Emission Rate, lb/hr as C	0.1 *	0.1 *	0.1	0.1

COMMENTS

M18 data for run 1 on 4/28/92 was rejected due to dirty system.

* One or more values were less than the detection limit.

SECTION 16.2 EMISSION TEST RESULTS - MISCELLANEOUS

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - LUFKIN | Source: Brown Stock Head Box Vent | FIN: BLPT-1
Source Code: CL-BPBSHB | Date: 4/28/92 | EPN: 12-13 | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1230	1335		
Flow Data				
Stack Temperature, °F	94			94
Moisture Content, %	2.3			2.3
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	9.0			9.0
Volumetric Flow Rate, x10^3 DSCFM	8.3			8.3
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8			20.8
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	1.0	0.5 *		0.6
Emission Rate, lb/hr	0.2	0.1 *		0.1
Hydrogen chloride				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - LUFKIN | Source: Brown Stock Head Box Vent | FIN: BLPT-1
Source Code: CL-BPBSHB | Date: 4/29/92 | EPN: 12-13 | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1406	1444		
Flow Data				
Stack Temperature, °F	77			77
Moisture Content, %	3.2			3.2
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	9.0			9.0
Volumetric Flow Rate, x10^3 DSCFM	8.5			8.5
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8			20.8
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	9.3	0.5 *		4.8
Emission Rate, lb/hr	1.5	0.1 *		0.8
Hydrogen chloride				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

*One or more values were less than the detection limit.

SECTION 16.3 VOC QUALITY CONTROL RESULTS

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

BROWN STOCK HEAD BOX VENT (CL-BPBSHB)
THC Quality Control
(Concentrations in ppm)

Calibration

	4/28/92		4/29/92	
Theoretical	Found	% Error	Found	% Error
0	1	0.7	0	0.0
36	37	0.7	37	0.7
91	84	4.8	86	3.5
150	153	2.0	152	1.3
Correlation coefficient	0.9977		0.9990	

Line Study

Bag sample

4/29/92		
Analyzer	Line	% Rec
151	148	98.0

Nitrogen Blank

4/29/92	
Analyzer	Line
---	4a

a = Ambient air down the line.

BROWN STOCK HEAD BOX VENT (CL-BPBSHB)
VOC Quality Control
(Concentrations in ppm)

Calibration

Analyte	4/28/92 Theor	4/28/92 Check Std	4/28/92 % Rec	4/29/92 Theor	4/29/92 Check Std	4/29/92 % Rec
Acetone	87.7	91.4	104.2	175.4	188.1	107.2
Isopropanol	84.1	72.0	85.6	168.2	183.5	109.1
Benzene	72.0	70.2	97.4	144.1	150.1	104.2
Bromodichloromethane	77.8	78.9	101.4	155.6	135.0	86.8
Toluene	60.6	56.9	93.9	121.2	113.5	93.6
Ethyl Benzene	52.6	49.5	94.2	105.2	88.3	83.9
p-Xylene	52.5	57.9	110.3	105.0	94.7	90.2
o-Xylene	52.8	52.7	99.9	105.5	89.9	85.2
Cumene	46.3	40.9	88.4	92.6	78.4	84.7
alpha-Pinene	40.4	37.9	93.8	80.8	79.6	98.5
beta-Pinene	40.6	52.6	129.6	81.2	91.7	112.9
3-Carene	40.6	158.0	388.8	81.3	72.5	89.2
p-Cymene	41.3	52.4	127.0	82.5	58.3	70.7

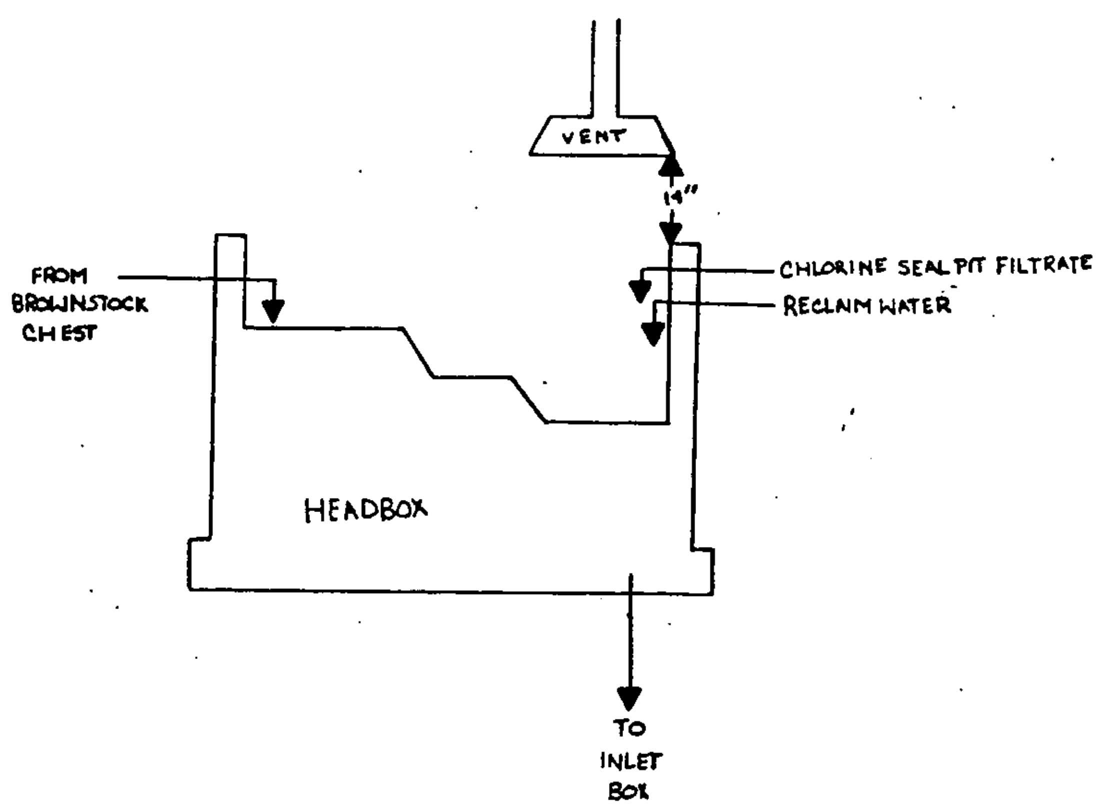
Nitrogen blank Not performed

Line Study		GC	Line	% Rec
Methanol	(100 ppm)			
	4/28/92	77.4	73.7	95.2
	4/29/92	71.0	81.2	114.4

SECTION 16.4 PROCESS DESCRIPTION AND OPERATING CONDITIONS

BROWNSTOCK HEADBOX
A & B Side

The bleach plant is divided into sides A and B producing 360 tons/day and 180 tons/day of pulp respectively. Brownstock pulp enters the brownstock headbox where reclaim water and chlorine seal pit filtrate are added. It then splits into two respective sides and continues onto the tower. The system is vented through a pipe in the hood that covers one-third of the area above the open headbox.



BLEACH PLANT
HYPO DECKER
BROWN STOCK HEADBOX

BLEACHING SEQUENCE: CEH
WOOD SPECIES: SOFTWOOD - SOUTHERN PINE

PARAMETER	UNITS	RUN 1	RUN 2	RUN 3	RUN 4	RUN 5	RUN 6
DATE		4/28	4/28	4/28	4/29	4/29	4/29
START TIME		1144	1245	1345	1116	1218	1320
STOP TIME		1229	1330	1430	1201	1303	1405
BLEACHED PULP PROD RATE	ADT/D	A 340 B 160	A 340 B 160	A 340 B 160	A 260 B 120	A 260 B 120	A 260 B 120
PN NUMBER		21.0	21.6	21.8	19.9	23.3	23.6
CL2 USAGE A	LB/HR	1826	1875	1929	1306	1350	1387
CL2 USAGE B	LB/HR	976	953	957	658	669	763.8
CAUS USAGE A	LB/HR	1077	1077	1077	671	671	650
CAUS USAGE B	LB/HR	427	427	427	280	280	280
HYPO USAGE A	LB/HR	712	679	718	476	476	520
HYPO USAGE B	LB/HR	248	255	235	160	160	170
CL2 TOW TEMP	F	89.4	82.8	81.9	80.0	86.0	85.0
CAU TOW TEMP	F	156.5	156.9	157.8	157.4	157.3	158.9
HYP TOW TEMP	F	129.7	129.4	130.2	126.7	126.7	127.6
CL2 RET TIME	MIN	27	27	27	35	35	35
CAU TOW LEVL	%	58.2	60.4	61.2	49.6	50.3	51.7
CAU DUMP CT	%	46.2	44.8	45.6	34.8	40.2	48.9
CAU RET TIME	MIN	35	36	36	38	38	39
HYP TOW LEVL	%	60.1	60.0	59.9	60.0	60.0	60.0
HYP RET TIME	MIN	146	146	146	191	191	191
CE PN NO.		5.4	5.6	5.4	5.1	5.4	5.8

NCASI: METHANOL, ACETONE, MEK, CHLOROFORM, ACETILE

BLEACH PLANT DIAGRAMS AND PROCESS INFORMATION

A. Bleaching Practice

The mill has two parallel bleach lines with CEH sequences which produce 500 ton/day bleached kraft softwood pulp to a final G.E. brightness of 70. During the tests, bleach plant 1 operated at a rate of 15 ton/hour and bleach plant 2 operated at a rate of 8 ton/hour. Figure 1 is a diagram of the bleaching process for both of these lines.

Table 1 shows the bleaching conditions for the two bleach plants during the testing. There was little difference between the bleach plant configurations other than capacity. The kappa number of the brownstock was 30 during run 1 and was 30 during run 2. Other than that, all conditions were the same for both runs.

Representative Process Conditions

Bleaching Sequence:	CEH
Wood Species:	Southern Pine
Production Rate:	500-540 T/D Total; 1=360max, 2=180max
Kappa Number:	PN 18-24
Chemical Usage (Cl_2, ClO_2, NaOH, NaOCl, O_2 in E Stage, pH in towers, etc.):	Cl_2, NaOH, NaOCL
Percent ClO_2 Substitution:	N/A
Tower Temperatures & Retention Times:	Cl_2, 74-95° F, 25-35 min NaOH, 157-159° F, 32-39 min NaOCL, 126-131° F, 146-221 min
CE Kappa Number:	CE PN 4.5-6.5

B. Water Reuse

Fresh water was used on all of the showers.

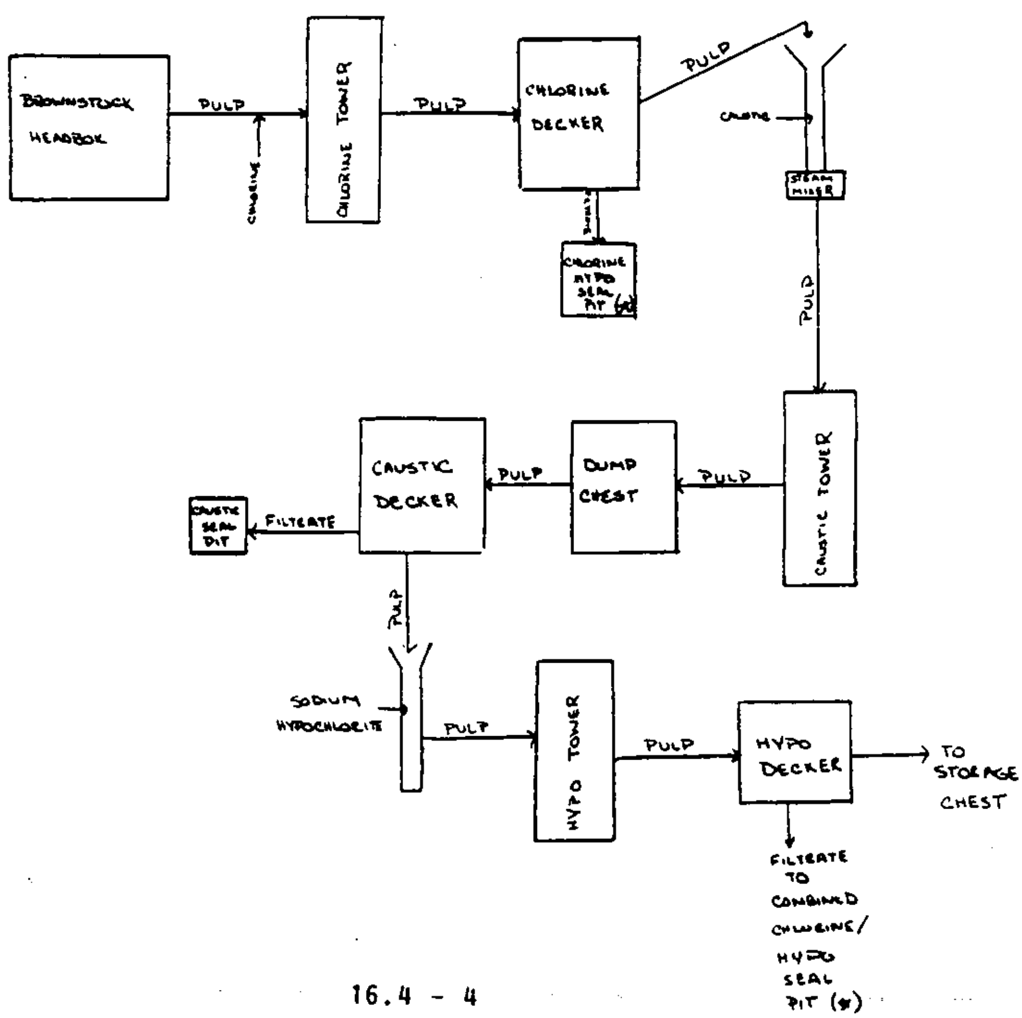
C. Bleach Plant Venting

Most of the vents from both bleach plants are vented to the atmosphere individually with no scrubbing. Figure 2 shows the location of various vents.

TABLE 2 BLEACHING CONDITIONS IN BLEACH PLANT 1

	C	E	H	D
Consistency, Percent	3.5	10	10	-
Temperature, °F	110	160	125	-
Time, Minutes	25	25	90	-
Chlorine, lb/ton odbs	130	-	-	-
Hypochlorite as Cl_2 lb/ton	-	-	44	-
Caustic, lb/ton	-	88	-	-
Peroxide, lb/ton	-	-	-	-
Chlorine Dioxide	-	-	-	-
Residual Chlorine, lb/ton	Trace	10.5	Trace	-
Vat pH	1.8	6.	9.5	-
K Number	-	-	-	-
Elrepho Brightness	-	-	70	-

Note: Bleach Plant 2 had the same conditions as Bleach Plant 1.



APPENDIX A PRELIMINARY SCREENING DATA

A.1 Lime Kiln with NCGs (VOST)

APPENDIX A

A.1 LIME KILN WITH NCGs (VOST)

EMISSION TEST RESULTS - VOST

Mill CHAMPION - LUFKIN Source: Lime Kiln
Source Code: CL-LK EPN: FIN: CIN:

Compound	LK-T (μg)	LK-TC (μg)	LK-C (μg/L)	Sampling Date: Total (μg)	March, 1992 CL-LK (μg/m3)	Conc. (ppm)
TARGET COMPOUNDS						
Chloromethane		1.625		1.63	162.50	0.077
Methylene Chloride	0.066	0.019		0.09	8.50	0.002
Acetone	1.166	0.007	11.35	1.66	166.11	0.069
Carbon Disulfide	11.768	4.146		15.91	1591.40	0.503
Chloroform	1.147	0.016	3.79	1.33	132.60	0.027
1,3-Butadiene	0.301			0.30	30.10	0.013
Dimethyl disulfide	13.789	0.301		14.09	1409.00	0.360
Isooctane		0.039		0.04	3.90	0.001
n-Hexane	0.324	0.062		0.39	38.60	0.011
2-Butanone (MEK)	0.555	0.084		0.64	63.90	0.021
Bromodichloromethane	0.194			0.19	19.40	0.003
Benzene	3.649			3.65	364.90	0.112
Toluene	1.093			1.09	109.30	0.029
Ethylbenzene	0.054			0.05	5.40	0.001
o-Xylene	0.040			0.04	4.00	0.001
m-/p-Xylene	0.113			0.11	11.30	0.003
A-Pinene	1.518			1.52	151.80	0.027
B-Pinene	0.442			0.44	44.20	0.008
TENTATIVELY IDENTIFIED CMPDS.						
Thiophene	19.794			19.79	1979.40	
Branched HCs	16.386	0.047	0.064	16.44	1643.58	
Cyclic HCs	10.006			10.01	1000.60	
Subst'd HC	10.773	0.043		10.82	1081.60	
Subst'd Hexane	4.749			4.75	474.90	
2-Butene		0.358		0.36	35.80	
Furan		0.102		0.10	10.20	
Sulfur-cont'g HC		0.056		0.06	5.60	
Siloxane		0.021		0.02	2.10	
SURROGATE STDS (% Recovery)						
Toluene-d8	94.4	94.2	94.2			
1,2-Dichloroethane-d4	82.3	93.9	87.7			
Benzene-d6	115.9	103.0	97.1			

NOTES:
-T=Tenax
-TC=Tenax/Charcoal
-C = Condensate

Air Volume = 0.01000 cu.m.
Condensate Vol. = 43.0 mL

Triangle Laboratories of RTP, Inc.	FILE NAME: HH020	SAMPLE ID:	CLLKV2 T
801 Capitola Drive	RF FILE: ICAL 031692	TLI ID:	54.180.2A
Durham, NC 27713	DATE: 03/25/92	ANALYSIS DATE:	03/23/92
Telephone: (919) 544-5729	TLI PROJ #: 20367	DILUTION FACTOR:	1

QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	1972		790	1		IS	
2	Chloromethane	0	.872	0	1	.003	ND	.05
3	Bromomethane	0	.634	0	1	.004	ND	.05
4	Vinyl Chloride	0	1.005	0	1	.003	ND	.05
5	Chloroethane	0	.848	0	1	.003	ND	.05
6	Methylene Chloride	651	1.245	597	1	.066	D	.05
7	Acetone	3016	.328	538	1	1.166	D	.05
8	Carbon Disulfide	390697	4.209	519	1	11.768	D	.05
9	1,1-Dichloroethene	0	1.090	0	1	.002	ND	.05
10	1,1-Dichloroethane	0	3.476	0	1	.001	ND	.05
11	trans-1,2-Dichloroethene	0	1.290	0	1	.002	ND	.05
12	Chloroform	27691	3.061	808	1	1.147	D	.05
13	1,2-Dichloroethane	0	2.165	0	1	.001	ND	.05
43	Trichlorofluoromethane	0	1.480	0	1	.002	ND	.05
46	Acrylonitrile	0	.502	0	1	.005	ND	.05
47	cis-1,2-Dichloroethene	0	1.514	0	1	.002	ND	.05
52	1,3-butadiene	1174	.495	236	1	.301	D	.05
57	Allyl chloride	0	.770	0	1	.003	ND	.05
62	Dimethyl disulfide	350881	3.226	1094	1	13.789	D	.05
63	Dimethyl sulfide	0	1.545	0	1	.002	ND	.05
65	Iodomethane	0	2.351	0	1	.001	ND	.05
66	Isooctane	0	11.661	0	1	.001	ND	.05
68	Tert-Butyl methyl ether	0	3.206	0	1	.001	ND	.05
69	Vinyl Bromide	0	.945	0	1	.003	ND	.05
70	n-Hexane	7951	3.111	677	1	.324	D	.05
14	1,4-Difluorobenzene	9199		922	14		IS	
15	2-Butanone	612	.030	776	14	.555	D	.05
16	1,1,1-Trichloroethane	0	.501	0	14	.001	ND	.05
17	Carbon Tetrachloride	0	.513	0	14	.001	ND	.05
18	Vinyl Acetate	0	.488	0	14	.001	ND	.05
19	Bromodichloromethane	3642	.509	1020	14	.194	D	.05
20	1,2-Dichloropropane	0	.536	0	14	.001	ND	.05
21	cis-1,3-Dichloropropene	0	.757	0	14	.001	ND	.05
22	Trichloroethene	0	.545	0	14	.001	ND	.05
23	Dibromochloromethane	0	.500	0	14	.001	ND	.05
24	1,1,2-Trichloroethane	0	.314	0	14	.002	ND	.05
25	Benzene	165405	1.232	862	14	3.649	D	.05
26	trans-1,3-Dichloropropene	0	.569	0	14	.001	ND	.05
27	Bromoform	0	.352	0	14	.002	ND	.05
54	1,4-Dichloro-2-butene	0	.107	0	14	.005	ND	.05
60	Dibromomethane	0	.195	0	14	.003	ND	.05
28	Chlorobenzene-d5	11703		1374	28		IS	
29	4-Methyl-2-Pentanone	0	.146	0	28	.003	ND	.05
30	2-Hexanone	0	.123	0	28	.003	ND	.05
31	Tetrachloroethene	0	.394	0	28	.001	ND	.05
32	1,1,2,2-Tetrachloroethane	0	.245	0	28	.002	ND	.05
33	Toluene	32501	.635	1133	28	1.093	D	.05
34	Chlorobenzene	0	.938	0	28	.001	ND	.05

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

Tangle Laboratories of RTP, Inc.
401 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME:	HH020	SAMPLE ID:	CLLKV2 T
RF FILE:	ICAL 031692	TLI ID:	54.180.2A
DATE:	03/25/92	ANALYSIS DATE:	03/23/92
TLI PROJ #:	20367	DILUTION FACTOR:	1

QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
35 Ethylbenzene	1220	.486	1408	28	.054	D	.05
36 Styrene	0	.984	0	28	.001	ND	.05
37 o-Xylene	1063	.566	1506	28	.040	E	.05
38 m-/p-Xylene	3217	.607	1432	28	.113	D	.05
49 1,2 Dichlorobenzene	0	.737	0	28	.001	ND	.05
50 1,2,3-Trichloropropane	0	.232	0	28	.002	ND	.05
51 1,3 Dichlorobenzene	0	.955	0	28	.001	ND	.05
53 1,4 Dichlorobenzene	0	.800	0	28	.001	ND	.05
56 A-Pinene	68486	.964	1578	28	1.518	D	.05
58 B-Pinene	20712	1.001	1735	28	.442	D	.05
59 Cumene (isopropylbenzene)	0	1.545	0	28	.001	ND	.05
64 Ethyl methacrylate	0	.425	0	28	.001	ND	.05
67 P-Cymene	0	2.159	0	28	.001	ND	.05

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT,ug	CODE	% RECOVERY
39 Toluene-d8	11132	1.008	1124	28	.236	D	94.4
41 1,2-Dichloroethane-d4	2947	1.816	861	1	.206	D	82.3
48 Benzene-d6	13128	1.231	858	14	.290	D	115.9

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

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FILE NAME: HH020T
DATE: 03/26/92
TLI PROJ #: 20367

SAMPLE ID: CLLKV2 T
TLI ID: 54.180.2A
ANALYSIS DATE: 03/23/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
THIOPHENE	890	1029190	791	.25	19.794
UNKNOWN	2056	2090185	1374	.25	14.809
BRANCHED HYDROCARBON	1963	1519358	1374	.25	10.764
CYCLIC HYDROCARBON	2122	929093	1374	.25	6.582
BRANCHED HYDROCARBON	2088	793592	1374	.25	5.622
SUBSTITUTED HYDROCARBON	1890	703477	1374	.25	4.984
SUBSTITUTED HEXANE	911	246922	791	.25	4.749
SUBSTITUTED HYDROCARBON	1783	523226	1374	.25	3.707
CYCLIC HYDROCARBON	2013	483345	1374	.25	3.424
SUBSTITUTED HYDROCARBON	1744	293887	1374	.25	2.082

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
1,4-Difluorobenzene	791	12999	14
Chlorobenzene-d5	1374	35287	28

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FILE NAME: MH018
RF FILE: ICAL 031692
DATE: 03/25/92
TLI PROJ #: 20367

SAMPLE ID: CLLKV2 TC
TLI ID: 54.180.2B
ANALYSIS DATE: 03/23/92
DILUTION FACTOR: 1

Q U A N T I T A T I O N   R E P O R T

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1 Bromochloromethane	2243		781	1		IS	
2 Chloromethane	12718	.872	170	1	1.625	D	.05
3 Bromomethane	0	.634	0	1	.004	ND	.05
4 Vinyl Chloride	0	1.005	0	1	.002	ND	.05
5 Chloroethane	0	.848	0	1	.003	ND	.05
6 Methylene Chloride	217	1.245	587	1	.019	E	.05
7 Acetone	0	.328	0	1	.007	ND	.05
8 Carbon Disulfide	156579	4.209	507	1	4.146	D	.05
9 1,1-Dichloroethene	0	1.090	0	1	.002	ND	.05
10 1,1-Dichloroethane	0	3.476	0	1	.001	ND	.05
11 trans-1,2-Dichloroethene	0	1.290	0	1	.002	ND	.05
12 Chloroform	436	3.061	798	1	.016	E	.05
13 1,2-Dichloroethane	0	2.165	0	1	.001	ND	.05
43 Trichlorofluoromethane	0	1.480	0	1	.002	ND	.05
46 Acrylonitrile	0	.502	0	1	.004	ND	.05
47 cis-1,2-Dichloroethene	0	1.514	0	1	.001	ND	.05
52 1,3-butadiene	0	.495	0	1	.005	ND	.05
57 Allyl chloride	0	.770	0	1	.003	ND	.05
62 Dimethyl disulfide	8706	3.226	1075	1	.301	D	.05
63 Dimethyl sulfide	0	1.545	0	1	.001	ND	.05
65 Iodomethane	0	2.351	0	1	.001	ND	.05
66 Isooctane	4041	11.661	871	1	.039	E	.05
68 Tert-Butyl methyl ether	0	3.206	0	1	.001	ND	.05
69 Vinyl Bromide	0	.945	0	1	.002	ND	.05
70 n-Hexane	1733	3.111	669	1	.062	D	.05
14 1,4-Difluorobenzene	10665		913	14		IS	
15 2-Butanone	108	.030	764	14	.084	D	.05
16 1,1,1-Trichloroethane	0	.501	0	14	.001	ND	.05
17 Carbon Tetrachloride	0	.513	0	14	.001	ND	.05
18 Vinyl Acetate	0	.488	0	14	.001	ND	.05
19 Bromodichloromethane	0	.509	0	14	.001	ND	.05
20 1,2-Dichloropropane	0	.536	0	14	.001	ND	.05
21 cis-1,3-Dichloropropene	0	.757	0	14	.001	ND	.05
22 Trichloroethene	0	.545	0	14	.001	ND	.05
23 Dibromochloromethane	0	.500	0	14	.001	ND	.05
24 1,1,2-Trichloroethane	0	.314	0	14	.001	ND	.05
25 Benzene	0	1.232	0	14	.001	ND	.05
26 trans-1,3-Dichloropropene	0	.569	0	14	.001	ND	.05
27 Bromoform	0	.352	0	14	.001	ND	.05
54 1,4-Dichloro-2-butene	0	.107	0	14	.004	ND	.05
60 Dibromomethane	0	.195	0	14	.002	ND	.05
28 Chlorobenzene-d5	13551		1354	28		IS	
29 4-Methyl-2-Pentanone	0	.146	0	28	.003	ND	.05
30 2-Hexanone	0	.123	0	28	.003	ND	.05
31 Tetrachloroethene	0	.394	0	28	.001	ND	.05
32 1,1,2,2-Tetrachloroethane	0	.245	0	28	.002	ND	.05
33 Toluene	0	.635	0	28	.001	ND	.05
34 Chlorobenzene	0	.938	0	28	.001	ND	.05

CODES: ND = Not Detected; D = Detected; E = Est[illegible]

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
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Telephone: (919) 544-5729

FILE NAME:	MH018	SAMPLE ID:	CLLKV2 TC
RF FILE:	ICAL 031692	TLI ID:	54.180.2B
DATE:	03/25/92	ANALYSIS DATE:	03/23/92
TLI PROJ #:	20367	DILUTION FACTOR:	1

QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
35 Ethylbenzene	0	.486	0	28	.001	ND	.05
36 Styrene	0	.984	0	28	.001	ND	.05
37 o-Xylene	0	.566	0	28	.001	ND	.05
38 m-/p-Xylene	0	.607	0	28	.001	ND	.05
49 1,2 Dichlorobenzene	0	.737	0	28	.001	ND	.05
50 1,2,3-Trichloropropane	0	.232	0	28	.002	ND	.05
51 1,3 Dichlorobenzene	0	.955	0	28	.001	ND	.05
53 1,4 Dichlorobenzene	0	.800	0	28	.001	ND	.05
56 A-Pinene	0	.964	0	28	.001	ND	.05
58 B-Pinene	0	1.001	0	28	.001	ND	.05
59 Cumene (isopropylbenzene)	0	1.545	0	28	.001	ND	.05
64 Ethyl methacrylate	0	.425	0	28	.001	ND	.05
67 P-Cymene	0	2.159	0	28	.001	ND	.05

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT,ug	CODE	% RECOVERY
39 Toluene-d8	12864	1.008	1110	28	.235	D	94.2
41 1,2-Dichloroethane-d4	3826	1.816	849	1	.235	D	93.9
48 Benzene-d6	13528	1.231	848	14	.258	D	103.0

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801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HH018T
DATE: 03/26/92
TLI PROJ #: 20367

SAMPLE ID: CLLKV2 TC
TLI ID: 54.180.2B
ANALYSIS DATE: 03/23/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
2-BUTENE	211	19054	781	.25	.358
UNKNOWN	146	7813	781	.25	.147
FURAN	414	3289	781	.25	.062
SULFUR CONTAINING HYDROCARBON	1752	8478	1355	.25	.056
SUBSTITUTED HYDROCARBON	259	2263	781	.25	.043
FURAN	474	2154	781	.25	.040
BRANCHED HYDROCARBON	2091	3747	1355	.25	.025
BRANCHED HYDROCARBON	1160	3308	1355	.25	.022
SILOXANE	1236	3179	1355	.25	.021

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	781	13299	1
1,4-Difluorobenzene	913	29312	14
Chlorobenzene-d5	1355	37600	28

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FILE NAME: HH029
RF FILE: HH026
DATE: 03/25/92
TLI PROJ #: 20367

SAMPLE ID: CLLKV2
TLI ID: 54.180.2C
SAMPLE VOL: .005 L
ANALYSIS DATE: 03/24/92
DILUTION FACTOR: 1

QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	CONC, ug/L	CODE	QUAN LIMIT
1 Bromochloromethane	2933		788	1		IS	
2 Chloromethane	0	.759	0	1	.45	ND	10
3 Bromomethane	0	.750	0	1	.45	ND	10
4 Vinyl Chloride	0	1.113	0	1	.31	ND	10
5 Chloroethane	0	.943	0	1	.36	ND	10
6 Methylene Chloride	0	1.318	0	1	.26	ND	10
7 Acetone	363	.546	536	1	11.35	D	10
8 Carbon Disulfide	0	4.421	0	1	.08	ND	10
9 1,1-Dichloroethene	0	1.174	0	1	.29	ND	10
10 1,1-Dichloroethane	0	3.524	0	1	.10	ND	10
11 trans-1,2-Dichloroethene	0	1.391	0	1	.24	ND	10
12 Chloroform	682	3.065	806	1	3.79	E	10
13 1,2-Dichloroethane	0	2.429	0	1	.14	ND	10
43 Trichlorofluoromethane	0	1.471	0	1	.23	ND	10
46 Acrylonitrile	0	.509	0	1	.67	ND	10
47 cis-1,2-Dichloroethene	0	1.554	0	1	.22	ND	10
52 1,3-butadiene	0	.531	0	1	.64	ND	10
57 Allyl chloride	0	.752	0	1	.45	ND	10
62 Dimethyl disulfide	0	3.604	0	1	.09	ND	10
63 Dimethyl sulfide	0	1.692	0	1	.20	ND	10
65 Iodomethane	0	2.543	0	1	.13	ND	10
66 Isooctane	0	12.746	0	1	.03	ND	10
68 Tert-Butyl methyl ether	0	3.828	0	1	.09	ND	10
69 Vinyl Bromide	0	1.016	0	1	.34	ND	10
70 n-Hexane	0	3.296	0	1	.10	ND	10
14 1,4-Difluorobenzene	14053		921	14		IS	
15 2-Butanone	0	.045	0	14	1.58	ND	10
16 1,1,1-Trichloroethane	0	.530	0	14	.13	ND	10
17 Carbon Tetrachloride	0	.537	0	14	.13	ND	10
18 Vinyl Acetate	0	.579	0	14	.12	ND	10
19 Bromodichloromethane	0	.528	0	14	.13	ND	10
20 1,2-Dichloropropane	0	.559	0	14	.13	ND	10
21 cis-1,3-Dichloropropene	0	.787	0	14	.09	ND	10
22 Trichloroethene	0	.535	0	14	.13	ND	10
23 Dibromochloromethane	0	.546	0	14	.13	ND	10
24 1,1,2-Trichloroethane	0	.346	0	14	.21	ND	10
25 Benzene	0	1.214	0	14	.06	ND	10
26 trans-1,3-Dichloropropene	0	.643	0	14	.11	ND	10
27 Bromoform	0	.428	0	14	.17	ND	10
54 1,4-Dichloro-2-butene	0	.176	0	14	.40	ND	10
60 Dibromomethane	0	.215	0	14	.33	ND	10
28 Chlorobenzene-d5	17810		1368	28		IS	
29 4-Methyl-2-Pentanone	0	.255	0	28	.22	ND	10
30 2-Hexanone	0	.253	0	28	.22	ND	10
31 Tetrachloroethene	0	.404	0	28	.14	ND	10
32 1,1,2,2-Tetrachloroethane	0	.397	0	28	.14	ND	10
33 Toluene	0	.672	0	28	.08	ND	10
34 Chlorobenzene	0	1.024	0	28	.05	ND	10

CODES: ND = Not Detected; ...

Triangle Laboratories of RTP, Inc.
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FILE NAME: HH029
RF FILE: HH026
DATE: 03/25/92
TLI PROJ #: 20367

SAMPLE ID: CLLKV2
TLI ID: 54.180.2C
SAMPLE VOL: .005 L
ANALYSIS DATE: 03/24/92
DILUTION FACTOR: 1

Q U A N T I T A T I O N   R E P O R T

NAME	AREA	RF	SCAN	ISID	CONC, ug/L	CODE	QUAN LIMIT
35 Ethylbenzene	0	.522	0	28	.11	ND	10
36 Styrene	0	1.049	0	28	.05	ND	10
37 o-Xylene	0	.606	0	28	.09	ND	10
38 m-/p-Xylene	0	.641	0	28	.09	ND	10
49 1,2 Dichlorobenzene	0	.918	0	28	.06	ND	10
50 1,2,3-Trichloropropane	0	.338	0	28	.17	ND	10
51 1,3 Dichlorobenzene	0	1.066	0	28	.05	ND	10
53 1,4 Dichlorobenzene	0	.935	0	28	.06	ND	10
56 A-Pinene	0	1.020	0	28	.06	ND	10
58 B-Pinene	0	1.063	0	28	.05	ND	10
59 Cumene (isopropylbenzene)	0	1.640	0	28	.03	ND	10
64 Ethyl methacrylate	0	.561	0	28	.10	ND	10
67 P-Cymene	0	2.316	0	28	.02	ND	10

S U R R O G A T E   S U M M A R Y

	AREA	RF	SCAN	ISID	AMT,ug	CODE	% RECOVERY
39 Toluene-d8	18161	1.083	1126	28	.24	D	94.2
41 1,2-Dichloroethane-d4	5472	2.128	857	1	.22	D	87.7
48 Benzene-d6	16718	1.225	856	14	.24	D	97.1

CODES: ND = Not Detected; [illegible]

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FILE NAME: HH029T
DATE: 03/26/92
TLI PROJ #: 20367

SAMPLE ID: CLLKV2
TLI ID: 54.180.2C
ANALYSIS DATE: 03/24/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
BRANCHED HYDROCARBON	2099	8500	1368	.25	.042
BRANCHED HYDROCARBON	2155	4403	1368	.25	.022

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	788	18733	1
1,4-Difluorobenzene	922	31465	14
Chlorobenzene-d5	1368	50275	28

WESTON.
MANAGERS DESIGNERS/CONSULTANTS

APPENDIX B

APPENDIX B PROCESS STREAM SAMPLE RESULTS

ncasi

WEST COAST REGIONAL CENTER
P.O. Box 458
Corvallis, OR 97339
(503) 752-8801

NATIONAL COUNCIL OF THE PAPER INDUSTRY FOR AIR AND STREAM IMPROVEMENT, INC.

November 11, 1992

MEMO TO: Ms. Bonnie Blickhahn, Champion International Corp.

FROM: Alex R. Gholson, NCASI

SUBJECT: Results of Method 25D and Method 305 Analysis for the TACB Emissions Speciation Study, Champion Lufkin Mill

In support of the TACB Emissions Speciation Study, NCASI analyzed selected samples using EPA Draft Method 25D. As part of a method development effort the samples were also analyzed for specific volatile organic compounds using an experimental method referred to as Method 305. Due to conflicting resources, one of the samples was analyzed without the halogen selective detector specified by Method 25D. Volatile organic chlorine was not expected to be significant in this particular sample. This memo is an been updated from a previous memo issued on September 10, 1992 to include additional discussion of the analytical methods and reporting procedures.

Samples were collected by the contractor Roy F. Weston and sent to NCASI's West Coast Regional Center in Corvallis. Volatile organic sampling procedures were used to collect the samples instead of the sampling procedures specified by Method 25D so that compositing of the samples would be easier. I feel that the Method 25D sample procedures are prone to contamination from the outside environment during storage and shipment of sample containers half filled with polyethylene glycol (PEG) and a bias due to spillage of sample/PEG during sample collection. Samples were composited at NCASI and then carefully transferred to vials containing PEG in the laboratory. Table 1 list the samples received and how they were combined to form the samples analyzed.

The composited samples were analyzed as described by the draft Method 25D proposed in the Federal Register with the modifications mentioned above. Method 25D was proposed to determine if a sample has a total volatile organic emission potential below a specified limit (500 ppmwVO). The samples analyzed from Champion Lufkin were found to be below that limit. However, for this study it was desired to use the method to provide an estimate of the actual level of volatile organic in each sample collected. Because this objective differs slightly from the define purpose of the method, a brief discussion of the method and the method results are in order. In Method 25D a sample is purged under specified conditions to remove the volatile compounds. The removed compounds are then analyzed for total organic carbon using a flame ionization detector (FID) resulting in a value expressed as parts-per-million carbon (as CH_4) by weight (ppmwC) or µgC/g. The total purged chlorine is measured with an electrolytic conductivity detector and reported as ppm chlorine by weight (ppmwCl) or µgCl/g. Method 25D then calculates a total volatile organic by summing the total organic carbon and the total organic chlorine and reports the total as parts-per-million volatile organic (ppmwVO). Because the method was designed to show that a value is below a level well within its standard working range, no guidance is provided for reporting values near or below the limit of detection (LOD) or adding values when one or both are below the LOD. For this study the American Chemical Society definition of LOD which is defined as three standard deviations of the measurement above the blank response was used. All Method 25D values are blank corrected so the blank level is well characterized and the standard deviation of multiple blank measurements is used to determine the LOD. The LOD for the total carbon value was 12.4 ppmwC for a 15 gram sample and 5.8 ppmwCl total chlorine value for a 15 gram sample. Actual LODs were dependant on the sample size which varied from 11.3 to 15.1 grams. When measured concentration values are below the LOD, they are reported as not detected (ND) and the LOD is then listed in parentheses. The total volatile organic which is the sum of two measured values was not reported for this study. Because proper guidance for handling values below the LOD is not provided by the method, the data user should choose the most appropriate method for determining the total which is consistent with the users data objectives and his best professional judgement. For example, in the case of an evaporator condensate, a non-detect for chlorine could be considered as a zero when determining a total. Likewise, for a bleach plant sewer, it might be prudent to assume the LOD as the best estimate of the chlorine level.

The experimental modifications made to speciate the volatile organics (Method 305) purged using Method 25D included removing a third slip stream from the sample purge line at approximately 100 mL/min through an ice cold aqueous impinger and into a Tenax/charcoal adsorbent trap. The aqueous impinger solution was analyzed for methanol, ethanol, acetone, 2-propanol, and 2-butanone by microdistillation followed by GC-FID analysis. The Tenax/charcoal trap was thermally desorbed and analyzed by GC/MS for a list of 28 compounds. Table 2 list the results of the Method 25D and Method 305 analyses. All Method 305 values are reported in the units of microgram of compound per gram of sample (µg/g). No effort was made to determine the LOD for this method because of the lack of historical data needed to characterize the background level or the analytical variance. Not detected (ND) was reported for all compounds not found or found but below a level generally considered reliable based on professional judgment of a limited database. This level was chosen to be 1.0 µg/g for the impinger values and 0.1 µg/g for the trap values.

The quality assurance checks of Method 25D for this program included two sets of sample duplicate analyses and a matrix spike duplicate. Only volatile carbon was detected by Method 25D in the duplicates and the difference between duplicates relative to the average expressed as a percent or relative percent difference (RPD) between duplicate samples were 8.1 and 5.6 percent indicating good precision. Only one set of duplicates were obtained using the experimental Method 305. Methanol duplicate results were found to have a RPD or 1.3 percent. Values of other compounds detected at lower levels and analyzed using the adsorbent trap and GC/MS were of lower precision. RPDs for compounds detected ranged from 112 percent for dimethyl sulfide to 10.2 percent for ß-pinene.

The matrix spike duplicate provided both recovery and precision information for the two methods. For Method 25D the total carbon average recovery was 61.6 percent with a RPD of 0.3 percent. This indicates good recovery because typical recovery for a QC spike in reagent water is 70 percent. The less than 100 percent recovery found is due to the large percentage of methanol in the spiking solution which is only 80 percent purged by Method 25D and has a poor FID response. The chlorine spike was near the LOD for chlorine and an average recovery of 47.8 percent with a RPD of 13.7 percent. It is believed the low recovery of the chlorine spike is due to the low concentration level spiked. The average recovery of methanol by Method 305 was found to be 82.6 percent with a RPD of 10.8 percent while acetone and 2-butanone had approximately 50 percent recoveries with 10 percent RPDs. Trap recoveries of compound more volatile than chloroform were generally less than 10 percent including dimethyl sulfide. Chloroforms recovery was 71 percent with a RPD of 58 percent. Recoveries of the other compounds ranged from 33 percent for ß-pinene to 134 percent for limonene with RPDs ranging from 8.9 percent to 56.8 percent. In summary, the Method 25D QA results are within an acceptable range while the Method 305 results other than the methanol values should be considered semi-quantitative at this time. More development of Method 305 is currently being performed to improve the overall data quality for Method 305.

cc: Ashok Jain
Larry LaFleur

TABLE 1. SAMPLES COMPOSITED AND THEIR ANALYTICAL CODE NUMBERS

Analytical code #	Composited sample code #
CL-LK/2/SCBR/0501	CL-LK/2/SCBR/0501/1-1700
	CL-LK/2/SCBR/0501/1-1820
	CL-LK/2/SCBR/0501/1-1900
	CL-LK/2/SCBR/0501/1-2000
	CL-LK/2/SCBR/0501/1-2100
CL-BSWA/25D/0422	CL-BSWA/25D/0422/1
	CL-BSWA/25D/0422/2
	CL-BSWA/25D/0422/3

TABLE 2 RESULTS OF METHOD 25D AND 305 ANALYSES AT CHAMPION'S LUFKIN MILL

Compound	Concentration (μg/g) CL-LK/2/SCBR/0501	CL-BSWA/25D/0422
Method 25D		
Total Carbon (ppmwC)	ND (13.6)	120
Total Chlorine (ppmwCl)	NA	ND (5.8)
Method 305		
Impinger analysis		
Methanol	ND	189
Ethanol	ND	4.20
Impinger + Trap		
Acetone	ND	2.20
2-Butanone	ND	0.214
Trap analysis		
Dimethyl sulfide	ND	1.32
Methylene chloride	ND	ND
Chloroform	ND	ND
Benzene	ND	ND
Bromodichloromethane	ND	ND
Dimethyl disulfide	ND	7.79
Toluene	ND	ND
α-Pinene	ND	0.599
β-Pinene	ND	0.137
Limonene	ND	0.606

NA is not available because chlorine selective detector was not used.
ND is not detected. The limit of detection is given in parenthesis when available (see text for explanation).

APPENDIX C COMPARISON OF CHLOROFORM RESULTS

APPENDIX C

TEXAS EMISSIONS SPECIATION STUDY
EMISSION TEST RESULTS
CHAMPION INTERNATIONAL
SHELDON, TEXAS

VOLUME 3 OF 6

Prepared For:

TEXAS PAPER INDUSTRY ENVIRONMENTAL COMMITTEE

CHAMPION INTERNATIONAL CORPORATION: LUFKIN, TX
CHAMPION INTERNATIONAL CORPORATION: SHELDON, TX
INLAND-ORANGE, INC.: ORANGE, TX
SIMPSON PASADENA PAPER COMPANY: PASADENA, TX
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JANUARY 1993

06848-001-001

WESTON MANAGERS DESIGNERS/CONSULTANTS

TABLE OF CONTENTS

WESTON

EXECUTIVE SUMMARY

This volume of the report presents the results of the sources tested at the Champion International mill in Sheldon, Texas. Volume 1 describes the objectives of the study, methodology used to collect the data, and the quality control results which are applicable to the entire study at the five mills. A copy of the project work plan is also included as an Appendix to Volume 1.

The table on the following page summarizes the sources tested for the various parameters. The testing was conducted during the time period of 18 May through 25 June by a WESTON test team led by Mr. Gary Lloyd. Mr. Luis Suerio of Champion was responsible for collection of process operating data and coordination of testing activities with mill operations.

Data is presented by source as sections in this volume. Each section will include a brief narrative SOURCE SUMMARY, a tabular SUMMARY OF RESULTS, a graphic THC TREND PLOT (if applicable), and exhibits for all source data, quality control data and process operating conditions. Supporting data (chromatograms, calibration data, field data sheets, etc.) will remain on file for a period of three years.

SOURCES TESTED AT CHAMPION - SHELDON

SOURCE TESTED	SOURCE CODE	Phase 2 M16 TRS	M18 M25A	VOST	MM5	CH2O	Metals	Cr+6	HCl	Acid Mist	Chloro-form
CHAMPION - SHELDON											
TPIEC-POOLED SOURCES											
Tall Oil Reactor Vent	CS-TORV	Y	Y	Y							
Black Liquor Oxidation Vent	CS-BLOV	Y	Y	Y							
Recovery Furnace (Casc) w/ NaOAc	CS-RF/1	Y	Y	Y		Y	Y		Y	Y	
Recovery Furnace (Casc) w/o NaOAc	CS-RF/2	Y	Y			Y			Y		
Smelt-Dissolving Tank Vent	CS-SDTV	Y	Y				Y				
CHAMPION-POOLED SOURCES											
No. 1 Bark Boiler w/ Sludge	CS-BB1/1		Y	Y	Y	Y	Y	Y	Y	Y	
No. 1 Bark Boiler w/o Sludge	CS-BB1/2		Y	Y	Y	Y	Y	Y	Y	Y	
Groundwood, Old Grinder	CS-GWOG		Y								
Groundwood, New Grinder	CS-GWNG		Y								
Groundwood, Coarse Screen Vent	CS-GWCSV		Y								
MILL-SPECIFIC SOURCES											
NCG Vent at Lime Kiln	CS-NCGLK	Y	Y								
TMP No. 1 Preheater Vent	CS-TMP1PH		Y								
TMP No. 2 Preheater Vent	CS-TMP2PH		Y								
TMP Cyclone Vent	CS-TMPCV		Y								
TMP Deep Wash Water Drain Tank	CS-TMPDCW		Y								
Chlorine Scrubber Vent	CS-BPCSV		Y						Y		Y
Caustic Washer Hood Vent	CS-BPCWV		Y						Y		Y
Caustic Seal Tank Vent	CS-BPCSTV		Y						Y		Y
Hypo Washer Vent	CS-BPHWV		Y						Y		Y
Hypo Seal Tank Vent	CS-BPHSTV		Y						Y		Y
Hypo Tower Vent	CS-BPHTV		Y						Y		Y
Caustic Vent	CS-BPCV		Y						Y		Y

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Printed 1/6/93

1. CS-TORV

SECTION 1

TALL OIL REACTOR VENT

(CS-TORV)

SECTION 1
TALL OIL REACTOR VENT
(CS-TORV)

The Tall Oil Reactor was tested on two different days for volatile organic compounds by M25A, M16, M18 and VOST. Two different cooks were tested - one each day. This batch process lasted approximately 1.5 hours and was run once per day. The flow varied with time with the highest flow at the beginning of the cook and decreasing throughout the run. Results are based on the mean flow over the sampling period.

Total Hydrocarbons (M25A)

Figures 1.1 and 1.2 present the THC trends for the test periods on 6/17/92 and 6/20/92. Readings ranged from 20,000 to 150,000 ppm. The variation in the emissions is typical of a batch process.

Volatile Organic Compounds (M16 and M18)

Table 1.1 summarizes the results for the Method 16 and Method 18 target compounds, and Section 1.1 is a tabulation of the data. The volumetric flow was measured during sampling with a pitot tube. Dimethyl disulfide and carbon disulfide were not detected by Method 16. The other reduced sulfur compounds were present, with hydrogen sulfide being the major component. Results for both days were comparable.

The M18 target compounds identified included methanol, acetone, the pinenes and p-cymene. The sample was diluted by a factor of about 111 and 152 prior to analysis.

Volatile Organic Sampling Train (VOST)

Table 1.2 summarizes the result of the VOST sample collected on 6/20/92. Section 1.2 tabulates the results for target compounds. The Tentatively Identified Compounds (TICs) are summarized in Section 1.2 only. The VOST analysis is extremely sensitive and is used here to confirm the identity of target compounds identified in Method 18, as well as attempt identification of other organic compounds which may be present, the TICs. Of the target compounds the predominant components were the pinenes, dimethyl sulfide, chloroform, chloromethane and n-hexane.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 1.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 1.4 includes the process operating data as recorded and provided by mill personnel. The Tall Oil Reactor was operating normally during the testing.

FIGURE 1.1
THC TREND ANALYSIS (6/17/92)
TALL OIL REACTOR VENT (CS-TORV)

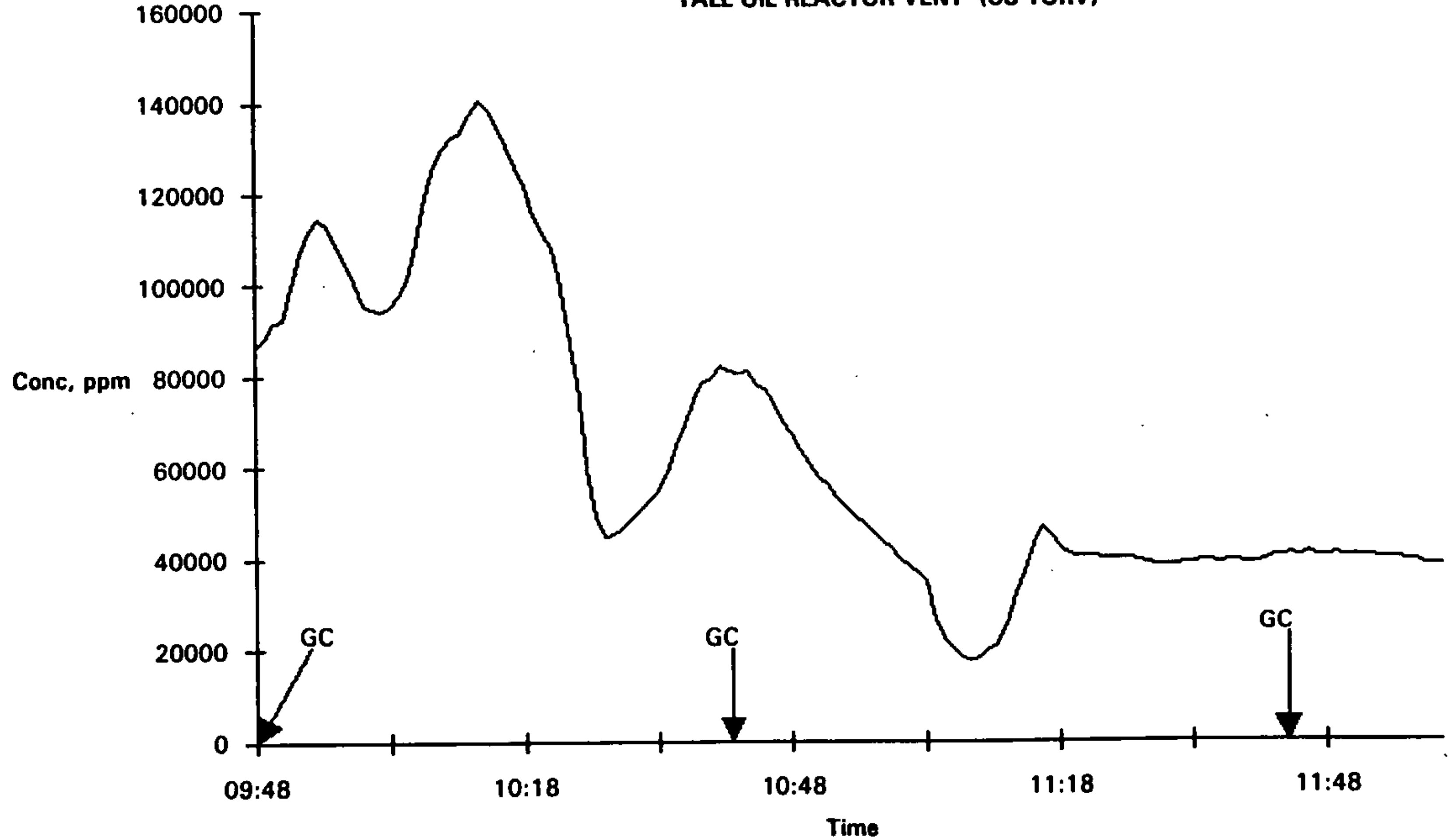
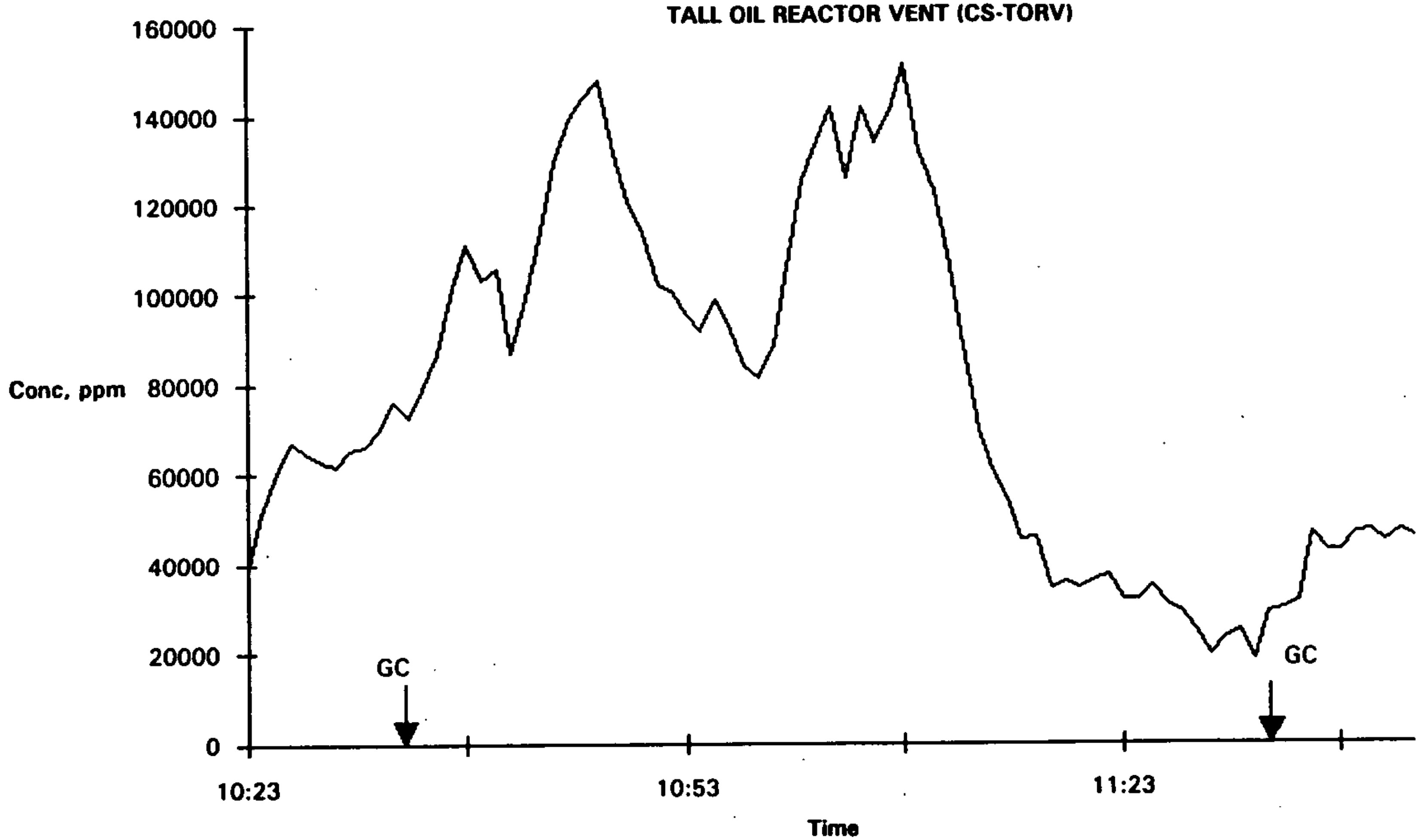


FIGURE 1.2
THC TREND ANALYSIS (6/20/92)
TALL OIL REACTOR VENT (CS-TORV)



WESTON
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TABLE 1.1 SUMMARY OF VOC RESULTS

Mill:	CHAMPION - SHELDON	Source:	Tall Oil Reactor Vent
Source Code:	CS-TORV	Test Dates:	6/17/92 6/20/92
FIN: 7100	CIN: EC30	EPN:	E41

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	99	130	112	
Volumetric Flow Rate, $x10^3$ DSCFM	0.8	2.1	1.6	
Process Operating Conditions				
Production Rate, T Crude Tall Oil/hr	25.0	25.0	25.0	
Method 16 Data, lb/hr				
Hydrogen sulfide	1.3	24.9	11.8	0.1
Methyl mercaptan	1.0	13.5	5.2	0.1
Dimethyl sulfide	2.3	9.9	5.8	0.1
Carbon disulfide	ND	ND	ND	0.1
Dimethyl disulfide	ND	ND	ND	0.1
Method 18 Data, lb/hr				
Methanol	0.9	15.4	6.4	0.6
Ethanol	ND	ND	ND	0.6
Acetone	ND	2.0	1.2	0.7
2-Propanol	ND	ND	ND	0.8
2-Butanone	ND	ND	ND	1.0
Chloroform	ND	ND	ND	3.2
Benzene	ND	ND	ND	1.1
Bromodichloromethane	ND	ND	ND	4.4
Toluene	ND	ND	ND	1.2
Ethyl benzene	ND	ND	ND	1.2
m-, p-Xylene	ND	ND	ND	1.4
o-Xylene	ND	ND	ND	1.4
Cumene	2.3	4.3	3.3	1.4
alpha-Pinene	3.9	217.0	105.1	1.4
beta-Pinene	ND	61.6	30.3	3.2
3-Carene	ND	2.2	1.4	1.8
Terpenes (Unspecified)	5.7	136.4	68.8	3.2
p-Cymene	9.5	30.1	19.4	1.4
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	44.3	390.8	199.8	0.1
Unknowns as C, lb/hr	0.4	23.8	7.1	0.1
Sum of Compounds as C, lb/hr	68.1	391.6	206.8	0.1

ND=Not Detected
DL=Detection Limit

TABLE 1.2 SUMMARY OF VOST RESULTS

Mill: CHAMPION-SHELDON
Source Code: CS-TORV
FIN: 7100 EPN: E41

Source: Tall Oil Reactor Vent
Test Dates: 6/20/92
CIN: EC30

TIME	1037
Volumetric Flow Data	
Stack Temperature, °F	115
Volumetric Flow Rate, x 10^3 DSCFM	1.8
Process Operating Conditions	
Production Rate, T Crude Tall Oil/hr	25.0
Target Compounds, ppm	
Chloromethane	54.045
Bromomethane	1.184
Methylene Chloride	4.910
Acetone	0.783
Carbon Disulfide	4.245
Chloroform	59.816
Trichlorofluoromethane	7.471
Dimethyl disulfide	11.298
Dimethyl sulfide	97.685
Iodomethane	0.113
n-Hexane	42.497
1,1,1-Trichloroethane	0.051
Bromodichloromethane	0.021
Toluene	3.631
A-Pinene	209.309
B-Pinene	168.492
p-Cymene	55.661

Section 1.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON	Source:	Tall Oil Reactor Vent		FIN:	7100
Source Code: CS-TORV	Date:	6/17/92	EPN: E41	CIN:	EC30

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	947	1047	1140	
Flow Data				
Stack Temperature, °F	130	99	100	110
Moisture Content, %	15.0	6.0	6.0	9.0
Oxygen Concentration, %	20.8	20.8	20.8	20.8
Carbon Dioxide Concentration, %	0.0	0.0	0.0	0.0
Volumetric Flow Rate, x10^3 ACFM	2.8	1.6	0.9	1.7
Volumetric Flow Rate, x10^3 DSCFM	2.1	1.4	0.8	1.4
Process Operating Conditions				
Production Rate, tons/hr	25.0	25.0	25.0	25.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	2116.6	663.2	172.3	984.0
Emission Rate, lb/hr	16.0	5.0	1.3	7.4
Methyl mercaptan				
Concentration, ppmvd	467.6	111.9	97.0	225.5
Emission Rate, lb/hr	5.0	1.2	1.0	2.4
Dimethyl sulfide				
Concentration, ppmvd	562.2	214.2	169.0	315.1
Emission Rate, lb/hr	7.8	3.0	2.3	4.3
Carbon disulfide				
Concentration, ppmvd	55.5 *	55.5 *	55.5 *	55.5 *
Emission Rate, lb/hr	0.9 *	0.9 *	0.9 *	0.9 *
Dimethyl disulfide				
Concentration, ppmvd	55.5 *	55.5 *	55.5 *	55.5 *
Emission Rate, lb/hr	1.2 *	1.2 *	1.2 *	1.2 *
Method 18 Data				
Methanol				
Concentration, ppmvd	132.1	783.6	528.1	481.3
Emission Rate, lb/hr	0.9	5.6	3.8	3.4
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	61.0 *	61.0 *	61.0 *	61.0 *
Emission Rate, lb/hr	0.6 *	0.6 *	0.6 *	0.6 *
Acetone				
Concentration, ppmvd	50.7	154.2	61.0 *	78.4
Emission Rate, lb/hr	0.7	2.0	0.8 *	1.0
2-Propanol				
Concentration, ppmvd	61.0 *	61.0 *	61.0 *	61.0 *
Emission Rate, lb/hr	0.8 *	0.8 *	0.8 *	0.8 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Tall Oil Reactor Vent | FIN: 7100
Source Code: CS-TORV | Date: 6/17/92 | EPN: E41 | CIN: EC30

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	61.0 *	61.0 *	61.0 *	61.0 *
Emission Rate, lb/hr	1.0 *	1.0 *	1.0 *	1.0 *
Chloroform				
Concentration, ppmvd	122.0 *	122.0 *	122.0 *	122.0 *
Emission Rate, lb/hr	3.2 *	3.2 *	3.2 *	3.2 *
Benzene				
Concentration, ppmvd	61.0 *	61.0 *	61.0 *	61.0 *
Emission Rate, lb/hr	1.1 *	1.1 *	1.1 *	1.1 *
Bromodichloromethane				
Concentration, ppmvd	122.0 *	120.9 *	122.0 *	121.6 *
Emission Rate, lb/hr	4.5 *	4.4 *	4.5 *	4.4 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	61.0 *	61.0 *	61.0 *	61.0 *
Emission Rate, lb/hr	1.2 *	1.2 *	1.2 *	1.2 *
Ethyl benzene				
Concentration, ppmvd	61.0 *	61.0 *	61.0 *	61.0 *
Emission Rate, lb/hr	1.4 *	1.4 *	1.4 *	1.4 *
m-, p-Xylene				
Concentration, ppmvd	61.0 *	61.0 *	61.0 *	61.0 *
Emission Rate, lb/hr	1.4 *	1.4 *	1.4 *	1.4 *
o-Xylene				
Concentration, ppmvd	61.0 *	61.0 *	61.0 *	61.0 *
Emission Rate, lb/hr	1.4 *	1.4 *	1.4 *	1.4 *
Cumene				
Concentration, ppmvd	86.2	159.8	133.8	126.6
Emission Rate, lb/hr	2.3	4.3	3.6	3.4
alpha-Pinene				
Concentration, ppmvd	1782.0	7171.2	4811.6	4588.3
Emission Rate, lb/hr	53.9	217.0	145.6	138.8
beta-Pinene				
Concentration, ppmvd	398.1	2036.7	1460.9	1298.6
Emission Rate, lb/hr	12.0	61.6	44.2	39.3
3-Carene				
Concentration, ppmvd	61.0 *	61.0 *	73.6	44.9
Emission Rate, lb/hr	1.8 *	1.8 *	2.2	1.4
Terpenes (Unspecified)				
Concentration, ppmvd	1775.1	4508.0	2621.3	2968.1
Emission Rate, lb/hr	53.7	136.4	79.3	89.8

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON	Source:	Tall Oil Reactor Vent			FIN:	7100
Source Code: CS-TORV	Date:	6/17/92	EPN:	E41	CIN:	EC30

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	317.4	928.6	347.5	531.1
Emission Rate, lb/hr	9.5	27.7	10.4	15.8
Knowns as Carbon				
Concentration, ppmvd	44066.5	146373.0	92326.9	94255.5
Unknowns as Carbon				
Concentration, ppmvd	1175.1	328.5	136.0	546.5
Sum M18 as Carbon, lb/hr	120.8	391.6	246.8	253.1
Unknown Compounds % of Total	2.6%	0.2%	0.1%	1.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	102217.6	43424.2		72820.9
Emission Rate, lb/hr as C	272.9	115.9		194.4

COMMENTS :

Hydrogen sulfide (M16) was saturated for run 1 on 6/17/92 and 6/20/92.
M18 data for run 2 on 6/20/92 was rejected because not consistent with other GC injections.
Detections limits higher due to dilution factors of 111 (day 1) and 152 (day 2).

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON	Source:	Tall Oil Reactor Vent		FIN:	7100
Source Code: CS-TORV	Date:	6/20/92	EPN: E41	CIN:	EC30

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1017	1117		
Flow Data				
Stack Temperature, °F	130	99		115
Moisture Content, %	15.0	6.0		10.5
Oxygen Concentration, %	20.8	20.8		20.8
Carbon Dioxide Concentration, %	0.0	0.0		0.0
Volumetric Flow Rate, x10^3 ACFM	2.8	1.6		2.2
Volumetric Flow Rate, x10^3 DSCFM	2.1	1.4		1.8
Process Operating Conditions				
Production Rate, tons/hr	25.0	25.0		25.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	2679.9			2679.9
Emission Rate, lb/hr	24.9			24.9
Methyl mercaptan				
Concentration, ppmvd	1032.5			1032.5
Emission Rate, lb/hr	13.5			13.5
Dimethyl sulfide				
Concentration, ppmvd	583.1			583.1
Emission Rate, lb/hr	9.9			9.9
Carbon disulfide				
Concentration, ppmvd	76.0 *			76.0 *
Emission Rate, lb/hr	1.6 *			1.6 *
Dimethyl disulfide				
Concentration, ppmvd	76.0 *			76.0 *
Emission Rate, lb/hr	2.0 *			2.0 *
Method 18 Data				
Methanol				
Concentration, ppmvd	1758.9			1758.9
Emission Rate, lb/hr	15.4			15.4
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	84.9 *			84.9 *
Emission Rate, lb/hr	1.1 *			1.1 *
Acetone				
Concentration, ppmvd	109.4			109.4
Emission Rate, lb/hr	1.7			1.7
2-Propanol				
Concentration, ppmvd	84.9 *			84.9 *
Emission Rate, lb/hr	1.4 *			1.4 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON	Source: Tall Oil Reactor Vent		FIN:	7100
Source Code: CS-TORV	Date: 6/20/92	EPN: E41	CIN:	EC30

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	84.9 *			84.9 *
Emission Rate, lb/hr	1.7 *			1.7 *
Chloroform				
Concentration, ppmvd	169.8 *			169.8 *
Emission Rate, lb/hr	5.5 *			5.5 *
Benzene				
Concentration, ppmvd	84.9 *			84.9 *
Emission Rate, lb/hr	1.8 *			1.8 *
Bromodichloromethane				
Concentration, ppmvd	169.8 *			169.8 *
Emission Rate, lb/hr	7.6 *			7.6 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	84.9 *			84.9 *
Emission Rate, lb/hr	2.1 *			2.1 *
Ethyl benzene				
Concentration, ppmvd	84.9 *			84.9 *
Emission Rate, lb/hr	2.5 *			2.5 *
m-, p-Xylene				
Concentration, ppmvd	84.9 *			84.9 *
Emission Rate, lb/hr	2.5 *			2.5 *
o-Xylene				
Concentration, ppmvd	84.9 *			84.9 *
Emission Rate, lb/hr	2.5 *			2.5 *
Cumene				
Concentration, ppmvd	91.1			91.1
Emission Rate, lb/hr	3.0			3.0
alpha-Pinene				
Concentration, ppmvd	103.8			103.8
Emission Rate, lb/hr	3.9			3.9
beta-Pinene				
Concentration, ppmvd	84.9 *			84.9 *
Emission Rate, lb/hr	3.2 *			3.2 *
3-Carene				
Concentration, ppmvd	84.9 *			84.9 *
Emission Rate, lb/hr	3.2 *			3.2 *
Terpenes (Unspecified)				
Concentration, ppmvd	152.5			152.5
Emission Rate, lb/hr	5.7			5.7

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Tall Oil Reactor Vent | FIN: 7100
Source Code: CS-TORV | Date: 6/20/92 | EPN: E41 | CIN: EC30

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	823.2			823.2
Emission Rate, lb/hr	30.1			30.1
Knowns as Carbon				
Concentration, ppmvd	13512.1			13512.1
Unknowns as Carbon				
Concentration, ppmvd	7261.3			7261.3
Sum M18 as Carbon, lb/hr	68.1			68.1
Unknown Compounds % of Total	35.0%			35.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	99352.0	38721.8		69036.9
Emission Rate, lb/hr as C	325.7	126.9		226.3

COMMENTS :

Hydrogen sulfide (M16) was saturated for run 1 on 6/17/92 and 6/20/92.
M18 data for run 2 on 6/20/92 was rejected because not consistent with other GC injections.
Detections limits higher due to dilution factors of 111 (day 1) and 152 (day 2).

* One or more values were less than the detection limit.

Section 1.2 Emission Test Results - VOST

EMISSION TEST RESULTS - VOST

Mil CHAMPION - SHELDON   Source: Tall Oil Reactor Vent
Source Code: CS-TORV   EPN: E41   IN: 7100   CIN: EC30

Compound	TORV-T (μg)	TORV-TC (μg)	TORV-C (μg/L)	Total μg	Date: 6/20/92 CS-TORV (μg/m3)	Conc. (ppm)
TARGET COMPOUNDS						
Chloromethane	0.432	10.921		11.35	113530.00	54.045
Bromomethane		0.468		0.47	4680.00	1.184
Methylene Chloride	0.572	0.866	6.93	1.74	17359.90	4.910
Acetone			4.40	0.19	1892.00	0.783
Carbon Disulfide	1.001	0.289	1.25	1.34	13437.50	4.245
Chloroform	29.503		4.79	29.71	297089.70	59.816
Trichlorofluoromethane		4.270		4.27	42700.00	7.471
Dimethyl disulfide	4.276	0.151		4.43	44270.00	11.298
Dimethyl sulfide	25.234			25.23	252340.00	97.685
Iodomethane		0.067		0.07	670.00	0.113
Isooctane						
n-Hexane	8.347	6.852	0.91	15.24	152381.30	42.497
2-Butanone (MEK)						
1,1,1-Trichloroethane			0.66	0.03	283.80	0.051
Vinyl acetate						
Bromodichloromethane			0.33	0.01	141.90	0.021
Trichloroethene						
Benzene						
Dibromomethane						
Tetrachloroethene						
Toluene	0.952	0.439		1.39	13910.00	3.631
Ethylbenzene						
Styrene						
o-Xylene						
m-/p-Xylene						
A-Pinene	115.707	2.878		118.59	1185850.00	209.309
B-Pinene	93.741	1.719		95.46	954600.00	168.492
Cumene						
p-Cymene	29.108	1.964		31.07	310720.00	55.661
TENTATIVELY IDENTIFIED CMPDS.						
Bicyclic HC						
Branched HC						
Branched HC		1.978		1.98	19780.00	
Branched Pentane						
Cyclic HC						
Branched Butane						
Branched Heptane						
Branched Decane						
Branched Hexane						
Branched Octadiene						
Butene						
Cyclobutanol						
Pentanone						
Pinene-related cmpd.	336.094	11.080		347.17	3471740.00	
Siloxane						

EMISSION TEST RESULTS - VOST

Mil CHAMPION - SHELDON — Source: Tall Oil Reactor Vent

Source Code: CS-TORV — EPN: E41 — IN: 7100 — CIN: EC30

Compound	TORV-T (μg)	TORV-TC (μg)	TORV-C (μg/L)	Total μg	Date: 6/20/92 CS-TORV (μg/m3)	Conc. (ppm)
Subst'd HC						
Trisulfide HC						
SURROGATE STDS						
(% Recovery)						
Toluene-d8	151.3	156.2	97.7			
1,2-Dichloroethane-d4	67.4	70.8	91.4			
Benzene-d6	115.7	117.1	102.2			

NOTES:

- -T=Tenax — Air Volume = 0.00010 cu.m.
- -TC=Tenax/Charcoal
- -C = Condensate — Condensate Vol. 43.0 mL

Triangle Laboratories of RTP, Inc.
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FILE NAME: 88921
RF FILE: 88916
DATE: 07/20/92
TLI PROJ #: 21260

SAMPLE ID: CS-TORV-1-VOST
0620-1A T
TLI ID: 57.149.1
ANALYSIS DATE: 07/05/92

METHOD 8240--HIGH LEVEL VOST QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	4146		761	1		IS	
2	Chloromethane	71	.495	162	1	.432	E	5
3	Bromomethane	0	.927	0	1	.065	ND	5
4	Vinyl Chloride	0	.508	0	1	.119	ND	5
5	Chloroethane	0	.737	0	1	.082	ND	5
6	Methylene Chloride	506	2.670	568	1	.572	E	5
7	Acetone	0	.460	0	1	.131	ND	5
8	Carbon Disulfide	1640	4.939	486	1	1.001	E	5
9	1,1-Dichloroethene	0	1.727	0	1	.035	ND	5
10	1,1-Dichloroethane	0	5.348	0	1	.011	ND	5
11	trans-1,2-Dichloroethene	0	2.590	0	1	.023	ND	5
12	Chloroform	59630	6.093	780	1	29.503	D	5
13	1,2-Dichloroethane	0	2.676	0	1	.023	ND	5
43	Trichlorofluoromethane	0	1.099	0	1	.055	ND	5
47	cis-1,2-Dichloroethene	0	3.264	0	1	.018	ND	5
57	Allyl chloride	0	1.362	0	1	.044	ND	5
62	Dimethyl disulfide	7438	5.245	1054	1	4.276	E	5
63	Dimethyl sulfide	15180	1.814	497	1	25.234	D	5
65	Iodomethane	0	3.230	0	1	.019	ND	5
66	Isooctane	0	10.516	0	1	.006	ND	5
68	Tert-Butyl methyl ether	0	4.492	0	1	.013	ND	5
69	Vinyl Bromide	0	1.157	0	1	.052	ND	5
70	n-Hexane	7184	2.594	646	1	8.347	D	5
14	1,4-Difluorobenzene	27071		890	14		IS	
15	2-Butanone	0	.022	0	14	.423	ND	5
16	1,1,1-Trichloroethane	0	.551	0	14	.017	ND	5
17	Carbon Tetrachloride	0	.493	0	14	.019	ND	5
18	Vinyl Acetate	0	.543	0	14	.017	ND	5
19	Bromodichloromethane	0	.631	0	14	.015	ND	5
20	1,2-Dichloropropane	0	.569	0	14	.016	ND	5
21	cis-1,3-Dichloropropene	0	.616	0	14	.015	ND	5
22	Trichloroethene	0	.488	0	14	.019	ND	5
23	Dibromochloromethane	0	.456	0	14	.020	ND	5
24	1,1,2-Trichloroethane	0	.300	0	14	.031	ND	5
25	Benzene	0	1.045	0	14	.009	ND	5
26	trans-1,3-Dichloropropene	0	.558	0	14	.017	ND	5
27	Bromoform	0	.225	0	14	.041	ND	5
54	1,4-Dichloro-2-butene	0	.087	0	14	.106	ND	5
60	Dibromomethane	0	.221	0	14	.042	ND	5
28	Chlorobenzene-d5	29955		1327	28		IS	
29	4-Methyl-2-Pentanone	0	.200	0	28	.042	ND	5
30	2-Hexanone	0	.162	0	28	.051	ND	5
31	Tetrachloroethene	0	.292	0	28	.029	ND	5
33	Toluene	1306	.573	1099	28	.952	E	5
34	Chlorobenzene	0	.696	0	28	.012	ND	5

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FILE NAME: 88921
RF FILE: 88916
DATE: 07/20/92
TLI PROJ #: 21260

SAMPLE ID: CS-TORV-1-VOST
0820-1A T
TLI ID: 57.149.1
ANALYSIS DATE: 07/05/92

METHOD 8240--HIGH LEVEL VOST QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
35 Ethylbenzene	0	.425	0	28	.020	ND	5
36 Styrene	0	.330	0	28	.025	ND	5
37 o-Xylene	0	.454	0	28	.018	ND	5
38 m-/p-Xylene	0	.805	0	28	.010	ND	5
49 1,2 Dichlorobenzene	0	.334	0	28	.025	ND	5
50 1,2,3-Trichloropropane	0	.154	0	28	.054	ND	5
51 1,3 Dichlorobenzene	0	.520	0	28	.016	ND	5
53 1,4 Dichlorobenzene	0	.415	0	28	.020	ND	5
56 A-Pinene	192691	.695	1531	28	115.707	E	5
58 B-Pinene	167521	.746	1689	28	93.741	D	5
59 Cumene (isopropylbenzene)	0	.894	0	28	.009	ND	5
64 Ethyl methacrylate	0	.296	0	28	.028	ND	5
67 P-Cymene	65233	.935	1893	28	29.108	D	5

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	6212	2.223	830	1	8.42	D	67.4
48 Benzene-d6	35488	1.133	827	14	14.46	D	115.7
39 Toluene-d8	39482	.871	1088	28	18.91	D	151.3

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FILE NAME: 88921
DATE: 07/20/92
TLI PROJ #: 21260

SAMPLE ID: CS-TORV-1-VOST
0620-1A T
TLI ID: 57.149.1
ANALYSIS DATE: 07/05/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

	NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
1	PINENE RELATED COMPOUND	1869	810880	1327	12.50	111.857
2	PINENE RELATED COMPOUND	1575	643330	1327	12.50	88.744
3	PINENE RELATED COMPOUND	2107	231832	1327	12.50	31.980
4	PINENE RELATED COMPOUND	1822	207156	1327	12.50	28.576
5	PINENE RELATED COMPOUND	1716	200327	1327	12.50	27.634
6	PINENE RELATED COMPOUND	2008	113681	1327	12.50	15.682
7	PINENE RELATED COMPOUND	1492	92969	1327	12.50	12.825
8	PINENE RELATED COMPOUND	1778	77291	1327	12.50	10.662
9	PINENE RELATED COMPOUND	1621	32916	1327	12.50	4.541
10	PINENE RELATED COMPOUND	1601	26045	1327	12.50	3.593

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	761	30626	1
1,4-Difluorobenzene	891	62581	14
Chlorobenzene-d5	1327	90616	28

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FILE NAME: 88922
RF FILE: 88916
DATE: 07/20/92
TLI PROJ #: 21260

SAMPLE ID: CS-TORV-1-VOST 0620-1A TC
TLI ID: 57.149.2
ANALYSIS DATE: 07/05/92

METHOD 8240--HIGH LEVEL VOST QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	3719		762	1		IS	
2	Chloromethane	1609	.495	160	1	10.921	D	5
3	Bromomethane	129	.927	288	1	.468	E	5
4	Vinyl Chloride	0	.508	0	1	.132	ND	5
5	Chloroethane	0	.737	0	1	.091	ND	5
6	Methylene Chloride	688	2.670	570	1	.866	E	5
7	Acetone	0	.460	0	1	.146	ND	5
8	Carbon Disulfide	424	4.939	486	1	.289	E	5
9	1,1-Dichloroethene	0	1.727	0	1	.039	ND	5
10	1,1-Dichloroethane	0	5.348	0	1	.013	ND	5
11	trans-1,2-Dichloroethene	0	2.590	0	1	.026	ND	5
12	Chloroform	0	6.093	0	1	.011	ND	5
13	1,2-Dichloroethane	0	2.676	0	1	.025	ND	5
43	Trichlorofluoromethane	1349	1.099	387	1	4.127	E	5
47	cis-1,2-Dichloroethene	0	3.264	0	1	.021	ND	5
57	Allyl chloride	0	1.362	0	1	.049	ND	5
62	Dimethyl disulfide	236	5.245	1055	1	.151	E	5
63	Dimethyl sulfide	0	1.814	0	1	.037	ND	5
65	Iodomethane	64	3.230	490	1	.067	E	5
66	Isooctane	0	10.516	0	1	.006	ND	5
68	Tert-Butyl methyl ether	0	4.492	0	1	.015	ND	5
69	Vinyl Bromide	0	1.157	0	1	.058	ND	5
70	n-Hexane	5290	2.594	645	1	6.852	D	5
14	1,4-Difluorobenzene	23693		892	14		IS	
15	2-Butanone	0	.022	0	14	.483	ND	5
16	1,1,1-Trichloroethane	0	.551	0	14	.019	ND	5
17	Carbon Tetrachloride	0	.493	0	14	.021	ND	5
18	Vinyl Acetate	0	.543	0	14	.019	ND	5
19	Bromodichloromethane	0	.631	0	14	.017	ND	5
20	1,2-Dichloropropane	0	.569	0	14	.019	ND	5
21	cis-1,3-Dichloropropene	0	.616	0	14	.017	ND	5
22	Trichloroethene	0	.488	0	14	.022	ND	5
23	Dibromochloromethane	0	.456	0	14	.023	ND	5
24	1,1,2-Trichloroethane	0	.300	0	14	.035	ND	5
25	Benzene	0	1.045	0	14	.010	ND	5
26	trans-1,3-Dichloropropene	0	.559	0	14	.019	ND	5
27	Bromoform	0	.225	0	14	.047	ND	5
54	1,4-Dichloro-2-butene	0	.087	0	14	.122	ND	5
60	Dibromomethane	0	.221	0	14	.048	ND	5
28	Chlorobenzene-d5	26220		1327	28		IS	
29	4-Methyl-2-Pentanone	0	.200	0	28	.048	ND	5
30	2-Hexanone	0	.162	0	28	.059	ND	5
31	Tetrachloroethene	0	.292	0	28	.033	ND	5
33	Toluene	527	.573	1102	28	.439	E	5
34	Chlorobenzene	0	.696	0	28	.014	ND	5

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FILE NAME: B8922
RF FILE: B8916
DATE: 07/20/92
TLI PROJ #: 21260

SAMPLE ID: CS-TORV-1-VOST 0620-1A TC
TLI ID: 57.149.2
ANALYSIS DATE: 07/05/92

METHOD 8240--HIGH LEVEL VOST QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
35 Ethylbenzene	0	.425	0	28	.022	ND	5
36 Styrene	0	.330	0	28	.029	ND	5
37 o-Xylene	0	.454	0	28	.021	ND	5
38 m-/p-Xylene	0	.805	0	28	.012	ND	5
49 1,2 Dichlorobenzene	0	.334	0	28	.029	ND	5
50 1,2,3-Trichloropropane	0	.154	0	28	.062	ND	5
51 1,3 Dichlorobenzene	0	.520	0	28	.018	ND	5
53 1,4 Dichlorobenzene	0	.415	0	28	.023	ND	5
56 A-Pinene	4195	.695	1526	28	2.878	E	5
58 B-Pinene	2689	.746	1665	28	1.719	E	5
59 Cumene (isopropylbenzene)	0	.894	0	28	.011	ND	5
64 Ethyl methacrylate	0	.296	0	28	.032	ND	5
67 P-Cymene	3853	.935	1891	28	1.964	E	5

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	5850	2.223	830	1	8.84	D	70.8
48 Benzene-d6	31422	1.133	827	14	14.63	D	117.1
39 Toluene-d8	35671	.871	1089	28	19.52	D	156.2

TRIANGLE LABORATORIES OF RTP, INC.	FILE NAME: 88922	SAMPLE ID: CS-TORV-1-VOST
801 Capitola Drive	DATE: 07/20/92	0620-1A TC
Durham, NC 27713	TLI PROJ #: 21260	TLI ID: 57.149.2
Telephone: (919) 544-5729		ANALYSIS DATE: 07/05/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

	NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
1	PINENE RELATED COMPOUND	1867	35089	1327	12.50	5.554
2	PINENE RELATED COMPOUND	1715	14429	1327	12.50	2.284
3	BRANCHED HYDROCARBON	346	4489	762	12.50	1.978
4	PINENE RELATED COMPOUND	1824	12269	1327	12.50	1.942
5	PINENE RELATED COMPOUND	2107	8189	1327	12.50	1.298

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	762	28368	1
1,4-Difluorobenzene	892	55072	14
Chlorobenzene-d5	1327	78970	28

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FILE NAME: AC8289
RF FILE: AC826
DATE: 07/21/92
TLI PROJ #: 21260

SAMPLE ID: CS-TORV-1-VOST
0620-1A COND
TLI ID: 57.149.7
SAMPLE VOL: .005 L
ANALYSIS DATE: 07/03/92
DILUTION FACTOR: 1

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	CONC, ug/L	CODE	QUAN LIMIT
1 Bromochloromethane	1912		780	1		IS	
2 Chloromethane	0	1.547	0	1	.34	ND	10
3 Bromomethane	0	1.347	0	1	.39	ND	10
4 Vinyl Chloride	0	1.805	0	1	.29	ND	10
5 Chloroethane	0	1.382	0	1	.38	ND	10
6 Methylene Chloride	554	2.091	586	1	6.93	E	10
7 Acetone	379	2.252	529	1	4.40	E	10
8 Carbon Disulfide	295	6.160	506	1	1.25	E	10
9 1,1-Dichloroethene	0	1.692	0	1	.31	ND	10
10 1,1-Dichloroethane	0	4.450	0	1	.12	ND	10
11 trans-1,2-Dichloroethene	0	1.963	0	1	.27	ND	10
12 Chloroform	779	4.254	799	1	4.79	E	10
13 1,2-Dichloroethane	0	3.706	0	1	.14	ND	10
43 Trichlorofluoromethane	0	1.155	0	1	.45	ND	10
45 Acrolein	0	.329	0	1	1.59	ND	10
46 Acrylonitrile	0	.980	0	1	.53	ND	10
47 cis-1,2-Dichloroethene	0	2.217	0	1	.24	ND	10
52 1,3 Dichlorobenzene	0	2.435	0	1	.21	ND	10
57 A-Pinene	0	.972	0	1	.54	ND	10
62 Dichlorodifluoromethane	0	4.421	0	1	.12	ND	10
63 Dimethyl disulfide	0	2.286	0	1	.23	ND	10
65 Ethyl methacrylate	0	1.825	0	1	.29	ND	10
66 Iodomethane	0	13.365	0	1	.04	ND	10
68 P-Cymene	0	5.355	0	1	.10	ND	10
69 Tert-Butyl methyl ether	0	1.467	0	1	.36	ND	10
70 Vinyl Bromide	0	4.065	0	1	.13	ND	10
71 n-Hexane	55	1.576	667	1	.91	E	10
14 1,4-Difluorobenzene	8633		913	14		IS	
15 2-Butanone	0	.097	0	14	1.19	ND	10
16 1,1,1-Trichloroethane	79	.695	808	14	.66	E	10
17 Carbon Tetrachloride	0	.507	0	14	.23	ND	10
18 Vinyl Acetate	0	1.423	0	14	.08	ND	10
19 Bromodichloromethane	45	.790	1013	14	.33	E	10
20 1,2-Dichloropropane	0	.811	0	14	.14	ND	10
21 cis-1,3-Dichloropropene	0	.906	0	14	.13	ND	10
22 Trichloroethene	0	.472	0	14	.25	ND	10
23 Dibromochloromethane	0	.560	0	14	.21	ND	10
24 1,1,2-Trichloroethane	0	.537	0	14	.22	ND	10
25 Benzene	0	1.614	0	14	.07	ND	10
26 trans-1,3-Dichloropropene	0	.868	0	14	.13	ND	10
27 Bromoform	0	.357	0	14	.32	ND	10
54 1,4 Dichlorobenzene	0	.313	0	14	.37	ND	10
60 Cumene (isopropylbenzene)	0	.371	0	14	.31	ND	10
28 Chlorobenzene-d5	10422		1356	28		IS	
29 4-Methyl-2-Pentanone	0	.800	0	28	.12	ND	10
30 2-Hexanone	0	.590	0	28	.16	ND	10
31 Tetrachloroethene	0	.342	0	28	.28	ND	10

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FILE NAME: AC8289
RF FILE: AC826
DATE: 07/21/92
TLI PROJ #: 21260

SAMPLE ID: CS-TORV-1-VOST
0820-1A COND
TLI ID: 57.149.7
SAMPLE VOL: .005 L
ANALYSIS DATE: 07/03/92
DILUTION FACTOR: 1

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	CONC, ug/L	CODE	QUAN LIMIT
32 1,1,2,2-Tetrachloroethane	0	.849	0	28	.11	ND	10
33 Toluene	0	.985	0	28	.10	ND	10
34 Chlorobenzene	0	1.001	0	28	.10	ND	10
35 Ethylbenzene	0	.585	0	28	.16	ND	10
36 Styrene	0	1.142	0	28	.08	ND	10
37 o-Xylene	0	.694	0	28	.14	ND	10
38 m-/p-Xylene	0	.660	0	28	.15	ND	10
49 1,1,2-Trichlorotrifluoroethane	0	.822	0	28	.12	ND	10
50 1,2 Dichlorobenzene	0	.623	0	28	.15	ND	10
51 1,2,3-Trichloropropane	0	.957	0	28	.10	ND	10
53 1,3-butadiene	0	.821	0	28	.12	ND	10
56 2-Chloro-1,3-Butadiene	0	1.191	0	28	.08	ND	10
58 Allyl chloride	0	1.257	0	28	.08	ND	10
59 B-Pinene	0	1.753	0	28	.05	ND	10
64 Dimethyl sulfide	0	.820	0	28	.12	ND	10
67 Isooctane	0	1.797	0	28	.05	ND	10

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT,ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	5261	3.010	849	1	.23	D	91.4
48 Benzene-d6	14447	1.638	847	14	.26	D	102.2
39 Toluene-d8	14785	1.453	1116	28	.24	D	97.7

Section 1.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

SOURCE CS-TORV

QUALITY CONTROL SUMMARY
METHOD 25A

1. CALIBRATION

THEOR	6/17/92		6/20/92	
ppm	ppm	%ERR	ppm	%ERR
0.0	-54.0	3.6	-160.0	11.0
91.0	3.0	2.2	76.0	-1.0
244.0	347.0	6.8	452.0	14.0
1506.0	1490.0	-1.1	1473.0	2.2
CORR COEFF	0.9952		0.9771	

2. PROPANE LINE RECOVERY

	DATE	6/17/92		DATE	6/20/92	
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	1508.0	1308.0	86.7%	1508.0	1308.0	86.7%
AFTER	1508.0	1308.0	86.7%	*		

3. LINE BLANK

	6/17/92	6/20/92
	ppm	ppm
BEFORE	*	0.0
AFTER	0.0	1.0

* Not performed

SOURCE CS-TORV

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR ppm	DATE 6/17/92 ppm	%REC	DATE 6/20/92 ppm	%REC
ethanol	52.0	42.3	81.4%	32.9	63.3%
acetone	41.6	34.3	82.4%	33.1	79.6%
isopropanol	39.9	38.4	96.4%	34.5	86.4%
dimethyl sulfide	9.1	8.4	92.3%	8.3	91.2%
benzene	34.2	32.2	94.4%	32.4	94.8%
bromodichloromethane	18.8	15.7	83.5%	16.8	89.4%
dimethyl disulfide	33.9	28.7	84.7%	30.5	90.1%
toluene	28.7	25.0	87.1%	26.3	91.7%
ethyl benzene	24.9	20.3	81.6%	23.5	94.2%
m-xylene	49.8	40.0	80.3%	48.6	97.6%
o-xylene	25.0	19.9	79.5%	23.9	95.5%
cumene	21.9	17.4	79.2%	20.3	92.7%
alpha-pinene	19.2	16.0	83.3%	17.4	91.1%
beta-pinene	19.2	15.4	79.8%	10.7	55.4%
3-carene	19.3	14.2	73.7%	16.3	84.8%
p-cymene	19.6	14.1	72.2%	17.4	88.9%

2. PROPANE RESPONSE

	THEOR		%REC		%REC
BEFORE	36.0	31.6	87.8%	35.9	99.7%
AFTER	36.0	35.3	98.1%	29.8	82.8%

3. METHANOL LINE RECOVERY

	6/17/92			6/20/92		
	GC	LINE	%REC	GC	LINE	%REC
BEFORE	*			10.0	11.1	111.0%
AFTER	10.0	11.1	111.0%	17.4	16.6	95.4%

4. LINE BLANK

	[-------------FILE REF-------------]	
BEFORE	FHA2007	FHA2010
AFTER	FHA2010	FKB2016

*Not performed

SOURCE CS-TORV

QUALITY CONTROL SUMMARY
METHOD 16

1. CALIBRATION

ANALYTE	LO ppm	MED ppm	HI ppm	CORR COEFF
6/17/92 •				
hydrogen sulfide	3.1	5.9	9.5	1.0000
methyl mercaptan	2.8	5.5	8.8	1.0000
dimethyl sulfide	3.9	7.6	12.2	1.0000
carbon disulfide	1.2	2.4	3.8	1.0000
dimethyl disulfide	1.7	3.3	5.3	1.0000
6/20/92 •				
hydrogen sulfide	3.1	5.9	9.5	1.0000
methyl mercaptan	2.8	5.5	8.8	1.0000
dimethyl sulfide	3.9	7.6	12.2	1.0000
carbon disulfide	1.2	2.4	3.8	1.0000
dimethyl disulfide	1.7	3.3	5.3	1.0000

• Calibration from 6/16/92 checked and used

Section 1.4 Process Operating Data

TALL OIL ACIDULATION PLANT

The tall oil plant employs a batch process. Soap and sulfuric acid are pumped to the reactor. After soap addition is completed, the acid pump continues to operate until the pH of the solution reaches 3.3, at which time the acid pump is shut off. The reactor temperature is then increased to 215°F. At the completion of the reaction, the content is allowed to separate in the reactor and later pumped to the wet oil or spent acid tank. Brine from the spent acid tank is neutralized and sent to the recovery furnace for chemical recovery.

The vent gases from the reactor, the wet oil tank and the spent acid tank are collected and scrubbed with white liquor in a packed scrubber. These gases are ultimately discharged to the air through the smelt dissolving tank vent. The scrubber is 10 ft tall and 3 ft wide.

Representative Process Conditions

Production rate : 1400 tons/month (50 tons/batch)
Cooking time : 2 hours
Acid/oil ratio : 360 lbs of acid/ ton of crude oil
Scrubber type : Packed scrubber

Appendix B

TALL OIL PLANT LOG SHEET

Operator: Hettl h   Date: 6-17-92, 19__

NO. ON OPERATOR'S PROCEDURE	ITEM	TANK VOLUMES			TIME		TEMP.	
		Orig. Inches	Final Inches	Difference Gallons	Start	Finish	°F.	
2	Skim Tall Oil for Reactor to Wet Oil Tank				7³⁰	8⁰⁰	X	
3	Drain Spent Acid from Reactor to Spent Acid Tank				8⁰⁰	8³⁰	X	
5	Drain Spent Acid from Wet Oil Tank to Reactor				8³⁰	8⁴⁰	X	
6 & 22	Start Dehydrator; Pump Wet Oil to Dry Tank - (Rate: ______ lb./hr.)				8⁴⁰	2³⁰	Temp. IN	Temp. OUT
7	Drain Spent Acid from Dry Oil Tank to Reactor						X	
8a	Drain Black Liquor from #1 Soap Tank to Weak B.L. Tank				7³⁰ am		X	
8b	Ditto #2 Soap						X	
9	Start adding Water and Acid to Reactor			1260 6000	9⁰⁰	10³⁰	X	
10	Turn on Steam and Agitator Heat to 200°F.	X	X	X		@ 200°F.		
11 & 13	Pump Soap to Reactor from #2 Soap Tank			21000	9⁰⁰	10³⁰	18'	14'
15	1ST SAMPLE: ml. 0.5 N NaOH req'd= 12	X	X	X				
16	1st Correction: Add____gal. (Acid) (Soap)							
17a	2ND SAMPLE: ml. 0.5N NaOH = ______	X	X	X				
17b	2nd Correction: Add____gal. (Acid) (Soap)							
18a	3RD SAMPLE: ml. 0.5N NaOH = ______	X	X	X				
18b	3rd Correction: Add____gal. (Acid) (Soap)							
18c	4TH SAMPLE ml. 0.5N NaOH = ______	X	X	X				
18d	4th Correction: Add____gal. (Acid) (Soap)							
18e	5TH SAMPLE ml 0.5N NaOH = ______	X	X	X				
19	Stop Sparge & Agitation	X	X	X				
20a	White Liquor			0				
20b	Caustic			581				
22	Drain Tall Oil from Top of Reactor to Wet Oil Tank							
24	Secure Area	X	X	X	X			
	Sulphuric Acid			1260				

FC-14127 (Old WHD-16) (Nonstock: Reorder time 3 weeks)

Appendix 9

TALL OIL PLANT LOG SHEET

Operator: Hartrick Date 6-19-92 / 16-20 , 19__

NO. OF OPERATOR'S PROCEDURE	ITEM	TANK VOLUMES Orig. Inches	Final Inches	Difference Gallons	TIME Start	Finish	TEMP. °F.	
2	Skim Tall Oil for Reactor to Wet Oil Tank				7^{30}	8^{00}		
3	Drain Spent Acid from Reactor to Spent Acid Tank				8^{00}	8^{30}		
5	Drain Spent Acid from Wet Oil Tank to Reactor				8^{30}	[illegible]		
6 & 22	Start Dehydrator; Pump Wet Oil to Dry Tank - (Rate: ______ lb./hr.)				8^{40}	1^{30}	Temp. IN	Temp. OUT
7	Drain Spent Acid from Dry Oil Tank to Reactor							
8a	Drain Black Liquor from #1 Soap Tank to Weak B.L. Tank				7^{30}			
8b	Ditto #2 Soap							
9	Start adding Water and Acid to Reactor			1260 6000	9^{00}	10^{30}		
10	Turn on Steam and Agitator Heat to 200°F.					@ 200°F.		
11 & 13	Pump Soap to Reactor from #2 Soap Tank			E1000	7^{00}	10^{30}	28'	24'
15	1ST SAMPLE: ml. 0.5 N NaOH req'd= ______							
16	1st Correction: Add ____ gal. (Acid) (Soap)							
17a	2ND SAMPLE: ml. 0.5N NaOH = ______							
17b	2nd Correction: Add ____ gal. (Acid) (Soap)							
18a	3RD SAMPLE: ml. 0.5N NaOH = ______							
18b	3rd Correction: Add ____ gal. (Acid) (Soap)							
18c	4TH SAMPLE ml. 0.5N NaOH = ______							
18d	4th Correction: Add ____ gal. (Acid) (Soap)							
18e	5TH SAMPLE: ml 0.5N NaOH = ______							
19	Stop Steam & Agitation							
20a	White Liquor			14655				
20b	Caustic			564				
22	Drain Tall Oil from Top of Reactor to Wet Oil Tank							
24	Secure Area							
	Sulphuric Acid			1260				

FC-14127 (Old WHD-16) (Nonstock: Reorder time 3 weeks)

1.4 - 4

TALL OIL PLANT

Month Ending Date	SOAP PRODUCTION - TONS Soap from Lufkin	Soap from Sheldon	Total Available	Used for Tall Oil	Lbs Soap per ADT USK	TALL OIL PRODUCTION - TONS Total Produced	Total Available	Total Shipments	% Yield Soap to Tall Oil	Sulfuric Acid Lbs/Ton	Wh. Liq Lbs/Ton
06/30/92	1394.16	1667.86	3504.01	2722.19	245.61	1582.47	1654.28	1512.17	58.13	396.02	232.86
AVERAGE	1394.16	1667.86	3504.01	2722.19	245.61	1582.47	1654.28	1512.17	58.13	396.02	232.86
TOTAL	1394.16	1667.86	3504.01	2722.19	245.61	1582.47	1654.28	1512.17	59.13	396.02	232.86

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SECTION 2
BLACK LIQUOR OXIDATION VENT
(CS-BLOV)

2. CS-BLOV

Section 2.1 Emission Test Results - VOC

SECTION 2
BLACK LIQUOR OXIDATION VENT
(CS-BLOV)

The Black Liquor Oxidation Vent was tested on two different days for volatile organic compounds by M25A, M16, M18 and VOST.

Total Hydrocarbons (M25A)

Figures 2.1 and 2.2 present the THC trends for the test periods on 6/10/92 and 6/16/92. Emissions averaged 100 ppm, generally ranging from 80 to 120 ppm.

Volatile Organic Compounds (M16 and M18)

Table 2.1 summarizes the results for the Method 16 and Method 18 target compounds, and Section 2.1 is a tabulation of the data. The volumetric flow was measured during sampling with a pitot tube. Of the M16 target compounds, only carbon disulfide was not present. The major components of the emissions were methanol and acetone. Also, m-p-Xylene appeared in only one analysis.

Volatile Organic Sampling Train (VOST)

Table 2.2 summarizes the result of the VOST sample collected on 6/10/92. Section 2.2 tabulates the results for target compounds. The Tentatively Identified Compounds (TICs) are summarized in Section 2.2 only. The VOST analysis is extremely sensitive and is used here to confirm the identity of target compounds identified in Method 18, as well as attempt identification of other organic compounds which may be present, the TICs. Of the target compounds the predominant components were acetone, dimethyl sulfide, dimethyl disulfide, and 2-butanone (MEK).

VOC Quality Control Results

The VOC quality control data are tabulated in Section 2.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 2.4 includes the process operating data as recorded and provided by mill personnel.

FIGURE 2.1
THC TREND ANALYSIS (6/10/92)
BLACK LIQUOR OXIDATION VENT (CS-BLOV)

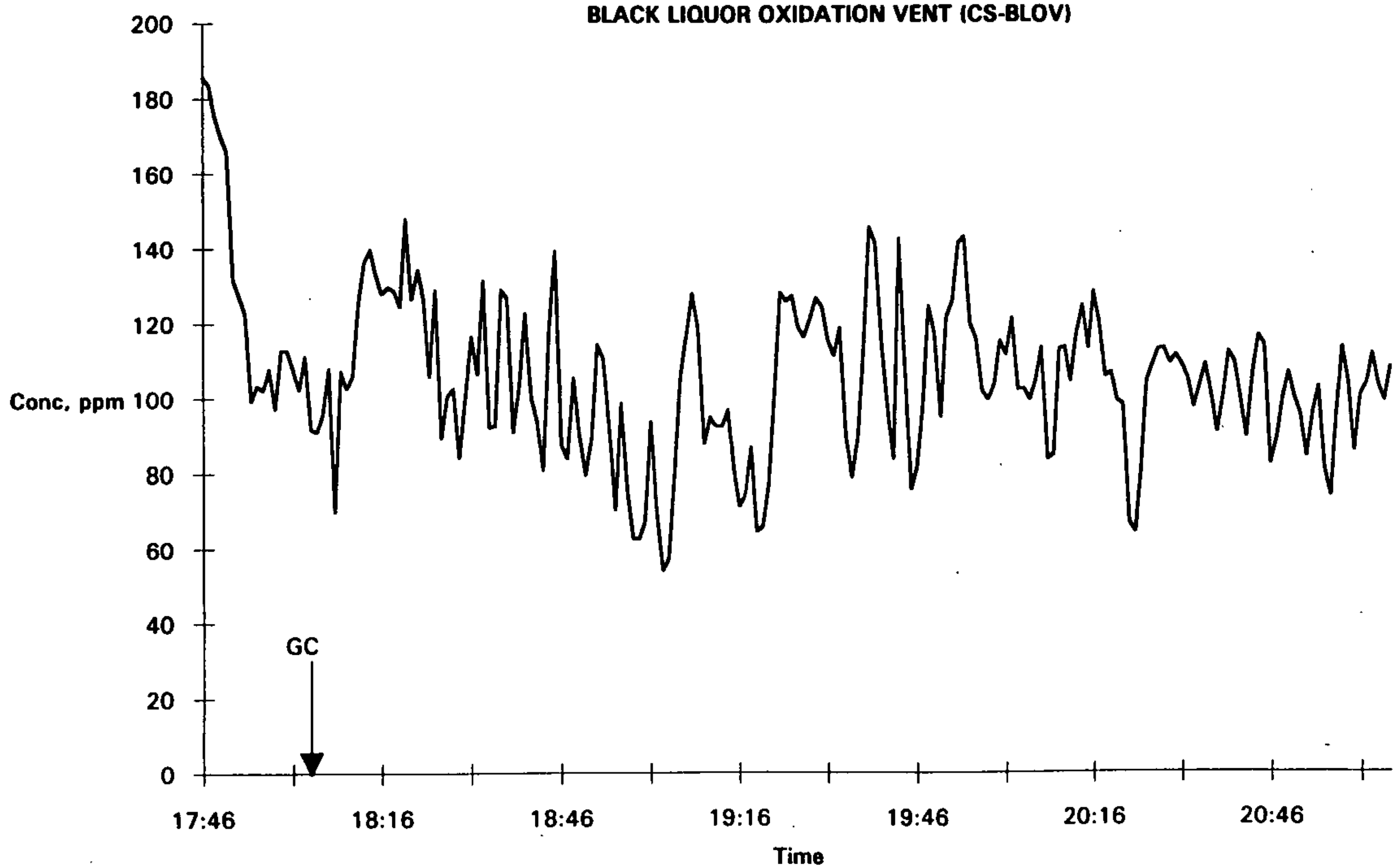

FIGURE 2.2
THC TREND ANALYSIS (6/16/92)
BLACK LIQUOR OXIDATION VENT (CS-BLOV)

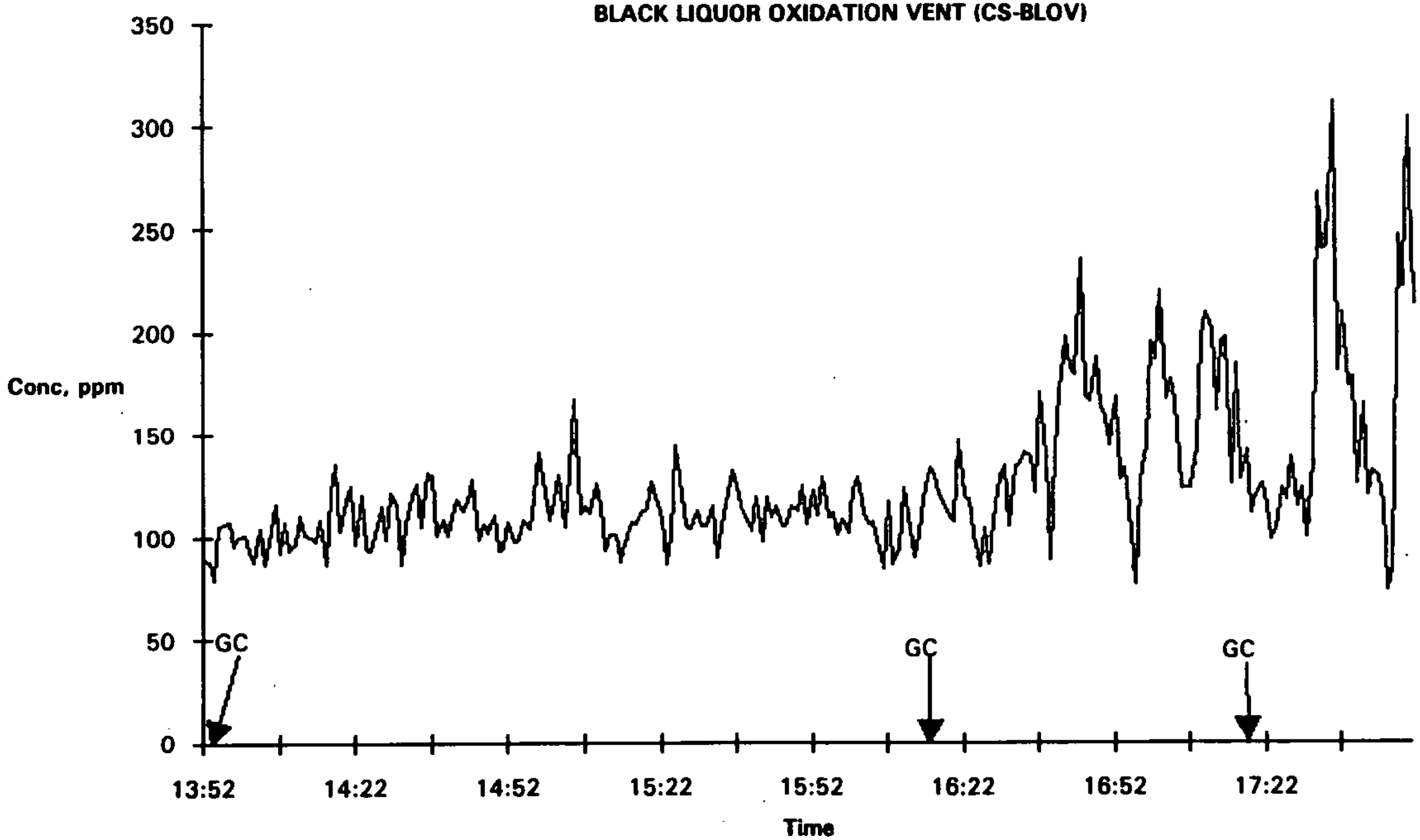

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TABLE 2.1 SUMMARY OF VOC RESULTS

Mill:	CHAMPION - SHELDON	Source:	Black Liquor Oxidation Vent
Source Code:	CS-BLOV	Test Dates:	6/10/92 6/16/92
FIN: 5000	CIN:	EPN:	E35

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	81	105	93	
Volumetric Flow Rate, $x10^3$ DSCFM	3.8	4.2	4.0	
Process Operating Conditions				
Production Rate, GPM	222	222	222	
Method 16 Data, lb/hr				
Hydrogen sulfide	<0.1	0.4	0.2	0.1
Methyl mercaptan	0.4	0.7	0.6	0.1
Dimethyl sulfide	<0.1	0.3	0.1	0.1
Carbon disulfide	ND	<0.1	0.1	0.1
Dimethyl disulfide	0.2	0.5	0.4	0.1
Method 18 Data, lb/hr				
Methanol	1.4	1.9	1.7	0.1
Ethanol	ND	<0.1	0.1	0.1
Acetone	0.1	0.3	0.2	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	ND	ND	ND	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	0.9	0.3	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	<0.1	0.2	0.1	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	1.0	1.3	1.1	0.1
Unknowns as C, lb/hr	ND	2.7	0.9	0.1
Sum of Compounds as C, lb/hr	1.0	3.9	2.0	0.1

ND=Not Detected
DL=Detection Limit

TABLE 2.2 SUMMARY OF VOST RESULTS

Mill: CHAMPION-SHELDON
Source Code: CS-BLOV
FIN: 5000 EPN: E40

Source: Black Liquor Oxidation Vent
Test Dates: 6/10/92
CIN: ,PN5005

TIME	1500
Volumetric Flow Data	
Stack Temperature, °F	81
Volumetric Flow Rate, x 10^3 DSCFM	3.8
Process Operating Conditions	
Production Rate, GPM	222
Target Compounds, ppm	
Chloromethane	0.092
Bromomethane	0.002
Methylene Chloride	0.032
Acetone	1.756
Carbon Disulfide	0.328
Chloroform	0.022
Trichlorofluoromethane	0.005
Dimethyl disulfide	2.127
Dimethyl sulfide	1.271
n-Hexane	0.189
2-Butanone (MEK)	0.883
Bromodichloromethane	0.001
Trichloroethane	0.000
Benzene	0.016
Dibromomethane	0.001
Toluene	0.037
Ethylbenzene	0.001
Styrene	0.003
o-Xylene	0.001
m-/p-Xylene	0.004
A-Pinene	0.039
B-Pinene	0.017
p-Cymene	0.007

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Black Liquor Oxidation Vent | FIN: 5000
Source Code: CS-BLOV | Date: 6/10/92 | EPN: E35 | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1321	1821	1921	
Flow Data				
Stack Temperature, °F			81	81
Moisture Content, %			4.0	4.0
Oxygen Concentration, %			20.8	20.8
Carbon Dioxide Concentration, %			0.0	0.0
Volumetric Flow Rate, x10^3 ACFM			4.1	4.1
Volumetric Flow Rate, x10^3 DSCFM			3.8	3.8
Process Operating Conditions				
Production Rate, GPM	222.0	222.0		222.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	19.5		13.5	16.5
Emission Rate, lb/hr	0.4		0.3	0.3
Methyl mercaptan				
Concentration, ppmvd	13.7		23.4	18.6
Emission Rate, lb/hr	0.4		0.7	0.5
Dimethyl sulfide				
Concentration, ppmvd	7.4		2.0	4.7
Emission Rate, lb/hr	0.3		0.1 *	0.2
Carbon disulfide				
Concentration, ppmvd	0.5 *		0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	4.6		2.8	3.7
Emission Rate, lb/hr	0.3		0.2	0.2
Method 18 Data				
Methanol				
Concentration, ppmvd		74.7		74.7
Emission Rate, lb/hr		1.4		1.4
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd		0.7		0.7
Emission Rate, lb/hr		0.1 *		0.1 *
Acetone				
Concentration, ppmvd		10.1		10.1
Emission Rate, lb/hr		0.3		0.3
2-Propanol				
Concentration, ppmvd		0.5 *		0.5 *
Emission Rate, lb/hr		0.1 *		0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Black Liquor Oxidation Vent | FIN: 5000
Source Code: CS-BLOV | Date: 6/10/92 | EPN: E35 | CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd		0.5 *		0.5 *
Emission Rate, lb/hr		0.1 *		0.1 *
Chloroform				
Concentration, ppmvd		1.0 *		1.0 *
Emission Rate, lb/hr		0.1 *		0.1 *
Benzene				
Concentration, ppmvd		0.5 *		0.5 *
Emission Rate, lb/hr		0.1 *		0.1 *
Bromodichloromethane				
Concentration, ppmvd		1.0 *		1.0 *
Emission Rate, lb/hr		0.1 *		0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd		0.5 *		0.5 *
Emission Rate, lb/hr		0.1 *		0.1 *
Ethyl benzene				
Concentration, ppmvd		0.5 *		0.5 *
Emission Rate, lb/hr		0.1 *		0.1 *
m-, p-Xylene				
Concentration, ppmvd		0.5 *		0.5 *
Emission Rate, lb/hr		0.1 *		0.1 *
o-Xylene				
Concentration, ppmvd		0.5 *		0.5 *
Emission Rate, lb/hr		0.1 *		0.1 *
Cumene				
Concentration, ppmvd		0.5 *		0.5 *
Emission Rate, lb/hr		0.1 *		0.1 *
alpha-Pinene				
Concentration, ppmvd		0.5 *		0.5 *
Emission Rate, lb/hr		0.1 *		0.1 *
beta-Pinene				
Concentration, ppmvd		0.5 *		0.5 *
Emission Rate, lb/hr		0.1 *		0.1 *
3-Carene				
Concentration, ppmvd		0.5 *		0.5 *
Emission Rate, lb/hr		0.1 *		0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd		1.9		1.9
Emission Rate, lb/hr		0.2		0.2

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Black Liquor Oxidation Vent | FIN: 5000
Source Code: CS-BLOV | Date: 6/10/92 | EPN: E35 | CIN: -

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd		0.5 *		0.5 *
Emission Rate, lb/hr		0.1 *		0.1 *
Knowns as Carbon				
Concentration, ppmvd		153.2		153.2
Unknowns as Carbon				
Concentration, ppmvd		14.3		14.3
Sum M18 as Carbon, lb/hr		1.2		1.2
Unknown Compounds % of Total		8.5%		8.5%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	162.5	99.0	115.6	125.7
Emission Rate, lb/hr as C	1.2	0.7	0.8	0.9

COMMENTS :

M18 run 1 for 6/10/92 was rejected because it was not consistent with other GC injections.
M16 hydrogen sulfide and methyl mercaptan values for 6/10/92 were saturated for runs 1 and 3.
Methyl mercaptan values for 6/16/92 were saturated for runs 1, 2, and 3.
M18 run 3 for 6/16/92 was rejected because it was not consistent with other GC injections.

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON   Source: Black Liquor Oxidation Vent   FIN: 5000
Source Code: CS-BLOV   Date: 6/16/92   EPN: E35   CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1351	1551	1651	
Flow Data				
Stack Temperature, °F			105	105
Moisture Content, %			8.0	8.0
Oxygen Concentration, %			20.8	20.8
Carbon Dioxide Concentration, %			0.0	0.0
Volumetric Flow Rate, x10^3 ACFM			4.9	4.9
Volumetric Flow Rate, x10^3 DSCFM			4.2	4.2
Process Operating Conditions				
Production Rate, GPM	222.0	222.0	222.0	222.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	2.8	2.3	2.2	2.4
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd	21.4	20.5	20.0	20.6
Emission Rate, lb/hr	0.7	0.6	0.6	0.6
Dimethyl sulfide				
Concentration, ppmvd	2.2	2.1	2.4	2.2
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Carbon disulfide				
Concentration, ppmvd	0.6	0.6	1.4	0.9
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	8.1	8.2	5.2	7.2
Emission Rate, lb/hr	0.5	0.5	0.3	0.4
Method 18 Data				
Methanol				
Concentration, ppmvd	83.2	88.9		86.0
Emission Rate, lb/hr	1.7	1.9		1.8
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Acetone				
Concentration, ppmvd	3.7	7.2		5.4
Emission Rate, lb/hr	0.1	0.3		0.2
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON	Source:	Black Liquor Oxidation Vent		FIN:	5000
Source Code: CS-BLOV	Date:	6/16/92	EPN: E35	CIN:	-

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Chloroform				
Concentration, ppmvd	1.1 *	1.1 *		1.1 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Benzene				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *		1.1 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
m-, p-Xylene				
Concentration, ppmvd	13.3	0.5 *		6.8
Emission Rate, lb/hr	0.9	0.1 *		0.5
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	1.5	1.0		1.3
Emission Rate, lb/hr	0.1	0.1 *		0.1

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON		Source: Black Liquor Oxidation Vent		FIN:	5000
Source Code:	CS-BLOV	Date: 6/16/92	EPN: E35	CIN:	

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Knowns as Carbon				
Concentration, ppmvd	162.1	124.3		143.2
Unknowns as Carbon				
Concentration, ppmvd	341.2	1.7		171.5
Sum M18 as Carbon, lb/hr	3.9	1.0		2.5
Unknown Compounds % of Total	67.8%	1.4%		34.6%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	115.2	138.0	172.8	142.0
Emission Rate, lb/hr as C	0.9	1.1	1.4	1.1

COMMENTS :

M18 run 1 for 6/10/92 was rejected because it was not consistent with other GC injections.
M16 hydrogen sulfide and methyl mercaptan values for 6/10/92 were saturated for runs 1 and 3.
Methyl mercaptan values for 6/16/92 were saturated for runs 1, 2, and
M18 run 3 for 6/16/92 was rejected because it was not consistent with other GC injections.

*One or more values were less than the detection limit.

Section 2.2 Emission Test Results - VOST

EMISSION TEST RESULTS - VOST

Mill CHAMPION - SHELDON Source: Black Liquor Oxidation Vent
Source Code: CS-BLOV EPN: E40 FIN: 5000 CIN: ,PN5005

Date: 6/10/92

Compound	BLOV-T (µg)	BLOV-TC (µg)	BLOV-C (µg/L)	Total µg	CS-BLOV (µg/m3)	Conc. (ppm)
TARGET COMPOUNDS						
Chloromethane		0.370		0.37	193.72	0.092
Bromomethane		0.014		0.01	7.33	0.002
Methylene Chloride	0.157	0.022	0.92	0.22	114.43	0.032
Acetone	5.546	0.169	55.56	8.10	4242.97	1.756
Carbon Disulfide	1.962	0.009	0.34	1.99	1039.59	0.328
Chloroform	0.027	0.045	3.17	0.21	109.06	0.022
Trichlorofluoromethane	0.037	0.017		0.05	28.27	0.005
Dimethyl disulfide	11.042	2.806	48.09	15.92	8332.92	2.127
Dimethyl sulfide	6.076	0.006	4.43	6.27	3284.03	1.271
Iodomethane						
Isooctane						
n-Hexane	0.672	0.621		1.29	676.96	0.189
2-Butanone (MEK)	4.108	0.334	14.32	5.06	2648.04	0.883
1,1,1-Trichloroethane						
Vinyl acetate						
Bromodichloromethane			0.27	0.01	6.08	0.001
Trichloroethene		0.004		0.00	2.09	0.000
Benzene	0.102			0.10	53.40	0.016
Dibromomethane			0.42	0.02	9.46	0.001
Tetrachloroethene						
Toluene	0.253	0.016		0.27	140.84	0.037
Ethylbenzene	0.010	0.001		0.01	5.76	0.001
Styrene	0.020	0.004		0.02	12.57	0.003
o-Xylene	0.007			0.01	3.66	0.001
m-/p-Xylene	0.023	0.004	0.17	0.03	17.96	0.004
A-Pinene	0.396	0.031		0.43	223.56	0.039
B-Pinene	0.167	0.014		0.18	94.76	0.017
Cumene						
p-Cymene	0.073			0.07	38.22	0.007
TENTATIVELY IDENTIFIED CMPDS.						
Bicyclic HC	0.760			0.76	397.91	
Branched HC	0.219			0.22	114.66	
Branched HC						
Branched Pentane						
Cyclic HC	0.273			0.27	142.93	
Branched Butane						
Branched Heptane		0.004		0.00	2.09	
Branched Decane		0.008		0.01	4.19	
Branched Hexane		0.020		0.02	10.47	
Branched Octadiene						
Butene		0.010		0.01	5.24	
Cyclobutanol	0.618	0.062		0.68	356.02	
Pentanone	0.126	0.006	0.52	0.15	80.82	
Pinene-related cmpd.						

EMISSION TEST RESULTS - VOST

Mill CHAMPION - SHELDON   Source: Black Liquor Oxidation Vent

Source Code: CS-BLOV   EPN: E40   FIN: 5000   CIN: ,PN5005

Date: 6/10/92

Compound	BLOV-T (µg)	BLOV-TC (µg)	BLOV-C (µg/L)	Total µg	CS-BLOV (µg/m3)	Conc. (ppm)
Siloxane	1.047	0.156		1.20	629.84	
Subst'd HC	0.289	0.032	0.40	0.34	177.07	
Trisulfide HC	3.789	0.326		4.12	2154.45	

SURROGATE STDS
(% Recovery)

Toluene-d8	102.1	99.8	100.6
1,2-Dichloroethane-d4	91.2	74.5	81.9
Benzene-d6	98.1	108.7	101.6

NOTES:

-T=Tenax

-TC=Tenax/Charcoal

-C = Condensate

Air Volume = 0.00191 cu.m.

Condensate Vol. 43.0 mL

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HH957
RF FILE: HH953
DATE: 07/27/92
TLI PROJ #: 21159

SAMPLE ID: CS-BLOV-1VOST-0610-1A T
TLI ID: 57.74.4A
ANALYSIS DATE: 06/16/92

METHOD 8240 QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	6133		774	1		IS	
2	Chloromethane	0	1.152	0	1	.001	ND	.05
3	Bromomethane	0	1.405	0	1	.001	ND	.05
4	Vinyl Chloride	0	1.820	0	1	.001	ND	.05
5	Chloroethane	0	1.410	0	1	.001	ND	.05
6	Methylene Chloride	7351	1.903	581	1	.157	D	.05
7	Acetone	53742	.395	523	1	5.546	E	.05
8	Carbon Disulfide	238606	4.956	500	1	1.962	E	.05
9	1,1-Dichloroethene	0	1.551	0	1	.001	ND	.05
10	1,1-Dichloroethane	0	4.728	0	1	.001	ND	.05
11	trans-1,2-Dichloroethene	0	2.088	0	1	.001	ND	.05
12	Chloroform	2254	3.387	793	1	.027	E	.05
13	1,2-Dichloroethane	0	2.253	0	1	.001	ND	.05
43	Trichlorofluoromethane	1427	1.569	396	1	.037	E	.05
45	Acrolein	0	.110	0	1	.007	ND	.05
46	Acrylonitrile	0	.470	0	1	.002	ND	.05
47	cis-1,2-Dichloroethene	0	2.282	0	1	.001	ND	.05
52	1,3-butadiene	0	1.451	0	1	.001	ND	.05
57	Allyl chloride	0	1.070	0	1	.001	ND	.05
62	Dimethyl disulfide	1204722	4.448	1098	1	11.042	E	.05
63	Dimethyl sulfide	293920	1.972	511	1	6.076	E	.05
65	Iodomethane	0	2.290	0	1	.001	ND	.05
66	Isooctane	0	13.523	0	1	.001	ND	.05
68	Tert-Butyl methyl ether	0	3.626	0	1	.001	ND	.05
69	Vinyl Bromide	0	1.425	0	1	.001	ND	.05
70	n-Hexane	55920	3.391	662	1	.672	D	.05
14	1,4-Difluorobenzene	30480		907	14		IS	
15	2-Butanone	16917	.034	759	14	4.108	E	.05
16	1,1,1-Trichloroethane	0	.503	0	14	.001	ND	.05
17	Carbon Tetrachloride	0	.403	0	14	.001	ND	.05
18	Vinyl Acetate	0	.527	0	14	.001	ND	.05
19	Bromodichloromethane	0	.642	0	14	.001	ND	.05
20	1,2-Dichloropropane	0	.747	0	14	.001	ND	.05
21	cis-1,3-Dichloropropene	0	.754	0	14	.001	ND	.05
22	Trichloroethene	0	.600	0	14	.001	ND	.05
23	Dibromochloromethane	0	.483	0	14	.001	ND	.05
24	1,1,2-Trichloroethane	0	.364	0	14	.001	ND	.05
25	Benzene	17707	1.430	646	14	.102	D	.05
26	trans-1,3-Dichloropropene	0	.565	0	14	.001	ND	.05
27	Bromoform	0	.241	0	14	.001	ND	.05
54	1,4-Dichloro-2-butene	0	.100	0	14	.002	ND	.05
60	Dibromomethane	0	.282	0	14	.001	ND	.05
28	Chlorobenzene-d5	39427		1349	28		IS	
29	4-Methyl-2-Pentanone	0	.168	0	28	.001	ND	.05
30	2-Hexanone	1583	.108	1246	28	.095	D	.05
31	Tetrachloroethene	0	.371	0	28	.001	ND	.05
32	1,1,2,2-Tetrachloroethane	0	.221	0	28	.001	ND	.05
33	Toluene	35131	.880	1124	28	.253	D	.05

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HH957
RF FILE: HH953
DATE: 07/27/92
TLI PROJ #: 21159

SAMPLE ID: CS-BLOV-1VOST-0610-1A T
TLI ID: 57.74.4A
ANALYSIS DATE: 06/16/92

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
34 Chlorobenzene	0	.966	0	28	.001	ND	.05
35 Ethylbenzene	809	.500	1383	28	.010	E	.05
36 Styrene	3229	1.020	1485	28	.020	E	.05
37 o-Xylene	707	.608	1480	28	.007	E	.05
38 m-/p-Xylene	2214	.603	1407	28	.023	E	.05
49 1,2 Dichlorobenzene	0	.573	0	28	.001	ND	.05
50 1,2,3-Trichloropropane	0	.188	0	28	.001	ND	.05
51 1,3 Dichlorobenzene	0	.798	0	28	.001	ND	.05
53 1,4 Dichlorobenzene	0	.700	0	28	.001	ND	.05
56 A-Pinene	74163	1.187	1549	28	.398	D	.05
58 B-Pinene	32704	1.245	1694	28	.167	D	.05
59 Cumene (isopropylbenzene)	0	1.415	0	28	.001	ND	.05
64 Ethyl methacrylate	0	.367	0	28	.001	ND	.05
67 P-Cymene	20028	1.735	1927	28	.073	D	.05

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	11220	2.008	843	1	.23	D	91.2
48 Benzene-d6	47510	1.589	841	14	.25	D	98.1
39 Toluene-d8	55733	1.385	1116	28	.26	D	102.1

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TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HH957
DATE: 07/24/92
TLI PROJ #: 21159

SAMPLE ID: CS-BLOV/1VOST/0610/1A
TLI ID: 57.74.4A
ANALYSIS DATE: 06/16/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
TRISULFIDE HYDROCARBON	1744	1929592	1349	.25	3.789
BICYCLIC HYDROCARBON	1599	387215	1349	.25	.760
CYCLOBUTANOL	255	99883	774	.25	.618
SILOXANE	1234	302897	1349	.25	.595
SILOXANE	871	166891	907	.25	.452
SUBSTITUTED HYDROCARBON	732	46618	774	.25	.289
CYCLIC HYDROCARBON	1903	138939	1349	.25	.273
BRANCHED HYDROCARBON	1308	111640	1349	.25	.219
PENTANONE	993	46668	907	.25	.126
UNKNOWN	1261	61033	1349	.25	.120

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	774	40379	1
1,4-Difluorobenzene	907	92392	14
Chlorobenzene-d5	1349	127315	28

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HH956
RF FILE: HH953
DATE: 07/27/92
TLI PROJ #: 21159

SAMPLE ID: CS-BLOV-1VOST-0610-1A TC
TLI ID: 57.74.48
ANALYSIS DATE: 06/16/92

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1 Bromochloromethane	5864		773	1		IS	
2 Chloromethane	10004	1.152	166	1	.370	D	.05
3 Bromomethane	470	1.405	305	1	.014	E	.05
4 Vinyl Chloride	0	1.820	0	1	.001	ND	.05
5 Chloroethane	0	1.410	0	1	.001	ND	.05
6 Methylene Chloride	1000	1.903	581	1	.022	E	.05
7 Acetone	1566	.395	522	1	.169	D	.05
8 Carbon Disulfide	1088	4.956	498	1	.009	E	.05
9 1,1-Dichloroethene	0	1.551	0	1	.001	ND	.05
10 1,1-Dichloroethane	0	4.728	0	1	.001	ND	.05
11 trans-1,2-Dichloroethene	0	2.088	0	1	.001	ND	.05
12 Chloroform	3604	3.387	792	1	.045	E	.05
13 1,2-Dichloroethane	0	2.253	0	1	.001	ND	.05
43 Trichlorofluoromethane	628	1.569	397	1	.017	E	.05
45 Acrolein	0	.110	0	1	.008	ND	.05
46 Acrylonitrile	0	.470	0	1	.002	ND	.05
~~47 cis-1,2-Dichloroethene~~	~~0~~	~~2.262~~	~~0~~	~~1~~	~~.001~~	~~ND~~	~~.05~~
~~52 1,3-butadiene~~	~~0~~	~~1.451~~	~~0~~	~~1~~	~~.001~~	~~ND~~	~~.05~~
57 Allyl chloride	0	1.070	0	1	.001	ND	.05
62 Dimethyl disulfide	292720	4.448	1072	1	2.806	E	.05
63 Dimethyl sulfide	293	1.972	509	1	.006	E	.05
65 Iodomethane	0	2.290	0	1	.001	ND	.05
66 Isooctane	0	13.523	0	1	.001	ND	.05
68 Tert-Butyl methyl ether	0	3.626	0	1	.001	ND	.05
69 Vinyl Bromide	0	1.425	0	1	.001	ND	.05
70 n-Hexane	49390	3.391	661	1	.621	D	.05
14 1,4-Difluorobenzene	22106		904	14		IS	
15 2-Butanone	999	.034	758	14	.334	D	.05
16 1,1,1-Trichloroethane	0	.503	0	14	.001	ND	.05
17 Carbon Tetrachloride	0	.403	0	14	.001	ND	.05
18 Vinyl Acetate	0	.527	0	14	.001	ND	.05
19 Bromodichloromethane	0	.642	0	14	.001	ND	.05
20 1,2-Dichloropropane	0	.747	0	14	.001	ND	.05
21 cis-1,3-Dichloropropene	0	.754	0	14	.001	ND	.05
22 Trichloroethene	233	.600	930	14	.004	E	.05
23 Dibromochloromethane	0	.483	0	14	.001	ND	.05
24 1,1,2-Trichloroethane	0	.364	0	14	.001	ND	.05
25 Benzene	0	1.430	0	14	.001	ND	.05
26 trans-1,3-Dichloropropene	0	.565	0	14	.001	ND	.05
27 Bromoform	0	.241	0	14	.001	ND	.05
54 1,4-Dichloro-2-butene	0	.100	0	14	.002	ND	.05
60 Dibromomethane	0	.282	0	14	.001	ND	.05
28 Chlorobenzene-d5	36027		1347	28		IS	
29 4-Methyl-2-Pentanone	0	.188	0	28	.001	ND	.05
30 2-Hexanone	0	.106	0	28	.001	ND	.05
31 Tetrachloroethene	0	.371	0	28	.001	ND	.0
32 1,1,2,2-Tetrachloroethane	0	.221	0	28	.001	ND	.05
33 Toluene	2001	.880	1116	28	.016	E	.05

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

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Durham, NC 27713
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FILE NAME: HH956
RF FILE: HH953
DATE: 07/27/92
TLI PROJ #: 21159

SAMPLE ID: CS-BLOV-1VOST-0610-1A TC
TLI ID: 57.74.48
ANALYSIS DATE: 06/16/92

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
34 Chlorobenzene	0	.966	0	28	.001	ND	.05
35 Ethylbenzene	74	.500	1381	28	.001	E	.05
36 Styrene	542	1.020	1483	28	.004	E	.05
37 o-Xylene	0	.808	0	28	.001	ND	.05
38 m-/p-Xylene	332	.803	1406	28	.004	E	.05
49 1,2 Dichlorobenzene	0	.573	0	28	.001	ND	.05
50 1,2,3-Trichloropropane	0	.188	0	28	.001	ND	.05
51 1,3 Dichlorobenzene	0	.798	0	28	.001	ND	.05
53 1,4 Dichlorobenzene	0	.700	0	28	.001	ND	.05
56 A-Pinene	5389	1.187	1548	28	.031	E	.05
58 B-Pinene	2601	1.245	1693	28	.014	E	.05
59 Cumene (isopropylbenzene)	0	1.415	0	28	.001	ND	.05
64 Ethyl methacrylate	0	.367	0	28	.001	ND	.05
67 P-Cymene	0	1.735	0	28	.001	ND	.05

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	6772	2.006	841	1	.19	D	74.5
48 Benzene-d6	38189	1.589	840	14	.27	D	108.7
39 Toluene-d8	49783	1.385	1106	28	.25	D	99.8

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HH956
DATE: 07/24/92
TLI PROJ #: 21159

SAMPLE ID: CS-BLOV/1VOST/0610/1A
TLI ID: 57.74.4B
ANALYSIS DATE: 06/16/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
TRISULFIDE HYDROCARBON	1735	141567	1347	.25	.326
SILOXANE	870	22769	905	.25	.105
CYCLOBUTANOL	255	9307	773	.25	.062
SILOXANE	1232	22255	1347	.25	.051
SUBSTITUTED HYDROCARBON	729	4779	773	.25	.032
BRANCHED HEXANE	619	2979	773	.25	.020
BUTENE	206	1466	773	.25	.010
BRANCHED DECANE	2139	3290	1347	.25	.008
PENTANONE	988	1209	905	.25	.006
BRANCHED HEPTANE	2001	1782	1347	.25	.004

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	773	37343	1
1,4-Difluorobenzene	905	54041	14
Chlorobenzene-d5	1347	108494	28

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FILE NAME: AC7971
RF FILE: AC793
DATE: 07/27/92
TLI PROJ #: 21159

SAMPLE ID: CS-BLOV-1VOST-0610-1A
TLI ID: 57.74.4C
SAMPLE VOL: .005 L
ANALYSIS DATE: 06/22/92
DILUTION FACTOR: 1

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	CONC, ug/L	CODE	QUAN LIMIT
1 Bromochloromethane	2800		779	1		IS	
2 Chloromethane	0	1.281	0	1	.28	ND	10
3 Bromomethane	0	1.353	0	1	.26	ND	10
4 Vinyl Chloride	0	1.646	0	1	.22	ND	10
5 Chloroethane	0	1.392	0	1	.26	ND	10
6 Methylene Chloride	108	2.108	583	1	.92	E	10
7 Acetone	5097	1.638	526	1	55.56	D	10
8 Carbon Disulfide	100	5.327	502	1	.34	E	10
9 1,1-Dichloroethene	0	1.816	0	1	.20	ND	10
10 1,1-Dichloroethane	0	4.724	0	1	.08	ND	10
11 trans-1,2-Dichloroethene	0	2.103	0	1	.17	ND	10
12 Chloroform	816	4.593	798	1	3.17	E	10
13 1,2-Dichloroethane	0	3.736	0	1	.10	ND	10
43 Trichlorofluoromethane	0	.900	0	1	.40	ND	10
~~45 Acrolein~~	~~0~~	~~.431~~	~~0~~	~~1~~	~~.83~~	~~ND~~	~~10~~
~~46 Acrylonitrile~~	~~0~~	~~.978~~	~~0~~	~~1~~	~~.36~~	~~ND~~	~~10~~
47 cis-1,2-Dichloroethene	0	2.464	0	1	.14	ND	10
52 1,3-butadiene	0	2.008	0	1	.18	ND	10
57 Allyl chloride	0	1.038	0	1	.34	ND	10
62 Dimethyl disulfide	13513	5.017	1080	1	48.09	D	10
63 Dimethyl sulfide	607	2.445	513	1	4.43	E	10
65 Iodomethane	0	1.958	0	1	.18	ND	10
66 Isooctane	0	13.863	0	1	.03	ND	10
68 Tert-Butyl methyl ether	0	5.332	0	1	.07	ND	10
69 Vinyl Bromide	0	1.394	0	1	.26	ND	10
70 n-Hexane	0	4.119	0	1	.09	ND	10
14 1,4-Difluorobenzene	12450		913	14		IS	
15 2-Butanone	283	.079	763	14	14.32	D	10
16 1,1,1-Trichloroethane	0	.769	0	14	.10	ND	10
17 Carbon Tetrachloride	0	.550	0	14	.15	ND	10
18 Vinyl Acetate	0	.902	0	14	.09	ND	10
19 Bromodichloromethane	55	.827	1012	14	.27	E	10
20 1,2-Dichloropropane	0	.852	0	14	.09	ND	10
21 cis-1,3-Dichloropropene	0	.893	0	14	.09	ND	10
22 Trichloroethene	0	.495	0	14	.16	ND	10
23 Dibromochloromethane	0	.636	0	14	.13	ND	10
24 1,1,2-Trichloroethane	0	.586	0	14	.14	ND	10
25 Benzene	0	1.466	0	14	.05	ND	10
26 trans-1,3-Dichloropropene	0	.994	0	14	.08	ND	10
27 Bromoform	0	.443	0	14	.18	ND	10
54 1,4-Dichloro-2-butene	0	.339	0	14	.24	ND	10
60 Dibromomethane	41	.393	983	14	.42	E	10
28 Chlorobenzene-d5	15122		1358	28		IS	
29 4-Methyl-2-Pentanone	0	.690	0	28	.10	ND	10
30 2-Hexanone	0	.488	0	28	.14	ND	10
31 Tetrachloroethene	0	.370	0	28	.18	ND	10
32 1,1,2,2-Tetrachloroethane	0	.839	0	28	.08	ND	10
33 Toluene	0	.971	0	28	.07	ND	10

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FILE NAME: AC7971
RF FILE: AC793
DATE: 07/27/92
TLI PROJ #: 21159

SAMPLE ID: CS-BLOV-1VOST-0810-1A
TLI ID: 57.74.4C
SAMPLE VOL: .005 L
ANALYSIS DATE: 06/22/92
DILUTION FACTOR: 1

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	CONC, ug/L	CODE	QUAN LIMIT
34 Chlorobenzene	0	1.038	0	28	.08	ND	10
35 Ethylbenzene	0	.630	0	28	.11	ND	10
36 Styrene	0	1.168	0	28	.06	ND	10
37 o-Xylene	0	.753	0	28	.09	ND	10
38 m-/p-Xylene	34	.673	1417	28	.17	E	10
49 1,2 Dichlorobenzene	0	.950	0	28	.07	ND	10
50 1,2,3-Trichloropropane	0	.608	0	28	.11	ND	10
51 1,3 Dichlorobenzene	0	1.093	0	28	.06	ND	10
53 1,4 Dichlorobenzene	0	.956	0	28	.07	ND	10
56 A-Pinene	0	1.277	0	28	.05	ND	10
58 B-Pinene	0	1.390	0	28	.05	ND	10
59 Cumene (isopropylbenzene)	0	1.904	0	28	.03	ND	10
64 Ethyl methacrylate	0	.771	0	28	.09	ND	10
67 P-Cymene	0	1.990	0	28	.03	ND	10

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT,ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	6751	2.945	848	1	.20	D	81.9
48 Benzene-d6	19228	1.520	847	14	.25	D	10
39 Toluene-d8	20699	1.360	1116	28	.25	D	100.[illegible]

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FILE NAME: AC7971
DATE: 07/24/92
TLI PROJ #: 21159

SAMPLE ID: CS-8LOV/1VOST/08
TLI ID: 57.74.4C
SAMPLE VOL: .005 L
ANALYSIS DATE: 08/22/92
DILUTION FACTOR: 1

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	SCAN	AREA	IS SCAN #	IS AMT	CONC, ug/L
PENTANONE	978	381	913	.25	.52
SUBSTITUTED HYDROCARBON	998	294	913	.25	.40
UNKNOWN	1192	427	1358	.25	.38

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	779	27995	1
1,4-Difluorobenzene	913	38795	14
Chlorobenzene-d5	1358	58282	28

Section 2.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

SOURCE CS-BLOV

QUALITY CONTROL SUMMARY
METHOD 25A

1. CALIBRATION

THEOR ppm	6/10/92 ppm	6/10/92 %ERR	6/16/92 ppm	6/16/92 %ERR
0.0	3.0	0.2	7.0	0.5
36.0	28.0	-0.5	24.0	-0.8
91.0	95.0	0.3	** 248.	0.3
1506.0	1505.0	-0.1	1505.0	-0.1
CORR COEFF	0.9999		0.9999	

** THEOR ppm = 244

2. PROPANE LINE RECOVERY

	DATE 6/10/92 INST	LINE	%REC	DATE 6/16/92 INST	LINE	%REC
BEFORE	*			245.0	228.0	93.1%
AFTER	245.0	228.0	93.1%	238.0	224.0	94.1%

3. LINE BLANK

	6/10/92 ppm	6/16/92 ppm
BEFORE	5.0	8.0
AFTER	8.0	8.0

* Not performed

SOURCE CS-BLOV

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR ppm	DATE 6/10/92 ppm	%REC	DATE 6/16/92 ppm	%REC
ethanol	52.0	48.6	93.4%	48.6	93.5%
acetone	41.6	32.9	79.1%	39.3	94.5%
isopropanol	39.9	37.3	93.5%	36.3	91.1%
dimethyl sulfide	9.1	8.0	87.5%	8.6	94.1%
benzene	34.2	34.4	100.8%	33.5	98.2%
bromodichloromethane	18.8	16.8	89.5%	16.0	85.2%
dimethyl disulfide	33.9	31.9	94.3%	31.5	93.1%
toluene	28.7	25.1	87.3%	27.0	93.9%
ethyl benzene	24.9	24.9	100.1%	24.0	96.3%
m-xylene	49.8	51.2	102.8%	48.6	97.6%
o-xylene	25.0	24.5	97.8%	23.9	95.4%
cumene	21.9	21.3	97.0%	20.7	94.4%
alpha-pinene	19.2	19.1	99.9%	18.2	94.8%
beta-pinene	19.2	17.3	90.1%	17.5	90.9%
3-carene	19.3	18.1	93.8%	17.4	90.2%
p-cymene	19.6	18.5	94.4%	17.9	91.5%

2. PROPANE RESPONSE

	THEOR		%REC		%REC
BEFORE	36.0	36.1	100.3%	34.8	96.7%
AFTER	36.0	35.2	97.8%	33.5	93.1%

3. METHANOL LINE RECOVERY

	6/10/92 GC	6/10/92 LINE	6/10/92 %REC	6/16/92 GC	6/16/92 LINE	6/16/92 %REC
BEFORE	*			11.3	11.5	101.8%
AFTER	11.3	11.5	101.8%	11.3	11.3	100.0%

4. LINE BLANK

	[-------------FILE REF-------------]	
BEFORE	FAB2004	FGB2004
AFTER	FGB2004	FHB2010

* Not performed

SOURCE CS-BLOV

QUALITY CONTROL SUMMARY
METHOD 16

1. CALIBRATION

ANALYTE	LO ppm	MED ppm	HI ppm	CORR COEFF
6/10/92				
hydrogen sulfide	2.1	4.7	10.5	1.0000
methyl mercaptan	1.9	4.4	9.7	1.0000
dimethyl sulfide	2.6	6.1	13.5	1.0000
carbon disulfide	0.8	1.9	4.2	1.0000
dimethyl disulfide	1.1	2.6	5.8	1.0000
6/16/92				
hydrogen sulfide	3.1	5.9	9.5	1.0000
methyl mercaptan	2.8	5.5	8.8	1.0000
dimethyl sulfide	3.9	7.6	12.2	1.0000
carbon disulfide	1.2	2.4	3.8	1.0000
dimethyl disulfide	1.7	3.3	5.3	1.0000

Section 2.4 Process Operating Data

BLACK LIQUOR OXIDATION SYSTEM

The black liquor is oxidized in a two-stage system. After leaving the primary tower, the liquor is fed to the secondary tower where final oxidation takes place. Brine from the tall oil plant is added ahead of the secondary tower. Retention time in the first stage is 460 minutes. Retention time in the second tower is 140 minutes.

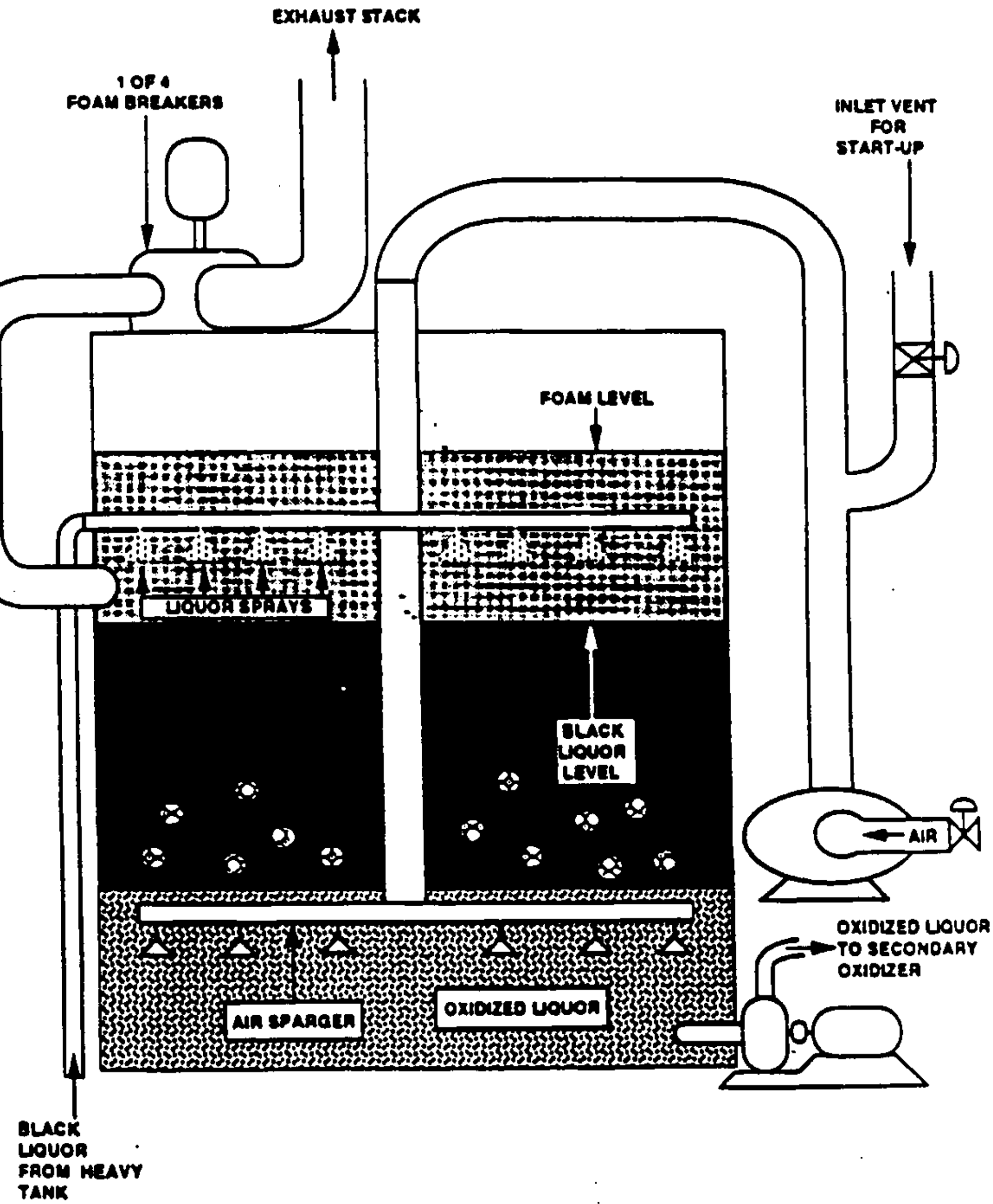
Air is provided by a compressor on each stage. The compressor on the primary is rated at 6,760 SCFM while the one on the secondary is rated at 9,000 SCFM. Vent gases pass through four Impco foam breakers on the primary stage and a cyclone separator on the secondary where liquid is drained to the soap skim tank. The oxidation towers are included.

System design information is shown in Table 1.

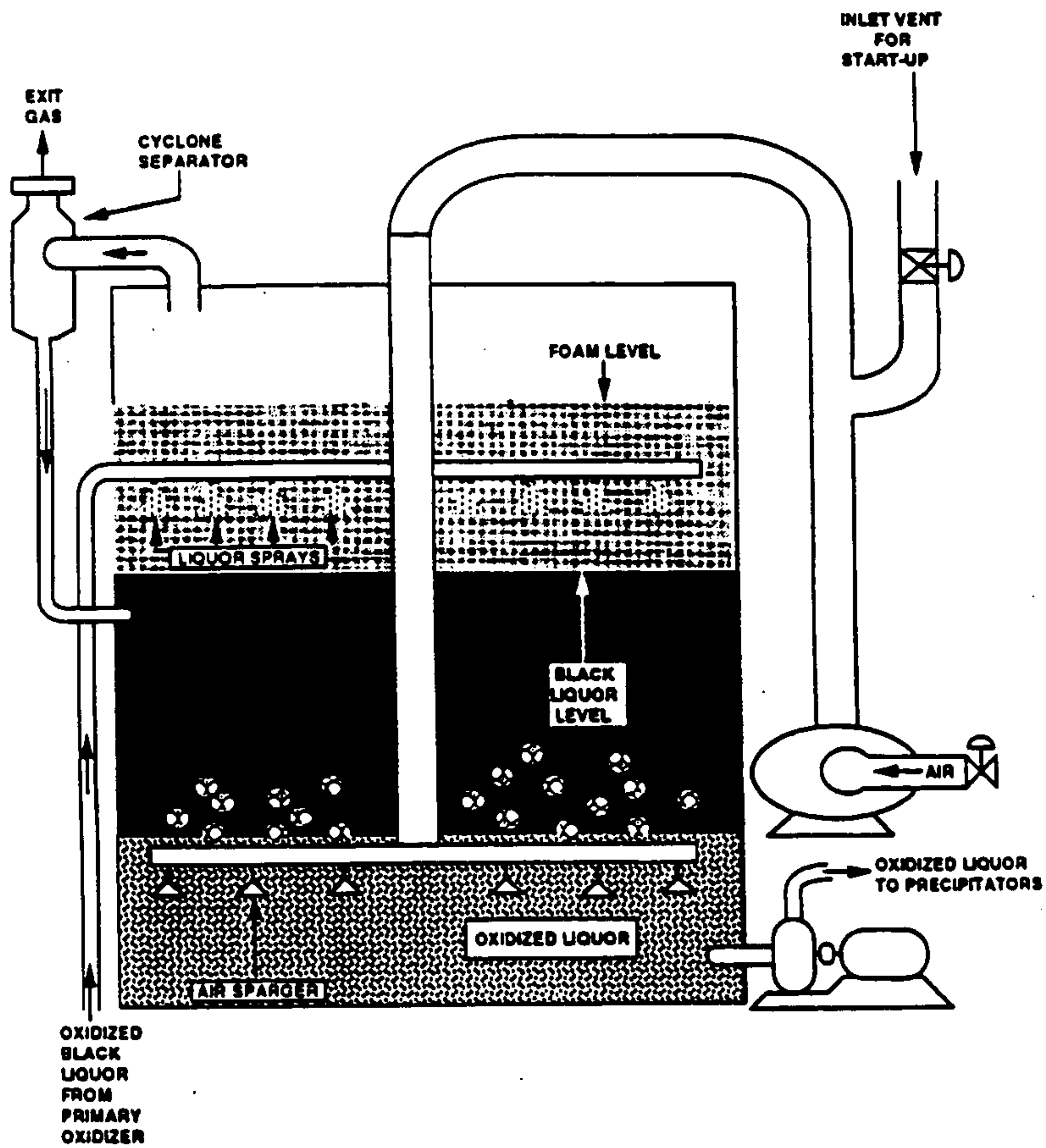
TABLE 1 SYSTEM DESIGN INFORMATION

POSITION	LIQUOR TEMP. °F	LIQUOR FLOW, GPM	AIR FLOW, SCFM	$S^=$ CONC. g/L	LIQUOR SOLIDS, %
Inlet 1°	215	300	6710	67	52
Outlet 1°	N/A	N/A	N/A	N/A	N/A
Intermediate Storage Outlet	N\A	N\A	N\A	N\A	N\A
Outlet 2°	190-200	300	9000	0.2	54

PRIMARY OXIDATION TOWER



SECONDARY OXIDATION TOWER



Mill: Champion-Sheldon
Source: Primary Black Liquor Oxidizer
FIN: 5000

Source: Recovery
Date:6-10-92
EPN:E35
CIN:

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		13:21	18:21		
Inlet BL Na2S Content	g/L Na2S	30.80	30.80		0.00
Outlet BL Na2S Content	g/L Na2S	9.2			0.00
Inlet BL Temperature	degree F	221.0			0.00
Outlet BL Temperature	degree F				0.00
BL Solids Content	Be, %	55	55		0.00
BL Flow Rate	GPM	222	222		0.00
BL Volume in Tank	Gal x 1000	200.000	200.000		0.00
Air Flow Rate	ACFM	2800	2800		0.00

Mill: Champion-Sheldon
Source: Primary Black Liquor Oxidizer
FIN: 5000

Source: Recovery
Date:6-16-92
EPN:E35
CIN:

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		13:51	18:21	16:51	
Inlet BL Na2S Content	g/L Na2S	26.50	20.80	17.90	0.00
Outlet BL Na2S Content	g/L Na2S	5.5	4.8	2.5	0.00
Inlet BL Temperature	degree F	221.0	220.0	220.0	0.00
Outlet BL Temperature	degree F				0.00
BL Solids Content	Be, %	55	55	55	0.00
BL Flow Rate	GPM	222	222	222	0.00
BL Volume in Tank	Gal x 1000	200.000	200.000	2000.000	0.00
Air Flow Rate	ACFM	2100	2100	2100	0.00

SECTION 3

RECOVERY FURNACE (CASC) WITH NaOAc

(CS-RF/1)

3. CS-RF/1

WESTON

SECTION 3
RECOVERY FURNACE (CASC) WITH NaOAc
(CS-RF/1)

The Recovery Furnace was tested on two different days for volatile organics compounds by M25A, M16, M18, and VOST. In addition, emissions were monitored for aldehydes hydrogen chloride, sulfuric acid mist, and metals.

Total Hydrocarbons (M25A)

Figures 3.1 and 3.2 present the THC trends for the test periods on 6/9/92 and 6/10/92. Emissions were very erratic on 6/9/92 ranging from 33 to >135 ppm. THC readings were much more stable on 6/10/92, varying over a narrower range, but still exhibiting some wide fluctuations.

Volatile Organic Compounds (M16 and M18)

Table 3.1 summarizes the results for the Method 16 and Method 18 target compounds, and Section 3.1 is a tabulation of the data. The volumetric flow was measured during sampling with a pitot tube. Of the target compounds, only benzene had a mean concentration greater than the limit of detection.

Volatile Organic Sampling Train (VOST)

Table 3.2 summarizes the result of the VOST sample collected on 6/9/92. Section 3.2 tabulates the results for target compounds and tentatively identified compounds (TIC). Chloroform and a-Pinene were the predominant target compounds present. Numerous other compounds were present at lower levels.

Miscellaneous Parameters

Table 3.3 summarizes the results of testing for aldehydes, hydrogen chloride, and sulfuric acid mist. Section 3.3 tabulates the results for each compound. Formaldehyde, acetaldehyde, and acetone were detected. However, their mean concentrations were less than their limits of detection. Of the acids, hydrogen chloride averaged 2.5 lb/hr. Sulfuric acid mist was non-detectable.

Metals

Table 3.4 summarizes the result of the samples collected for metals analyses. Section 3.4 tabulates the results for each compound. Traces of cadmium, copper, manganese, and phosphorus were detected.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 3.5. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 3.6 includes the process operating data as recorded and provided by mill personnel. Not all process operating data were given for VOC run times. The data with the closest run time was used.

FIGURE 3.1.
THC TREND ANALYSIS (6/9/92)
RECOVERY FURNACE (CASC) WITH NaOAc
(CS-RF/1)

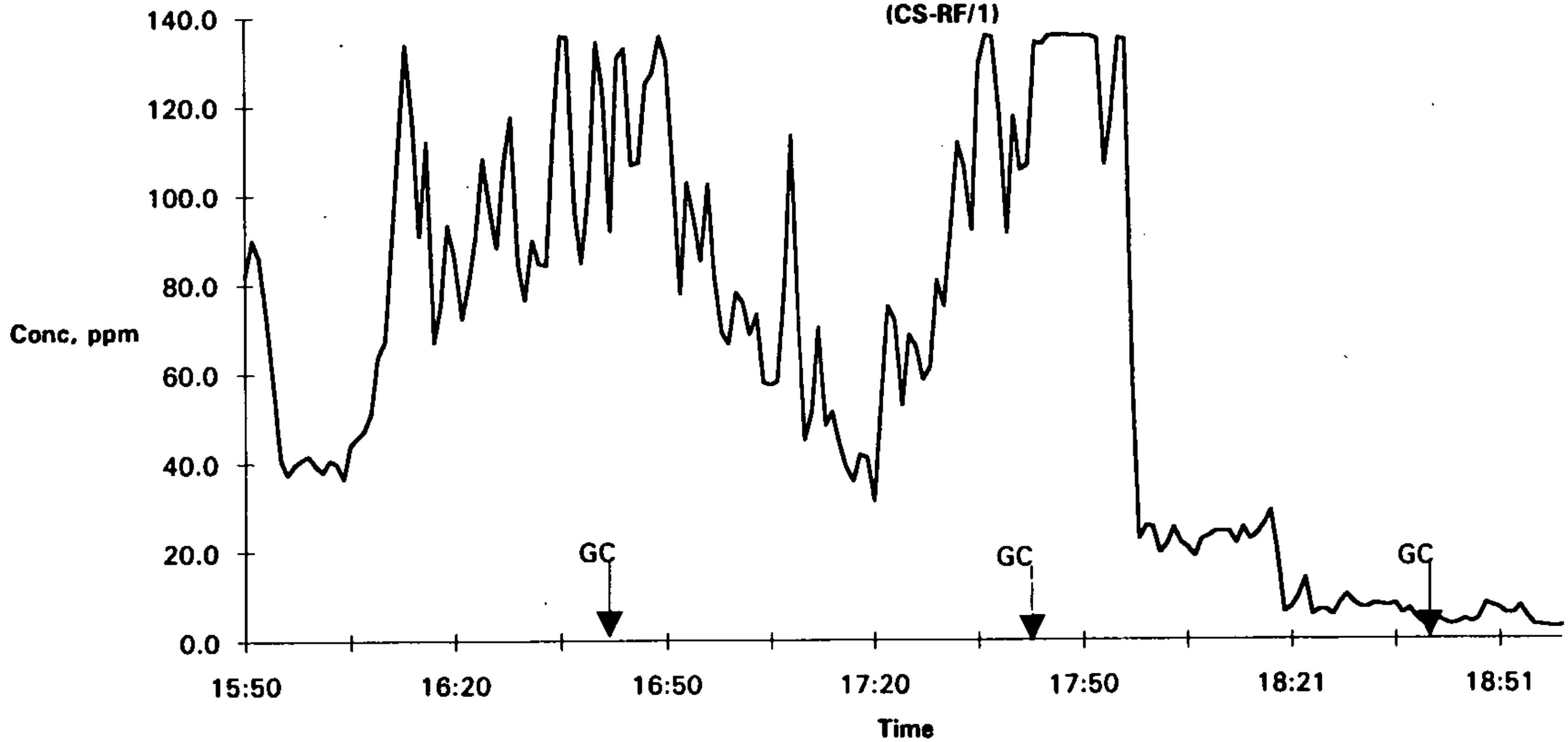


FIGURE 3.2.
THC TREND ANALYSIS (6/10/92)
RECOVERY FURNACE (CASC) WITH NaOAc
(CS-RF/1)

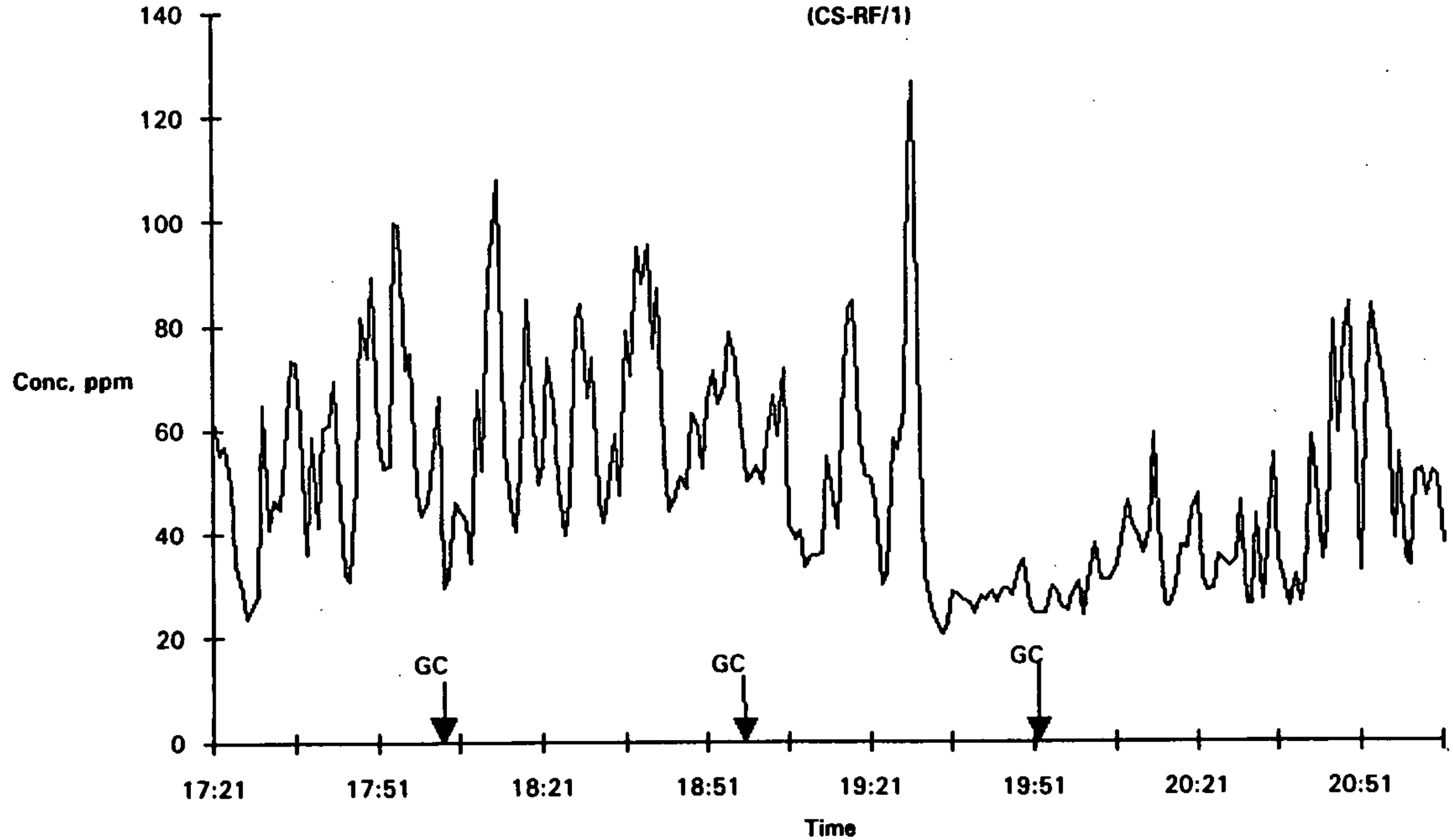


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TABLE 3.1 SUMMARY OF VOC RESULTS

Mill: CHAMPION - SHELDON
Source Code: CS-RF/1
FIN: 5000 CIN: EC13,PN5005

Source: Recovery Furnace (Casc) with NaOAc
Test Dates: 6/9/92 6/10/92
EPN: E40

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	260	291	276	
Volumetric Flow Rate, x10^3 DSCFM	259.8	297.0	278.4	
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	81.7	85.4	83.6	
Method 16 Data, lb/hr				
Hydrogen sulfide	15.6	36.4	27.1	0.7
Methyl mercaptan	3.1	30.9	17.7	1
Dimethyl sulfide	ND	2.0	1.0	1.3
Carbon disulfide	ND	ND	ND	1.7
Dimethyl disulfide	ND	ND	ND	2
Method 18 Data, lb/hr				
Methanol	ND	3.7	2.1	3.5
Ethanol	ND	ND	ND	1.3
Acetone	ND	ND	ND	1.6
2-Propanol	ND	ND	ND	1.6
2-Butanone	ND	ND	ND	2
Chloroform	ND	ND	ND	6.5
Benzene	ND	17.9	7.5	2.1
Bromodichloromethane	ND	ND	ND	9
Toluene	ND	ND	ND	2.5
Ethyl benzene	ND	ND	ND	2.9
m-, p-Xylene	ND	ND	ND	2.9
o-Xylene	ND	ND	ND	2.9
Cumene	ND	ND	ND	3.3
alpha-Pinene	ND	ND	ND	3.7
beta-Pinene	ND	ND	ND	3.7
3-Carene	ND	ND	ND	3.7
Terpenes (Unspecified)	ND	4.5	3.1	3.7
p-Cymene	ND	ND	ND	3.7
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	3.7	22.1	11.1	0.3
Unknowns as C, lb/hr	0.4	1.1	0.7	0.1
Sum of Compounds as C, lb/hr	4.1	23.1	11.7	0.1

ND=Not Detected
DL=Detection Limit

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TABLE 3.2 SUMMARY OF VOST RESULTS

Mill: CHAMPION-SHELDON
Source Code: CS-RF/1
FIN: 5000 EPN: E40

Source: Recovery Furnace (CASC) With NaOAc
Test Dates: 6/9/92
CIN: EC13,PN5005

TIME	1802
Volumetric Flow Data	
Stack Temperature, °F	291
Volumetric Flow Rate, x 10^3 DSCFM	259.8
Process Operating Conditions	
Production Rate, 1000 lb BLS/hr	85.4
Target Compounds, ppm	
Chloromethane	0.020
Methylene Chloride	0.009
Acetone	0.016
Carbon Disulfide	0.001
Chloroform	0.150
Trichlorofluoromethane	0.007
Dimethyl disulfide	0.027
Dimethyl sulfide	0.049
Isooctane	0.002
n-Hexane	0.079
2-Butanone (MEK)	0.008
1,1,1-Trichloroethane	0.001
Vinyl acetate	0.006
Bromodichloromethane	0.001
Trichloroethene	0.001
Benzene	0.019
Dibromomethane	0.001
Tetrachloroethene	0.001
Toluene	0.018
Ethylbenzene	0.002
Styrene	0.000
o-Xylene	0.001
m-/p-Xylene	0.004
A-Pinene	0.219
B-Pinene	0.092
Cumene	0.001
p-Cymene	0.003

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TABLE 3.3 SUMMARY OF MISCELLANEOUS RESULTS

Mill: CHAMPION-SHELDON
Source Code: CS-RF1
FIN: 5000 EPN: E40

Source: Recovery Furnace (CASC) With NaOAc
Test Dates: 6/9/92, 6/10/92, 6/24/92
CIN: EC13,PN5005

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	243	291	268	
Volumetric Flow Rate, x 10^3 DSCFM	179.3	297.0	248.3	
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	85.4	85.4	85.4	
Emission Rate, lb/hr				
Formaldehyde	ND	0.6	0.5	0.7
Acetaldehyde	ND	0.9	0.7	1.0
Acetone (Impinger)	ND	1.2	0.9	1.3
Acetophenone	ND	ND	ND	2.6
2-Butanone (Impinger)	ND	ND	ND	1.6
Methyl isobutyl ketone	ND	ND	ND	2.2
Acrolein	ND	ND	ND	1.2
Benzaldehyde	ND	ND	ND	2.3
Hydrogen Chloride	1.2	3.7	2.5	0.8
Sulfuric Acid Mist	ND	ND	ND	ND

ND = Not Detected
DL = Detection Limit

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TABLE 3.4 SUMMARY OF METALS EMISSIONS

Mill: CHAMPION-SHELDON
Source Code: CS-RF3
FIN: 5000 EPN: E40

Source: Recovery Furnace
Test Dates: 6/24/92
CIN: EC13,PN5005

	RUN 1	RUN 2	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	243	251	247	
Volumetric Flow Rate, x 10^3 DSCFM	179	168	173	
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	85.4	85.4	85.4	
Metals Emission Rate, x10^{-5}lb/hr				
Antimony (Sb)	ND	ND	ND	4.9
Arsenic (As)	ND	ND	ND	4.9
Barium (Ba)	ND	ND	ND	3900
Beryllium (Be)	ND	ND	ND	4.9
Cadmium (Cd)	18.0	ND	10.2	4.9
Chromium (Cr)	ND	ND	ND	9.8
Copper (Cu)	ND	6.6	4.5	4.9
Lead (Pb)	ND	ND	ND	9.8
Manganese (Mn)	72.0	57.0	64.5	9.8
Mercury (Hg)	ND	ND	ND	4.9
Nickel (Ni)	ND	ND	ND	4.9
Phosphorus (P)	ND	100.0	75.0	98
Silver (Ag)	ND	ND	ND	4.9
Selenium (Se)	ND	ND	ND	4.9
Thallium (Tl)	ND	ND	ND	4.9

ND = Not Detected
DL = Detection Limit

Section 3.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON		Source: Recovery Furnace (Casc) with NaOAc		FIN:	5000
Source Code:	CS-RF/1	Date: 6/9/92	EPN: E40	CINEC13,PN5005	

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1549	1649		
Flow Data				
Stack Temperature, °F		291		291
Moisture Content, %		26.0		26.0
Oxygen Concentration, %		13.0		13.0
Carbon Dioxide Concentration, %		7.0		7.0
Volumetric Flow Rate, x10^3 ACFM		504.1		504.1
Volumetric Flow Rate, x10^3 DSCFM		259.8		259.8
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	85.4	85.4		85.4
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	17.1	11.3		14.2
Emission Rate, lb/hr	23.6	15.6		19.6
Methyl mercaptan				
Concentration, ppmvd	1.6	1.6		1.6
Emission Rate, lb/hr	3.1	3.1		3.1
Dimethyl sulfide				
Concentration, ppmvd	0.8	0.5 *		0.5
Emission Rate, lb/hr	2.0	1.3 *		1.3
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	1.5 *	1.5 *		1.5 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	1.9 *	1.9 *		1.9 *
Method 18 Data				
Methanol				
Concentration, ppmvd	2.8	2.7 *		2.1
Emission Rate, lb/hr	3.7	3.5 *		2.7
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.7 *	0.7 *		0.7 *
Emission Rate, lb/hr	1.3 *	1.3 *		1.3 *
Acetone				
Concentration, ppmvd	0.7 *	0.7 *		0.7 *
Emission Rate, lb/hr	1.6 *	1.6 *		1.6 *
2-Propanol				
Concentration, ppmvd	0.7 *	0.7 *		0.7 *
Emission Rate, lb/hr	1.6 *	1.6 *		1.6 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Recovery Furnace (Casc) with NaOAc | FIN: 5000
Source Code: CS-RF/1 | Date: 6/9/92 | EPN: E40 | CINEC13,PN5005

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.7 *	0.7 *		0.7 *
Emission Rate, lb/hr	2.0 *	2.0 *		2.0 *
Chloroform				
Concentration, ppmvd	1.4 *	1.4 *		1.4 *
Emission Rate, lb/hr	6.5 *	6.5 *		6.5 *
Benzene				
Concentration, ppmvd	5.7	3.9		4.8
Emission Rate, lb/hr	17.9	12.4		15.2
Bromodichloromethane				
Concentration, ppmvd	1.4 *	1.4 *		1.4 *
Emission Rate, lb/hr	9.0 *	9.0 *		9.0 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.7 *	0.7 *		0.7 *
Emission Rate, lb/hr	2.5 *	2.5 *		2.5 *
Ethyl benzene				
Concentration, ppmvd	0.7 *	0.7 *		0.7 *
Emission Rate, lb/hr	2.9 *	2.9 *		2.9 *
m-, p-Xylene				
Concentration, ppmvd	0.7 *	0.7 *		0.7 *
Emission Rate, lb/hr	2.9 *	2.9 *		2.9 *
o-Xylene				
Concentration, ppmvd	0.7 *	0.7 *		0.7 *
Emission Rate, lb/hr	2.9 *	2.9 *		2.9 *
Cumene				
Concentration, ppmvd	0.7 *	0.7 *		0.7 *
Emission Rate, lb/hr	3.3 *	3.3 *		3.3 *
alpha-Pinene				
Concentration, ppmvd	0.7 *	0.7 *		0.7 *
Emission Rate, lb/hr	3.7 *	3.7 *		3.7 *
beta-Pinene				
Concentration, ppmvd	0.7 *	0.7 *		0.7 *
Emission Rate, lb/hr	3.7 *	3.7 *		3.7 *
3-Carene				
Concentration, ppmvd	0.7 *	0.7 *		0.7 *
Emission Rate, lb/hr	3.7 *	3.7 *		3.7 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.7	0.8		0.7
Emission Rate, lb/hr	3.7	4.5		4.1

*One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON Source: Recovery Furnace (Casc) with NaOAc FIN: 5000
Source Code: CS-RF/1 Date: 6/9/92 EPN: E40 CINEC13,PN5005

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.7 *	0.7 *		0.7 *
Emission Rate, lb/hr	3.7 *	3.7 *		3.7 *
Knowns as Carbon				
Concentration, ppmvd	45.4	35.7		40.5
Unknowns as Carbon				
Concentration, ppmvd	2.2	1.8		2.0
Sum M18 as Carbon, lb/hr	23.1	18.2		20.7
Unknown Compounds % of Total	4.5%	4.7%		4.6%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	115.8	114.9		115.3
Emission Rate, lb/hr as C	56.3	55.9		56.1

COMMENTS :

Hydrogen sulfide values for all runs on 6/9/92 and 6/10/92 were saturated.

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Recovery Furnace (Casc) with NaOAc | FIN: 5000
Source Code: CS-RF/1 | Date: 6/10/92 | EPN: E40 | CINEC13,PN5005

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1721	1821	1921	
Flow Data				
Stack Temperature, °F			260	260
Moisture Content, %			15.0	15.0
Oxygen Concentration, %			13.0	13.0
Carbon Dioxide Concentration, %			8.0	8.0
Volumetric Flow Rate, x10^3 ACFM			481.0	481.0
Volumetric Flow Rate, x10^3 DSCFM			297.0	297.0
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	85.4	85.4	81.7	84.2
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	23.1	19.4	18.6	20.4
Emission Rate, lb/hr	36.4	30.6	29.3	32.1
Methyl mercaptan				
Concentration, ppmvd	13.0	13.9	10.1	12.3
Emission Rate, lb/hr	28.9	30.9	22.5	27.4
Dimethyl sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	1.4 *	1.4 *	1.4 *	1.4 *
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	1.8 *	1.8 *	1.8 *	1.8 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	2.2 *	2.2 *	2.2 *	2.2 *
Method 18 Data				
Methanol				
Concentration, ppmvd	2.4 *	2.4 *	2.4 *	2.4 *
Emission Rate, lb/hr	3.5 *	3.5 *	3.5 *	3.5 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.3 *	1.3 *	1.3 *	1.3 *
Acetone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.6 *	1.6 *	1.6 *	1.6 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.6 *	1.6 *	1.6 *	1.6 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Recovery Furnace (Casc) with NaOAc | FIN: 5000
Source Code: CS-RF/1 | Date: 6/10/92 | EPN: E40 | CINEC13,PN5005

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	2.0 *	2.0 *	2.0 *	2.0 *
Chloroform				
Concentration, ppmvd	1.2 *	1.2 *	1.2 *	1.2 *
Emission Rate, lb/hr	6.5 *	6.5 •	6.5 *	6.5 *
Benzene				
Concentration, ppmvd	0.9	0.7	0.6 *	0.6
Emission Rate, lb/hr	3.4	2.6	2.1 *	2.3
Bromodichloromethane				
Concentration, ppmvd	1.2 *	1.2 *	1.2 *	1.2 •
Emission Rate, lb/hr	8.9 *	8.9 *	8.9 *	8.9 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	2.5 *	2.5 *	2.5 *	2.5 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	2.9 *	2.9 *	2.9 *	2.9 •
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 •	0.6 *
Emission Rate, lb/hr	2.9 *	2.9 *	2.9 *	2.9 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	2.9 *	2.9 *	2.9 *	2.9 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 •	0.6 *	0.6 *
Emission Rate, lb/hr	3.3 *	3.3 *	3.3 •	3.3 *
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6 •	0.6 *	0.6 *
Emission Rate, lb/hr	3.7 *	3.7 *	3.7 *	3.7 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	3.7 *	3.7 *	3.7 *	3.7 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	3.7 *	3.7 *	3.7 *	3.7 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 *	0.6 *	0.6	0.4
Emission Rate, lb/hr	3.7 *	3.7 *	3.7	2.5

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill:	CHAMPION - SHELDON	Source:	Recovery Furnace (Casc) with NaOAc	FIN:	5000
Source Code:	CS-RF/1	Date:	6/10/92 EPN: E40		CINEC13,PN5005

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	3.7 *	3.7 *	3.7 *	3.7 *
Knowns as Carbon				
Concentration, ppmvd	12.1	10.4	6.6	9.7
Unknowns as Carbon				
Concentration, ppmvd	0.8	0.7	0.8	0.8
Sum M18 as Carbon, lb/hr	7.2	6.1	4.1	5.8
Unknown Compounds % of Total	6.4%	6.4%	11.1%	8.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	65.9	70.6	42.4	59.6
Emission Rate, lb/hr as C	36.6	39.2	23.5	33.1

COMMENTS :

Hydrogen sulfide values for all runs on 6/9/92 and 6/10/92 were saturated.

* One or more values were less than the detection limit.

Section 3.2 Emission Test Results - VOST

EMISSION TEST RESULTS - VOST

Mill CHAMPION - SHELDON Source: Recovery Furnace (Casc) with NaOAc

Source Code: CS-RF/1 EPN: E40 FIN: 5000 CIN: ,PN5005

Date: 6/9/92

Compound	RF/1-T (μg)	RF/1-TC (μg)	RF/1-C (μg/L)	Total μg	CS-RF/1 (μg/m3)	Conc. (ppm)
TARGET COMPOUNDS						
Chloromethane		0.205		0.21	42.98	0.020
Bromomethane						
Methylene Chloride		0.046	2.65	0.16	33.53	0.009
Acetone	0.106		1.75	0.18	38.00	0.016
Carbon Disulfide	0.012	0.003		0.02	3.14	0.001
Chloroform	2.540	0.881	2.94	3.55	743.69	0.150
Trichlorofluoromethane	0.067	0.122		0.19	39.62	0.007
Dimethyl disulfide	0.293	0.217		0.51	106.92	0.027
Dimethyl sulfide	0.539	0.038	0.48	0.60	125.29	0.049
Iodomethane						
Isooctane	0.017	0.023		0.04	8.39	0.002
n-Hexane	1.126	0.224		1.35	283.02	0.079
2-Butanone (MEK)	0.065	0.044		0.11	22.85	0.008
1,1,1-Trichloroethane			0.60	0.03	5.41	0.001
Vinyl acetate	0.075	0.028		0.10	21.59	0.006
Bromodichloromethane	0.014	0.004	0.26	0.03	6.12	0.001
Trichloroethene	0.008	0.011		0.02	3.98	0.001
Benzene	0.232	0.066		0.30	62.47	0.019
Dibromomethane			0.43	0.02	3.88	0.001
Tetrachloroethene	0.012	0.005		0.02	3.56	0.001
Toluene	0.228	0.090	0.40	0.34	70.27	0.018
Ethylbenzene	0.012	0.032		0.04	9.22	0.002
Styrene		0.007		0.01	1.47	0.000
o-Xylene	0.003	0.014		0.02	3.56	0.001
m-/p-Xylene	0.017	0.042	0.41	0.08	16.06	0.004
A-Pinene	3.254	2.661		5.92	1240.04	0.219
B-Pinene		2.499		2.50	523.90	0.092
Cumene		0.013		0.01	2.73	0.001
p-Cymene		0.071		0.07	14.88	0.003
TENTATIVELY IDENTIFIED CMPDS.						
Bicyclic HC	0.430			0.43	90.15	
Branched HC						
Branched HC	0.113			0.11	23.69	
Branched Pentane	0.204			0.20	42.77	
Cyclic HC	0.101	1.310		1.41	295.81	
Branched Butane		0.068		0.07	14.26	
Branched Heptane						
Branched Decane						
Branched Hexane	0.171	0.055		0.23	47.38	
Branched Octadiene		0.292		0.29	61.22	
Butene						
Cyclobutanol						
Pentanone						
Pinene-related cmpd.						

EMISSION TEST RESULTS - VOST

Mill CHAMPION - SHELDON Source: Recovery Furnace (Casc) with NaOAc
Source Code: CS-RF/1 EPN: E40 FIN: 5000 CIN: ,PN5005

Date: 6/9/92

Compound	RF/1-T (μg)	RF/1-TC (μg)	RF/1-C ($\mu g/L$)	Total μg	CS-RF/1 ($\mu g/m3$)	Conc. (ppm)
Siloxane	0.223			0.22	46.75	
Subst'd HC	0.579	0.242	0.01	0.82	172.18	
Trisulfide HC						

SURROGATE STDS
(% Recovery)

	RF/1-T	RF/1-TC	RF/1-C
Toluene-d8	87.0	101.0	102.9
1,2-Dichloroethane-d4	83.3	106.6	82.9
Benzene-d6	92.7	97.9	101.0

NOTES:
-T=Tenax
-TC=Tenax/Charcoal
-C = Condensate

Air Volume = 0.00477 cu.m.

Condensate Vol. 43.0 mL

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HH985
RF FILE: HH983
DATE: 07/27/92
TLI PROJ #: 21159

SAMPLE ID: CS-RF-1VOST-0809-1B T
TLI ID: 57.74.2A
ANALYSIS DATE: 08/17/92

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1 Bromochloromethane	8807		770	1		IS	
2 Chloromethane	0	1.152	0	1	.001	ND	.05
3 Bromomethane	0	1.405	0	1	.001	ND	.05
4 Vinyl Chloride	0	1.820	0	1	.001	ND	.05
5 Chloroethane	0	1.410	0	1	.001	ND	.05
6 Methylene Chloride	0	1.903	0	1	.001	ND	.05
7 Acetone	1105	.395	520	1	.108	D	.05
8 Carbon Disulfide	1634	4.956	498	1	.012	E	.05
9 1,1-Dichloroethene	0	1.551	0	1	.001	ND	.05
10 1,1-Dichloroethane	0	4.728	0	1	.001	ND	.05
11 trans-1,2-Dichloroethene	0	2.088	0	1	.001	ND	.05
12 Chloroform	227340	3.387	789	1	2.540	E	.05
13 1,2-Dichloroethane	0	2.253	0	1	.001	ND	.05
43 Trichlorofluoromethane	2760	1.569	394	1	.067	D	.05
45 Acrolein	0	.110	0	1	.007	ND	.05
46 Acrylonitrile	0	.470	0	1	.002	ND	.05
~~47 cis-1,2-Dichloroethene~~	~~0~~	~~2.262~~	~~0~~	~~1~~	~~.001~~	~~ND~~	~~.05~~
~~52 1,3-butadiene~~	~~0~~	~~1.451~~	~~0~~	~~1~~	~~.001~~	~~ND~~	~~.05~~
57 Allyl chloride	0	1.070	0	1	.001	ND	.05
62 Dimethyl disulfide	34419	4.448	1067	1	.293	D	.05
63 Dimethyl sulfide	28075	1.972	507	1	.539	D	.05
65 Iodomethane	0	2.290	0	1	.001	ND	.05
66 Isooctane	6129	13.523	861	1	.017	E	.05
68 Tert-Butyl methyl ether	0	3.626	0	1	.001	ND	.05
69 Vinyl Bromide	0	1.425	0	1	.001	ND	.05
70 n-Hexane	100926	3.391	659	1	1.126	E	.05
14 1,4-Difluorobenzene	32903		903	14		IS	
15 2-Butanone	290	.034	756	14	.085	D	.05
16 1,1,1-Trichloroethane	0	.503	0	14	.001	ND	.05
17 Carbon Tetrachloride	0	.403	0	14	.001	ND	.05
18 Vinyl Acetate	5236	.527	694	14	.075	D	.05
19 Bromodichloromethane	1182	.642	1001	14	.014	E	.05
20 1,2-Dichloropropane	0	.747	0	14	.001	ND	.05
21 cis-1,3-Dichloropropene	0	.754	0	14	.001	ND	.05
22 Trichloroethene	599	.600	929	14	.008	E	.05
23 Dibromochloromethane	0	.483	0	14	.001	ND	.05
24 1,1,2-Trichloroethane	0	.364	0	14	.001	ND	.05
25 Benzene	43614	1.430	842	14	.232	D	.05
26 trans-1,3-Dichloropropene	0	.565	0	14	.001	ND	.05
27 Bromoform	0	.241	0	14	.001	ND	.05
54 1,4-Dichloro-2-butene	0	.100	0	14	.002	ND	.05
60 Dibromomethane	0	.282	0	14	.001	ND	.05
28 Chlorobenzene-d5	40710		1343	28		IS	
29 4-Methyl-2-Pentanone	0	.168	0	28	.001	ND	.05
30 2-Hexanone	0	.106	0	28	.001	ND	.05
31 Tetrachloroethene	703	.371	1198	28	.012	E	.05
32 1,1,2,2-Tetrachloroethane	0	.221	0	28	.001	ND	.05
33 Toluene	32637	.880	1113	28	.228	D	.05

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HH965
RF FILE: HH963
DATE: 07/27/92
TLI PROJ #: 21159

SAMPLE ID: CS-RF-1VOST-0609-18 T
TLI ID: 57.74.2A
ANALYSIS DATE: 06/17/92

M E T H O D 8 2 4 0 Q U A N T I T A T I O N R E P O R T

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
34 Chlorobenzene	0	.966	0	28	.001	ND	.05
35 Ethylbenzene	1001	.500	1378	28	.012	E	.05
36 Styrene	0	1.020	0	28	.001	ND	.05
37 o-Xylene	342	.608	1474	28	.003	E	.05
38 m-/p-Xylene	1636	.603	1402	28	.017	E	.05
49 1,2 Dichlorobenzene	0	.573	0	28	.001	ND	.05
50 1,2,3-Trichloropropane	0	.188	0	28	.001	ND	.05
51 1,3 Dichlorobenzene	0	.798	0	28	.001	ND	,05
53 1,4 Dichlorobenzene	0	.700	0	28	.001	ND	.05
56 A-Pinene	629155	1.187	1551	28	3.254	E	.05
58 B-Pinene	0	1.245	0	28	.001	ND	.05
59 Cumene (isopropylbenzene)	0	1.415	0	28	.001	ND	.05
64 Ethyl methacrylate	0	.367	0	28	.001	ND	.05
67 P-Cymene	0	1.735	0	28	.001	ND	.05

S U R R O G A T E S U M M A R Y	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	11044	2.008	839	1	.21	D	83.3
48 Benzene-d6	48440	1.589	838	14	.23	D	92.7
39 Toluene-d8	49040	1.385	1103	28	.22	D	87.0

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

TRIANGLE LABORATORIES OF RTP, INC.	FILE NAME: HH965	SAMPLE ID: CS-RF/1VOST/0609/1B
801 Capitola Drive	DATE: 07/24/92	TLI ID: 57.74.2A
Durham, NC 27713	TLI PROJ #: 21159	ANALYSIS DATE: 06/17/92
Telephone: (919) 544-5729		

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
BICYCLIC HYDROCARBON	1595	213305	1343	.25	.430
SUBSTITUTED HYDROCARBON	581	59633	770	.25	.350
SUBSTITUTED HYDROCARBON	355	39021	770	.25	.229
SILOXANE	1228	110579	1343	.25	.223
BRANCHED PENTANE	417	34790	770	.25	.204
BRANCHED HEXANE	815	29182	770	.25	.171
CYCLOHEXANE	724	22173	770	.25	.130
CYCLIC HYDROCARBON	1510	49931	1343	.25	.101
HYDROCARBON (C5H8)	460	13946	770	.25	.082
HYDROCARBON	974	13073	903	.25	.031

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	770	42562	1
1,4-Difluorobenzene	903	103845	14
Chlorobenzene-d5	1343	124135	28

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Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HH941
RF FILE: HH934
DATE: 07/27/92
TLI PROJ #: 21159

SAMPLE ID: CS-RF-1VOST-0609-1B TC
TLI ID: 57.74.28
ANALYSIS DATE: 06/15/92

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1 Bromochloromethane	5303		780	1		IS	
2 Chloromethane	4586	1.053	169	1	.205	D	.05
3 Bromomethane	0	1.310	0	1	.001	ND	.05
4 Vinyl Chloride	0	1.628	0	1	.001	ND	.05
5 Chloroethane	0	1.328	0	1	.001	ND	.05
6 Methylene Chloride	1449	1.472	586	1	.046	E	.05
7 Acetone	0	.218	0	1	.004	ND	.05
8 Carbon Disulfide	288	4.356	502	1	.003	E	.05
9 1,1-Dichloroethene	0	1.476	0	1	.001	ND	.05
10 1,1-Dichloroethane	0	3.885	0	1	.001	ND	.05
11 trans-1,2-Dichloroethene	0	1.875	0	1	.001	ND	.05
12 Chloroform	66556	3.560	800	1	.881	D	.05
13 1,2-Dichloroethane	0	2.110	0	1	.001	ND	.05
43 Trichlorofluoromethane	5124	1.979	401	1	.122	D	.05
~~45 Acrolein~~	~~0~~	~~.076~~	~~0~~	~~1~~	~~.012~~	~~ND~~	~~.05~~
~~46 Acrylonitrile~~	~~0~~	~~.344~~	~~0~~	~~1~~	~~.003~~	~~ND~~	~~.05~~
47 cis-1,2-Dichloroethene	0	2.088	0	1	.001	ND	.05
52 1,3-butadiene	0	1.679	0	1	.001	ND	.05
57 Allyl chloride	0	.768	0	1	.001	ND	.05
62 Dimethyl disulfide	19041	4.129	1081	1	.217	D	.05
63 Dimethyl sulfide	1131	1.388	514	1	.038	E	.05
65 Iodomethane	0	2.345	0	1	.001	ND	.05
66 Isooctane	5007	10.211	872	1	.023	E	.05
68 Tert-Butyl methyl ether	2142	3.533	640	1	.029	E	.05
69 Vinyl Bromide	0	1.481	0	1	.001	ND	.05
70 n-Hexane	11928	2.515	686	1	.224	D	.05
14 1,4-Difluorobenzene	26896		914	14		IS	
15 2-Butanone	88	.019	769	14	.044	E	.05
16 1,1,1-Trichloroethane	0	.579	0	14	.001	ND	.05
17 Carbon Tetrachloride	0	.429	0	14	.001	ND	.05
18 Vinyl Acetate	1770	.594	705	14	.028	E	.05
19 Bromodichloromethane	281	.659	1015	14	.004	E	.05
20 1,2-Dichloropropane	0	.644	0	14	.001	ND	.05
21 cis-1,3-Dichloropropene	0	.750	0	14	.001	ND	.05
22 Trichloroethene	727	.627	941	14	.011	E	.05
23 Dibromochloromethane	0	.539	0	14	.001	ND	.05
24 1,1,2-Trichloroethane	0	.370	0	14	.001	ND	.05
25 Benzene	9448	1.327	852	14	.066	D	.05
26 trans-1,3-Dichloropropene	0	.592	0	14	.001	ND	.05
27 Bromoform	0	.277	0	14	.001	ND	.05
54 1,4-Dichloro-2-butene	0	.102	0	14	.002	ND	.05
60 Dibromomethane	0	.283	0	14	.001	ND	.05
28 Chlorobenzene-d5	33142		1359	28		IS	
29 4-Methyl-2-Pentanone	0	.180	0	28	.001	ND	.05
30 2-Hexanone	0	.096	0	28	.002	ND	.05
31 Tetrachloroethene	265	.386	1213	28	.005	E	.05
32 1,1,2,2-Tetrachloroethane	0	.247	0	28	.001	ND	.05
33 Toluene	10236	.857	1127	28	.090	D	.05

Triangle Laboratories of RTP, Inc.	FILE NAME: HH941	SAMPLE ID:	CS-RF-1VOST-0609-18 TC
801 Capitola Drive	RF FILE: HH934	TLI ID:	57.74.28
Durham, NC 27713	DATE: 07/27/92	ANALYSIS DATE:	06/15/92
Telephone: (919) 544-5729	TLI PROJ #: 21159		

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
34 Chlorobenzene	0	.969	0	28	.001	ND	.05
35 Ethylbenzene	2130	.507	1393	28	.032	E	.05
36 Styrene	982	1.049	1497	28	.007	E	.05
37 o-Xylene	1152	.823	1491	28	.014	E	.05
38 m-/p-Xylene	3452	.817	1418	28	.042	E	.05
49 1,2 Dichlorobenzene	0	.668	0	28	.001	ND	.05
50 1,2,3-Trichloropropane	0	.208	0	28	.001	ND	.05
51 1,3 Dichlorobenzene	0	.899	0	28	.001	ND	.05
53 1,4 Dichlorobenzene	0	.790	0	28	.001	ND	.05
56 A-Pinene	397293	1.126	1563	28	2.861	E	.05
58 B-Pinene	323586	.977	1712	28	2.499	E	.05
59 Cumene (isopropylbenzene)	2719	1.560	1823	28	.013	E	.05
64 Ethyl methacrylate	0	.377	0	28	.001	ND	.05
67 P-Cymene	18257	1.946	1949	28	.071	D	.05

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	10342	1.830	850	1	.27	D	106.6
48 Benzene-d6	38380	1.458	848	14	.24	D	97.9
39 Toluene-d8	47005	1.404	1117	28	.25	D	101.0

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801 Capitola Drive
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Telephone: (919) 544-5729

FILE NAME: HH941
DATE: 07/24/92
TLI PROJ #: 21159

SAMPLE ID: CS-RF/1VOST/0609/18
TLI ID: 57.74.28
ANALYSIS DATE: 08/15/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
CYCLIC HYDROCARBON	1926	297951	1359	.25	.726
CYCLIC HYDROCARBON	1947	145110	1359	.25	.354
BRANCHED OCTADIENE	1766	119910	1359	.25	.292
CYCLIC HYDROCARBON	1612	79065	1359	.25	.193
SUBSTITUTED HYDROCARBON	159	23267	780	.25	.161
BRANCHED BUTANE	362	9773	780	.25	.068
BRANCHED HEXANE	624	7998	780	.25	.055
SUBSTITUTED HYDROCARBON	212	5910	780	.25	.041
CYCLIC HYDROCARBON	1527	16316	1359	.25	.040
SUBSTITUTED HYDROCARBON	424	5502	780	.25	.038

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	780	36150	1
1,4-Difluorobenzene	915	69882	14
Chlorobenzene-d5	1359	102568	28

Triangle Laboratories of RTP, Inc
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: AC796
RF FILE: AC793
DATE: 07/27/92
TLI PROJ #: 21159

SAMPLE ID: CS-RF-1VOST-0609-1B
TLI ID: 57.74.2C
SAMPLE VOL: .005 L
ANALYSIS DATE: 06/22/92
DILUTION FACTOR 1

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	CONCODEg/L		QUAN LIMIT
1 Bromochloromethane	2731		777	1		IS	
2 Chloromethane	0	1.281	0	1	.29	ND	10
3 Bromomethane	0	1.353	0	1	.27	ND	10
4 Vinyl Chloride	0	1.646	0	1	.22	ND	10
5 Chloroethane	0	1.392	0	1	.26	ND	10
6 Methylene Chloride	305	2.108	580	1	2.65	E	10
7 Acetone	156	1.638	524	1	1.75	E	10
8 Carbon Disulfide	0	5.327	0	1	.07	ND	10
9 1,1-Dichloroethene	0	1.816	0	1	.20	ND	10
10 1,1-Dichloroethane	0	4.724	0	1	.08	ND	10
11 trans-1,2-Dichloroethene	0	2.103	0	1	.17	ND	10
12 Chloroform	737	4.593	796	1	2.94	E	10
13 1,2-Dichloroethane	0	3.736	0	1	.10	ND	10
43 Trichlorofluoromethane	0	.900	0	1	.41	ND	10
45 Acrolein	0	.431	0	1	.85	ND	10
46 Acrylonitrile	0	.979	0	1	.37	ND	10
~~47 cis-1,2-Dichloroethene~~	~~0~~	~~2.464~~	~~0~~	~~1~~	~~.15~~	~~ND~~	~~10~~
~~52 1,3-butadiene~~	~~0~~	~~2.008~~	~~0~~	~~1~~	~~.18~~	~~ND~~	~~10~~
57 Allyl chloride	0	1.038	0	1	.35	ND	10
62 Dimethyl disulfide	0	5.017	0	1	.07	ND	10
63 Dimethyl sulfide	64	2.445	510	1	.48	E	10
65 Iodomethane	0	1.956	0	1	.19	ND	10
66 Isooctane	0	13.863	0	1	.03	ND	10
68 Tert-Butyl methyl ether	0	5.332	0	1	.07	ND	10
69 Vinyl Bromide	0	1.394	0	1	.26	ND	10
70 n-Hexane	0	4.119	0	1	.09	ND	10
14 1,4-Difluorobenzene	12268		911	14		IS	
15 2-Butanone	0	.079	0	14	1.03	ND	10
16 1,1,1-Trichloroethane	113	.769	805	14	.60	E	10
17 Carbon Tetrachloride	0	.550	0	14	.15	ND	10
18 Vinyl Acetate	0	.902	0	14	.09	ND	10
19 Bromodichloromethane	53	.827	1012	14	.26	E	10
20 1,2-Dichloropropane	0	.852	0	14	.10	ND	10
21 cis-1,3-Dichloropropene	0	.893	0	14	.09	ND	10
22 Trichloroethene	0	.495	0	14	.16	ND	10
23 Dibromochloromethane	0	.636	0	14	.13	ND	10
24 1,1,2-Trichloroethane	0	.566	0	14	.14	ND	10
25 Benzene	0	1.466	0	14	.06	ND	10
26 trans-1,3-Dichloropropene	0	.994	0	14	.08	ND	10
27 Bromoform	0	.443	0	14	.18	ND	10
54 1,4-Dichloro-2-butene	0	.339	0	14	.24	ND	10
60 Dibromomethane	41	.393	981	14	.43	E	10
28 Chlorobenzene-d5	14468		1357	28		IS	
29 4-Methyl-2-Pentanone	0	.690	0	28	.10	ND	10
30 2-Hexanone	0	.489	0	28	.14	ND	10
31 Tetrachloroethene	0	.370	0	28	.19	ND	10
32 1,1,2,2-Tetrachloroethane	0	.839	0	28	.08	ND	10
33 Toluene	113	.971	1126	28	.40	E	10

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

Triangle Laboratories of RTP, Inc
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: AC796
RF FILE: AC793
DATE: 07/27/92
TLI PROJ #: 21159

SAMPLE ID: CS-RF-1VOST-0609-18
TLI ID: 57.74.2C
SAMPLE VOL: .005 L
ANALYSIS DATE: 06/22/92
DILUTION FACTOR 1

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	CONC	CODEg/L	QUAN LIMIT
34 Chlorobenzene	0	1.038	0	28	.07	ND	10
35 Ethylbenzene	0	.630	0	28	.11	ND	10
36 Styrene	0	1.168	0	28	.06	ND	10
37 o-Xylene	0	.753	0	28	.09	ND	10
38 m-/p-Xylene	80	.673	1416	28	.41	E	10
49 1,2 Dichlorobenzene	0	.950	0	28	.07	ND	10
50 1,2,3-Trichloropropane	0	.608	0	28	.11	ND	10
51 1,3 Dichlorobenzene	0	1.093	0	28	.06	ND	10
53 1,4 Dichlorobenzene	0	.956	0	28	.07	ND	10
56 A-Pinene	0	1.277	0	28	.05	ND	10
58 B-Pinene	0	1.390	0	28	.05	ND	10
59 Cumene (isopropylbenzene)	0	1.904	0	28	.04	ND	10
64 Ethyl methacrylate	0	.771	0	28	.09	ND	10
67 P-Cymene	0	1.990	0	28	.03	ND	10

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	6666	2.945	847	1	.21	D	82.9
48 Benzene-d6	18823	1.520	645	14	.25	D	101.0
39 Toluene-d8	20239	1.360	1115	28	.26	D	102.9

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: AC796
DATE: 07/24/92
TLI PROJ #: 21159

SAMPLE ID: CS-RF/1VOST/0809/18
TLI ID: 57.74.2C
ANALYSIS DATE: 08/22/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
SUBSTITUTED HYDROCARBON	1400	552	1357	.25	.003
SUBSTITUTED HYDROCARBON	1921	432	1357	.25	.002
UNKNOWN	1191	397	1357	.25	.002
SUBSTITUTED HYDROCARBON	829	178	777	.25	.002

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	777	27389	1
1,4-Difluorobenzene	911	35602	14
Chlorobenzene-d5	1357	53900	28

Section 3.3 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - SHELDON Source: Recovery Furnace (Casc) with NaOAc FIN: 5000
Source Code: CS-RF/1 Date: 6/9/92 EPN: E40 CINEC13,PN5005

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1650			
Flow Data				
Stack Temperature, °F	291			291
Moisture Content, %	26.0			26.0
Oxygen Concentration, %	13.0			13.0
Carbon Dioxide Concentration, %	7.0			7.0
Volumetric Flow Rate, x10^3 ACFM	504.1			504.1
Volumetric Flow Rate, x10^3 DSCFM	259.8			259.8
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	85.4			85.4
Miscellaneous Parameters				
Formaldehyde				
Concentration, ppmvd	0.5			0.5
Emission Rate, lb/hr	0.6			0.6
Acetaldehyde				
Concentration, ppmvd	0.5			0.5
Emission Rate, lb/hr	0.9			0.9
Acetone (Impinger)				
Concentration, ppmvd	0.5			0.5
Emission Rate, lb/hr	1.2			1.2
Acetophenone				
Concentration, ppmvd	0.5 •			0.5 *
Emission Rate, lb/hr	2.4 *			2.4 *
2-Butanone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.5 •			1.5 *
Methyl isobutyl ketone				
Concentration, ppmvd	0.5 •			0.5 *
Emission Rate, lb/hr	2.0 *			2.0 *
Acrolein				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.1 •			1.1 •
Benzaldehyde				
Concentration, ppmvd	0.5 •			0.5 *
Emission Rate, lb/hr	2.1 *			2.1 *
Hydrogen chloride				
Concentration, ppmvd	0.8			0.8
Emission Rate, lb/hr	1.2			1.2

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - SHELDON   Source: Recovery Furnace (Casc) with NaOAc   FIN: 5000
Source Code: CS-RF/1   Date: 6/10/92   EPN: E40   CINEC13,PN5005

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1730			
Flow Data				
Stack Temperature, °F	260			260
Moisture Content, %	15.0			15.0
Oxygen Concentration, %	13.0			13.0
Carbon Dioxide Concentration, %	8.0			8.0
Volumetric Flow Rate, x10^3 ACFM	481.0			481.0
Volumetric Flow Rate, x10^3 DSCFM	297.0			297.0
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	85.4			85.4
Miscellaneous Parameters				
Formaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.7 *			0.7 *
Acetaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.0 *			1.0 *
Acetone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.3 *			1.3 *
Acetophenone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	2.8 *			2.8 *
2-Butanone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.7 *			1.7 *
Methyl isobutyl ketone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	2.3 *			2.3 *
Acrolein				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.3 *			1.3 *
Benzaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	2.5 *			2.5 *
Hydrogen chloride				
Concentration, ppmvd	2.2			2.2
Emission Rate, lb/hr	3.7			3.7

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - SHELDON | Source: Recovery Furnace (Casc) with NaOAc | FIN: 5000
Source Code: CS-RF/1 | Date: 6/24/92 | EPN: E40 | CINEC13,PN5005

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1840	1930	2020	
Flow Data				
Stack Temperature, °F	243			243
Moisture Content, %	20.9			20.9
Oxygen Concentration, %	15.0			15.0
Carbon Dioxide Concentration, %	7.0			7.0
Volumetric Flow Rate, x10^3 ACFM	301.7			301.7
Volumetric Flow Rate, x10^3 DSCFM	179.3			179.3
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	85.4	85.4	85.4	85.4
Miscellaneous Parameters				
Sulfuric Acid Mist (Impinger)				
Concentration, lb/dscf	7.40E-08	7.40E-08	7.40E-08	7.40E-08
Emission Rate, lb/hr	7.96E-01 *	7.96E-01 *	7.96E-01 *	7.96E-01 *

*One or more values were less than the detection limit.

Section 3.4 Emission Test Results - Metals

Mill: Champion-Sheldon
Source: RF

Run 1
Sample volume (DSCF)--------- 24.16
Source Vol Flow (DSCFM)------ 179000

		FH+BH Amt (ug)	Conc (lb/DSCF)	Mass Rt. (lb/hr)	Detection Limit(ug)	Det Limit (lb/DSCF)	Det Limit (lb/hr)
Antimony	Sb	•	0.0E+00	0.0E+00	5	4.6E-10	4.9E-03
Arsenic	As	•	0.0E+00	0.0E+00	5	4.6E-10	4.9E-03
Barium	Ba	*	0.0E+00	0.0E+00	4000	3.6E-07	3.9E+00
Beryllium	Be	*	0.0E+00	0.0E+00	5	4.6E-10	4.9E-03
Cadmium	Cd	18	1.6E-09	1.8E-02	5	4.6E-10	4.9E-03
Chromium	Cr	•	0.0E+00	0.0E+00	10	9.1E-10	9.8E-03
Copper	Cu	*	0.0E+00	0.0E+00	5	4.6E-10	4.9E-03
Lead	Pb	•	0.0E+00	0.0E+00	10	9.1E-10	9.8E-03
Manganese	Mn	73	6.7E-09	7.2E-02	10	9.1E-10	9.8E-03
Mercury	Hg	*	0.0E+00	0.0E+00	5	4.6E-10	4.9E-03
Nickel	Ni	*	0.0E+00	0.0E+00	5	4.6E-10	4.9E-03
Phosphorus	P	*	0.0E+00	0.0E+00	100	9.1E-09	9.8E-02
Silver	Ag	*	0.0E+00	0.0E+00	5	4.6E-10	4.9E-03
Selenium	Se	*	0.0E+00	0.0E+00	5	4.6E-10	4.9E-03
Thallium	Tl	•	0.0E+00	0.0E+00	5	4.6E-10	4.9E-03

Run 2
Sample volume (DSCF)--------- 23.71
Source Vol Flow (DSCFM)------ 168000

		FH+BH Amt (ug)	Conc (lb/DSCF)	Mass Rt. (lb/hr)	Detection Limit(ug)	Det Limit (lb/DSCF)	Det Limit (lb/hr)
Antimony	Sb	•	0.0E+00	0.0E+00	5	4.6E-10	4.7E-03
Arsenic	As	*	0.0E+00	0.0E+00	5	4.6E-10	4.7E-03
Barium	Ba	*	0.0E+00	0.0E+00	4000	3.7E-07	3.7E+00
Beryllium	Be	•	0.0E+00	0.0E+00	5	4.6E-10	4.7E-03
Cadmium	Cd	*	0.0E+00	0.0E+00	5	4.6E-10	4.7E-03
Chromium	Cr	*	0.0E+00	0.0E+00	10	9.3E-10	9.4E-03
Copper	Cu	7	6.5E-10	6.6E-03	5	4.6E-10	4.7E-03
Lead	Pb	•	0.0E+00	0.0E+00	10	9.3E-10	9.4E-03
Manganese	Mn	61	5.7E-09	5.7E-02	10	9.3E-10	9.4E-03
Mercury	Hg	•	0.0E+00	0.0E+00	5	4.6E-10	4.7E-03
Nickel	Ni	*	0.0E+00	0.0E+00	5	4.6E-10	4.7E-03
Phosphorus	P	111	1.0E-08	1.0E-01	100	9.3E-09	9.4E-02
Silver	Ag	*	0.0E+00	0.0E+00	5	4.6E-10	4.7E-03
Selenium	Se	•	0.0E+00	0.0E+00	5	4.6E-10	4.7E-03
Thallium	Tl	•	0.0E+00	0.0E+00	5	4.6E-10	4.7E-03

M E T A L S   C A L C U L A T I O N S

Client: TPIEC
Location: Champion-Sheldon
WESTON Project No.: 6848-01-01
Source: RF

INPUT DATA

Run Number		1	2	3	Mean
Date		6/24/92	6/24/92		---
Time Began		1850	2010		---
Time Ended		1950	2110		---
Sampling Time, min	(Theta)	60	60		60
Stack Diameter, in.	(Dia)	116x112	116x112	116x112	0
Barometric Pressure, in. Hg	(Pb)	30.00	30.00		30.00
Static Pressure, in. H2O	(Pg)	-1.00	-1.10		-1.05
Pitot Tube Coefficient	(Cp)	0.84	0.84		0.84
Meter Correction Factor	(Y)	1.010	1.010		1.010
Nozzle Diameter, in.	(Dn)	0.193	0.193		0.193
Meter Volume, ft^3	(Vm)	25.192	24.788		24.990
Meter Temperature, |F	(tm)	98	100		99
Meter Orifice Pressure, in. H2O	(Delta H)	0.750	0.706		0.728
Volume H2O Collected, mL	(Vlc)	135.5	154.2		144.9
CO2 Concentration, %	(CO2)	7.0	7.0		7.0
O2 Concentration, %	(O2)	15.0	15.0		15.0
Average Sq Rt Velo Head, (in. H2O)^*	((Delta P)^*)avg	0.8363	0.8124		0.8244
Stack Temperature, |F	(ts)	243	251		247
Total Metals Collected, ug					ERR
Moisture Fraction (at Saturation)	(Bws)	NA	NA	NA	

CALCULATED DATA

Stack Area, ft^2	(As)	90.22	90.22	0.00	60.15
Stack Pressure, in. Hg	(Ps)	29.93	29.92	0.00	19.95
Standard Meter Volume, ft^3	(Vmstd)	24.162	23.714	0.000	15.959
Standard Water Volume, ft^3	(Vwstd)	6.378	7.258	0.000	4.545
Moisture Fraction (Measured)	(Bws)	0.209	0.234	ERR	ERR
Moisture Fraction (lower sat/meas)	(Bws)	0.209	0.234	ERR	ERR
Mol. Wt. of Stack Gas, lb/lb-mole	(Ms)	27.3	27.0	ERR	ERR
Average Stack Gas Velocity, ft/sec	(Vs)	55.7	54.8	ERR	ERR
Stack Gas Flow @ Stack Cond, ft^3/min	(Qa)	3.02E+05	2.96E+05	ERR	ERR
Stack Gas Flow @ Std Cond, ft^3/min	(Qs)	1.79E+05	1.68E+05	ERR	ERR
Isokinetic Sampling Rate, %	(%I)	100	104	ERR	ERR
Metals Concentration, lb/ft^3		0.00E+00	0.00E+00	ERR	ERR

Blanks for the Multimetals Train. Three blanks were collected during the study. One was collected at Champion-Lufkin and two at Champion-Sheldon. These blanks were used to correct all samples.

		CL Blank Front(ug)	CS Blk 1 Front(ug)	CS Blk 2 Front(ug)	Front Blk(ug)
Antimony	Sb	0.7	0.5 •	0.5 •	0 *
Arsenic	As	3.9	0.8	0.8	1
Barium	Ba	2476	2 *	3742	2073
Beryllium	Be	0.2	0.2 •	0.3	0 *
Cadmium	Cd	0.5	0.4 •	1.4	0 *
Chromium	Cr	9.4	1.2 •	9.3	6.4
Copper	Cu	1.6	1.5 •	1.5 •	0 *
Lead	Pb	10.8	0.3	5.2	5.4
Manganese	Mn	4.4	1 *	4.5	3.1
Mercury	Hg	0.4 •	0.4 •	0.4 •	0 *
Nickel	Ni	2 *	2 *	2 *	0 *
Phosphorus	P	22.6	50 •	53.4	34.7
Silver	Ag	8.3	0.7 •	0.7 •	0 *
Selenium	Se	0.5	0.4 •	0.4 •	0 *
Thallium	Tl	1	0.5	0.7	0 *

The • beside a value means that the analytical value was less than the detection limit for the analysis. The front and the back blank (right column) was developed from the average for most metals. The 8.3 ug from the CL blank was not used because it was unexplainably high.

		CL Blank Back(ug)	CS Blk 1 Back(ug)	CS Blk 2 Back(ug)	Back Blk(ug)
Antimony	Sb	1 *	1 *	0.7 •	0 *
Arsenic	As	1 *	0.5	0.3 •	0 *
Barium	Ba	3.8 •	0.4 •	2.6 •	0 *
Beryllium	Be	0.4 •	0.4 •	0.3 •	0 *
Cadmium	Cd	0.8	1.4	1	1
Chromium	Cr	2.3 •	2.4 •	1.6 •	0 *
Copper	Cu	2.9 •	3 *	2 *	0 *
Lead	Pb	1.5	0.4 •	0.6	0.8
Manganese	Mn	1.9 •	2 *	1.3 •	0 *
Mercury	Hg	0.8 •	0.8 •	1.1	0 *
Nickel	Ni	3.8 •	4 *	2.6 •	0 *
Phosphorus	P	188	100 •	26 *	100 •
Silver	Ag	1.3 •	1.4 •	0.9 •	0 *
Selenium	Se	1 *	0.8 •	0.5 •	0 *
Thallium	Tl	1.9 •	0.4 •	0.3 •	0 *

BAF
9/7/92

TRIANGLE LABORATORIES of RTP, INC.

PO BOX 13485
RTP, NC 27709

Project: 21359 Date in: 06-Jul-92
Weston Date out: 04-Aug-92

CASE NARRATIVE

Overview

This project involves the analysis of 5 Multi-Metals Trains of which one is the Train Blank, for Ag, As, Ba, Be, Cd, Cr, Cu, Hg, Mn, Na, Ni, P, Pb, Sb, Se, and Tl. The Multi-Metal analysis was conducted according to the protocol described in sections 5-7 of the EPA Draft Document *"Methodology for the Determination of Metals Emissions in Exhaust Gases from Hazardous Waste Incineration and Similar Combustion Processes."*

Preparation

MMTL samples were prepared by microwave and hotplate digestion, as required by the contract. Detailed flow charts of the sample preparation are included with this report.

Analysis

Ag, Ba, Be, Cd, Cr, Cu, Mn, Ni, and P concentrations were determined by Inductively Coupled Plasma (ICP) Emission Spectroscopy. As, Pb, Sb, Se, and Tl concentrations were determined by Graphite Furnace AA (GFAA). Those analytes which failed the postdigestion spike requirement during GFAA analysis were redetermined by MSA. Hg concentrations were determined by Cold Vapor AA (CVAA). Na concentrations were determined by Flame AA.

Results

There were three results that were unobtainable for this project due to sample matrix interference. Se for samples SDTV-2BH, RF-1BH, and RF-2BH. These samples were analyzed by MSA several times for Se. A dilution of the samples would not help due to the fact that the samples absorptions are already at zero.

%RPD:

All of the applicable %RPD were within control limits of 25% except 1METL-1BH for Ag, Cd, and P. However in these cases the %RPD is not considered a valid parameter because the concentration of the sample and duplicate is less than four times the instrument detection limit.

%REC:

Any postdigestion spike results that were less than 75%REC resulte in all samples related to that spike being reanalyzed by Method of Standard Addition (MSA).

Hg:

All of the Hg %RPD and %REC were within control limits except the %RPD for SDTV-2BH, RF-2 5A, RF-2 5B, MM-5 BLK 5B, and MM-5 BLK 5C. In these cases, except RF-2 5A, the Hg was detected in the sample but not in the duplicate. All of these QC parameters are not considered valid since the Hg concentration in the sample and duplicate is less than four times the detection limit. The undetected result for the duplicate is the reported result. The average Total ug result was reported for RF-2 5A.

The Raw data for this report includes TLI Project #21259.

TRIANGLE LABORATORIES of RTP, INC.
PO BOX 13485
RTP, NC 27709

INORGANICS ANALYSIS REPORT

TLI PROJECT #: 21359
CLIENT: WESTON
DATE RECIEVED: 07/06/92
DATE REPORTED: 08/04/92

RESULTS REPORTED IN TOTAL ug

CLIENT SAMPLE ID	Ag	As	Ba	Be	Cd	Cr	Cu	Mn	Na	Ni	P	Pb	Sb	Se	Tl
SDTV-1 FH	1.05	1.79	14.7	<.200	.649	7.14	8.84	56.2	254,000	7.11	125	2.9	1.37	<.400	.530
SDTV-1 BH	<.830	.379	< 2.37	<.237	<.474	<1.42	<1.78	1.80	137	<2.37	80.0	1.97	<.593	<.474	<.237
SDTV-2 FH	3.03	1.29	12.8	<.200	1.75	4.31	5.11	35.5	180,000	6.73	87.1	2.63	1.24	<.400	.570
SDTV-2 BH	<.871	1.27	< 2.49	<.249	1.39	<1.49	<1.87	2.08	93.9	<2.49	37.9	1.68	<.622	*	<.249
RF-1 FH	<.700	1.58	337	<.200	.744	<1.20	2.91	2.15	9,610	<2.00	66.1	3.64	<.500	<.400	.260
RF-1 BH	<.924	1.11	< 2.64	<.264	18.4	<1.58	<1.98	71.2	135	<2.64	60.2	.911	<.660	*	<.264
RF-2 FH	.992	2.13	687	<.200	.438	<1.20	6.00	2.83	19,400	<2.00	95.5	5.49	<.500	<.400	.700
RF-2 BH	<.911	.755	< 2.60	<.260	.708	<1.56	<1.95	59.1	80.5	<2.60	36.8	.781	<.651	*	<.260
MM-5 BLK FH	<.700	.850	3,742	.329	1.39	9.34	<1.50	4.51	58,900	<2.00	53.4	5.21	<.500	<.400	.730
MM-5 BLK BH	<.916	<.262	< 2.62	<.262	1.03	<1.57	<1.96	<1.31	133	<2.62	<26.2	.602	<.654	<.523	<.262

QC SUMMARY: %RPD or %REC

CLIENT SAMPLE ID	Ag	As	Ba	Be	Cd	Cr	Cu	Mn	Na	Ni	P	Pb	Sb	Se	Tl
1METL-1 FH(D)	8.84%	N/A	3.15%	N/A	1.74%	18.2%	2.30%	.65%	N/A	N/A	1.77%	N/A	N/A	N/A	N/A
1METL-1 BH(D)	200%	N/A	N/A	N/A	200%	14.6%	N/A	8.14%	N/A	N/A	74.6%	N/A	N/A	N/A	N/A
SDTV-1 FH(S)	N/A	9.50%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	44.8%	112%	N/A	43.0%
SDTV-1 BH(S)	N/A	46.0%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	93.6%	87.4%	N/A	84.7%

INORGANICS ANALYSIS REPORT

Hg RESULTS

	SDTV-1 FH	SDTV-1 BH	SDTV-1 5A	SDTV-1 5B	SDTV-1 5C
AVG TOTAL ug	.440	3.45	<.400	<1.60	<.902
%RPD	18.2%	22.2%	N/A	N/A	N/A

	SDTV-2 FH	SDTV-2 BH	SDTV-2 5A	SDTV-2 5B	SDTV-2 5C
AVG TOTAL ug	.520	<2.75	<.408	<1.52	<.848
%RPD	.00%	N/A	N/A	N/A	N/A

	RF-1 FH	RF-1 BH	RF-1 5A	RF-1 5B	RF-1 5C
AVG TOTAL ug	.430	2.35	<.412	<1.20	<.800
%RPD	4.65%	3.51%	N/A	N/A	N/A

	RF-2 FH	RF-2 BH	RF-2 5A	RF-2 5B	RF-2 5C
AVG TOTAL ug	.930	2.50	.560	<1.03	<.888
%RPD	6.45%	.00%	28.6%	N/A	N/A

	MM-5 BLK FH	MM-5 BLK BH	MM-5 BLK 5B	MM-5 BLK 5C
AVG TOTAL ug	<.400	1.10	<.480	<.400
%RPD	N/A	7.69%	N/A	N/A

	% REC
STVD-1 BH	107%

DESCRIPTION OF ABBREVIATIONS

ICV=Initial Calibration Verification
ICB=Initial Calibration Blank
CCV=Continuing Calibration Verification
CCB=Continuing Calibration Blank
PBW=Preparation Blank Water
PBS=Preparation Blank Soil
LCS=Laboratory Control Spike
ICSA=Interference Check Sample(Solution A)   I=Initial F=Final
ICSAB=Interference Check Sample(Solution AB) I=Initial F=Final
      Solution A contains common interferents, while Solution AB
      contains the interferents plus the analyte in question.
CRDL=Contract Required Detection Limit (for CLP)
IDL=Instrument Detection Limit
CRI=CRDL Standard for ICP I=Initial F=Final
CRA=CRDL Standard for AA   I=Initial F=Final
%RPD=Relative Percent Difference
%REC=% Recovery
SPK=Spike
AMT=Amount
BLK=Blank
MSA=Method of Standard Additions

CALCULATIONS

MMTL TRAINS:

ICP & GFAA

$$\text{FH \& BH TOTAL ug} = \frac{[\text{ug/L}] * (\text{mL TV/mL USED}) * (\text{mL FV} * \text{DF})}{1000}$$

FLAA

$$\text{FH \& BH TOTAL ug} = [\text{ug/L}] * (\text{mL TV/mL USED}) * (\text{mL FV} * \text{DF})$$

FV=FINAL VOLUME DF=DILUTION FACTOR
WT=WEIGHT TV=TOTAL VOLUME
BV=BEGINNING VOLUME

Hg

MMTL Trains:

FH TOTAL ug = [ug/L] * (ml FV/ml aliquot) * MPV * (DF)

BH TOTAL ug = [ug/L] * (ml TV/ml aliquot) * MPV * (DF)

MMTL Impingers:

TOTAL ug = [ug/L] * (ml TV/ml aliquot) * MPV * (DF)

MPV = Mercury Preparation Volume, which is always 0.1L

$$\%RPD = \frac{|SR - DR|}{(SR + DR)/2} * 100$$

$$\%REC = \frac{SSR - SR}{SA} * 100$$

SR=SAMPLE RESULT DR=DUPLICATE RESULT
SSR=SPIKE SAMPLE RESULT SA=SPIKE ADDED

Metals Data

Mill CS Run no 1 Sample Volume (DSCF) 24.16

Source RF Run Date 6/24/92 Source Vol Flow (DSCFM) 179,000

		MEAS FH (µg)	FH Blk Corr (µg)	FH Corr Amt (µg)	meas BH (µg)	BH Blk corr (µg)	BH Corr Amt (µg)	FH + BH Amt (µg)	Detection Limit (µg)
Antimony	Sb	<0.5	0	<0.5	<0.7	0	<0.7	<1	5
Arsenic	As	1.6	1.0	0.6	1.1	0	1.1	2	5
Barium	Ba	337	2073	<2073	<2.6	0	<2.6	1038	4000
Beryllium	Be	<0.2	0	<0.2	<0.3	0	<0.3	<1	5
Cadmium	Cd	0.7	1.4	<1.4	18.4	1.0	17.4	18	5
Chromium	Cr	<1.2	6.4	<6.4	<1.6	0	<1.6	4	10
	+6								
Copper	Cu	2.9	0	2.9	<2.0	0	<2.0	4	5
Lead	Pb	3.6	5.4	<5.4	0.9	0.8	0.1	3	10
Manganese	Mn	2.2	3.1	<3.1	71.2	0	71.2	73	10
Mercury	Hg	0.4	0	0.4	3.6	0	3.6	4	5
Nickel	Ni	<2.0	0	<2.0	<2.6	0	<2.6	2	5
Phosphorus	P	66.1	34.7	31.4	60.2	100	<100	81	100
Silver	Ag	<0.7	0	<0.7	<0.9	0	<0.9	<1	5
Selenium	Se	<0.4	0	<0.4	—	0	—	<1	5
Thallium	Tl	0.3	0	0.3	<0.3	0	<0.3	<1	5

Blank is ~ mean of 3 blanks for project
See notes by Bruce dated 9/3/92.

Metals Data

Mill CS | Run no 2 | Sample Volume (DSCF) 23.71

Source RF | Run Date 6/24/92 | Source Vol Flow (DSCFM) 168,000

		MEAS FH (ug)	FH Blk Corr (ug)	FH Corr Amt (ug)	Meas BH (ug)	BH Blk corr (ug)	BH Corr Amt (ug)	FH + BH Amt (ug)	Detection Limit (ug)
Antimony	Sb	<0.5	0	<0.5	<0.7	0	<0.7	<1	5
Arsenic	As	2.1	1.0	1.1	0.8	0	0.8	2	5
Barium	Ba	687	2073	<2073	<2.6	0	<2.6	1038	4000
Beryllium	Be	<0.2	0	<0.2	<0.3	0	<0.3	<1	5
Cadmium	Cd	0.4	1.4	<1.4	0.7	1.0	<1.0	1	5
Chromium	Cr	<1.2	6.4	<6.4	<1.6	0	<1.6	4	10
,	+6								
Copper	Cu	6.0	0	6.0	<2.0	0	<2.0	7	5
Lead	Pb	5.5	5.4	0.1	0.8	0.8	0.0	<1	10
Manganese	Mn	2.8	3.1	<3.1	59.1	0	59.1	61	10
Mercury	Hg	0.9	0	0.9	4.0	0	4.0	5	5
Nickel	Ni	<2.0	0	<2.0	<2.6	0	<2.6	2	5
Phosphorus	P	95.5	34.7	60.8	36.8	100	<100	111	100
Silver	Ag	1.0	0	1.0	<0.9	0	<0.9	1	5
Selenium	Se	<0.4	0	<0.4	—	0	—	<1	5
Thallium	Tl	0.7	0	0.7	<0.3	0	<0.3	<1	5

Blank is ~ mean of 3 blanks for project
See notes by Bruce dated 9/3/92.

Section 3.5 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

SOURCE CS-RF/1

QUALITY CONTROL SUMMARY
METHOD 25A

1. CALIBRATION

THEOR ppm	6/9/92 ppm	6/9/92 %ERR	6/10/92 ppm *	6/10/92 %ERR
0.0	-0.1	-0.1	-17.0	-1.1
1.0	0.0	-1.1	38.0	0.1
36.0	37.9	2.1	106.0	1.0
91.2	90.4	-0.9	1505.0	-0.1
CORR COEFF	0.9995		0.9998	
*THEOR ppm				
0				
36				
91				
1506				

2. PROPANE LINE RECOVERY

	DATE 6/9/92 INST	LINE	%REC	DATE 6/10/92 INST	LINE	%REC
BEFORE	92.9	91.6	98.6%	**		
AFTER	**	90.5		**		

3. LINE BLANK

	6/9/92 ppm	6/10/92 ppm
BEFORE	1.1	**
AFTER	**	**

** Not performed

SOURCE CS-RF/1

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR	DATE	6/9/92	DATE	6/10/92
	ppm	ppm	%REC	ppm	%REC
ethanol	52.0	45.3	87.1%	48.1	92.5%
acetone	41.6	36.8	88.6%	33.2	79.8%
isopropanol	39.9	38.0	95.4%	37.7	94.5%
dimethyl sulfide	9.1	8.3	91.2%	7.5	82.4%
benzene	34.2	34.0	99.5%	34.1	99.9%
bromodichloromethane	18.8	16.7	88.8%	15.9	84.6%
dimethyl disulfide	33.9	30.0	88.6%	28.7	84.7%
toluene	28.7	22.3	77.6%	25.7	89.5%
ethyl benzene	24.9	20.8	83.6%	21.1	84.7%
m-xylene	49.8	41.0	82.3%	41.4	83.1%
o-xylene	25.0	19.9	79.8%	20.7	82.6%
cumene	21.9	17.8	81.3%	18.1	82.4%
alpha-pinene	19.2	16.3	85.0%	16.6	86.8%
beta-pinene	19.2	16.0	83.1%	15.7	81.6%
3-carene	19.3	7.9	41.2%	15.1	78.3%
p-cymene	19.6	14.1	72.3%	14.4	73.7%

2. PROPANE RESPONSE

	THEOR		%REC		%REC
BEFORE	36.0	37.5	104.2%	35.0	97.2%
AFTER	36.0	36.2	100.6%	33.7	93.6%

3. METHANOL LINE RECOVERY

	6/9/92			6/10/92		
	GC	LINE	%REC	GC	LINE	%REC
BEFORE	9.7	8.2	84.5%	9.3 •		
AFTER	9.3 •			12.4	12.1	97.6%

4. LINE BLANK

	[-------------FILE REF-------------]	
BEFORE	F9A2005	FAA2004
AFTER	FAA2004	FGA2004

SOURCE CS-RF/1

QUALITY CONTROL SUMMARY
METHOD 16

1. CALIBRATION

ANALYTE	LO ppm	MED ppm	HI ppm	CORR COEFF
6/9/92				
hydrogen sulfide	3.3	5.0	7.8	1.0000
methyl mercaptan	3.1	4.6	7.2	1.0000
dimethyl sulfide	4.2	6.4	10.0	1.0000
carbon disulfide	1.3	2.0	3.2	1.0000
dimethyl disulfide	1.8	2.8	4.3	1.0000
6/10/92				
hydrogen sulfide	2.1	4.7	10.5	1.0000
methyl mercaptan	1.9	4.4	9.7	1.0000
dimethyl sulfide	2.6	6.1	13.5	1.0000
carbon disulfide	0.8	1.9	4.2	1.0000
dimethyl disulfide	1.1	2.6	5.8	1.0000

Section 3.6 Process Operating Data

RECOVERY FURNACES

Recovery furnace is a Combustion Engineering unit, initially built in 1967 with a direct contact evaporator. This unit fires nearly 2,100,000 lb of black liquor solids/day, corresponding to a wood pulping rate of 575 ton/day. This unit is supplied combustion air in two zones; primary and secondary. The primary and secondary ports are located at elevations of 8 ft and 24 ft from the base of the furnace. Liquor is fed through eight guns at the same elevation as the secondary air ports. This furnace fires auxiliary natural gas only in four starter burners located just above the primary air ports. The black liquor is fired at a solids weight percent of 65 percent. Occasionally, makeup sulfur is added in the form of elemental sulfur. Sodium is added to black liquor at a rate of 0.003 gal/lb BLS in the form of byproduct sodium acetate from the chemical industry. Brine from the tall oil plant is added to the liquor. The Btu content of black liquor is around 5800 Btu/lb BLS. Recovery furnace temperature range is 1850-1950 °F.

The recovery furnace is equipped with an electrostatic precipitator for particulate control. Particulate concentrations in flue gases are typically around 0.026 gr/SDCF.

Representative Process Conditions

Liquor firing rate : 42 tons BLS/hour
Sulfidity (green liquor) : 65-70%
Primary, secondary air: N/A.
Excess air or O_2 in furnace : 1-2%
Makeup chemicals and addition rates : Sodium acetate @ 4 gpm
CO, NO_x, SO_2, TRS in the furnace at 8% O_2:

CO : 175-275 ppm
NOx : 40 ppm
SO_2 : 75-100 ppm
TRS : 10-15 ppm

Liquor chloride content : N/A
Liquor Btu content : 5800 Btu/lb

RECOVERY FURNACES - PROCESS OPERATING CONDITIONS

Mill: Sheldon Mill
Source: Recovery Furnace
FIN: 5000

Source: Recovery
Date: 6-9-92
EPN: E40

CIN: EC13, PN 5005

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		15:39	16:40		
Furnace Data					
Type		Cascade Evaporator			
Manufacturer		Combustion Engineering			
When Constructed		1967			
When Modified		1976			
Contact or Non-contact		Direct Contact			
Production Data					
BLS Density	lb/gal	11.90	11.90		0.00
BL Solids Content	decimal	0.65	0.65		0.00
Liquor Firing Rate	GPM	184.0	184.0		0.00
Liquor Firing Rate	lb BLS/hr	85400	85400		0.00
Sulfidity (Green Liquor)	% by wt	67	67		0.00
BL BTU Content	BTU/lb	5800	5800		0.00
BL Chloride Content	% by wt				0.00
Make-Up Chemicals (list)					
		Sodium Acetate			0.00
					0.00
					0.00
					0.00
					0.00
Emission Data					
O2 Concentration	%	12.3	12.3		0.00
CO2 Concentration	%				0.00
CO Concentration	PPM				0.00
SO2 Concentration	PPM				0.00
NOX Concentration	PPM				0.00
TRS Concentration	PPM	20.8	16.9		0.00

Notes : Economizer O2 readings averaged 1%
TRS readings corrected to 8% O2

RECOVERY FURNACES - PROCESS OPERATING CONDITIONS

Mill: Sheldon Mill
Source: Recovery Furnace
FIN: 5000

Source: Recovery
Date: 6-10-92
EPN: E40
CIN: EC13, PN 5005

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		13:59	17:21	19:21	
Furnace Data					
Type		Cascade Evaporator			
Manufacturer		Combustion Engineering			
When Constructed		1967			
When Modified		1976			
Contact or Non-contact		Direct Contact			
Production Data					
BLS Density	lb/gal	11.90	11.90	11.90	0.00
BL solids Content	decimal	0.645	0.65	0.65	0.00
Liquor Firing Rate	GPM	180.0	184.0	170.0	0.00
Liquor Firing Rate	lb BLS/hr	83500	85400	81700	0.00
Sulfidity (Green Liquor)	% by wt	66.9	66.9	66.9	0.00
BL BTU Content	BTU/lb	5800	5800	5800	0.00
BL Chloride Content	% by wt				0.00
Make-Up Chemicals (list)					
		Sodium Acetate			0.00
					0.00
					0.00
					0.00
					0.00
Emission Data					
O2 Concentration	%	12.3	12.3	12.5	0.00
CO2 Concentration	%				0.00
CO Concentration	PPM				0.00
SO2 Concentration	PPM				0.00
NOX Concentration	PPM				0.00
TRS Concentration	PPM	14.4	12.6	8.9	0.00
O2 Concentration (@ econonizer)		1	0	1.5	

Notes : All emission data is corrected to 8% O2

RECOVERY FURNACES - PROCESS OPERATING CONDITIONS

Mill: Sheldon Mill
Source: Recovery Furnace
FIN: 5000

Source: Recovery
Date: 6-24-92
EPN: E40
CIN: EC13, PN 5005

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		18:50	20:10		
Furnace Data					
Type		Cascade Evaporator			
Manufacturer		Combustion Engineering			
When Constructed		1967			
When Modified		1976			
Contact or Non-contact		Direct Contact			
Production Data					
BLS Density	lb/gal	11.90	11.90		0.00
BL Solids Content	decimal	0.65	0.65		0.00
Liquor Firing Rate	GPM	184.0	184.0		0.00
Liquor Firing Rate	lb BLS/hr	854000.0	854000.0		0.00
Sulfidity (Green Liquor)	% by wt	67	67		0.00
BL BTU Content	BTU/lb	5800	5800		0.00
BL Chloride Content	% by wt				0.00
Make-Up Chemicals (list)					
		Sodium Acetate			0.00
					0.00
					0.00
					0.00
					0.00
Emission Data					
O2 Concentration	%	13.6	13.5		0.00
CO2 Concentration	%				0.00
CO Concentration	PPM				0.00
SO2 Concentration	PPM				0.00
NOX Concentration	PPM				0.00
TRS Concentration	PPM	2.1	2.2		0.00

Notes :	Economizer O2 readings averaged	1.9	1.9
	TRS readings corrected to 8% O2		

SECTION 4

RECOVERY FURNACE (CASC) WITHOUT NaOAc

(CS-RF/2)

Section 4.1 Emission Test Results - VOC

Section 4.2 Emission Test Results - Miscellaneous

Section 4.3 Quality Control Results

Section 4.4 Process Operating Data

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SECTION 4
RECOVERY FURNACE (CASC) WITHOUT NaOAc
(CS-RF/2)

The Recovery Furnace was tested on two different days for VOC by M16, M18, and on four days for M25A. This source was also tested for aldehydes and hydrogen chloride.

Total Hydrocarbons (M25A)

Figures 4.1, 4.2, 4.3, and 4.4 present the THC trends for the test periods on 6/9/92, 6/16/92, 6/17/92, and 6/20/92. The THC readings were low on 6/16/92, dropping for a level period to less than 10 ppm, probably an anomaly. Readings on 6/17/92 were significantly higher. As a result of this increase, a fourth day's testing was required. Data from days 3 and 4 correlated well.

Volatile Organic Compounds (M16 and M18)

Table 4.1 summarizes the results for the Method 16 and Method 18 target compounds, and Section 4.1 is a tabulation of the data. The volumetric flow was measured during sampling using a pitot tube. Methanol, benzene, and o-Xylene were detected. All other target compounds were non-detectable.

All reduced sulfur compounds were detected except for carbon disulfide.

Miscellaneous Parameters

Table 4.2 summarizes the results of testing for aldehydes, ketones, and hydrogen chloride. Section 4.2 tabulates the results for each compound. All aldehydes and ketones were non-detectable. Hydrogen chloride was detected.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 4.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 4.4 includes the process operating data as recorded and provided by mill personnel.

FIGURE 4.1.
THC TREND ANALYSIS (6/9/92)
RECOVERY FURNACE (CASC) WITHOUT NaOAc
(CS-RF/2)

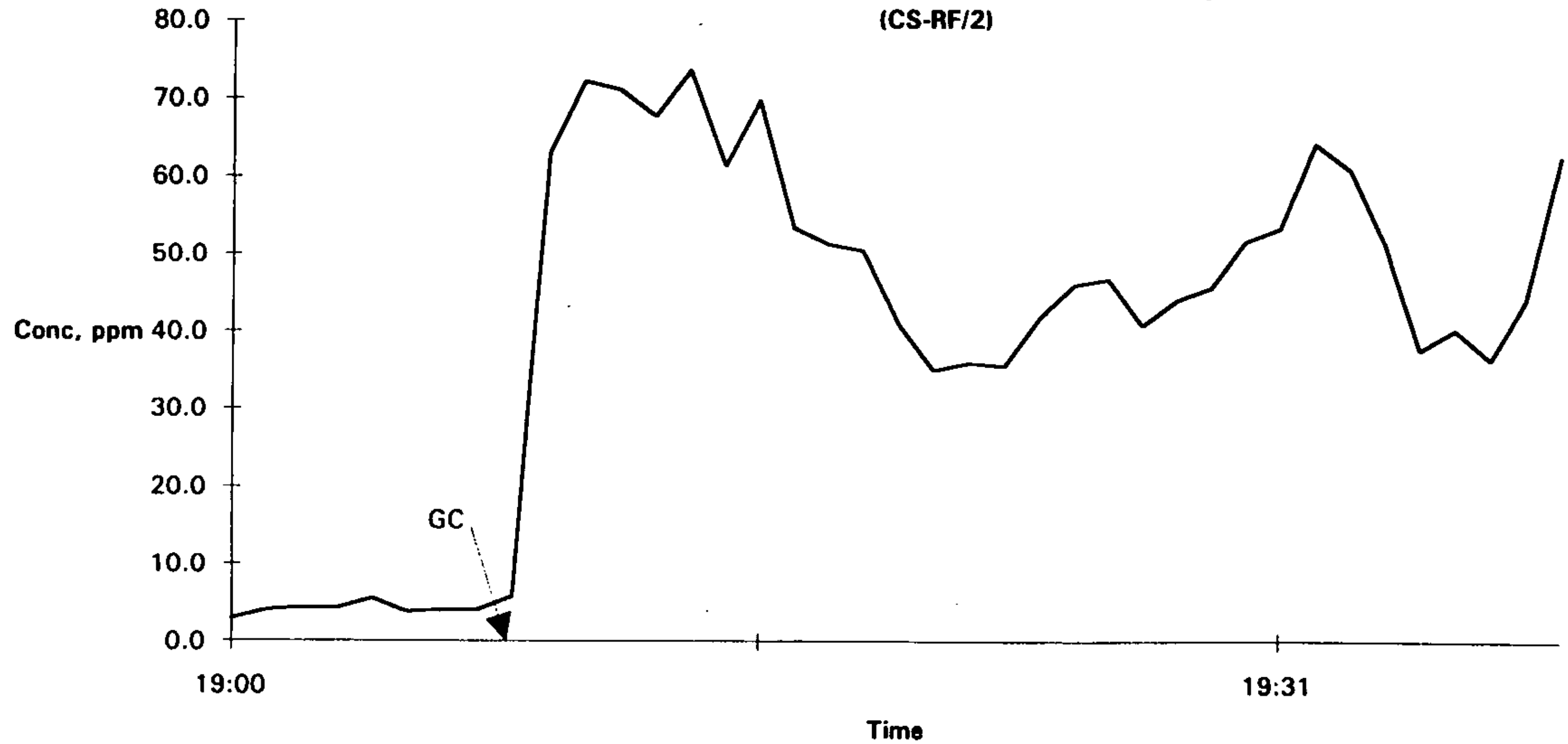

FIGURE 4.2.
THC TREND ANALYSIS (6/16/92)
RECOVERY FURNACE (CASC) WITHOUT NaOAc

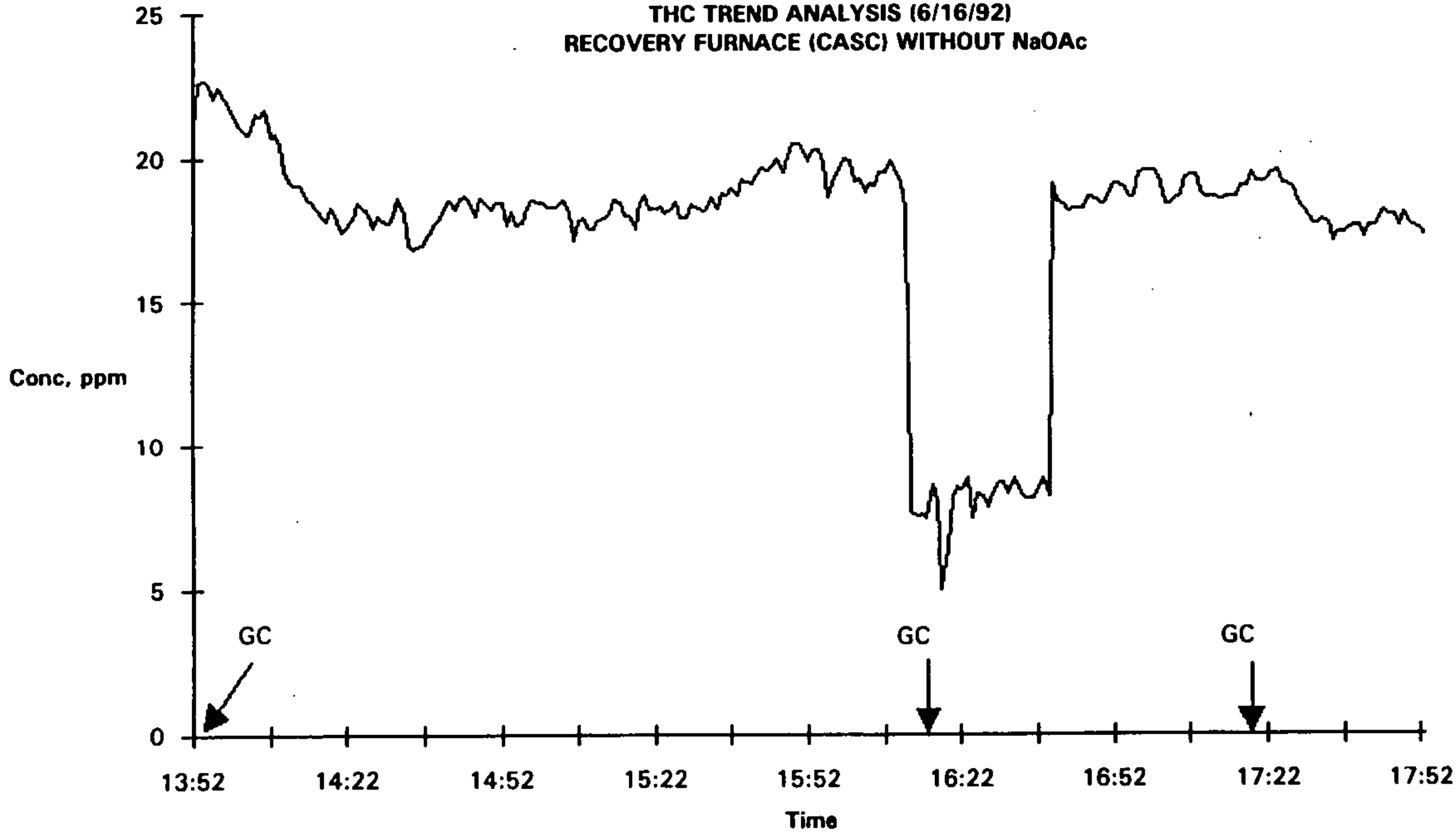

FIGURE 4.3.
THC TREND ANALYSIS (6/17/92)
RECOVERY FURNACE (CASC) WITHOUT NaOAc
(CS-RF/2)

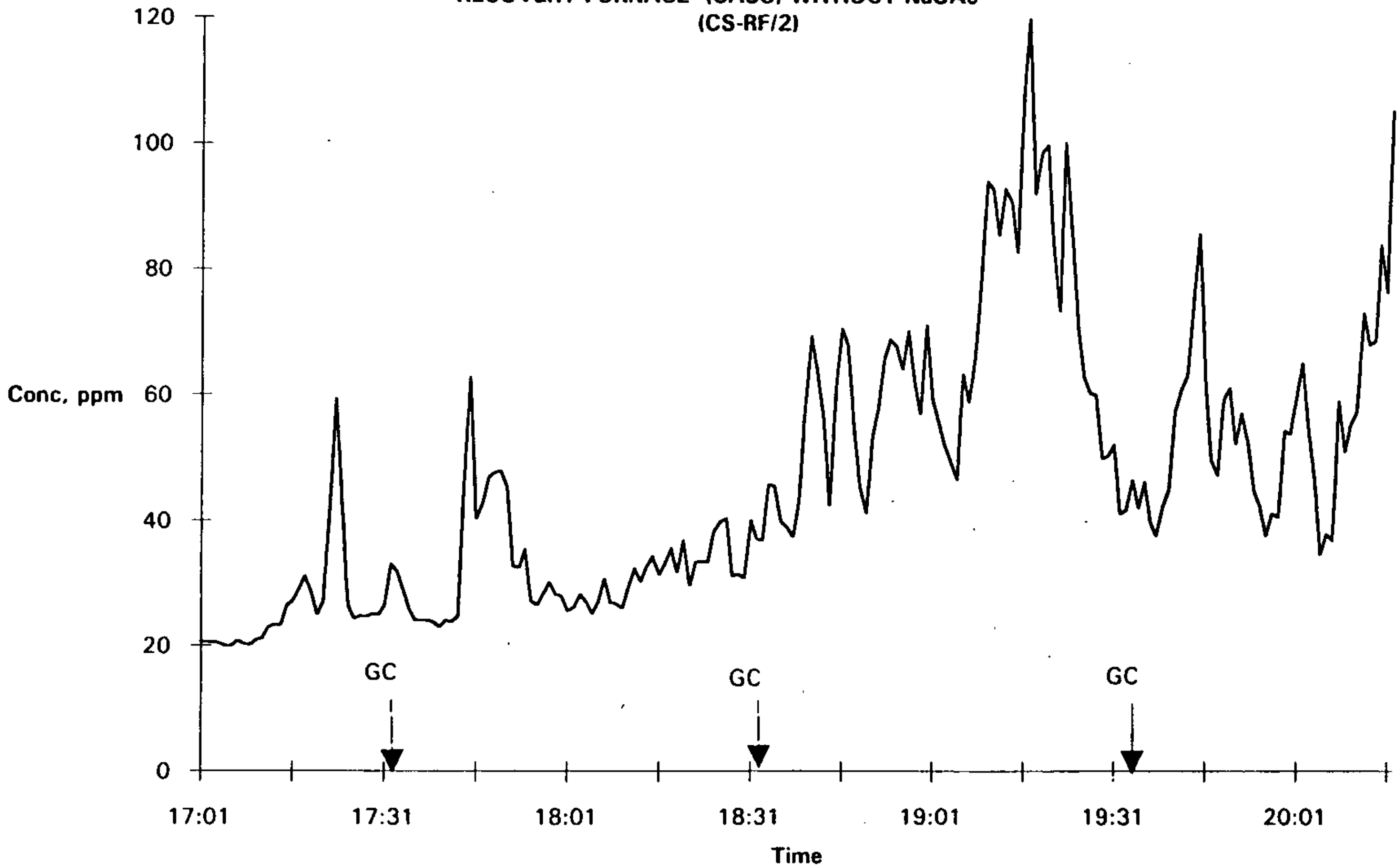

FIGURE 4.4.
THC TREND ANALYSIS (6/20/92)
RECOVERY FURNACE (Casc) WITHOUT NaOAc
(CS-RF/2)

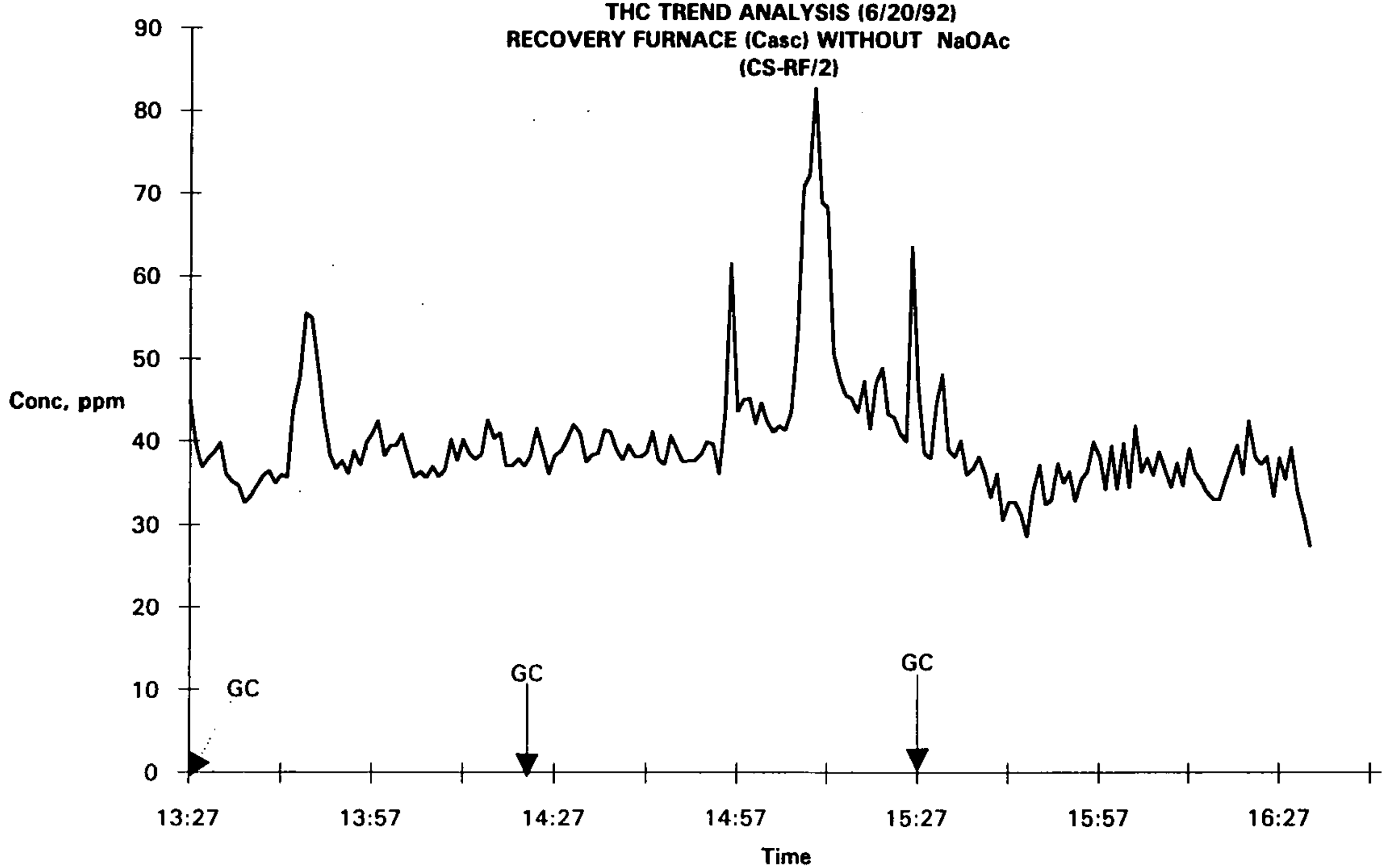

TABLE 4.1 SUMMARY OF VOC RESULTS

Mill:	CHAMPION - SHELDON	Source:	Recovery Furnace (Casc) w/o NaOAc
Source Code:	CS-RF/2	Test Dates:	6/9/92 6/16/92 6/17/92 6/20/92
FIN: 5000	CIN:	EPN:	E40

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	245	291	263	
Volumetric Flow Rate, $x10^3$ DSCFM	259.8	382.7	321.4	
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	69.6	84.5	78.0	
Method 16 Data, lb/hr				
Hydrogen sulfide	2.9	14.2	7.4	0.9
Methyl mercaptan	2.7	4.8	3.7	1.3
Dimethyl sulfide	ND	4.8	3.1	1.7
Carbon disulfide	ND	ND	ND	2
Dimethyl disulfide	ND	4.0	2.5	2.5
Method 18 Data, lb/hr				
Methanol	3.5	5.7	4.4	3.8
Ethanol	ND	ND	ND	1.4
Acetone	ND	ND	ND	1.7
2-Propanol	ND	ND	ND	1.8
2-Butanone	ND	ND	ND	2.2
Chloroform	ND	ND	ND	7.2
Benzene	ND	2.1	1.3	2.3
Bromodichloromethane	ND	ND	ND	9.9
Toluene	ND	ND	ND	2.8
Ethyl benzene	ND	ND	ND	3.2
m-, p-Xylene	ND	ND	ND	3.2
o-Xylene	ND	4.0	1.8	3.2
Cumene	ND	ND	ND	3.6
alpha-Pinene	ND	ND	ND	4.1
beta-Pinene	ND	ND	ND	4.1
3-Carene	ND	ND	ND	4.1
Terpenes (Unspecified)	ND	ND	ND	4.1
p-Cymene	ND	ND	ND	4
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	1.8	7.1	4.1	0.4
Unknowns as C, lb/hr	ND	7.1	1.8	0.1
Sum of Compounds as C, lb/hr	2.7	14.2	5.9	0.1

ND=Not Detected
DL=Detection Limit

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TABLE 4.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: CHAMPION-SHELDON
Source Code: CS-RF/2
FIN: 5000 EPN: E40

Source: Recovery Furnace w/o NaOAc
Test Dates: 6/16/92 6/17/92 6/20/92
CIN: EC13,PN5005

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	245	265	253	
Volumetric Flow Rate, x 10^3 DSCFM	303.7	382.7	341.9	
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	71.9	84.9	78.3	
Emission Rate, lb/hr				
Formaldehyde	ND	ND	ND	0.8
Acetaldehyde	ND	ND	ND	1.2
Acetone (Impinger)	ND	ND	ND	1.5
Acetophenone	ND	ND	ND	3.2
2-Butanone (Impinger)	ND	ND	ND	1.9
Methyl isobutyl ketone	ND	ND	ND	2.7
Acrolein	ND	ND	ND	1.5
Benzaldehyde	ND	ND	ND	2.8
Hydrogen chloride	ND	2.5	1.7	1.0

ND = Not Detected
DL = Detection Limit

Section 4.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Recovery Furnace (Casc) w/o NaOAc | FIN: 5000
Source Code: CS-RF/2 | Date: 6/9/92 | EPN: E40 | CINEC13,PN5005

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1910			
Flow Data				
Stack Temperature, °F	291			291
Moisture Content, %	26.0			26.0
Oxygen Concentration, %	13.0			13.0
Carbon Dioxide Concentration, %	7.0			7.0
Volumetric Flow Rate, x10^3 ACFM	504.1			504.1
Volumetric Flow Rate, x10^3 DSCFM	259.8			259.8
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	78.9			78.9
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	10.3			10.3
Emission Rate, lb/hr	14.2			14.2
Methyl mercaptan				
Concentration, ppmvd	1.7			1.7
Emission Rate, lb/hr	3.3			3.3
Dimethyl sulfide				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.3 *			1.3 *
Carbon disulfide				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.5 *			1.5 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.9 *			1.9 •
Method 18 Data				
Methanol				
Concentration, ppmvd	2.7			2.7
Emission Rate, lb/hr	3.5			3.5
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	1.3 •			1.3 •
Acetone				
Concentration, ppmvd	0.7 *			0.7 •
Emission Rate, lb/hr	1.6 •			1.6 •
2-Propanol				
Concentration, ppmvd	0.7 *			0.7 •
Emission Rate, lb/hr	1.6 •			1.6 •

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON   Source: Recovery Furnace (Casc)-w/o NaOAc   FIN: 5000
Source Code: CS-RF/2   Date: 6/9/92   EPN: E40   CINEC13;PN5005

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	2.0 *			2.0 *
Chloroform				
Concentration, ppmvd	1.4 *			1.4 *
Emission Rate, lb/hr	6.5 *			6.5 *
Benzene				
Concentration, ppmvd	0.7			0.7
Emission Rate, lb/hr	2.1			2.1
Bromodichloromethane				
Concentration, ppmvd	1.4 *			1.4 *
Emission Rate, lb/hr	9.0 *			9.0 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	2.5 *			2.5 *
Ethyl benzene				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	2.9 *			2.9 *
m-, p-Xylene				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	2.9 *			2.9 *
o-Xylene				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	2.9 *			2.9 *
Cumene				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	3.3 *			3.3 *
alpha-Pinene				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	3.7 *			3.7 *
beta-Pinene				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	3.7 *			3.7 *
3-Carene				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	3.7 *			3.7 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	3.7 *			3.7 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON	Source: Recovery Furnace (Casc) w/o NaOAc		FIN: 5000
Source Code: CS-RF/2	Date: 6/9/92	EPN: E40	CINEC13,PN5005

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	3.7 *			3.7 *
Knowns as Carbon				
Concentration, ppmvd	11.6			11.6
Unknowns as Carbon				
Concentration, ppmvd	0.9			0.9
Sum M18 as Carbon, lb/hr	6.1			6.1
Unknown Compounds % of Total	7.5%			7.5%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	69.2			69.2
Emission Rate, lb/hr as C	33.7			33.7

COMMENTS :

The hydrogen sulfide value for the run on 6/9/92 was saturated.

*One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON	Source: Recovery Furnace (Casc) w/o NaOAc		FIN:	5000
Source Code: CS-RF/2	Date: 6/16/92	EPN: E40		CINEC13,PN5005

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1351	1551	1651	
Flow Data				
Stack Temperature, °F			245	245
Moisture Content, %			13.0	13.0
Oxygen Concentration, %			15.0	15.0
Carbon Dioxide Concentration, %			5.0	5.0
Volumetric Flow Rate, x10^3 ACFM			467.9	467.9
Volumetric Flow Rate, x10^3 DSCFM			303.7	303.7
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	69.6	71.9	71.9	71.1
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	1.8	2.0	1.8	1.9
Emission Rate, lb/hr	2.9	3.2	2.9	3.0
Methyl mercaptan				
Concentration, ppmvd	1.2	1.3	1.4	1.3
Emission Rate, lb/hr	2.7	3.0	3.2	3.0
Dimethyl sulfide				
Concentration, ppmvd	1.0	1.0	1.0	1.0
Emission Rate, lb/hr	2.9	2.8	2.9	2.9
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	1.8 *	1.8 *	1.8 *	1.8 *
Dimethyl disulfide				
Concentration, ppmvd	0.9	0.9	0.9	0.9
Emission Rate, lb/hr	4.0	4.0	4.0	4.0
Method 18 Data				
Methanol				
Concentration, ppmvd	2.3	2.3	2.5	2.4
Emission Rate, lb/hr	3.5	3.5	3.7	3.6
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.3 *	1.3 *	1.3 *	1.3 *
Acetone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.6 *	1.6 *	1.6 *	1.6 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.6 *	1.6 *	1.6 *	1.6 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Recovery Furnace (Casc) w/o NaOAc | FIN: 5000
Source Code: CS-RF/2 | Date: 6/16/92 | EPN: E40 | CINEC13,PN5005

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	2.0 *	2.0 *	2.0 *	2.0 *
Chloroform				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	6.5 *	6.5 *	6.5 *	6.5 *
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	2.1 *	2.1 *	2.1 *	2.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	8.9 *	8.9 *	8.9 *	8.9 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	2.5 *	2.5 *	2.5 *	2.5 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	2.9 *	2.9 *	2.9 *	2.9 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	2.9 *	2.9 *	2.9 *	2.9 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.8	0.5
Emission Rate, lb/hr	2.9 *	2.9 *	4.0	2.3
Cumene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	3.3 *	3.3 *	3.3 *	3.3 *
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	3.7 *	3.7 *	3.7 *	3.7 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	3.7 *	3.7 *	3.7 *	3.7 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	3.7 *	3.7 *	3.7 *	3.7 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	3.7 *	3.7 *	3.7 *	3.7 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON
Source Code: CS-RF/2

Source: Recovery Furnace (Casc) w/o NaOAc
Date: 6/16/92 EPN: E40

FIN: 5000
CINEC13,PN5005

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	3.6 *	3.6 *	3.6 *	3.6 *
Knowns as Carbon				
Concentration, ppmvd	5.7	5.9	12.5	8.0
Unknowns as Carbon				
Concentration, ppmvd	0.7	0.0	12.4	4.4
Sum M18 as Carbon, lb/hr	3.7	3.3	14.2	7.1
Unknown Compounds % of Total	10.7%	0.0%	49.8%	20.2%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	21.8	16.1	20.7	19.5
Emission Rate, lb/hr as C	12.4	9.1	11.8	11.1

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Recovery Furnace (Casc) w/o NaOAc | FIN: 5000
Source Code: CS-RF/2 | Date: 6/17/92 | EPN: E40 | CINEC13,PN5005

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1730	1800	1900	
Flow Data				
Stack Temperature, °F	250			250
Moisture Content, %	14.0			14.0
Oxygen Concentration, %	14.0			14.0
Carbon Dioxide Concentration, %	5.0			5.0
Volumetric Flow Rate, x10^3 ACFM	532.7			532.7
Volumetric Flow Rate, x10^3 DSCFM	339.2			339.2
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	78.0	78.0	78.0	78.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	2.2	5.9	7.8	5.3
Emission Rate, lb/hr	4.0	10.6	14.0	9.5
Methyl mercaptan				
Concentration, ppmvd	1.1	1.5	1.9	1.5
Emission Rate, lb/hr	2.8	3.8	4.8	3.8
Dimethyl sulfide				
Concentration, ppmvd	0.9	1.1	1.2	1.1
Emission Rate, lb/hr	3.0	3.6	3.9	3.5
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	2.0 *	2.0 *	2.0 *	2.0 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	2.5 *	2.5 *	2.5 *	2.5 *
Method 18 Data				
Methanol				
Concentration, ppmvd	2.6	3.3	2.8	2.9
Emission Rate, lb/hr	4.4	5.6	4.8	4.9
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.4 *	1.4 *	1.4 *	1.4 *
Acetone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.8 *	1.8 *	1.8 *	1.8 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.8 *	1.8 *	1.8 *	1.8 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Recovery Furnace (Casc) w/o NaOAc | FIN: 5000
Source Code: CS-RF/2 | Date: 6/17/92 | EPN: E40 | CINEC13,PN5005

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	2.2 *	2.2 *	2.2 *	2.2 *
Chloroform				
Concentration, ppmvd	1.2 *	1.2 *	1.2 *	1.2 *
Emission Rate, lb/hr	7.3 *	7.3 *	7.3 *	7.3 *
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	2.4 *	2.4 *	2.4 *	2.4 *
Bromodichloromethane				
Concentration, ppmvd	1.2 *	1.2 *	1.2 *	1.2 *
Emission Rate, lb/hr	10.1 *	10.1 *	10.1 *	10.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	2.8 *	2.8 *	2.8 *	2.8 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	3.3 *	3.3 *	3.3 *	3.3 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	3.3 *	3.3 *	3.3 *	3.3 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	3.3 *	3.3 *	3.3 *	3.3 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	3.7 *	3.7 *	3.7 *	3.7 *
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	4.2 *	4.2 *	4.2 *	4.2 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	4.2 *	4.2 *	4.2 *	4.2 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	4.2 *	4.2 *	4.2 *	4.2 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	4.2 *	4.2 *	4.2 *	4.2 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON	Source: Recovery Furnace (Casc) w/o NaOAc		FIN: 5000
Source Code: CS-RF/2	Date: 6/17/92	EPN: E40	CINEC13,PN5005

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	4.1 *	4.1 *	4.1 *	4.1 *
Knowns as Carbon				
Concentration, ppmvd	6.9	8.4	9.3	8.2
Unknowns as Carbon				
Concentration, ppmvd	0.6 *	7.8	3.4	3.9
Sum M18 as Carbon, lb/hr	4.7	10.3	8.0	7.7
Unknown Compounds % of Total	7.8%	48.2%	26.6%	27.5%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	38.4	50.0	73.3	53.9
Emission Rate, lb/hr as C	24.4	31.7	46.5	34.2

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Recovery Furnace (Casc) w/o NaOAc | FIN: 5000
Source Code: CS-RF/2 | Date: 6/20/92 | EPN: E40 | CINEC13,PN5005

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1326	1426	1526	
Flow Data				
Stack Temperature, °F			265	265
Moisture Content, %			7.0	7.0
Oxygen Concentration, %			14.5	14.5
Carbon Dioxide Concentration, %			8.0	8.0
Volumetric Flow Rate, x10^3 ACFM			569.3	569.3
Volumetric Flow Rate, x10^3 DSCFM			382.7	382.7
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	84.5	84.5	84.5	84.5
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	4.1	4.3	2.5	3.6
Emission Rate, lb/hr	8.3	8.7	5.1	7.4
Methyl mercaptan				
Concentration, ppmvd	1.5	1.6	1.6	1.6
Emission Rate, lb/hr	4.3	4.6	4.6	4.5
Dimethyl sulfide				
Concentration, ppmvd	0.8	1.3	1.0	1.0
Emission Rate, lb/hr	3.0	4.8	3.7	3.8
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	2.3 *	2.3 *	2.3 *	2.3 *
Dimethyl disulfide				
Concentration, ppmvd	0.5	0.5	0.5	0.5
Emission Rate, lb/hr	2.8	2.8	2.8	2.8
Method 18 Data				
Methanol				
Concentration, ppmvd	2.3	2.7	3.0	2.7
Emission Rate, lb/hr	4.4	5.2	5.7	5.1
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	1.5 *	1.5 *	1.5 *	1.5 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	1.9 *	1.9 *	1.9 *	1.9 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	1.9 *	1.9 *	1.9 *	1.9 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Recovery Furnace (Casc) w/o NaOAc | FIN: 5000
Source Code: CS-RF/2 | Date: 6/20/92 | EPN: E40 | CINEC13,PN5005

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	2.3 *	2.3 *	2.3 *	2.3 *
Chloroform				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	7.6 *	7.6 *	7.6 *	7.6 *
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	2.5 *	2.5 *	2.5 *	2.5 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	10.5 *	10.5 *	10.5 *	10.5 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	3.0 *	3.0 *	3.0 *	3.0 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	3.4 *	3.4 *	3.4 *	3.4 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	3.4 *	3.4 *	3.4 *	3.4 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	3.4 *	3.4 *	3.4 *	3.4 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	3.9 *	3.9 *	3.9 *	3.9 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	4.4 *	4.4 *	4.4 *	4.4 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	4.4 *	4.4 *	4.4 *	4.4 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	4.4 *	4.4 *	4.4 *	4.4 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	4.4 *	4.4 *	4.4 *	4.4 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Recovery Furnace (Casc) w/o NaOAc | FIN: 5000
Source Code: CS-RF/2 | Date: 6/20/92 | EPN: E40 | CINEC13,PN5005

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	4.3 *	4.3 *	4.3 *	4.3 *
Knowns as Carbon				
Concentration, ppmvd	2.6	3.7	2.7	3.0
Unknowns as Carbon				
Concentration, ppmvd	1.5	1.2	1.1	1.3
Sum M18 as Carbon, lb/hr	2.9	3.5	2.7	3.0
Unknown Compounds % of Total	36.8%	24.4%	28.6%	30.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	41.9	48.4	39.8	43.4
Emission Rate, lb/hr as C	30.0	34.7	28.5	31.1

* One or more values were less than the detection limit.

Section 4.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - SHELDON Source: Recovery Furnace (Casc) w/o NaOAc FIN: 5000

Source Code: CS-RF/2 Date: 6/16/92 EPN: E40 CINEC13,PN5005

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1517			
Flow Data				
Stack Temperature, °F	245			245
Moisture Content, %	13.0			13.0
Oxygen Concentration, %	15.0			15.0
Carbon Dioxide Concentration, %	5.0			5.0
Volumetric Flow Rate, x10^3 ACFM	467.9			467.9
Volumetric Flow Rate, x10^3 DSCFM	303.7			303.7
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	71.9			71.9
Miscellaneous Parameters				
Formaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.7 *			0.7 *
Acetaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.0 *			1.0 *
Acetone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.4 *			1.4 *
Acetophenone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	2.8 *			2.8 *
2-Butanone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.7 *			1.7 *
Methyl isobutyl ketone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	2.4 *			2.4 *
Acrolein				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.3 *			1.3 *
Benzaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	2.5 *			2.5 *
Hydrogen chloride				
Concentration, ppmvd	1.1			1.1
Emission Rate, lb/hr	1.9			1.9

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - SHELDON | Source: Recovery Furnace (Casc) w/o NaOAc | FIN: 5000
Source Code: CS-RF/2 | Date: 6/17/92 | EPN: E40 | CINEC13,PN5005

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1905			
Flow Data				
Stack Temperature, °F	250			250
Moisture Content, %	14.0			14.0
Oxygen Concentration, %	14.0			14.0
Carbon Dioxide Concentration, %	5.0			5.0
Volumetric Flow Rate, x10^3 ACFM	532.7			532.7
Volumetric Flow Rate, x10^3 DSCFM	339.2			339.2
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	78.0			78.0
Miscellaneous Parameters				
Formaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.8 *			0.8 *
Acetaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.2 *			1.2 *
Acetone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.5 *			1.5 *
Acetophenone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	3.2 *			3.2 *
2-Butanone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.9 *			1.9 *
Methyl isobutyl ketone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	2.6 *			2.6 *
Acrolein				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.5 *			1.5 *
Benzaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	2.8 *			2.8 *
Hydrogen chloride				
Concentration, ppmvd	1.3			1.3
Emission Rate, lb/hr	2.5			2.5

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - SHELDON | Source: Recovery Furnace (Casc) w/o NaOAc | FIN: 5000
Source Code: CS-RF/2 | Date: 6/20/92 | EPN: E40 | CINEC13,PN5005

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1538			
Flow Data				
Stack Temperature, °F	265			265
Moisture Content, %	7.0			7.0
Oxygen Concentration, %	14.5			14.5
Carbon Dioxide Concentration, %	8.0			8.0
Volumetric Flow Rate, x10^3 ACFM	569.3			569.3
Volumetric Flow Rate, x10^3 DSCFM	382.7			382.7
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	84.9			84.9
Miscellaneous Parameters				
Formaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.9 *			0.9 *
Acetaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.3 *			1.3 *
Acetone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.7 *			1.7 *
Acetophenone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	3.6 *			3.6 *
2-Butanone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	2.1 *			2.1 *
Methyl isobutyl ketone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	3.0 *			3.0 *
Acrolein				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.7 *			1.7 *
Benzaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	3.2 *			3.2 *
Hydrogen chloride				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.1 *			1.1 *

* One or more values were less than the detection limit.

Section 4.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

SOURCE CS-RF/1

QUALITY CONTROL SUMMARY
METHOD 25A

1. CALIBRATION

THEOR	6/9/92		6/10/92	
ppm	ppm	%ERR	ppm *	%ERR
0.0	-0.1	-0.1	-17.0	-1.1
1.0	0.0	-1.1	38.0	0.1
36.0	37.9	2.1	106.0	1.0
91.2	90.4	-0.9	1505.0	-0.1
CORR COEFF	0.9995		0.9998	
*THEOR ppm				
0				
36				
91				
1506				

2. PROPANE LINE RECOVERY

	DATE	6/9/92		DATE	6/10/92	
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	92.9	91.6	98.6%	**		
AFTER	**	90.5		**		

3. LINE BLANK

	6/9/92	6/10/92
	ppm	ppm
BEFORE	1.1	**
AFTER	**	**

** Not performed

SOURCE CS-RF/2

QUALITY CONTROL SUMMARY
METHOD 25A

1. CALIBRATION

THEOR ppm	6/16/92 ppm	%ERR	6/17/92 ppm *	%ERR
0.0	1.0	0.1		
36.0	40.0	0.3		
244.0	237.0	-0.5		
1506.0	1506.0	0.0		
CORR COEFF	0.9999		0.9988	
*THEOR ppm				
0			4.0	1.6
36			28.0	3.3
91			93.0	0.7
244			244.0	0.0

2. PROPANE LINE RECOVERY

	DATE 6/16/92 INST	LINE	%REC	DATE 6/17/92 INST	LINE	%REC
BEFORE	248.0	241.0	97.2%	241.0	227.0	94.2%
AFTER	241.0	227.0	94.2%	245.0	244.0	99.6%

3. LINE BLANK

	6/16/92 ppm	6/17/92 ppm
BEFORE	4.0	*
AFTER	*	5

* Not performed

SOURCE CS-RF/2

QUALITY CONTROL SUMMARY
METHOD 25A

1. CALIBRATION

THEOR ppm	6/20/92 ppm	%ERR	
0.0	2.0	0.8	
36.0	37.0	0.4	
91.0	85.0	2.5	
244.0	245.0	0.4	
CORR COEFF	0.9994		

2. PROPANE LINE RECOVERY

	DATE INST	6/20/92 LINE	%REC	
BEFORE	245.0	244.0	99.6%	
AFTER	249.0	248.0	99.6%	

3. LINE BLANK

	6/20/92 ppm	
BEFORE	5.0	
AFTER	1.0	

SOURCE CS-RF/1

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR	DATE	6/9/92	DATE	6/10/92
	ppm	ppm	%REC	ppm	%REC
ethanol	52.0	45.3	87.1%	48.1	92.5%
acetone	41.6	36.8	88.6%	33.2	79.8%
isopropanol	39.9	38.0	95.4%	37.7	94.5%
dimethyl sulfide	9.1	8.3	91.2%	7.5	82.4%
benzene	34.2	34.0	99.5%	34.1	99.9%
bromodichloromethane	18.8	16.7	88.8%	15.9	84.6%
dimethyl disulfide	33.9	30.0	88.6%	28.7	84.7%
toluene	28.7	22.3	77.6%	25.7	89.5%
ethyl benzene	24.9	20.8	83.6%	21.1	84.7%
m-xylene	49.8	41.0	82.3%	41.4	83.1%
o-xylene	25.0	19.9	79.8%	20.7	82.6%
cumene	21.9	17.8	81.3%	18.1	82.4%
alpha-pinene	19.2	16.3	85.0%	16.6	86.8%
beta-pinene	19.2	16.0	83.1%	15.7	81.6%
3-carene	19.3	7.9	41.2%	15.1	78.3%
p-cymene	19.6	14.1	72.3%	14.4	73.7%

2. PROPANE RESPONSE

	THEOR		%REC		%REC
BEFORE	36.0	37.5	104.2%	35.0	97.2%
AFTER	36.0	36.2	100.6%	33.7	93.6%

3. METHANOL LINE RECOVERY

	6/9/92			6/10/92		
	GC	LINE	%REC	GC	LINE	%REC
BEFORE	9.7	8.2	84.5%	9.3 •		
AFTER	9.3 •			12.4	12.1	97.6%

4. LINE BLANK

	[-------------FILE REF-------------]	
BEFORE	F9A2005	FAA2004
AFTER	FAA2004	FGA2004

SOURCE CS-RF/2

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR ppm	DATE 6/16/92 ppm	%REC	DATE 6/17/92 ppm	%REC
ethanol	52.0	41.2	79.2%	42.3	81.4%
acetone	41.6	32.8	78.9%	34.3	82.4%
isopropanol	39.9	37.0	92.9%	38.4	96.4%
dimethyl sulfide	9.1	7.9	86.8%	8.4	92.3%
benzene	34.2	29.3	85.7%	32.2	94.4%
bromodichloromethane	18.8	14.5	77.1%	15.7	83.5%
dimethyl disulfide	33.9	27.2	80.1%	28.7	84.7%
toluene	28.7	24.0	83.4%	25.0	87.1%
ethyl benzene	24.9	19.2	77.1%	20.3	81.6%
m-xylene	49.8	37.6	75.5%	40.0	80.3%
o-xylene	25.0	18.7	74.6%	19.9	79.5%
cumene	21.9	16.5	75.2%	17.4	79.2%
alpha-pinene	19.2	14.8	77.2%	16.0	83.3%
beta-pinene	19.2	13.9	72.4%	15.4	79.8%
3-carene	19.3	13.5	70.3%	14.2	73.7%
p-cymene	19.6	13.4	68.3%	14.1	72.2%

2. PROPANE RESPONSE

	THEOR		%REC		%REC
BEFORE	36.0	33.3	92.5%	35.3	98.1%
AFTER	36.0	31.6	87.8%	36.2	100.6%

3. METHANOL LINE RECOVERY

	6/16/92			6/17/92		
	GC	LINE	%REC	GC	LINE	%REC
BEFORE	12.4	12.1	97.6%	10.0	11.0	110.0%
AFTER	10.0	11.1	111.0%	33.1	30.1	90.9%

4. LINE BLANK

	[------------FILE REF------------]	
BEFORE	FGA2004	FHA2010
AFTER	FHA2010	FKB2005

*Not performed

SOURCE CS-RF/2

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR ppm	DATE ppm	6/20/92 %REC
ethanol	52.0	32.6	62.7%
acetone	41.6	31.1	74.9%
isopropanol	39.9	36.8	92.4%
dimethyl sulfide	9.1	9.0	98.9%
benzene	34.2	32.8	96.0%
bromodichloromethane	18.8	16.4	87.2%
dimethyl disulfide	33.9	31.0	91.5%
toluene	28.7	26.9	93.6%
ethyl benzene	24.9	23.8	95.5%
m-xylene	49.8	48.8	98.0%
o-xylene	25.0	23.6	94.3%
cumene	21.9	20.7	94.1%
alpha-pinene	19.2	19.0	99.4%
beta-pinene	19.2	13.6	70.9%
3-carene	19.3	17.6	91.5%
p-cymene	19.6	18.1	92.6%

2. PROPANE RESPONSE

	THEOR		%REC
BEFORE	36.0	35.9	99.7%
AFTER	36.0	31.6	87.8%

3. METHANOL LINE RECOVERY

	GC	6/20/92 LINE	%REC
BEFORE	33.1	30.1	90.9%
AFTER	*		

4. LINE BLANK

	[-------------FILE REF-------------]
BEFORE	FGA2004
AFTER	FKB2014

*Not performed

SOURCE CS-RF/1

QUALITY CONTROL SUMMARY
METHOD 16

1. CALIBRATION

ANALYTE	LO ppm	MED ppm	HI ppm	CORR COEFF
6/9/92				
hydrogen sulfide	3.3	5.0	7.8	1.0000
methyl mercaptan	3.1	4.6	7.2	1.0000
dimethyl sulfide	4.2	6.4	10.0	1.0000
carbon disulfide	1.3	2.0	3.2	1.0000
dimethyl disulfide	1.8	2.8	4.3	1.0000
6/10/92				
hydrogen sulfide	2.1	4.7	10.5	1.0000
methyl mercaptan	1.9	4.4	9.7	1.0000
dimethyl sulfide	2.6	6.1	13.5	1.0000
carbon disulfide	0.8	1.9	4.2	1.0000
dimethyl disulfide	1.1	2.6	5.8	1.0000

SOURCE CS-RF/2

QUALITY CONTROL SUMMARY
METHOD 16

1. CALIBRATION

ANALYTE	LO ppm	MED ppm	HI ppm	CORR COEFF
6/16/92				
hydrogen sulfide	3.1	5.9	9.5	1.0000
methyl mercaptan	2.8	5.5	8.8	1.0000
dimethyl sulfide	3.9	7.6	12.2	1.0000
carbon disulfide	1.2	2.4	3.8	1.0000
dimethyl disulfide	1.7	3.3	5.3	1.0000
6/17/92 •				
hydrogen sulfide	3.1	5.9	9.5	1.0000
methyl mercaptan	2.8	5.5	8.8	1.0000
dimethyl sulfide	3.9	7.6	12.2	1.0000
carbon disulfide	1.2	2.4	3.8	1.0000
dimethyl disulfide	1.7	3.3	5.3	1.0000

• Calibration from 6/16/92 checked and used

SOURCE CS-RF/2

QUALITY CONTROL SUMMARY
METHOD 16

1. CALIBRATION

ANALYTE	LO ppm	MED ppm	HI ppm	CORR COEFF
6/20/92 •				
hydrogen sulfide	3.1	5.9	9.5	1.0000
methyl mercaptan	2.8	5.5	8.8	1.0000
dimethyl sulfide	3.9	7.6	12.2	1.0000
carbon disulfide	1.2	2.4	3.8	1.0000
dimethyl disulfide	1.7	3.3	5.3	1.0000

• Calibration from 6/16/92 checked and used

Section 4.4 Process Operating Data

RECOVERY FURNACES - PROCESS OPERATING CONDITIONS

Mill: Sheldon Mill
Source: Recovery Furnace
FIN: 5000

Source: Recovery
Date: 6-9-92
EPN: E40
CIN: EC13, PN 5005

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time				19:10	
Furnace Data					
Type				Cascade Evaporator	
Manufacturer				Combustion Engineering	
When Constructed				1967	
When Modified				1976	
Contact or Non-contact				Direct Contact	
Production Data					
BLS Density	lb/gal			11.90	0.00
BL Solids Content	decimal			0.65	0.00
Liquor Firing Rate	GPM			170.0	0.00
Liquor Firing Rate	lb BLS/hr			78900.0	0.00
Sulfidity (Green Liquor)	% by wt			67	0.00
BL BTU Content	BTU/lb			5800	0.00
BL Chloride Content	% by wt				0.00
Make-Up Chemicals (list)					
					0.00
					0.00
					0.00
					0.00
					0.00
Emission Data					
O2 Concentration	%			12.1	0.00
CO2 Concentration	%				0.00
CO Concentration	PPM				0.00
SO2 Concentration	PPM				0.00
NOX Concentration	PPM				0.00
TRS Concentration	PPM			8	0.00

Notes : Economizer O2 readings averaged 1%
TRS readings corrected to 8% O2

RECOVERY FURNACES - PROCESS OPERATING CONDITIONS

Mill: Sheldon Mill
Source: Recovery Furnace
FIN: 5000

Source: Recovery
Date: 6-16-92
EPN: E40
CIN: EC13, PN 5005

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		13:51	15:51	16:51	
Furnace Data					
Type			Cascade Evaporator		
Manufacturer			Combustion Engineering		
When Constructed			1967		
When Modified			1976		
Contact or Non-contact			Direct Contact		
Production Data					
BLS Density	lb/gal	11.90	11.90	11.90	0.00
BL Solids Content	decimal	0.658	0.651	0.65	0.00
Liquor Firing Rate	GPM	150.0	155.0	150.0	0.00
Liquor Firing Rate	lb BLS/hr	69600.0	71900.0	71900.0	0.00
Sulfidity (Green Liquor)	% by wt	68.3	66.7	66.1	0.00
BL BTU Content	BTU/lb	5800	5800	5800	0.00
BL Chloride Content	% by wt				0.00
Make-Up Chemicals (list)					
					0.00
					0.00
					0.00
					0.00
					0.00
Emission Data					
O2 Concentration	%	13.6	13.3	14	0.00
CO2 Concentration	%				0.00
CO Concentration	PPM	23.2	46.3		0.00
SO2 Concentration	PPM	24.7	7.6		0.00
NOX Concentration	PPM	47	2.4		0.00
TRS Concentration	PPM	3.1	2.5		0.00
O2 Concentration (@ econonizer)		3.9	3.6	3.6	

Notes : All emission data is corrected to 8% O2

RECOVERY FURNACES - PROCESS OPERATING CONDITIONS

Mill: Sheldon Mill
Source: Recovery Furnace
FIN: 5000

Source: Recovery
Date: 6-17-92
EPN: E40
CIN: EC13, PN 5005

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		17:30	19:05		
Furnace Data					
Type		Cascade Evaporator			
Manufacturer		Combustion Engineering			
When Constructed		1967			
When Modified		1976			
Contact or Non-contact		Diect Contact			
Production Data					
BLS Density	lb/gal	11.90	11.90		0.00
BL Solids Content	decimal	0.646	0.646		0.00
Liquor Firing Rate	GPM	168.0	168.0		0.00
Liquor Firing Rate	lb BLS/hr	78000.0	78000.0		0.00
Sulfidity (Green Liquor)	% by wt				0.00
BL BTU Content	BTU/lb	5800	5800		0.00
BL Chloride Content	% by wt				0.00
Make-Up Chemicals (list)					
					0.00
					0.00
					0.00
					0.00
					0.00
Emission Data					
O2 Concentration	%	12.3	12.7		0.00
CO2 Concentration	%				0.00
CO Concentration	PPM	695.9			0.00
SO2 Concentration	PPM	98.6			0.00
NOX Concentration	PPM	36.7			0.00
TRS Concentration	PPM	8.9	18.6		0.00
O2 Concentration (@ econonizer)		3.4	0.7		

Notes : All emission data is corrected to 8% O2

RECOVERY FURNACES - PROCESS OPERATING CONDITIONS

Mill: Sheldon Mill
Source: Recovery Furnace
PIN: 5000

Source: Recovery
Date: 6-20-92
EPN: E40
CIN: EC13, PN 5005

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		13:26	14:26	15:26	
Furnace Data					
Type			Cascade Evaporator		
Manufacturer			Combustion Engineering		
When Constructed			1967		
When Modified			1976		
Contact or Non-contact			Direct Contact		
Production Data					
BLS Density	lb/gal	11.90	11.90	11.90	0.00
BL Solids Content	decimal	0.65	0.65	0.65	0.00
Liquor Firing Rate	GPM	182.0	182.0	183.0	0.00
Liquor Firing Rate	lb BLS/hr	84500.0	84500.0	84500.0	0.00
Sulfidity (Green Liquor)	% by wt				0.00
BL BTU Content	BTU/lb	5800	5800	5800	0.00
BL Chloride Content	% by wt				0.00
Make-Up Chemicals (list)					
					0.00
					0.00
					0.00
					0.00
					0.00
Emission Data					
O2 Concentration	%	13.2	13	13.2	0.00
CO2 Concentration	%				0.00
CO Concentration	PPM				0.00
SO2 Concentration	PPM				0.00
NOX Concentration	PPM				0.00
TRS Concentration	PPM	16.4	10.7	9.3	0.00
O2 Concentration (@ econonizer)		1.8	1.8	2.3	

Notes : All emission data is corrected to 8% O2

RECOVERY FURNACES - PROCESS OPERATING CONDITIONS

Mill: Sheldon Mill
Source: Recovery Furnace
PIN: 5000

Source: Recovery
Date: 6-20-92
EPN: E40
CIN: EC13, PN 5005

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		15:38			
Furnace Data					
Type		Cascade Evaporator			
Manufacturer		Combustion Engineering			
When Constructed		1967			
When Modified		1976			
Contact or Non-contact		Diect Contact			
Production Data					
BLS Density	lb/gal	11.90			0.00
BL Solids Content	decimal	0.65			0.00
Liquor Firing Rate	GPM	183.0			0.00
Liquor Firing Rate	lb BLS/hr	84900.0			0.00
Sulfidity (Green Liquor)	% by wt				0.00
BL BTU Content	BTU/lb	5800			0.00
BL Chloride Content	% by wt				0.00
Make-Up Chemicals (list)					
					0.00
					0.00
					0.00
					0.00
					0.00
Emission Data					
O2 Concentration	%	13.2			0.00
CO2 Concentration	%				0.00
CO Concentration	PPM				0.00
SO2 Concentration	PPM				0.00
NOX Concentration	PPM				0.00
TRS Concentration	PPM	9.3			0.00

O2 Concentration (@ econonizer) 2.3

Notes : All emission data is corrected to 8% O2

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SECTION 5

SMELT-DISSOLVING TANK VENT

(CS-SDTV)

5. CS-SDTV

SECTION 5
SMELT-DISSOLVING TANK VENT
(CS-SDTV)

The Smelt Dissolving Tank Vent was tested on two different days for volatile organic compounds by M16, M18, and M25A. This source was also tested for metal emissions.

Total Hydrocarbons (M25A)

Figures 5.1 and 5.2 present the THC trends for the test periods on 6/9/92 and 6/17/92. The THC levels were consistent over the two days of sampling, generally ranging between 150 and 200 ppm. On 6/17/92, the readings drifted downward into the 100-150 ppm range.

Volatile Organic Compounds (M16 and M18)

Table 5.1 summarizes the results for the Method 16 and Method 18 target compounds, and Section 5.1 is a tabulation of the data. The volumetric flow was measured during sampling with a pitot tube. Other than methanol, only the heavier target organics were identified. Of these, a-Pinene and the terpenes dominated. Hydrogen sulfide was the only significant reduced sulfur compound present.

Metals

Table 5.2 summarizes the result of the samples collected for metals analyses. Section 5.2 tabulates the results for each compound. Traces of copper, manganese, nickel and phosphorus were found.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 5.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 5.4 includes the process operating data as recorded and provided by mill personnel.

FIGURE 5.1
THC TREND ANALYSIS (6/09/92)
SMELT DISSOLVING TANK VENT (CS-SDTV)

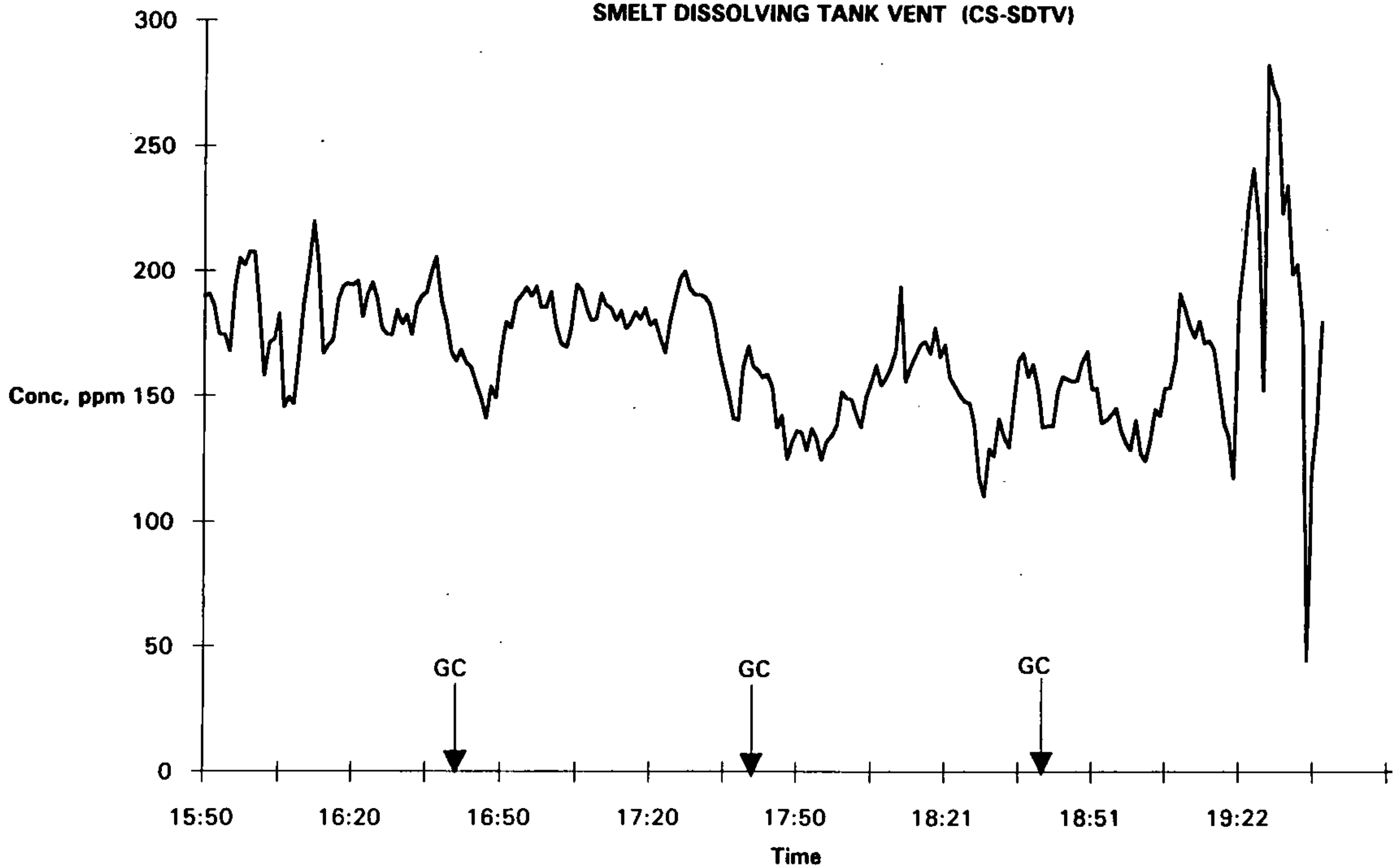

FIGURE 5.2
THC TREND ANALYSIS (6/17/92)
SMELT DISSOLVING TANK VENT (CS-SDTV)

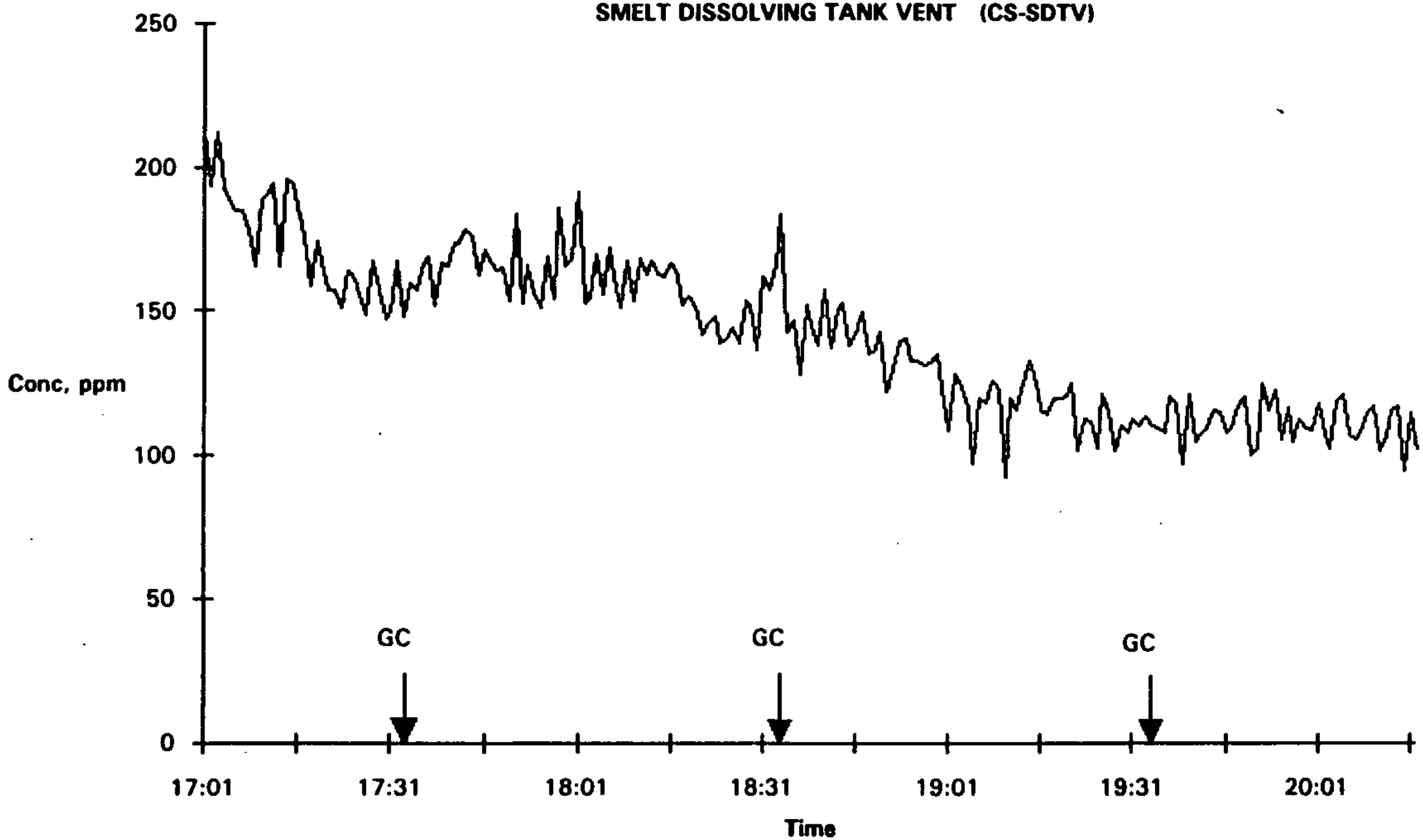

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TABLE 5.1 SUMMARY OF VOC RESULTS

Mill: CHAMPION - SHELDON
Source: Smelt Dissolving Tank Vent (metals)
Source Code: CS-SDTV
Test Dates: 6/9/92 6/17/92
FIN: 5000 CIN: EC14, EC21
EPN: E41

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	164	169	167	
Volumetric Flow Rate, x10³ DSCFM	10.3	11.7	11.0	
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	78.0	85.9	79.8	
Method 16 Data, lb/hr				
Hydrogen sulfide	0.9	1.8	1.4	0.1
Methyl mercaptan	0.1	0.3	0.2	0.1
Dimethyl sulfide	<0.1	0.3	0.2	0.1
Carbon disulfide	ND	ND	ND	0.1
Dimethyl disulfide	ND	<0.1	0.1	0.1
Method 18 Data, lb/hr				
Methanol	0.2	0.4	0.3	0.2
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	ND	ND	ND	0.3
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.5
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	0.6	0.2	0.2
alpha-Pinene	4.5	8.1	6.2	0.2
beta-Pinene	1.4	2.1	1.7	0.2
3-Carene	ND	2.0	0.4	0.2
Terpenes (Unspecified)	1.9	5.1	3.6	0.2
p-Cymene	0.5	1.6	0.8	0.2
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	7.3	14.0	11.0	0.1
Unknowns as C, lb/hr	ND	0.2	0.1	0.1
Sum of Compounds as C, lb/hr	7.3	14.0	11.0	0.1

ND=Not Detected
DL=Detection Limit

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TABLE 5.2 SUMMARY OF METALS EMISSIONS

Mill: CHAMPION-SHELDON
Source Code: CS-SDTV
FIN: 5000 EPN: E41

Source: Smelt-Dissolving Tank Vent
Test Dates: 6/21/92
CIN: EC14, EC21

	RUN 1	RUN 2	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	180	181	180	
Volumetric Flow Rate, x 10^3 DSCFM	10.4	10.4	10.4	
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	85.4	85.4	85.4	
Metals Emission Rate, x10^{-4}lb/hr				
Antimony (Sb)	ND	ND	ND	2.1
Arsenic (As)	ND	ND	ND	2.1
Barium (Ba)	ND	ND	ND	1700
Beryllium (Be)	ND	ND	ND	2.1
Cadmium (Cd)	ND	ND	ND	2.1
Chromium (Cr)	ND	ND	ND	4.3
Copper (Cu)	4.3	2.6	3.5	2.1
Lead (Pb)	ND	ND	ND	4.3
Manganese (Mn)	23.0	15.0	19.0	4.3
Mercury (Hg)	ND	ND	ND	2.1
Nickel (Ni)	3.4	3.4	3.4	2.1
Phosphorus (P)	60.0	43.0	51.5	43
Silver (Ag)	ND	ND	ND	2.1
Selenium (Se)	ND	ND	ND	2.1
Thallium (Tl)	ND	ND	ND	2.1

ND = Not Detected
DL = Detection Limit

Section 5.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Smelt Dissolving Tank Vent (metals) | FIN: 5000

Source Code: CS-SDTV | Date: 6/9/92 | EPN: E41 | CIN: EC14, 21

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1649	1749	1849	
Flow Data				
Stack Temperature, °F		169		169
Moisture Content, %		40.0		40.0
Oxygen Concentration, %		20.8		20.8
Carbon Dioxide Concentration, %		0.0		0.0
Volumetric Flow Rate, x10^3 ACFM		20.6		20.6
Volumetric Flow Rate, x10^3 DSCFM		10.3		10.3
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	78.9	78.9	78.9	78.9
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	20.9	16.1	16.0	17.7
Emission Rate, lb/hr	1.1	0.9	0.9	1.0
Methyl mercaptan				
Concentration, ppmvd	1.7	1.4	1.5	1.5
Emission Rate, lb/hr	0.1	0.1	0.1	0.1
Dimethyl sulfide				
Concentration, ppmvd	0.9	0.8	0.6	0.8
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Method 18 Data				
Methanol				
Concentration, ppmvd	4.7	4.5	4.2	4.4
Emission Rate, lb/hr	0.2	0.2	0.2	0.2
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON	Source:	Smelt Dissolving Tank Vent (metals)		FIN:	5000
Source Code: CS-SDTV	Date:	6/9/92	EPN: E41	CIN:	EC14, 21

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.7 *	1.7 *	1.7 *	1.7 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Benzene				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.7 *	1.7 *	1.7 *	1.7 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.8 *	3.3	0.8 *	1.4
Emission Rate, lb/hr	0.2 *	0.6	0.2 *	0.3
alpha-Pinene				
Concentration, ppmvd	25.7	25.8	20.5	24.0
Emission Rate, lb/hr	5.6	5.6	4.5	5.2
beta-Pinene				
Concentration, ppmvd	6.5	7.0	6.8	6.8
Emission Rate, lb/hr	1.4	1.5	1.5	1.5
3-Carene				
Concentration, ppmvd	9.3	0.8 *	0.8 *	3.4
Emission Rate, lb/hr	2.0	0.2 *	0.2 *	0.7
Terpenes (Unspecified)				
Concentration, ppmvd	14.0	15.2	8.7	12.6
Emission Rate, lb/hr	3.0	3.3	1.9	2.7

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON		Source:	Smelt Dissolving Tank Vent (metals)		FIN:	5000
Source Code:	CS-SDTV	Date:	6/9/92	EPN: E41	CIN:	EC14, 21

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	7.7	3.0	2.7	4.4
Emission Rate, lb/hr	1.6	0.6	0.6	1.0
Knowns as Carbon				
Concentration, ppmvd	572.8	497.2	377.8	482.6
Unknowns as Carbon				
Concentration, ppmvd	0.8	4.5	0.8	2.1
Sum M18 as Carbon, lb/hr	11.0	9.6	7.3	9.3
Unknown Compounds % of Total	0.1%	0.9%	0.2%	0.4%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	291.7	250.0	281.7	274.4
Emission Rate, lb/hr as C	5.6	4.8	5.4	5.3

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Smelt Dissolving Tank Vent (metals) | FIN: 5000
Source Code: CS-SDTV | Date: 6/17/92 | EPN: E41 | CIN: EC14, 21

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1700	1800	1900	
Flow Data				
Stack Temperature, °F		164		164
Moisture Content, %		36.0		36.0
Oxygen Concentration, %		20.8		20.8
Carbon Dioxide Concentration, %		0.0		0.0
Volumetric Flow Rate, x10^3 ACFM		21.7		21.7
Volumetric Flow Rate, x10^3 DSCFM		11.7		11.7
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	78.0	78.0	85.9	80.6
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	26.2	28.9	29.6	28.2
Emission Rate, lb/hr	1.6	1.8	1.8	1.7
Methyl mercaptan				
Concentration, ppmvd	2.5	3.2	3.9	3.2
Emission Rate, lb/hr	0.2	0.3	0.3	0.3
Dimethyl sulfide				
Concentration, ppmvd	2.1	2.2	2.7	2.3
Emission Rate, lb/hr	0.2	0.2	0.3	0.3
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	0.5	0.5 *	0.5 *	0.3
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Method 18 Data				
Methanol				
Concentration, ppmvd	6.7	5.2	5.8	5.9
Emission Rate, lb/hr	0.4	0.3	0.3	0.3
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON　　Source: Smelt Dissolving Tank Vent (metals)　　FIN: 5000

Source Code: CS-SDTV　　Date: 6/17/92　　EPN: E41　　CIN: EC14, 21

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.6 •	1.6 •	1.6 *	1.6 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Benzene				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 •
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.6 *	1.6 *	1.6 *	1.6 *
Emission Rate, lb/hr	0.5 *	0.5 •	0.5 *	0.5 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.2 •	0.2 *	0.2 *	0.2 *
m-, p-Xylene				
Concentration, ppmvd	0.8 •	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
o-Xylene				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Cumene				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 •	0.2 *
alpha-Pinene				
Concentration, ppmvd	22.0	32.8	31.7	28.9
Emission Rate, lb/hr	5.5	8.1	7.9	7.1
beta-Pinene				
Concentration, ppmvd	6.7	8.6	8.4	7.9
Emission Rate, lb/hr	1.7	2.1	2.1	2.0
3-Carene				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Terpenes (Unspecified)				
Concentration, ppmvd	13.0	20.5	20.2	17.9
Emission Rate, lb/hr	3.2	5.1	5.0	4.4

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON　　Source: Smelt Dissolving Tank Vent (metals)　　FIN: 5000
Source Code: CS-SDTV　　Date: 6/17/92　　EPN: E41　　CIN: EC14, 21

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	2.2	2.7	2.7	2.5
Emission Rate, lb/hr	0.5	0.6	0.6	0.6
Knowns as Carbon				
Concentration, ppmvd	475.8	638.9	627.0	580.6
Unknowns as Carbon				
Concentration, ppmvd	6.9	1.4	1.6	3.3
Sum M18 as Carbon, lb/hr	10.5	14.0	13.7	12.8
Unknown Compounds % of Total	1.4%	0.2%	0.2%	0.6%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	265.6	232.8	178.1	225.5
Emission Rate, lb/hr as C	5.8	5.1	3.9	4.9

• One or more values were less than the detection limit.

WESTON
MANAGERS DESIGNERS-CONSULTANTS

Section 5.2 Emission Test Results - Metals

Mill: Champion-Sheldon
Source: CS-SDTV

Run 1
Sample volume (DSCF)--------- 32.26
Source Vol Flow (DSCFM)------ 10400

		FH+BH Amt (ug)	Conc (lb/DSCF)	Mass Rt. (lb/hr)	Detection Limit(ug)	Det Limit (lb/DSCF)	Det Limit (lb/hr)
Antimony	Sb	*	0.0E+00	0.0E+00	5	3.4E-10	2.1E-04
Arsenic	As	*	0.0E+00	0.0E+00	5	3.4E-10	2.1E-04
Barium	Ba	*	0.0E+00	0.0E+00	4000	2.7E-07	1.7E-01
Beryllium	Be	*	0.0E+00	0.0E+00	5	3.4E-10	2.1E-04
Cadmium	Cd	*	0.0E+00	0.0E+00	5	3.4E-10	2.1E-04
Chromium	Cr	*	0.0E+00	0.0E+00	10	6.8E-10	4.3E-04
Copper	Cu	10	6.8E-10	4.3E-04	5	3.4E-10	2.1E-04
Lead	Pb	*	0.0E+00	0.0E+00	10	6.8E-10	4.3E-04
Manganese	Mn	55	3.8E-09	2.3E-03	10	6.8E-10	4.3E-04
Mercury	Hg	*	0.0E+00	0.0E+00	5	3.4E-10	2.1E-04
Nickel	Ni	8	5.5E-10	3.4E-04	5	3.4E-10	2.1E-04
Phosphorus	P	140	9.6E-09	6.0E-03	100	6.8E-09	4.3E-03
Silver	Ag	*	0.0E+00	0.0E+00	5	3.4E-10	2.1E-04
Selenium	Se	*	0.0E+00	0.0E+00	5	3.4E-10	2.1E-04
Thallium	Tl	*	0.0E+00	0.0E+00	5	3.4E-10	2.1E-04

Run 2
Sample volume (DSCF)--------- 32.52
Source Vol Flow (DSCFM)------ 10400

		FH+BH Amt (ug)	Conc (lb/DSCF)	Mass Rt. (lb/hr)	Detection Limit(ug)	Det Limit (lb/DSCF)	Det Limit (lb/hr)
Antimony	Sb	*	0.0E+00	0.0E+00	5	3.4E-10	2.1E-04
Arsenic	As	*	0.0E+00	0.0E+00	5	3.4E-10	2.1E-04
Barium	Ba	*	0.0E+00	0.0E+00	4000	2.7E-07	1.7E-01
Beryllium	Be	*	0.0E+00	0.0E+00	5	3.4E-10	2.1E-04
Cadmium	Cd	*	0.0E+00	0.0E+00	5	3.4E-10	2.1E-04
Chromium	Cr	*	0.0E+00	0.0E+00	10	6.8E-10	4.2E-04
Copper	Cu	6.1	4.1E-10	2.6E-04	5	3.4E-10	2.1E-04
Lead	Pb	*	0.0E+00	0.0E+00	10	6.8E-10	4.2E-04
Manganese	Mn	35	2.4E-09	1.5E-03	10	6.8E-10	4.2E-04
Mercury	Hg	*	0.0E+00	0.0E+00	5	3.4E-10	2.1E-04
Nickel	Ni	8	5.4E-10	3.4E-04	5	3.4E-10	2.1E-04
Phosphorus	P	102	6.9E-09	4.3E-03	100	6.8E-09	4.2E-03
Silver	Ag	*	0.0E+00	0.0E+00	5	3.4E-10	2.1E-04
Selenium	Se	*	0.0E+00	0.0E+00	5	3.4E-10	2.1E-04
Thallium	Tl	*	0.0E+00	0.0E+00	5	3.4E-10	2.1E-04

METALS CALCULATIONS

Client: TPIEC
Location: Champion-Sheldon
WESTON Project No.: 6848-01-01
Source: SDTV

INPUT DATA

Run Number		1	2	3	Mean
Date		6/21/92	6/21/92		---
Time Began		1110	1220		---
Time Ended		1158	1308		---
Sampling Time, min	(Theta)	48	48		48
Stack Diameter, in.	(Dia)	60	60	60	60
Barometric Pressure, in. Hg	(Pb)	30.00	30.00		30.00
Static Pressure, in. H2O	(Pg)	-0.10	-0.10		-0.10
Pitot Tube Coefficient	(Cp)	0.84	0.84		0.84
Meter Correction Factor	(Y)	1.010	1.010		1.010
Nozzle Diameter, in.	(Dn)	0.500	0.500		0.500
Meter Volume, ft^3	(Vm)	34.463	34.773		34.618
Meter Temperature, |F	(tm)	113	114		114
Meter Orifice Pressure, in. H2O	(Delta H)	1.601	1.635		1.618
Volume H2O Collected, mL	(Vlc)	691.4	701.8		696.6
CO2 Concentration, %	(CO2)	0.0	0.0		0.0
O2 Concentration, %	(O2)	20.8	20.8		20.8
Average Sq Rt Velo Head, (in. H2O)^*	((Delta P)^*)avg	0.3118	0.3141		0.3130
Stack Temperature, |F	(ts)	180	181		180
Total Metals Collected, ug					ERR
Moisture Fraction (at Saturation)	(Bws)	NA	NA	NA	

CALCULATED DATA

Stack Area, ft^2	(As)	19.63	19.63	19.63	19.63
Stack Pressure, in. Hg	(Ps)	29.99	29.99	0.00	20.00
Standard Meter Volume, ft^3	(Vmstd)	32.256	32.515	0.000	21.590
Standard Water Volume, ft^3	(Vwstd)	32.544	33.034	0.000	21.859
Moisture Fraction (Measured)	(Bws)	0.502	0.504	ERR	ERR
Moisture Fraction (lower sat/meas)	(Bws)	0.502	0.504	ERR	ERR
Mol. Wt. of Stack Gas, lb/lb-mole	(Ms)	23.4	23.4	ERR	ERR
Average Stack Gas Velocity, ft/sec	(Vs)	21.4	21.6	ERR	ERR
Stack Gas Flow @ Stack Cond, ft^3/min	(Qa)	2.52E+04	2.54E+04	ERR	ERR
Stack Gas Flow @ Std Cond, ft^3/min	(Qs)	1.04E+04	1.04E+04	ERR	ERR
Isokinetic Sampling Rate, %	(%I)	93	94	ERR	ERR
Metals Concentration, lb/ft^3		0.00E+00	0.00E+00	ERR	ERR

Blanks for the Multimetals Train. Three blanks were collected during the study. One was collected at Champion-Lufkin and two at Champion-Sheldon. These blanks were used to correct all samples.

		CL Blank Front(ug)	CS Blk 1 Front(ug)	CS Blk 2 Front(ug)	Front Blk(ug)
Antimony	Sb	0.7	0.5 *	0.5 *	0 *
Arsenic	As	3.9	0.8	0.8	1
Barium	Ba	2476	2 *	3742	2073
Beryllium	Be	0.2	0.2 *	0.3	0 *
Cadmium	Cd	0.5	0.4 *	1.4	0 *
Chromium	Cr	9.4	1.2 *	9.3	6.4
Copper	Cu	1.6	1.5 *	1.5 *	0 *
Lead	Pb	10.8	0.3	5.2	5.4
Manganese	Mn	4.4	1 *	4.5	3.1
Mercury	Hg	0.4 *	0.4 *	0.4 *	0 *
Nickel	Ni	2 *	2 *	2 *	0 *
Phosphorus	P	22.6	50 *	53.4	34.7
Silver	Ag	8.3	0.7 *	0.7 *	0 *
Selenium	Se	0.5	0.4 *	0.4 *	0 *
Thallium	Tl	1	0.5	0.7	0 *

The * beside a value means that the analytical value was less than the detection limit for the analysis. The front and the back blank (right column) was developed from the average for most metals. The 8.3 ug from the CL blank was not used because it was unexplainably high.

		CL Blank Back(ug)	CS Blk 1 Back(ug)	CS Blk 2 Back(ug)	Back Blk(ug)
Antimony	Sb	1 *	1 *	0.7 *	0 *
Arsenic	As	1 *	0.5	0.3 *	0 *
Barium	Ba	3.8 *	0.4 *	2.6 *	0 *
Beryllium	Be	0.4 *	0.4 *	0.3 *	0 *
Cadmium	Cd	0.8	1.4	1	1
Chromium	Cr	2.3 *	2.4 *	1.6 *	0 *
Copper	Cu	2.9 *	3 *	2 *	0 *
Lead	Pb	1.5	0.4 *	0.6	0.8
Manganese	Mn	1.9 *	2 *	1.3 *	0 *
Mercury	Hg	0.8 *	0.8 *	1.1	0 *
Nickel	Ni	3.8 *	4 *	2.6 *	0 *
Phosphorus	P	188	100 *	26 *	100 *
Silver	Ag	1.3 *	1.4 *	0.9 *	0 *
Selenium	Se	1 *	0.8 *	0.5 *	0 *
Thallium	Tl	1.9 *	0.4 *	0.3 *	0 *

BAF 9/7/92

TRIANGLE LABORATORIES of RTP, INC.

PO BOX 13485
RTP, NC 27709

Project: 21359 Date in: 06-Jul-92
Weston Date out: 04-Aug-92

CASE NARRATIVE

Overview

This project involves the analysis of 5 Multi-Metals Trains of which one is the Train Blank, for Ag, As, Ba, Be, Cd, Cr, Cu, Hg, Mn, Na, Ni, P, Pb, Sb, Se, and Tl. The Multi-Metal analysis was conducted according to the protocol described in sections 5-7 of the EPA Draft Document *"Methodology for the Determination of Metals Emissions in Exhaust Gases from Hazardous Waste Incineration and Similar Combustion Processes."*

Preparation

MMTL samples were prepared by microwave and hotplate digestion, as required by the contract. Detailed flow charts of the sample preparation are included with this report.

Analysis

Ag, Ba, Be, Cd, Cr, Cu, Mn, Ni, and P concentrations were determined by Inductively Coupled Plasma (ICP) Emission Spectroscopy. As, Pb, Sb, Se, and Tl concentrations were determined by Graphite Furnace AA (GFAA). Those analytes which failed the postdigestion spike requirement during GFAA analysis were redetermined by MSA. Hg concentrations were determined by Cold Vapor AA (CVAA). Na concentrations were determined by Flame AA.

Results

There were three results that were unobtainable for this project due to sample matrix interference. Se for samples SDTV-2BH, RF-1BH, and RF-2BH. These samples were analyzed by MSA several times for Se. A dilution of the samples would not help due to the fact that the samples absorptions are already at zero.

%RPD:

All of the applicable %RPD were within control limits of 25% except 1METL-1BH for Ag, Cd, and P. However in these cases the %RPD is not considered a valid parameter because the concentration of the sample and duplicate is less than four times the instrument detection limit.

%REC:

Any postdigestion spike results that were less than 75%REC resulte in all samples related to that spike being reanalyzed by Method of Standard Addition (MSA).

Hg:

All of the Hg %RPD and %REC were within control limits except the %RPD for SDTV-2BH, RF-2 5A, RF-2 5B, MM-5 BLK 5B, and MM-5 BLK 5C. In these cases, except RF-2 5A, the Hg was detected in the sample but not in the duplicate. All of these QC parameters are not considered valid since the Hg concentration in the sample and duplicate is less than four times the detection limit. The undetected result for the duplicate is the reported result. The average Total ug result was reported for RF-2 5A.

The Raw data for this report includes TLI Project #21259.

TRIANGLE LABORATORIES of RTP, INC.
PO BOX 13485
RTP, NC 27709

INORGANICS ANALYSIS REPORT

TLI PROJECT #: 21359
CLIENT: WESTON
DATE RECIEVED: 07/06/92
DATE REPORTED: 08/04/92

RESULTS REPORTED IN TOTAL ug

CLIENT SAMPLE ID	Ag	As	Ba	Be	Cd	Cr	Cu	Mn	Na	Ni	P	Pb	Sb	Se	Tl
SDTV-1 FH	1.05	1.79	14.7	<.200	.649	7.14	8.84	56.2	254,000	7.11	125	2.9	1.37	<.400	.530
SDTV-1 BH	<.830	.379	< 2.37	<.237	<.474	<1.42	<1.78	1.80	137	<2.37	80.0	1.97	<.593	<.474	<.237
SDTV-2 FH	3.03	1.29	12.8	<.200	1.75	4.31	5.11	35.5	180,000	6.73	87.1	2.63	1.24	<.400	.570
SDTV-2 BH	<.871	1.27	< 2.49	<.249	1.39	<1.49	<1.87	2.08	93.9	<2.49	37.9	1.68	<.622	*	<.249
RF-1 FH	<.700	1.58	337	<.200	.744	<1.20	2.91	2.15	9,610	<2.00	66.1	3.64	<.500	<.400	.260
RF-1 BH	<.924	1.11	< 2.64	<.264	18.4	<1.58	<1.98	71.2	135	<2.64	60.2	.911	<.660	*	<.264
RF-2 FH	.992	2.13	687	<.200	.438	<1.20	6.00	2.83	19,400	<2.00	95.5	5.49	<.500	<.400	.700
RF-2 BH	<.911	.755	< 2.60	<.260	.708	<1.56	<1.95	59.1	80.5	<2.60	36.8	.781	<.651	*	<.260
MM-5 BLK FH	<.700	.850	3,742	.329	1.39	9.34	<1.50	4.51	58,900	<2.00	53.4	5.21	<.500	<.400	.730
MM-5 BLK BH	<.916	<.262	< 2.62	<.262	1.03	<1.57	<1.96	<1.31	133	<2.62	<26.2	.602	<.654	<.523	<.262

QC SUMMARY: %RPD or %REC

CLIENT SAMPLE ID	Ag	As	Ba	Be	Cd	Cr	Cu	Mn	Na	Ni	P	Pb	Sb	Se	Tl
1METL-1 FH(D)	8.84%	N/A	3.15%	N/A	1.74%	18.2%	2.30%	.65%	N/A	N/A	1.77%	N/A	N/A	N/A	N/A
1METL-1 BH(D)	200%	N/A	N/A	N/A	200%	14.6%	N/A	8.14%	N/A	N/A	74.6%	N/A	N/A	N/A	N/A
SDTV-1 FH(S)	N/A	9.50%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	44.8%	112%	N/A	43.0%
SDTV-1 BH(S)	N/A	46.0%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	93.6%	87.4%	N/A	84.7%

INORGANICS ANALYSIS REPORT

Hg RESULTS

	SDTV-1 FH	SDTV-1 BH	SDTV-1 5A	SDTV-1 5B	SDTV-1 5C
AVG TOTAL ug	.440	3.45	<.400	<1.60	<.902
%RPD	18.2%	22.2%	N/A	N/A	N/A

	SDTV-2 FH	SDTV-2 BH	SDTV-2 5A	SDTV-2 5B	SDTV-2 5C
AVG TOTAL ug	.520	<2.75	<.408	<1.52	<.848
%RPD	.00%	N/A	N/A	N/A	N/A

	RF-1 FH	RF-1 BH	RF-1 5A	RF-1 5B	RF-1 5C
AVG TOTAL ug	.430	2.35	<.412	<1.20	<.800
%RPD	4.65%	3.51%	N/A	N/A	N/A

	RF-2 FH	RF-2 BH	RF-2 5A	RF-2 5B	RF-2 5C
AVG TOTAL ug	.930	2.50	.560	<1.03	<.888
%RPD	6.45%	.00%	28.6%	N/A	N/A

	MM-5 BLK FH	MM-5 BLK BH	MM-5 BLK 5B	MM-5 BLK 5C
AVG TOTAL ug	<.400	1.10	<.480	<.400
%RPD	N/A	7.69%	N/A	N/A

	% REC
STVD-1 BH	107%

DESCRIPTION OF ABBREVIATIONS

ICV=Initial Calibration Verification
ICB=Initial Calibration Blank
CCV=Continuing Calibration Verification
CCB=Continuing Calibration Blank
PBW=Preparation Blank Water
PBS=Preparation Blank Soil
LCS=Laboratory Control Spike
ICSA=Interference Check Sample(Solution A) I=Initial F=Final
ICSAB=Interference Check Sample(Solution AB) I=Initial F=Final
Solution A contains common interferents, while Solution AB contains the interferents plus the analyte in question.
CRDL=Contract Required Detection Limit (for CLP)
IDL=Instrument Detection Limit
CRI=CRDL Standard for ICP I=Initial F=Final
CRA=CRDL Standard for AA I=Initial F=Final
%RPD=Relative Percent Difference
%REC=% Recovery
SPK=Spike
AMT=Amount
BLK=Blank
MSA=Method of Standard Additions

CALCULATIONS

MMTL TRAINS:

ICP & GFAA

$$\text{FH \& BH TOTAL ug} = \frac{[\text{ug/L}] * (\text{mL TV/mL USED}) * (\text{mL FV} * \text{DF})}{1000}$$

FLAA

$$\text{FH \& BH TOTAL ug} = [\text{ug/L}] * (\text{mL TV/mL USED}) * (\text{mL FV} * \text{DF})$$

FV=FINAL VOLUME DF=DILUTION FACTOR
WT=WEIGHT TV=TOTAL VOLUME
BV=BEGINNING VOLUME

Hg

MMTL Trains:

FH TOTAL ug = [ug/L] * (ml FV/ml aliquot) * MPV * (DF)

BH TOTAL ug = [ug/L] * (ml TV/ml aliquot) * MPV * (DF)

MMTL Impingers:

TOTAL ug = [ug/L] * (ml TV/ml aliquot) * MPV * (DF)

MPV = Mercury Preparation Volume, which is always 0.1L

$$\%RPD = \frac{|SR - DR|}{(SR + DR)/2} * 100$$

$$\%REC = \frac{SSR - SR}{SA} * 100$$

SR=SAMPLE RESULT DR=DUPLICATE RESULT
SSR=SPIKE SAMPLE RESULT SA=SPIKE ADDED

Metals Data

Mill CS　　Run no 1　　Sample Volume (DSCF) 32.26

Source SDTV　　Run Date 6/21/92　　Source Vol Flow (DSCFM) 10,400

		MEAS FH (µg)	FH Blk Corr (µg)	FH Corr Amt (µg)		Meas BH (µg)	BH Blk Corr (µg)	BH Corr Amt (µg)		FH + BH Amt (µg)	Detection Limit (µg)
Antimony	Sb	1.4	0	1.4		<0.6	0	<0.6		2	5
Arsenic	As	1.8	1.0	0.8		0.4	0	0.4		1	5
Barium	Ba	14.7	2073	<2073		<2.4	0	<2.4		<1038	4000
Beryllium	Be	<0.2	0	<0.2		<0.2	0	<0.2		<1	5
Cadmium	Cd	0.6	1.4	<1		<0.5	1.0	<1		<1	5
Chromium	Cr	7.1	6.4	0.7		<1.4	0	<1.4		1	10
	+6										
Copper	Cu	8.8	0	8.8		<1.8	0	<1.8		10	5
Lead	Pb	2.9	5.4	<5.0		2.0	0.8	1.2		4	10
Manganese	Mn	56.2	3.1	53.1		1.8	0	1.8		55	10
Mercury	Hg	0.4	0	0.4		4.7	0	4.7		5	5
Nickel	Ni	7.1	0	7.1		<2.4	0	<2.4		8	5
Phosphorus	P	125	34.7	90.3		80	100	<100		140	100
Silver	Ag	1.1	0	1.1		<0.8	0	<0.8		2	5
Selenium	Se	<0.4	0	<0.4		<0.5	0	<0.5		<1	5
Thallium	Tl	0.5	0	0.5		<0.2	0	<0.2		<1	5

Blank is ~ mean of 3 blanks for project
See notes by Bruce dated 9/3/92.

Metals Data

Mill CS — Run no 2 — Sample Volume (DSCF) 32.52

Source SDTV — Run Date 6/21/92 — Source Vol Flow (DSCFM) 10,400

		MEAS FH (µg)	FH Blk Corr (µg)	FH Corr Amt (µg)	meas BH (µg)	BH Blk Corr (µg)	BH Corr Amt (µg)	FH + BH Amt (µg)	Detection Limit (µg)
Antimony	Sb	1.2	0	1.2	<0.6	0	<0.6	2	5
Arsenic	As	1.3	1.0	0.3	1.3	0	1.3	2	5
Barium	Ba	12.8	2073	<2073	<2.5	0	<2.5	1038	4000
Beryllium	Be	<0.2	0	<0.2	<0.2	0	<0.2	<1	5
Cadmium	Cd	1.8	1.4	0.4	1.4	1.0	0.4	<1	5
Chromium	Cr	4.3	6.4	<6.0	<1.5	0	<1.5	3.8	10
	+6								
Copper	Cu	5.1	0	5.1	<1.9	0	<1.9	6.1	5
Lead	Pb	2.6	5.4	<5.0	1.7	0.8	0.9	<1	10
Manganese	Mn	35.5	3.1	32.4	2.1	0	2.1	35	10
Mercury	Hg	0.5	0	0.5	2.8	0	2.8	3	5
Nickel	Ni	6.7	0	6.7	<2.5	0	<2.5	8	5
Phosphorus	P	87.1	34.7	52.4	37.9	100	<100	102	100
Silver	Ag	3.0	0	3.0	<0.9	0	<0.9	4	5
Selenium	Se	<0.4	0	<0.4	—	0	—	<1	5
Thallium	Tl	0.6	0	0.5	<0.2	0	<0.2	<1	5

Blank is ~ mean of 3 blanks for project
See notes by Bruce dated 9/3/92.

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Section 5.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

SOURCE CS-SDTV

QUALITY CONTROL SUMMARY
METHOD 25A

1. CALIBRATION

THEOR	6/9/92		6/17/92	
ppm	ppm	%ERR	ppm	%ERR
0.0	-136.0	9.0	-54.0	3.6
36.0	30.0	-0.4	3.0	2.2
244.0	242.0	10.0	347.0	6.8
1506.0	1496.0	-0.7	1490.0	-1.1
CORR COEFF	0.9873		0.9952	

2. PROPANE LINE RECOVERY

	DATE	6/9/92		DATE	6/17/92	
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	** 91	85.7	94.0%			#DIV/0!
AFTER	92.0	87.0	94.6%	1479.0	1453.0	98.2%

** Theor - not analyzed by instrument

3. LINE BLANK

	6/9/92	6/17/92
	ppm	ppm
BEFORE	3.2	8
AFTER	3.5	1

*Not performed

SOURCE CS-SDTV

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR ppm	DATE 6/9/92 ppm	%REC	DATE 6/17/92 ppm	%REC
ethanol	52.0	39.6	76.2%	50.0	96.1%
acetone	41.6	25.2	60.6%	43.3	104.3%
isopropanol	39.9	36.9	92.5%	36.0	90.4%
dimethyl sulfide	9.1	8.2	90.1%	8.7	95.6%
benzene	34.2	20.8	60.9%	34.0	99.7%
bromodichloromethane	18.8	15.9	84.6%	17.1	91.0%
dimethyl disulfide	33.9	29.1	85.7%	31.8	93.8%
toluene	28.7	24.2	84.2%	27.4	95.3%
ethyl benzene	24.9	22.0	88.4%	24.3	97.5%
m-xylene	49.8	46.2	92.8%	49.8	100.0%
o-xylene	25.0	22.2	88.7%	23.9	95.7%
cumene	21.9	18.9	86.2%	20.8	94.9%
alpha-pinene	19.2	16.6	86.7%	18.3	95.8%
beta-pinene	19.2	16.3	84.6%	18.0	93.4%
3-carene	19.3	16.0	82.9%	17.4	90.5%
p-cymene	19.6	16.7	85.5%	17.3	88.2%

2. PROPANE RESPONSE

	THEOR		%REC		%REC
BEFORE	36.0	37.8	105.0%	35.8	99.4%
AFTER	36.0	37.8	105.0%	36.5	101.4%

3. METHANOL LINE RECOVERY

	6/9/92			6/17/92		
	GC	LINE	%REC	GC	LINE	%REC
BEFORE	11.6	11.8	101.7%	11.3	11.3	100.0%
AFTER	9.4 •			17.4	16.6	95.4%

4. LINE BLANK

	[--------------FILE REF--------------]	
BEFORE	F9B2006	FHB2010
AFTER	FAB2004	FKB2016

• Not performed

SOURCE CS-SDTV

QUALITY CONTROL SUMMARY
METHOD 16

1. CALIBRATION

ANALYTE	LO ppm	MED ppm	HI ppm	CORR COEFF
6/9/92				
hydrogen sulfide	3.3	5.0	7.8	1.0000
methyl mercaptan	3.1	4.6	7.2	1.0000
dimethyl sulfide	4.2	6.4	10.0	1.0000
carbon disulfide	1.3	2.0	3.2	1.0000
dimethyl disulfide	1.8	2.8	4.3	1.0000
6/17/92 •				
hydrogen sulfide	3.1	5.9	9.5	1.0000
methyl mercaptan	2.8	5.5	8.8	1.0000
dimethyl sulfide	3.9	7.6	12.2	1.0000
carbon disulfide	1.2	2.4	3.8	1.0000
dimethyl disulfide	1.7	3.3	5.3	1.0000

• Calibration from 6/16/92 was checked and used

Section 5.4 Process Operating Data

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(L) WWC 21 September 1992

SMELT DISSOLVING TANK

The smelt dissolving tank on Recovery Furnace is equipped with Munters mist eliminators. The demister uses fresh water as the scrubbing medium. An extra set of showers, located below the eliminators, sprays weak wash to the flue gas. Weak wash, which contains unstripped condensate, is used for dissolving smelt. The fumes from the tall oil plant enter the dissolving tank vent at a point located 10 ft below the bottom showers.

Representative Process Conditions

BLS firing rate : 42 ton bls/hr
Source of scrubbing liquid : Fresh Water (demister), weak wash (bottom showers)
Scrubbing liquid flow rate: 30 gpm
Pressure drop in particulate control device 8 in. H_2O
Particulate control device (e.g., 4 mesh pads, 16" thick, packed scrubber, venturi scrubber, etc.) : Chevron type demister

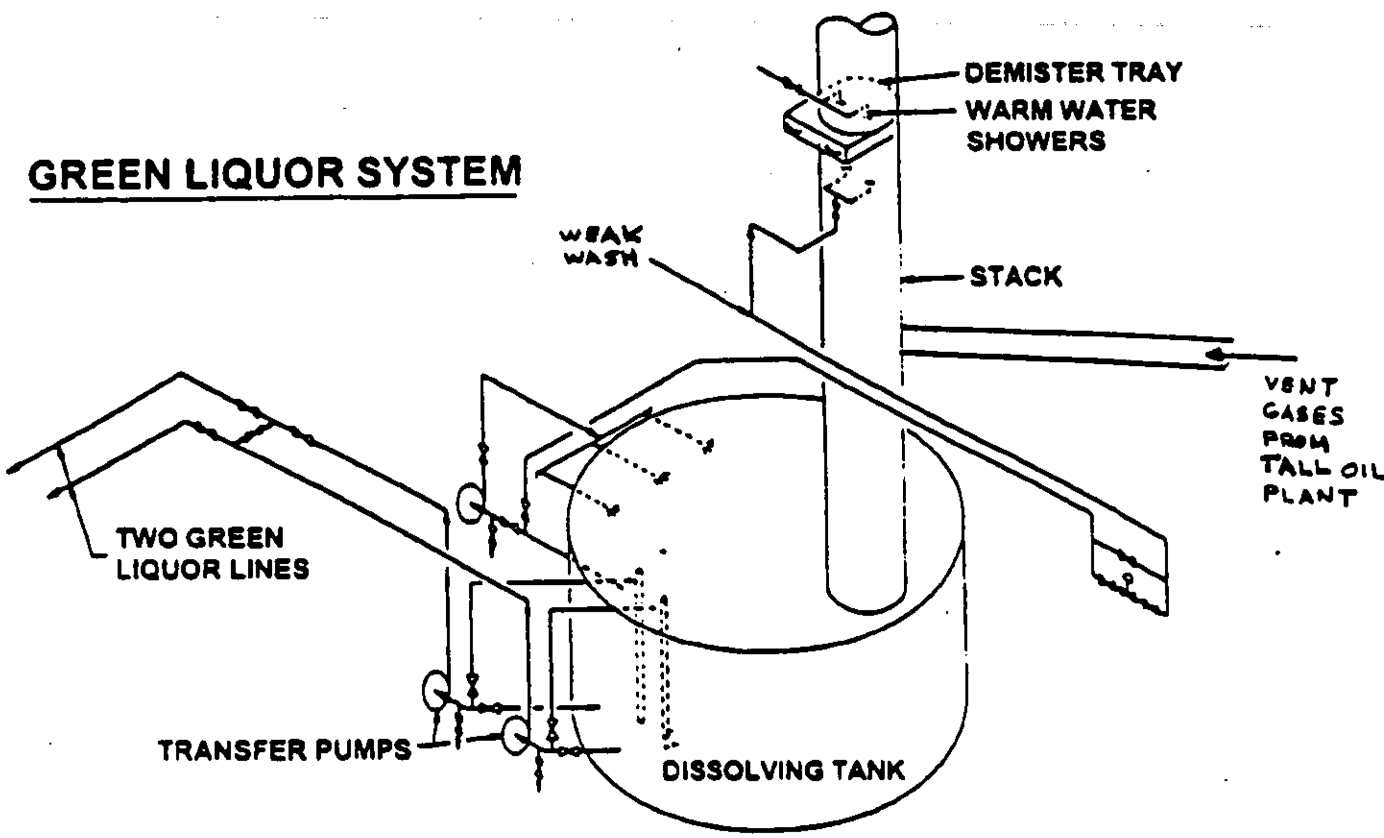

Figure 26 - Green Liquor System

SMELT DISSOLVING TANK - PROCESS OPERATING CONDITIONS

Mill: Sheldon Mill
Source: Smelt Dissolving Tank Vent
FIN: 5000

Source: Recovery
Date: 6-9-92
EPN: E41
CIN: EC14, EC21

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		15:39	16:40	17:40	
BLS Firing Rate	lb BLS/hr	85400.00	78900.00	78900.00	0.00
Source of Disolving Water			Weak Wash		0.00
Source of Scrubber Water			Weak Wash and Water		0.00
Scrubbing Water Flow Rate	GPM	29.0	29.0	29.0	0.00
Scrubber Pressure Drop	in. H2O				0.00
Scrubber Type			Chevron Demister		
Scrubber Water Make-up Rate	GPM				0.00
Scrubber Water Recirc Rate	GPM				0.00

SMELT DISSOLVING TANK - PROCESS OPERATING CONDITIONS

Mill: Sheldon Mill
Source: Smelt Dissolving Tank Vent
FIN: 5000

Source:Recovery
Date: 6-9-92
EPN:E41

CIN:EC14, EC21

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		18:40			
BLS Firing Rate	lb BLS/hr	78900.00			0.00
Source of Disolving Water		Weak Wash			0.00
Source of Scrubber Water		Weak Wash and Water			0.00
Scrubbing Water Flow Rate	GPM	29.0			0.00
Scrubber Pressure Drop	in. H2O				0.00
Scrubber Type		Chevron Demister			
Scrubber Water Make-up Rate	GPM				0.00
Scrubber Water Recirc Rate	GPM				0.00

SMELT DISSOLVING TANK - PROCESS OPERATING CONDITIONS

Mill: Sheldon Mill
Source: Smelt Dissolving Tank Vent
FIN: 5000

Source: Recovery
Date: 6-17-92
EPN: E41
CIN: EC14, EC21

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		17:00	18:00	19:00	
BLS Firing Rate	lb BLS/hr	78000.00	78000.00	85900.00	0.00
Source of Disolving Water			Weak Wash		0.00
Source of Scrubber Water			Weak Wash and Water		0.00
Scrubbing Water Flow Rate	GPM	29.0	29.0	29.0	0.00
Scrubber Pressure Drop	in. H2O				0.00
Scrubber Type			Chevron Demister		
Scrubber Water Make-up Rate	GPM				0.00
Scrubber Water Recirc Rate	GPM				0.00

SMELT DISSOLVING TANK - PROCESS OPERATING CONDITIONS

Mill: Sheldon Mill
Source: Smelt Dissolving Tank Vent
FIN: 5000

Source: Recovery
Date: 6-21-92
EPN: E41
CIN: EC14, EC21

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		11:10	12:20		
BLS Firing Rate	lb BLS/hr	85400.00	85400.00		0.00
Source of Disolving Water			Weak Wash		0.00
Source of Scrubber Water			Weak Wash and Water		0.00
Scrubbing Water Flow Rate	GPM	29.0	29.0		0.00
Scrubber Pressure Drop	in. H2O				0.00
Scrubber Type			Chevron Demister		
Scrubber Water Make-up Rate	GPM				0.00
Scrubber Water Recirc Rate	GPM				0.00

6. CS-BB1/1

SECTION 6

NO. 1 BARK BOILER WITH SLUDGE

(CS-BB1/1)

SECTION 6
NO. 1 BARK BOILER WITH SLUDGE
(CS-BB1/1)

The No. 1 Bark Boiler with sludge was tested on two different days for volatile organic compounds by M18 and M25A. VOST and Semi-VOST were each monitored once. In addition, this source was tested for aldehydes and ketones, hydrogen chloride, sulfuric acid mist and metals.

Total Hydrocarbons (M25A)

Figures 6.1, 6.2, 6.3 and 6.4 present the THC trends for operation with condensate on 6/6/92 and 6/8/92, and without condensate on 6/8/92 and 6/9/92. When the Bark Boiler was operated with condensate, the THC levels were in the 60-70 ppm range. The results for the two days were comparable. When the unit was operated without condensate, the THC levels were well below 10 ppm. We have no explanation for the high spike in the THC emissions on 6/8/92.

Volatile Organic Compounds (M18)

Tables 6.1A and 6.1B summarize the results for the Method 18 target compounds; Section 6.1 is a tabulation of the data. TRS was not analyzed. The volumetric flow was measured during sampling with a pitot tube. Operating with condensate, the emissions consisted largely of methanol, with traces of ethanol. No other target compounds were present. (Table 6.1A).

Without condensate, no target compounds were identified. (Table 6.1B).

Volatile Organic Sampling Train (VOST)

Table 6.2 summarizes the result of the VOST sample collected with sludge and with condensate on 6/8/92. Section 6.2 tabulates the results for target compounds and tentatively identified compounds (TIC). Since the reportable levels by VOST are much lower than those reported by M18, a number of compounds were identified by VOST and by M18 but below the 0.5 ppm cut off for the M18 summary. Acetone, dimethyl sulfide, and benzene fall into this category.

Semivolatile Organic Compounds (MM5)

Table 6.3 summarizes the result of the semivolatile organic compounds sample collected using the Modified Method 5 (MM5) train on 6/6/92. Section 6.3 tabulates the results of the target compounds and the tentatively identified compounds (TICs) from the gas chromatography-mass spectrometry (GC-MS) analysis. The predominant compounds are a-Terpineol, a-Pinene and B-Pinene. Naphthalene is a background contaminant in the XAD-2 resin.

Miscellaneous Parameters

Table 6.4 summarizes the results of testing for aldehydes, hydrogen chloride, chloroform, and sulfuric acid mist. Section 6.4 tabulates the results for each compound. The aldehydes and ketones were sampled only under the condition of condensate. On 6/6/92, no aldehydes or ketones were found. However, on 6/8/92, several of the target compounds were present at low levels. Hydrogen chloride was present on both days. Sulfuric acid was non-detectable on 6/17/92.

Metals

Tables 6.5A and 6.5B summarize the results of the samples collected for metals and hexavalent chromium analyses, respectively. Section 6.5 tabulates the results for each compound. The predominant metals in the emissions were phosphorus and copper. A trace amount of hexavalent chromium was detected.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 6.6. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 6.7 includes the process operating data as recorded and provided by mill personnel.

FIGURE 6.1
THC TREND ANALYSIS (6/6/92)
NO.1 BARK BOILER WITH SLUDGE WITH
CONDENSATE (CS-BB1/1)

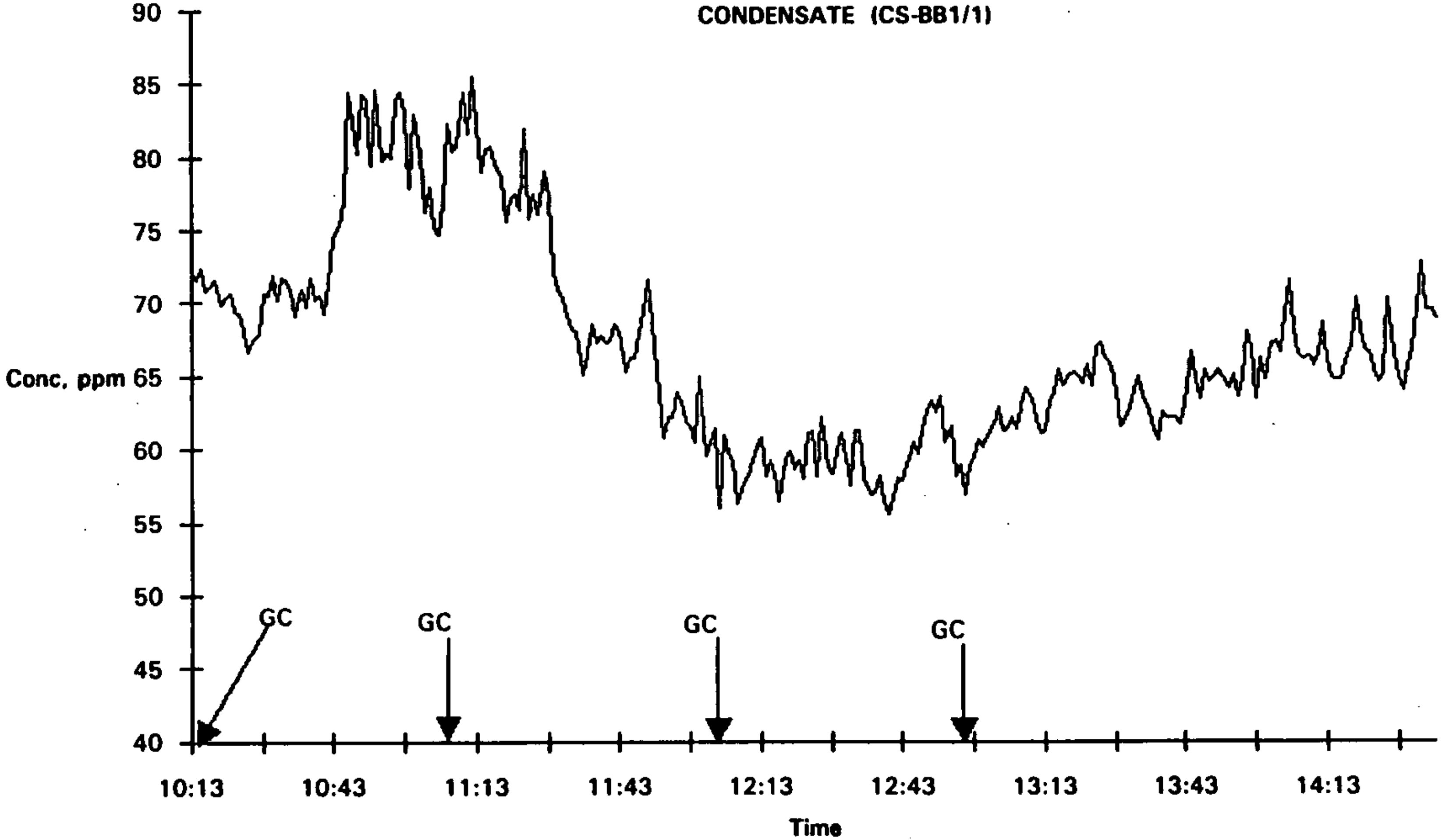

FIGURE 6.2
THC TREND ANALYSIS (6/8/92)
NO.1 BARK BOILER WITH SLUDGE WITH
CONDENSATE (CS-BB1/1)

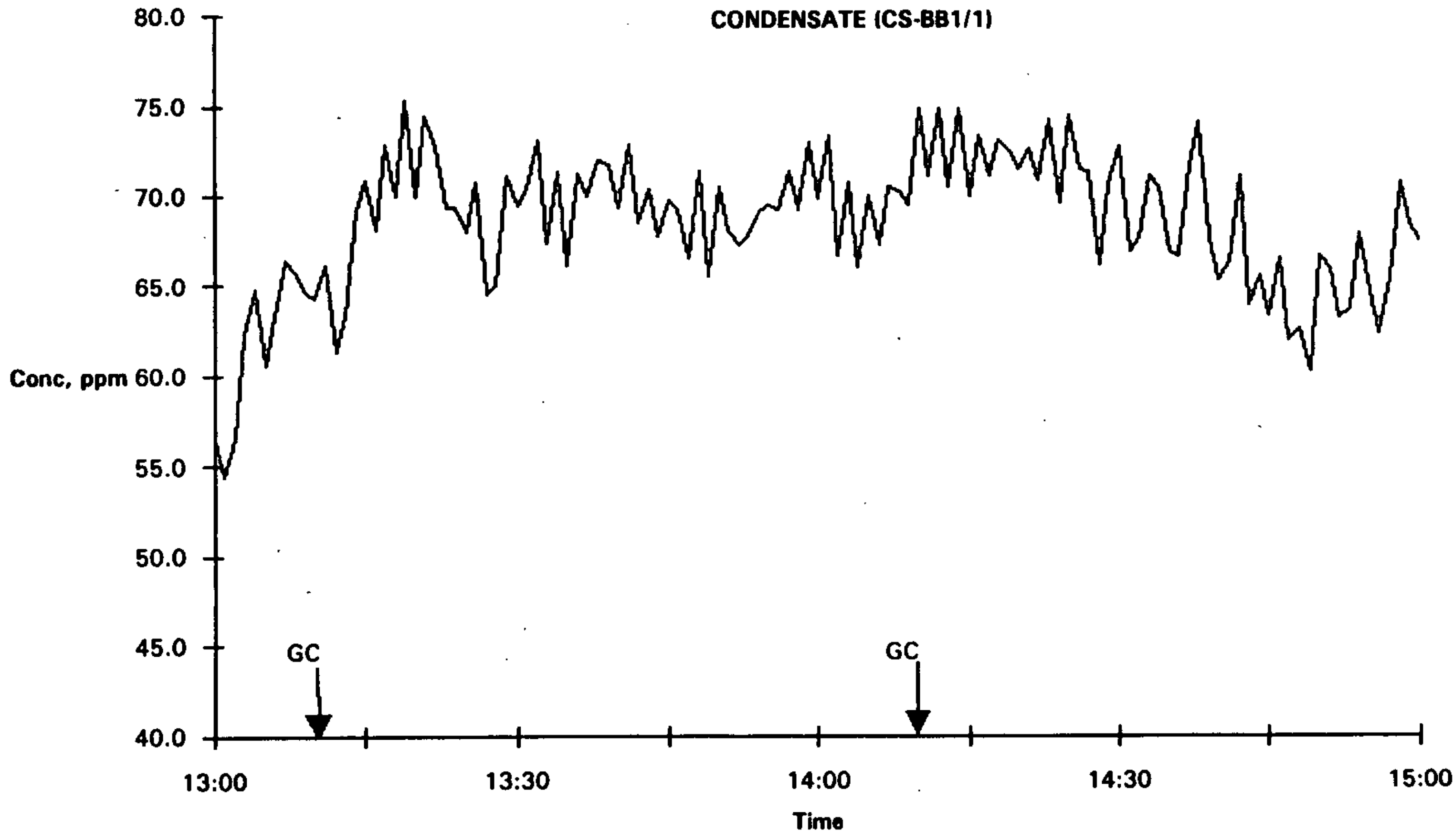

FIGURE 6.3

THC TREND ANALYSIS (6/8/92)
NO.1 BARK BOILER WITH SLUDGE WITHOUT
CONDENSATE (CS-BB1/1)

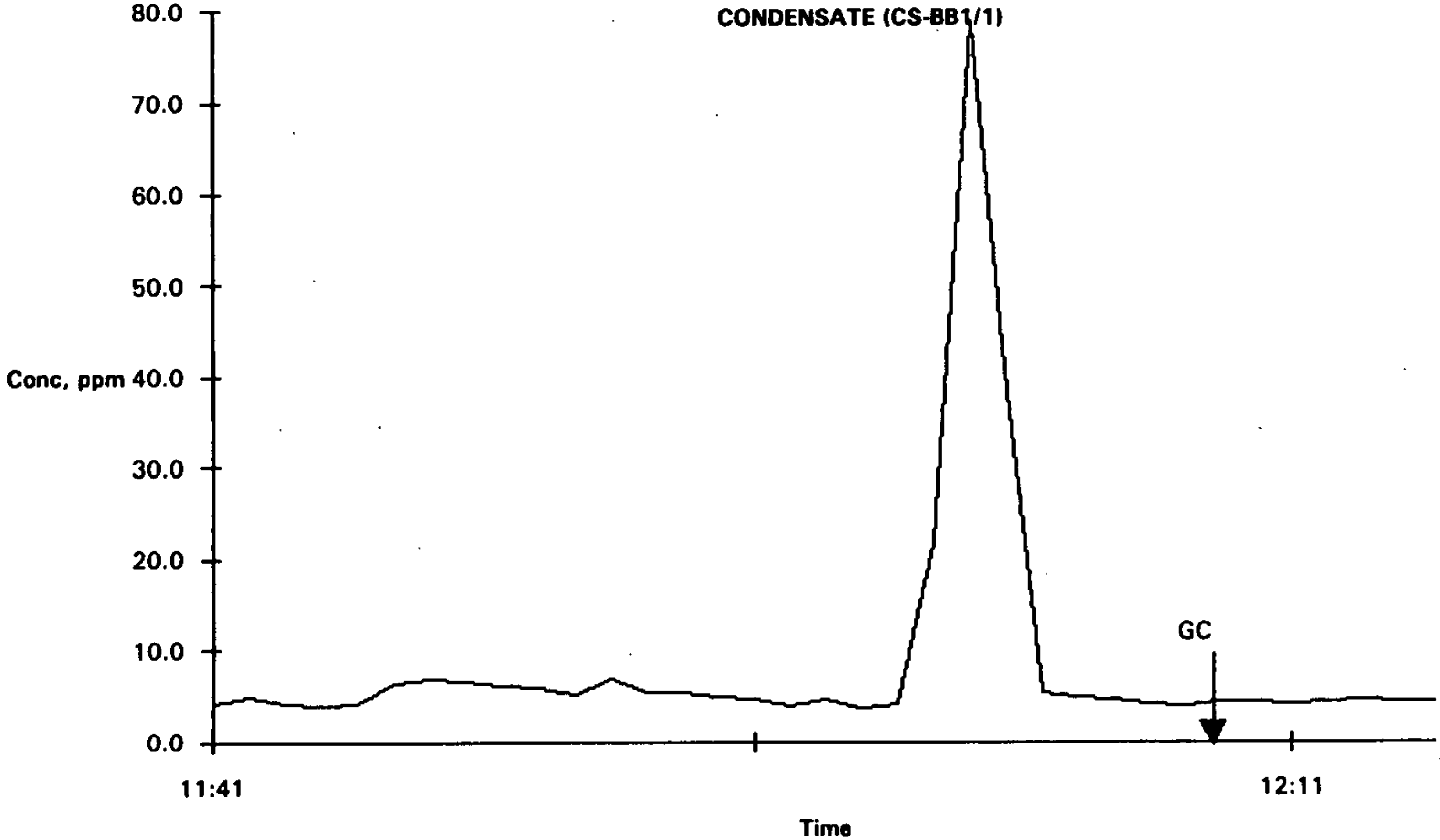

FIGURE 6.4

THC TREND ANALYSIS (6/9/92)
NO.1 BARK BOILER WITH SLUDGE WITHOUT
CONDENSATE (CS-BB1/1)

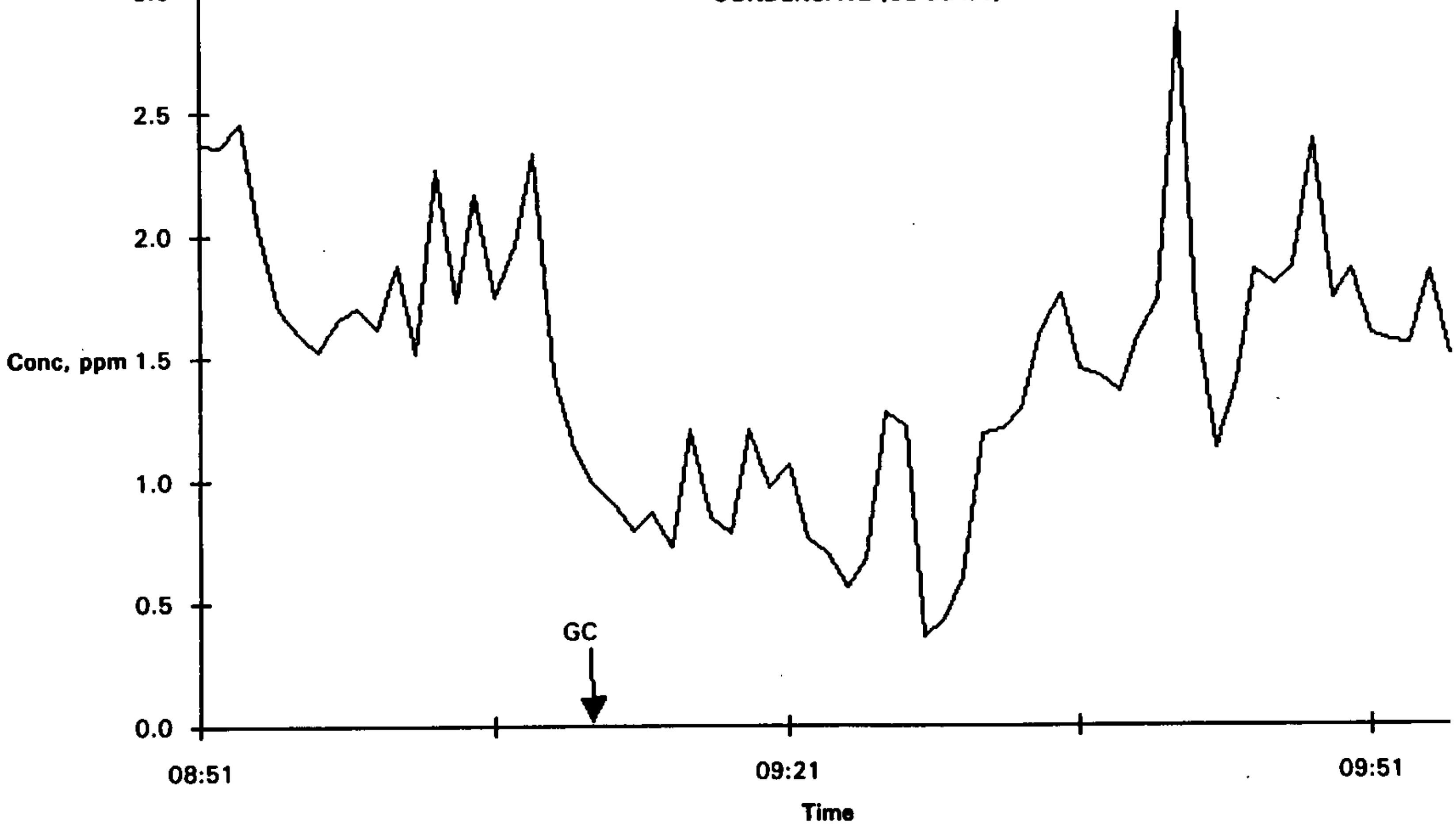

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TABLE 6.1A SUMMARY OF VOC RESULTS

Mill: CHAMPION - SHELDON
Source Code: CS-BB1/1
FIN: 5200 CIN: EC22, EC21

Source: Bark Boiler w/Sludge w/Condensate
Test Dates: 6/6/92 6/8/92
EPN: E40

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	152	154	153	
Volumetric Flow Rate, x10³ DSCFM	46.4	46.8	46.6	
Process Operating Conditions				
Production Rate, x10⁶ BTU/hr	230.0	275.0	255.8	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.2
Dimethyl sulfide				0.2
Carbon disulfide				0.3
Dimethyl disulfide				0.3
Method 18 Data, lb/hr				
Methanol	36.8	42.4	38.6	0.6
Ethanol	0.6	0.9	0.8	0.2
Acetone	ND	ND	ND	0.3
2-Propanol	ND	ND	ND	0.3
2-Butanone	ND	ND	ND	0.4
Chloroform	ND	ND	ND	1.2
Benzene	ND	ND	ND	0.4
Bromodichloromethane	ND	ND	ND	1.6
Toluene	ND	ND	ND	0.5
Ethyl benzene	ND	ND	ND	0.5
m-, p-Xylene	ND	ND	ND	0.5
o-Xylene	ND	ND	ND	0.5
Cumene	ND	ND	ND	0.6
alpha-Pinene	ND	ND	ND	0.7
beta-Pinene	ND	ND	ND	0.7
3-Carene	ND	ND	ND	0.7
Terpenes (Unspecified)	ND	ND	ND	0.7
p-Cymene	ND	ND	ND	0.7
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	10.2	11.8	10.8	0.1
Unknowns as C, lb/hr	ND	0.5	0.2	0.1
Sum of Compounds as C, lb/hr	10.3	12.1	11.0	0.1

ND=Not Detected
DL=Detection Limit

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TABLE 6.1B SUMMARY OF VOC RESULTS

Mill: CHAMPION - SHELDON
Source Code: CS-BB1/3
FIN: 5200 CIN: EC22, EC21

Source: Bark Boiler w/ Sludge w/o Condensate
Test Dates: 6/8/92 6/9/92
EPN: E40

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	152	152	152	
Volumetric Flow Rate, x10^3 DSCFM	46.8	46.8	46.8	
Process Operating Conditions				
Production Rate, x10^6 BTU/hr	255.0	294.0	274.5	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.2
Dimethyl sulfide				0.2
Carbon disulfide				0.3
Dimethyl disulfide				0.3
Method 18 Data, lb/hr				
Methanol	ND	ND	ND	0.6
Ethanol	ND	ND	ND	0.2
Acetone	ND	ND	ND	0.3
Isopropanol	ND	ND	ND	0.3
Methyl ethyl ketone	ND	ND	ND	0.4
Chloroform	ND	ND	ND	1.2
Benzene	ND	ND	ND	0.4
Bromodichloromethane	ND	ND	ND	1.6
Toluene	ND	ND	ND	0.5
Ethyl benzene	ND	ND	ND	0.5
m-, p-Xylene	ND	ND	ND	0.5
o-Xylene	ND	ND	ND	0.5
Cumene	ND	ND	ND	0.6
alpha-Pinene	ND	ND	ND	0.7
beta-Pinene	ND	ND	ND	0.7
3-Carene	ND	ND	ND	0.7
Terpenes (Unspecified)	ND	ND	ND	0.7
p-Cymene	ND	ND	ND	0.7
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	ND	ND	ND	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	ND	ND	ND	0.1

ND=Not Detected
DL=Detection Limit

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TABLE 6.2 SUMMARY OF VOST RESULTS

Mill: CHAMPION-SHELDON
Source Code: CS-BB1/1
FIN: 5200 EPN: E40

Source: Bark Boiler w/Sludge w/Condensate
Test Dates: 6/8/92
CIN: EC22,EC21

TIME	1255
Volumetric Flow Data	
Stack Temperature, °F	152
Volumetric Flow Rate, x 10^3 DSCFM	46.8
Process Operating Conditions	
Production Rate, x10^6 BTU/hr	275.0
Target Compounds, ppm	
Chloromethane	0.356
Bromomethane	0.001
Methylene Chloride	0.012
Acetone	0.067
Carbon Disulfide	0.002
Chloroform	0.018
Dimethyl disulfide	0.013
Dimethyl sulfide	0.259
Iodomethane	0.000
n-Hexane	0.100
2-Butanone (MEK)	0.018
1,1,1-Trichloroethane	0.003
Bromodichloromethane	0.001
Benzene	0.024
Dibromomethane	0.000
Toluene	0.008
Styrene	0.001
m-/p-Xylene	0.001
Acrolein	0.030
Acrylonitrile	0.003
A-Pinene	0.005
B-Pinene	0.001
p-Cymene	0.001

TABLE 6.3 SUMMARY OF SEMIVOLATILE RESULTS

Mill: CHAMPION-SHELDON

Source Code: CS-BB1/1
FIN: 5200 EPN: E40

Source: No. 1 Bark Boiler with Sludge w/Condensate
Test Dates: 6/6/92
CIN: EC22,EC21

TIME	1256
Volumetric Flow Data	
Stack Temperature, °F	154
Volumetric Flow Rate, x 10^3 DSCFM	46.4
Process Operating Conditions	
Production Rate, x10^6 BTU/hr	240.0
Target Compounds, ppm	
a-Pinene	0.005
B-Pinene	0.002
p-Cymene	0.002
Acetophenone	0.002
a-Terpineol	0.009
Naphthalene	0.005
Di-n-butyl phthalate	0.001
2-Methylnaphthalene	0.000
Dibenzofuran	0.000
Phenanthrene	0.000
Butylbenzylphthalate	0.001

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TABLE 6.4 SUMMARY OF MISCELLANEOUS RESULTS

Mill: CHAMPION-SHELDON

Source: No. 1 Bark Boiler with Sludge w/Condensate

Source Code: CS-BB1/1

Test Dates: 6/6/92 6/8/92 6/17/92

FIN: 5200 EPN: E40

CIN: EC22, EC21

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	152	154	153	
Volumetric Flow Rate, x 10^3 DSCFM	44.8	46.8	46.0	
Process Operating Conditions				
Production Rate, 10^6 BTU/hr	240.0	275.0	258.2	
Emission Rate, lb/hr				
Formaldehyde	ND	0.2	0.1	0.1
Acetaldehyde	ND	0.6	0.4	0.2
Acetone (Impinger)	ND	0.8	0.5	0.2
Acetophenone	ND	ND	ND	0.4
2-Butanone (Impinger)	ND	0.4	0.3	0.3
Methyl isobutyl ketone	ND	ND	ND	0.4
Acrolein	ND	ND	ND	0.2
Benzaldehyde	ND	0.5	0.4	0.4
Hydrogen chloride	0.3	0.6	0.5	0.1
Sulfuric Acid Mist	ND	<0.7	0.2	0.1

ND = Not Detected
DL = Detection Limit

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TABLE 6.5A SUMMARY OF METALS EMISSIONS

Mill: CHAMPION-SHELDON

Source: No. 1 Bark Boiler with Sludge w/Condensate

Source Code: CS-BB1/1

Test Dates: 6/17/92

FIN: 5200 EPN: E40

CIN: EC22, EC21

	RUN 1	RUN 2	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	153	152	163	
Volumetric Flow Rate, x 10^3 DSCFM	44.2	44.6	44.4	
Process Operating Conditions				
Production Rate, x10^6 BTU/hr	254.0	270.0	262.0	
Metals Emission Rate, x10^{-4}lb/hr				
Antimony (Sb)	ND	ND	ND	8
Arsenic (As)	9.6	9.6	9.6	8
Barium (Ba)	ND	ND	ND	6400
Beryllium (Be)	ND	ND	ND	8
Cadmium (Cd)	19.0	19.0	19.0	8
Chromium (Cr)	ND	46.0	27.0	16
Copper (Cu)	140.0	110.0	125.0	8
Lead (Pb)	64.0	56.0	60.0	16
Manganese (Mn)	70.0	86.0	78.0	16
Mercury (Hg)	ND	ND	ND	8
Nickel (Ni)	ND	46.0	25.0	8
Phosphorus (P)	1400.0	980.0	1190.0	160
Silver (Ag)	9.6	ND	6.8	8
Selenium (Se)	ND	ND	ND	8
Thallium (Tl)	ND	ND	ND	8

ND = Not Detected
DL = Detection Limit

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TABLE 6.5B SUMMARY OF HEXAVALENT CHROMIUM EMISSIONS

Mill: *CHAMPION-SHELDON*

Source Code: CS-BB1/1
FIN: 5200 EPN: E40

Source: No. 1 *Bark Boiler with Sludge* w/Condensate
Test Dates: 8/21/92
CIN: EC22, EC21

	RUN 1	DL
Volumetric Flow Data		
Stack Temperature, °F	152	
Volumetric Flow Rate, x 10^3 DSCFM	54.5	
Process Operating Conditions		
Production Rate, x10^6 BTU/hr	243.0	
Emission Rate, x10^{-4}lb/hr		
Hexavalent Chromium	2.2	1

ND = Not Detected
DL = Detection Limit

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Section 6.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON	Source: Bark Boiler w/ Sludge w/ Cond.		FIN: 5200
Source Code: CS-BB1/1	Date: 6/6/92	EPN: E40	CIN: EC22, EC21

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1012	1212	1312	
Flow Data				
Stack Temperature, °F			154	154
Moisture Content, %			27.5	27.5
Oxygen Concentration, %			9.5	9.5
Carbon Dioxide Concentration, %			8.5	8.5
Volumetric Flow Rate, x10^3 ACFM			73.3	73.3
Volumetric Flow Rate, x10^3 DSCFM			46.4	46.4
Process Operating Conditions				
Production Rate, x 10^6 BTU/hr	230.0	240.0	240.0	236.7
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	165.8	158.9	183.2	169.3
Emission Rate, lb/hr	38.4	36.8	42.4	39.2
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	2.2	1.9	2.6	2.3
Emission Rate, lb/hr	0.7	0.6	0.9	0.7
Acetone				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
2-Propanol				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Bark Boiler w/ Sludge w/ Cond. | FIN: 5200
Source Code: CS-BB1/1 | Date: 6/6/92 | EPN: E40 | CIN: EC22, EC21

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Chloroform				
Concentration, ppmvd	1.4 *	1.4 *	1.4 *	1.4 *
Emission Rate, lb/hr	1.2 *	1.2 *	1.2 *	1.2 *
Benzene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Bromodichloromethane				
Concentration, ppmvd	1.4 *	1.4 *	1.4 *	1.4 *
Emission Rate, lb/hr	1.6 *	1.6 *	1.6 *	1.6 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Ethyl benzene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
m-, p-Xylene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
o-Xylene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Cumene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.6 *	0.6 *	0.6 *	0.6 *
alpha-Pinene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
beta-Pinene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
3-Carene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON	Source:	Bark Boiler w/ Sludge w/ Cond.		FIN:	5200
Source Code: CS-BB1/1	Date:	6/6/92	EPN: E40	CIN:	EC22, EC21

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
Knowns as Carbon				
Concentration, ppmvd	124.4	117.8	136.4	126.2
Unknowns as Carbon				
Concentration, ppmvd	5.7	2.6	2.8	3.7
Sum M18 as Carbon, lb/hr	11.3	10.5	12.1	11.3
Unknown Compounds % of Total	4.3%	2.2%	2.0%	2.8%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	103.4	82.8	89.7	92.0
Emission Rate, lb/hr as C	9.0	7.2	7.8	8.0

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Bark Boiler w/ Sludge w/ Cond. | FIN: 5200

Source Code: CS-BB1/1 | Date: 6/8/92 | EPN: E40 | CIN: EC22, EC21

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1259	1359	1459	
Flow Data				
Stack Temperature, °F			152	152
Moisture Content, %			26.4	26.4
Oxygen Concentration, %			10.0	10.0
Carbon Dioxide Concentration, %			10.0	10.0
Volumetric Flow Rate, x10^3 ACFM			73.2	73.2
Volumetric Flow Rate, x10^3 DSCFM			46.8	46.8
Process Operating Conditions				
Production Rate, x 10^6 BTU/hr	275.0	275.0	275.0	275.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	159.0	164.1		161.5
Emission Rate, lb/hr	37.2	38.4		37.8
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	2.6	2.7		2.6
Emission Rate, lb/hr	0.9	0.9		0.9
Acetone				
Concentration, ppmvd	0.7 *	0.7 *		0.7 *
Emission Rate, lb/hr	0.3 *	0.3 *		0.3 *
2-Propanol				
Concentration, ppmvd	0.7 *	0.7 *		0.7 *
Emission Rate, lb/hr	0.3 *	0.3 *		0.3 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Bark Boiler w/ Sludge w/ Cond. | FIN: 5200
Source Code: CS-BB1/1 | Date: 6/8/92 EPN: E40 | CIN: EC22, EC21

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.7 *	0.7 *		0.7 *
Emission Rate, lb/hr	0.4 *	0.4 *		0.4 *
Chloroform				
Concentration, ppmvd	1.4 *	1.4 *		1.4 *
Emission Rate, lb/hr	1.2 *	1.2 *		1.2 *
Benzene				
Concentration, ppmvd	0.7 *	0.7 *		0.7 *
Emission Rate, lb/hr	0.4 *	0.4 *		0.4 *
Bromodichloromethane				
Concentration, ppmvd	1.4 *	1.4 *		1.4 *
Emission Rate, lb/hr	1.6 *	1.6 *		1.6 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.7 *	0.7 *		0.7 *
Emission Rate, lb/hr	0.5 *	0.5 *		0.5 *
Ethyl benzene				
Concentration, ppmvd	0.7 *	0.7 *		0.7 *
Emission Rate, lb/hr	0.5 *	0.5 *		0.5 *
m-, p-Xylene				
Concentration, ppmvd	0.7 *	0.7 *		0.7 *
Emission Rate, lb/hr	0.5 *	0.5 *		0.5 *
o-Xylene				
Concentration, ppmvd	0.7 *	0.7 *		0.7 *
Emission Rate, lb/hr	0.5 *	0.5 *		0.5 *
Cumene				
Concentration, ppmvd	0.7 *	0.7 *		0.7 *
Emission Rate, lb/hr	0.6 *	0.6 *		0.6 *
alpha-Pinene				
Concentration, ppmvd	0.7 *	0.7 *		0.7 *
Emission Rate, lb/hr	0.7 *	0.7 *		0.7 *
beta-Pinene				
Concentration, ppmvd	0.7 *	0.7 *		0.7 *
Emission Rate, lb/hr	0.7 *	0.7 *		0.7 *
3-Carene				
Concentration, ppmvd	0.7 *	0.7 *		0.7 *
Emission Rate, lb/hr	0.7 *	0.7 *		0.7 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.7 *	0.7 *		0.7 *
Emission Rate, lb/hr	0.7 *	0.7 *		0.7 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Bark Boiler w/ Sludge w/ Cond. | FIN: 5200
Source Code: CS-BB1/1 | Date: 6/8/92 | EPN: E40 | CIN: EC22, EC21

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.7 *	0.7 *		0.7 *
Emission Rate, lb/hr	0.7 •	0.7 *		0.7 *
Knowns as Carbon				
Concentration, ppmvd	117.8	122.4		120.1
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0		0.0
Sum M18 as Carbon, lb/hr	10.3	10.7		10.5
Unknown Compounds % of Total	0.0%	0.0%		0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	92.4	93.6	91.0	92.3
Emission Rate, lb/hr as C	8.1	8.2	8.0	8.1

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Bark Boiler w/ Sludge w/o Cond. | FIN: 5200
Source Code: CS-BB1/3 | Date: 6/8/92 | EPN: E40 | CIN: EC22, EC21

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1140			
Flow Data				
Stack Temperature, °F	152			152
Moisture Content, %	26.4			26.4
Oxygen Concentration, %	10.0			10.0
Carbon Dioxide Concentration, %	10.0			10.0
Volumetric Flow Rate, x10^3 ACFM	73.2			73.2
Volumetric Flow Rate, x10^3 DSCFM	46.8			46.8
Process Operating Conditions				
Production Rate, x 10^6 BTU/hr	294.0			294.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	2.7 *			2.7 *
Emission Rate, lb/hr	0.6 *			0.6 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	0.2 *			0.2 *
Acetone				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	0.3 *			0.3 *
Isopropanol				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	0.3 *			0.3 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Bark Boiler w/ Sludge w/o Cond. | FIN: 5200
Source Code: CS-BB1/3 | Date: 6/8/92 | EPN: E40 | CIN: EC22, EC21

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl ethyl ketone				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	0.4 *			0.4 *
Chloroform				
Concentration, ppmvd	1.4 *			1.4 *
Emission Rate, lb/hr	1.2 *			1.2 *
Benzene				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	0.4 *			0.4 *
Bromodichloromethane				
Concentration, ppmvd	1.4 *			1.4 *
Emission Rate, lb/hr	1.6 *			1.6 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	0.5 *			0.5 *
Ethyl benzene				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	0.5 *			0.5 *
m-, p-Xylene				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	0.5 *			0.5 *
o-Xylene				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	0.5 *			0.5 *
Cumene				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	0.6 *			0.6 *
alpha-Pinene				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	0.7 *			0.7 *
beta-Pinene				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	0.7 *			0.7 *
3-Carene				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	0.7 *			0.7 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	0.7 *			0.7 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Bark Boiler w/ Sludge w/o Cond. | FIN: 5200
Source Code: CS-BB1/3 | Date: 6/8/92 EPN: E40 | CIN: EC22, EC21

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	0.7 *			0.7 *
Knowns as Carbon				
Concentration, ppmvd	0.7 *			0.7 *
Unknowns as Carbon				
Concentration, ppmvd	0.0			0.0
Sum M18 as Carbon, lb/hr	0.1 *			0.1 *
Unknown Compounds % of Total	0.0%			0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	11.4			11.4
Emission Rate, lb/hr as C	1.0			1.0

COMMENTS :

Velocity data from 6/8/92 was also used on 6/9/92.

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Bark Boiler w/ Sludge w/o Cond. | FIN: 5200

Source Code: CS-BB1/3 | Date: 6/9/92 | EPN: E40 | CIN: EC22, EC21

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	850			
Flow Data				
Stack Temperature, °F	152			152
Moisture Content, %	26.4			26.4
Oxygen Concentration, %	10.0			10.0
Carbon Dioxide Concentration, %	10.0			10.0
Volumetric Flow Rate, x10^3 ACFM	73.2			73.2
Volumetric Flow Rate, x10^3 DSCFM	46.8			46.8
Process Operating Conditions				
Production Rate, x 10^6 BTU/hr	255.0			255.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	2.7 *			2.7 *
Emission Rate, lb/hr	0.6 *			0.6 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	0.2 *			0.2 *
Acetone				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	0.3 *			0.3 *
Isopropanol				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	0.3 *			0.3 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Bark Boiler w/ Sludge w/o Cond. | FIN: 5200
Source Code: CS-BB1/3 | Date: 6/9/92 EPN: E40 | CIN: EC22, EC21

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl ethyl ketone				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	0.4 *			0.4 *
Chloroform				
Concentration, ppmvd	1.4 *			1.4 *
Emission Rate, lb/hr	1.2 *			1.2 *
Benzene				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	0.4 *			0.4 *
Bromodichloromethane				
Concentration, ppmvd	1.4 *			1.4 *
Emission Rate, lb/hr	1.6 *			1.6 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	0.5 *			0.5 *
Ethyl benzene				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	0.5 *			0.5 *
m-, p-Xylene				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	0.5 *			0.5 *
o-Xylene				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	0.5 *			0.5 *
Cumene				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	0.6 *			0.6 *
alpha-Pinene				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	0.7 *			0.7 *
beta-Pinene				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	0.7 *			0.7 *
3-Carene				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	0.7 *			0.7 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	0.7 *			0.7 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Bark Boiler w/ Sludge w/o Cond. | FIN: 5200
Source Code: CS-BB1/3 | Date: 6/9/92 | EPN: E40 | CIN: EC22, EC21

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.7 *			0.7 *
Emission Rate, lb/hr	0.7 *			0.7 *
Knowns as Carbon				
Concentration, ppmvd	0.7 *			0.7 *
Unknowns as Carbon				
Concentration, ppmvd	0.0			0.0
Sum M18 as Carbon, lb/hr	0.1 *			0.1 *
Unknown Compounds % of Total	0.0%			0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	2.0			2.0
Emission Rate, lb/hr as C	0.2			0.2

COMMENTS :

Velocity data from 6/8/92 was also used on 6/9/92.

* One or more values were less than the detection limit.

Section 6.2 Emission Test Results - VOST

EMISSION TEST RESULTS - VOST

Mill CHAMPION - SHELDON | Source: No. 1 Bark Boiler with Sludge | Condition 1
Source Code: CS-BB1/1 | EPN: E40 | FIN: 5200 | CIN: EC22, EC21

Date: 6/8/92

Compound	BB1/1-T (μg)	BB1/1-TC (μg)	BB1/1-C (μg/L)	Total μg	CS-BB1/1 (μg/m3)	Conc. (ppm)
TARGET COMPOUNDS						
Chloromethane		3.507		3.51	747.76	0.356
Bromomethane		0.027		0.03	5.76	0.001
Methylene Chloride	0.068	0.051	1.71	0.19	41.09	0.012
Acetone	0.607	0.041	2.62	0.76	162.17	0.067
Carbon Disulfide	0.024	0.002		0.03	5.54	0.002
Chloroform	0.270	0.021	3.20	0.43	91.40	0.018
Dimethyl disulfide	0.238			0.24	50.75	0.013
Dimethyl sulfide	3.119		0.42	3.14	668.86	0.259
Iodomethane		0.011		0.01	2.35	0.000
n-Hexane	0.611	1.071		1.68	358.64	0.100
2-Butanone (MEK)	0.250			0.25	53.30	0.018
1,1,1-Trichloroethane	0.014	0.009	1.07	0.07	14.67	0.003
Bromodichloromethane	0.007		0.26	0.02	3.91	0.001
Benzene	0.361			0.36	76.97	0.024
Dibromomethane			0.36	0.02	3.31	0.000
Toluene	0.096	0.024	0.38	0.14	29.10	0.008
Styrene	0.010	0.003		0.01	2.77	0.001
m-/p-Xylene	0.010	0.004	0.32	0.03	5.91	0.001
Acrolein	0.325			0.33	69.30	0.030
Acrylonitrile	0.033			0.03	7.04	0.003
A-Pinene	0.136	0.006		0.14	30.28	0.005
B-Pinene	0.022			0.02	4.69	0.001
p-Cymene	0.030			0.03	6.40	0.001
TENTATIVELY IDENTIFIED CMPDS.						
Aromatic HC		0.015		0.02	3.20	
Branched bicyclic HC	0.083			0.08	17.70	
Branched cyclic, C10H16						
Branched HC, C13H28, #1	0.078			0.08	16.63	
Branched HC, C13H28, #2	0.035	0.010		0.05	9.59	
Branched HC		0.007		0.01	1.49	
Branched HC		0.006		0.01	1.28	
Branched HC, C13H28, #3		0.005		0.01	1.07	
Branched HC	0.046			0.05	9.81	
Branched HC						
Branched HC	0.064	0.015		0.08	16.84	
Branched HC		0.015		0.02	3.20	
Branched HC						
Butene		0.023		0.02	4.90	
Cyclohexane	0.036	0.031		0.07	14.29	
Dimethyl trisulfide	0.041			0.04	8.74	
Furan	0.084			0.08	17.91	
Hydrocarbon						
Siloxane						
Subst'd Alcohol	0.091			0.09	19.40	
Subst'd HC	0.168			0.17	35.82	

EMISSION TEST RESULTS - VOST

Mill CHAMPION - SHELDON Source: No. 1 Bark Boiler with Sludge Condition 1
Source Code: CS-BB1/1 EPN: E40 FIN: 5200 CIN: EC22, EC21

Date: 6/8/92

Compound	BB1/1-T (μg)	BB1/1-TC (μg)	BB1/1-C (μg/L)	Total μg	CS-BB1/1 (μg/m3)	Conc. (ppm)
SURROGATE STDS (% Recovery)						
Toluene-d8	99.6	98.4	105.9			
1,2-Dichloroethane-d4	88.8	88.2	85.6			
Benzene-d6	94.6	94.1	97.9			

NOTES:
- -T = Tenax
- -TC = Tenax/Charcoal
- -C = Condensate

Air Volume = 0.00469 cu.m.

Condensate Vol. 43.0 mL

Triangle Laboratories of RTP, Inc.	FILE NAME: HH980	SAMPLE ID:	CS-BB1-1VOST-0608-1B T
801 Capitola Drive	RF FILE: HH969		
Durham, N.C. 27713	DATE: 11/13/91	TLI ID:	57.82.13
Telephone: (919) 544-5729	TLI PROJ #: 21146	ANAL DATE:	06/18/92

QUANTITATION REPORT VOST METHOD 8240

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	6155		775	1		IS	
3	Chloromethane	0	.802	0	1	.001	ND	.05
4	Bromomethane	0	1.006	0	1	.001	ND	.05
5	Vinyl chloride	0	1.258	0	1	.001	ND	.05
6	Methylene chloride	2552	1.520	583	1	.068	D	.05
7	Acetone	7946	.532	524	1	.607	D	.05
8	Carbon disulfide	2781	4.850	501	1	.024	E	.05
9	1,1-Dichloroethene	0	1.433	0	1	.001	ND	.05
10	1,1-Dichloroethane	0	4.122	0	1	.001	ND	.05
11	Chloroform	26261	3.947	794	1	.270	D	.05
12	1,2-Dichloroethane	0	2.613	0	1	.001	ND	.05
13	1,4-Difluorobenzene	27284		908	13		IS	
14	2-Butanone	899	.033	760	13	.250	D	.05
15	1,1,1-Trichloroethane	1224	.813	803	13	.014	E	.05
16	Carbon tetrachloride	0	.640	0	13	.001	ND	.05
17	Vinyl acetate	0	.685	0	13	.001	ND	.05
18	Bromodichloromethane	571	.723	1008	13	.007	E	.05
19	1,2-Dichloropropane	0	.659	0	13	.001	ND	.05
20	trans-1,3-Dichloropropene	0	.645	0	13	.001	ND	.05
21	Trichloroethene	0	.568	0	13	.001	ND	.05
22	1,1,2-Trichloroethane	0	.380	0	13	.001	ND	.05
23	Benzene	57331	1.457	847	13	.361	D	.05
24	cis-1,3-Dichloropropene	0	.845	0	13	.001	ND	.05
25	Bromoform	0	.290	0	13	.001	ND	.05
26	Chlorobenzene-d5	32627		1351	26		IS	
29	4-Methyl-2-pentanone	0	.225	0	26	.001	ND	.05
30	Tetrachloroethene	0	.362	0	26	.001	ND	.05
31	1,1,2,2-Tetrachloroethane	0	.334	0	26	.001	ND	.05
32	Toluene	9960	.796	1120	26	.096	D	.05
33	Chlorobenzene	0	.998	0	26	.001	ND	.05
34	Ethylbenzene	0	.508	0	26	.001	ND	.05
35	Styrene	1438	1.099	1466	26	.010	E	.05
36	m-/p-Xylene	826	.857	1410	26	.010	E	.05
37	o-Xylene	281	.642	1483	26	.003	E	.05
38	Acrolein	871	.109	491	1	.325	D	.05
39	Acrylonitrile	274	.337	623	1	.033	E	.05
40	Iodomethane	0	2.463	0	1	.001	ND	.05
41	1,4-Dichloro-2-butene	0	.122	0	13	.002	ND	.05
44	n-Hexane	43062	2.861	684	1	.611	D	.05
45	Tert-Butyl methyl ether	0	3.625	0	1	.001	ND	.05
46	1,3-butadiene	1212	1.273	228	1	.039	E	.05
47	Dibromomethane	0	.290	0	1	.003	ND	.05
48	Vinyl Bromide	0	1.397	0	1	.001	ND	.05
49	Isooctane	1086	10.750	887	1	.004	E	.05

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard (VOST_PCV)

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, N.C. 27713
Telephone: (919) 544-5729

FILE NAME: HH980
RF FILE: HH969
DATE: 11/13/91
TLI PROJ #: 21146

SAMPLE ID: CS-881-1VOST-0608-18 T
TLI ID: 57.62.13
ANAL DATE: 06/18/92

QUANTITATION REPORT VOST METHOD 8240

NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
50 Allyl chloride	0	.919	0	1	.001	ND	.05
51 Cumene (isopropylbenzene)	0	1.538	0	26	.001	ND	.05
52 Dimethyl sulfide	130797	1.703	513	1	3.119	D	.05
53 Dimethyl disulfide	22348	3.813	1073	1	.238	D	.05
54 A-Pinene	20109	1.135	1553	26	.136	D	.05
55 B-Pinene	3396	1.179	1700	26	.022	E	.05
56 P-Cymene	6972	1.774	1939	26	.030	E	.05

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	% RECOVERY
2 1,2-Dichloroethane-d4	14424	2.638	844	1	.222	D	88.8
28 Toluene-d8	45765	1.408	1110	26	.249	D	99.6
42 Benzene-d6	39702	1.539	843	13	.236	D	94.6

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard (VOST_PCV)

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

DATA FILE: HH980
DATE: 07/14/92
TLI PROJECT NO. 21146
ANALYSIS DATE: 06/18/92

SAMPLE ID: CS-881-1VOST-0608-18 T
TLI ID: 57.62.13

TENTATIVELY IDENTIFIED COMPOUND REPORT

METHOD 8240

	NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
1	SUBSTITUTED HYDROCARBON	1308	76981	1351	.25	.168
2	SUBSTITUTED ALCOHOL	1915	41696	1351	.25	.091
3	FURAN	469	15248	775	.25	.084
4	BRANCHED BICYCLIC HYDROCARBON	1604	38055	1351	.25	.083
5	BRANCHED HYDROCARBON C13H28	1621	35591	1351	.25	.078
6	BRANCHED HYDROCARBON	360	11531	775	.25	.064
7	BRANCHED HYDROCARBON	1262	20970	1351	.25	.046
8	DIMETHYL TRISULFIDE	1742	18949	1351	.25	.041
9	CYCLOHEXANE	729	6527	775	.25	.036
10	BRANCHED HYDROCARBON C13H28	2007	16196	1351	.25	.035

INTERNAL STANDARD	IS SCAN	IS AREA
Bromochloromethane	775	45120
1,4-Difluorobenzene	909	74671
Chlorobenzene-d5	1351	114502

Triangle Laboratories of RTP, Inc. FILE NAME: HH978 SAMPLE ID: CS-881-1VOST-0608-1B TC
801 Capitola Drive RF FILE: HH969
Durham, N.C. 27713 DATE: 11/13/91 TLI ID: 57.82.14
Telephone: (919) 544-5729 TLI PROJ #: 21146 ANAL DATE: 06/18/92

QUANTITATION REPORT VOST METHOD 8240

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
51	Cumene (isopropylbenzene)	0	1.538	0	26	.001	ND	.05
52	Dimethyl sulfide	0	1.703	0	1	.001	ND	.05
53	Dimethyl disulfide	0	3.813	0	1	.001	ND	.05
54	A-Pinene	893	1.135	1551	26	.008	E	.05
55	B-Pinene	0	1.179	0	26	.001	ND	.05
56	P-Cymene	0	1.774	0	26	.001	ND	.05

	SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	% RECOVERY
2	1,2-Dichloroethane-d4	16017	2.638	843	1	.220	D	88.2
28	Toluene-d8	49566	1.408	1109	26	.246	D	98.4
42	Benzene-d6	42701	1.539	842	13	.235	D	94.1

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard (VOST_PCV)

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

DATA FILE:HH978
DATE: 07/14/92
TLI PROJECT NO. 21146
ANALYSIS DATE: 06/18/92

SAMPLE ID: CS-881-1VOST-0608-18 TC
TLI ID: 57.62.14

TENTATIVELY IDENTIFIED COMPOUND REPORT - METHOD 8240

	NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
1	CYCLOHEXANE	729	6155	774	.25	.031 ✓
2	BUTENE	207	4629	774	.25	.023 ✓
3	BRANCHED HYDROCARBON	620	3004	774	.25	.015 ✓
4	SUBSTITUTED HYDROCARBON	360	2989	774	.25	.015 ✓
5	SUBSTITUTED AROMATIC HYDROCARBON	1626	7045	1350	.25	.015 ✓
6	BRANCHED HYDROCARBON C13H28	2004	5000	1350	.25	.010 ✓
7	UNKNOWN	513	1934	774	.25	.010
8	BRANCHED HYDROCARBON	1748	3144	1350	.25	.007 ✓
9	BRANCHED HYDROCARBON	2033	3035	1350	.25	.006 ✓
10	BRANCHED HYDROCARBON C13H28	1441	2201	1350	.25	.005 ✓

INTERNAL STANDARD	IS SCAN	IS AREA
Bromochloromethane	774	49858
1,4-Difluorobenzene	908	81619
Chlorobenzene-d5	1350	119843

Triangle Laboratories of RTP, Inc. FILE NAME:AC7974 SAMPLE ID: CS-881-1VOST-0608-18
801 Capitola Drive RF FILE: AC793
Durham, NC 27713 DATE: 07/13/92 DILUTION FACTOR 1
Telephone: (919) 544-5729 ANALYSIS DATE: 06/22/92
TLI Project Number:21146 TLI Sample ID: 57.62.15
SAMPLE VOL: .005 L

QUANTITATION REPORT METHOD 8240

	NAME	AREA	RF	SCAN	ISID	AMT,ug/L	CODE	QUAN LIMIT
1	Bromochloromethane	2531		780	1		IS	
3	Chloromethane	0	1.281	0	1	.308	ND	10
4	Bromomethane	0	1.353	0	1	.292	ND	10
5	Vinyl chloride	0	1.646	0	1	.240	ND	10
6	Methylene chloride	163	2.106	566	1	1.714	E	10
7	Acetone	217	1.838	529	1	2.618	E	10
8	Carbon disulfide	0	5.327	0	1	.074	ND	10
9	1,1-Dichloroethene	0	1.816	0	1	.218	ND	10
10	1,1-Dichloroethane	0	4.724	0	1	.084	ND	10
11	Chloroform	745	4.593	799	1	3.202	E	10
12	1,2-Dichloroethane	0	3.736	0	1	.106	ND	10
13	1,4-Difluorobenzene	11828		913	13		IS	
14	2-Butanone	0	.079	0	13	1.064	ND	10
15	1,1,1-Trichloroethane	194	.769	808	13	1.065	E	10
16	Carbon tetrachloride	0	.550	0	13	.154	ND	10
17	Vinyl acetate	0	.902	0	13	.094	ND	10
18	Bromodichloromethane	52	.827	1014	13	.264	E	10
19	1,2-Dichloropropane	0	.852	0	13	.099	ND	10
20	trans-1,3-Dichloropropene	0	.994	0	13	.085	ND	10
21	Trichloroethene	0	.495	0	13	.171	ND	10
22	1,1,2-Trichloroethane	0	.566	0	13	.149	ND	10
23	Benzene	0	1.466	0	13	.058	ND	10
24	cis-1,3-Dichloropropene	0	.893	0	13	.095	ND	10
25	Bromoform	0	.443	0	13	.191	ND	10
26	Chlorobenzene-d5	13826		1358	26		IS	
29	4-Methyl-2-pentanone	0	.690	0	26	.105	ND	10
30	Tetrachloroethene	0	.370	0	26	.196	ND	10
31	1,1,2,2-Tetrachloroethane	0	.839	0	26	.086	ND	10
32	Toluene	103	.971	1128	26	.383	E	10
33	Chlorobenzene	0	1.038	0	26	.070	ND	10
34	Ethylbenzene	0	.630	0	26	.115	ND	10
35	Styrene	0	1.168	0	26	.062	ND	10
36	m-/p-Xylene	59	.673	1416	26	.319	E	10
37	o-Xylene	0	.753	0	26	.096	ND	10
38	Acrolein	0	.431	0	1	.916	ND	10
39	Acrylonitrile	0	.979	0	1	.404	ND	10
40	Iodomethane	0	1.958	0	1	.202	ND	10
41	1,4-Dichloro-2-butene	0	.339	0	13	.249	ND	10
44	n-Hexane	0	4.119	0	1	.096	ND	10
45	Tert-Butyl methyl ether	0	5.332	0	1	.074	ND	10
46	1,3-butadiene	0	2.008	0	1	.197	ND	10
47	Dibromomethane	37	2.036	983	1	.361	E	10
48	Vinyl Bromide	0	1.394	0	1	.283	ND	10
49	Isooctane	0	13.863	0	1	.028	ND	10

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard (VCON_PCV)

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME:AC7974
RF FILE: AC793
DATE: 07/13/92
ANALYSIS DATE: 08/22/92
TLI Project Number:21146

SAMPLE ID: CS-BB1-1VOST-0808-18
DILUTION FACTOR 1
TLI Sample ID: 57.82.15
SAMPLE VOL: .005 L

QUANTITATION REPORT METHOD 8240

	NAME	AREA	RF	SCAN	ISID	AMT,ug/L	CODE	QUAN LIMIT
50	Allyl chloride	0	1.038	0	1	.381	ND	10
51	Cumene (isopropylbenzene)	0	1.904	0	26	.038	ND	10
52	Dimethyl sulfide	52	2.445	515	1	.417	E	10
53	Dimethyl disulfide	0	5.017	0	1	.079	ND	10
54	A-Pinene	0	1.277	0	26	.057	ND	10
55	B-Pinene	0	1.390	0	26	.052	ND	10
56	P-Cymene	0	1.990	0	26	.036	ND	10

	SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT,ug/L	CODE	% RECOVERY
2	1,2-Dichloroethane-d4	6377	2.945	849	1	42.8	D	85.6
26	Toluene-d8	19908	1.360	1117	26	52.9	D	105.9
42	Benzene-d6	17590	1.520	848	13	48.9	D	97.9

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard (VCON_PCV)

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

DATA FILE:AC7974
DATE: 07/21/92
TLI PROJECT NO. 21146
ANALYSIS DATE: 06/22/92
TLI ID: 57.82.15

SAMPLE ID: CS-SB1-1VOST-0608-1B
SAMPLE VOL. .005 L

TENTATIVELY IDENTIFIED COMPOUND REPORT METHOD 8240

NAME	Scan	Area	Scan # IS	Amt IS	Conc, ug/L
1 UNKNOWN	1401	529	1358	.25	.5
2 UNKNOWN	1193	375	1358	.25	.4
3 UNKNOWN	342	187	780	.25	.4
4 UNKNOWN	1553	174	1358	.25	.2

INTERNAL STANDARD	IS SCAN	IS AREA
Bromochloromethane	780	26200
Chlorobenzene-d5	1358	52348

Section 6.3 Emission Test Results - SEMI-VOST

EMISSION TEST RESULTS - SEMI-VOST

Mill CHAMPION - SHELDON Source: No. 1 Bark Boiler with Sludge Condition 1
Source Code: CS-BB1/1 EPN: E40 FIN: 5200 CIN: EC22, EC21

Compound	CS-BB1/1 (μg)	Date: 6/6/92 CS-BB1/1 (μg/m3)	Conc. (ppm)
TARGET COMPOUNDS			
a-Pinene	32.87	30.65	0.005
B-Pinene	12.44	11.60	0.002
p-Cymene	9.12	8.50	0.002
Acetophenone	8.30	7.74	0.002
a-Terpineol	60.18	56.12	0.009
Naphthalene	26.54	24.75	0.005
Di-n-butyl phthalate	8.37	7.80	0.001
2-Methylnaphthalene	1.15	1.07	0.000
Dibenzofuran	1.85	1.73	0.000
Phenanthrene	1.08	1.01	0.000
Butylbenzylphthalate	18.87	17.60	0.001
Dimethylphthalate			
Phenol			
Benzoic Acid			
Diethylphthalate			
TENTATIVELY IDENTIFIED CMPDS.			
Phthalate	1145.81	1068.45	
Halogenated HC	424.65	395.98	
Siloxane	247.65	230.93	
Cyclic HC	76.58	71.41	
Acidic subst'd HC	67.12	62.59	
Subst'd Hexanedioic acid	65.06	60.67	
Subst'd HC	58.98	55.00	
Hexanol	57.90	53.99	
Siloxane	54.96	51.25	
Cyclic HC	53.07	49.49	
Subst'd HC			
Subst'd HC			
Acidic subst'd HC			
Acidic Ester			
Branched Heptene			
SURROGATE STDS (% Recovery)			
Nitrobenzene-d5	87.6		
1,3,5-Trichlorobenzene-d3	52.2		
1,4-Dibromobenzene-d4	68.2		
2-Fluorobiphenyl	80.3		
2,4,6-Tribromophenol	57.0		
Anthracene-d10	68.5		
Pyrene-d10	79.3		

EMISSION TEST RESULTS - SEMI-VOST

Mill CHAMPION - SHELDON | Source: No. 1 Bark Boiler with Sludge | Condition 1

Source Code: CS-BB1/1 EPN: E40 FIN: 5200 CIN: EC22, EC21

Compound	CS-BB1/1 (μg)	Date: 6/6/92 CS-BB1/1 ($\mu g/m3$)	Conc. (ppm)

NOTES:

Air Volume = 1.07240 cu.m.

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DATA FILE: FH728 SAMPLE ID: CS-BB1/1MM5/0808/1A-E
RF FILE: FH721 TLI SAMPLE ID: 57.61.1A-E
DATE: 07/09/92 DILUTION FACTOR: 1
TLI PROJ: 21145 ANALYSIS DATE: 06/25/92

METHOD 8270 QUANTITATION REPORT

	NAME	AREA	RF	SCAN		AMT, ug	CODE	QUAN LIMIT
1	1,4-Dichlorobenzene-d4	2120		366	1		IS	
2	Naphthalene-d8	10183		544	2		IS	
3	Acenaphthene-d10	6316		792	3		IS	
4	Phenanthrene-d10	13688		995	4		IS	
5	Chrysene-d12	22179		1370	5		IS	
6	Perylene-d12	30109		1561	6		IS	
20	n-Nitrosodimethylamine	0	.626	0	1	.60	ND	10
21	Cumene	0	2.527	0	1	.15	ND	10
22	a-Pinene	2102	1.206	272	1	32.87	D	10
23	b-Pinene	1098	1.656	327	1	12.44	D	10
24	Aniline	0	3.131	0	1	.12	ND	10
25	1,2,4-Trimethylbenzene	0	2.269	0	1	.17	ND	10
26	Phenol	0	2.090	0	1	.18	ND	10
27	Benzyl Chloride	0	2.900	0	1	.13	ND	10
28	bis-(2-Chloroethyl)ether	0	1.646	0	1	.23	ND	10
29	n-Nitrosomorpholine	0	1.060	0	1	.36	ND	10
30	1,4-Dichlorobenzene	0	1.472	0	1	.26	ND	10
31	p-Cymene	1293	2.675	388	1	9.12	E	10
32	Acetophenone	814	1.849	434	1	8.30	E	10
33	1,2-Dibromo-3-chloropropane	0	.644	0	1	.59	ND	10
34	Hexachloroethane	0	.612	0	1	.62	ND	10
35	o-Toluidine	0	2.419	0	1	.16	ND	10
36	2-Methylphenol	0	1.348	0	1	.28	ND	10
37	Nitrobenzene	0	.566	0	2	.14	ND	10
38	N,N-Dimethylaniline	0	.500	0	2	.16	ND	10
39	Isophorone	0	.777	0	2	.10	ND	10
40	Catechol	0	.328	0	2	.24	ND	10
41	3/4-Methylphenol	0	.305	0	2	.26	ND	10
42	1,2,4-Trichlorobenzene	0	.275	0	2	.29	ND	10
43	a-Terpineol	4563	.298	561	2	60.18	D	10
44	Naphthalene	7237	1.071	546	2	26.54	D	10
45	o-Anisidine	0	.262	0	2	.30	ND	10
46	Hexachlorobutadiene	0	.108	0	2	.73	ND	10
47	2-Chloroacetophenone	0	.661	0	2	.12	ND	10
48	a,a,a-Trichlorotoluene	0	.279	0	2	.28	ND	10
49	N,N-Diethylaniline	0	.510	0	2	.15	ND	10
50	1,4-Phenylenediamine	0	.355	0	2	.22	ND	10
51	Hydroquinone	0	.200	0	2	.39	ND	10
52	Pentamethylbenzene	0	.566	0	2	.14	ND	10
53	Hexachlorocyclopentadiene	0	.183	0	3	.69	ND	10
55	2,4,6-Trichlorophenol	0	.298	0	3	.42	ND	10
56	2,4,5-Trichlorophenol	0	.352	0	3	.36	ND	10
57	2,4-Toluenediamine	0	.262	0	3	.48	ND	10
58	2,4-Dichlorophenol	0	.465	0	3	.27	ND	10

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

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DATA FILE:	FH728	SAMPLE ID:	CS-881/1MM5/0606/1A-E
RF FILE:	FH721	TLI SAMPLE ID:	57.61.1A-E
DATE:	07/09/92	DILUTION FACTOR:	1
TLI PROJ:	21145	ANALYSIS DATE:	08/25/92

METHOD 8270 QUANTITATION REPORT

	NAME	AREA	RF	SCAN		AMT, ug	CODE	QUAN LIMIT
59	2,3-Dichlorophenol	0	.447	0	3	.28	ND	10
60	2,6-Dichlorophenol	0	.531	0	3	.24	ND	10
61	3,5-Dichlorophenol	0	.691	0	3	.18	ND	10
62	3,4-Dichlorophenol	0	.600	0	3	.21	ND	10
63	Biphenyl	0	1.220	0	3	.10	ND	10
64	Dimethylphthalate	0	1.136	0	3	.11	ND	10
65	2,4-Dinitrotoluene	0	.413	0	3	.31	ND	10
66	2,4-Dinitrophenol	0	.154	0	3	.82	ND	10
67	4,6-Dinitro-2-methylphenol	0	.229	0	3	.55	ND	10
68	Dibenzofuran	0	1.827	0	3	.07	ND	10
69	4-Nitrophenol	0	.353	0	3	.36	ND	10
70	Trifluralin	0	.182	0	3	.70	ND	10
71	Hexachlorobenzene	0	.173	0	4	.34	ND	10
72	4-Aminobiphenyl	0	.833	0	4	.07	ND	10
73	Pentachlorophenol	0	.156	0	4	.37	ND	10
74	Pentachloronitrobenzene	0	.063	0	4	.92	ND	10
75	4-Nitrobiphenyl	0	.485	0	4	.12	ND	10
76	Di-n-butylphthalate	5244	1.831	1117	4	8.37	E	10
77	Pyrene	0	1.003	0	5	.04	ND	10
78	Benzidine	0	.663	0	5	.05	ND	10
79	4,4'-Methylenedianiline	0	.327	0	5	.11	ND	10
80	Dimethylaminoazobenzene	0	.377	0	5	.10	ND	10
81	Butylbenzylphthalate	6749	.645	1325	5	18.87	D	10
82	3,3'-Dimethylbenzidine	0	.733	0	5	.05	ND	10
83	Methylene bis-chloroaniline	0	.231	0	5	.16	ND	10
84	Chrysene	0	1.053	0	5	.03	ND	10
85	3,3'-Dichlorobenzidine	0	.478	0	5	.08	ND	10
86	bis(2-Ethylhexyl)phthalate	0	1.583	0	5	.02	ND	10
87	3,3'-Dimethoxybenzidine	0	.324	0	5	.11	ND	10

	SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
10	Phenol-d5	0	1.722	0	1	.00	ND	.0
12	Nitrobenzene-d5	9181	.412	450	2	87.61	D	87.6
13	1,3,5-Trichlorobenzene-d3	3402	.256	496	2	52.24	D	52.2
14	1,4-Dibromobenzene-d4	2564	.709	549	1	68.20	D	68.2
15	2-Fluorobiphenyl	13041	1.029	708	3	80.30	D	80.3
16	2,4,6-Tribromophenol	1990	.111	905	3	114.03	D	57.0
17	Anthracene-d10	25548	1.090	1003	4	68.47	D	68.5
18	Pyrene-d10	33899	.771	1193	5	79.29	D	79.3

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

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FILE NAME: FH728
DATE: 07/08/92
TLI PROJ #: 21145

SAMPLE ID: CS-BB1/MM5/0606/1A-E
TLI ID: 57.81.1A-E
DILN FACTOR: 1
ANAL DATE: 06/25/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
PHTHALATE	1433	2939211	1371	40.00	1145.81
HALOGENATED HYDROCARBON	1412	1089308	1371	40.00	424.65
SILOXANE	1533	1119827	1561	40.00	247.65
CYCLIC HYDROCARBON	537	98371	544	40.00	76.58
ACIDIC SUBSTITUTED HYDROCARBON	1120	92460	996	40.00	67.12
SUBSTITUTED HEXANEDIOIC ACID	1354	166892	1371	40.00	65.08
SUBSTITUTED HYDROCARBON	414	1443827	367	40.00	58.98
HEXANOL	470	74372	544	40.00	57.90
SILOXANE	1500	248537	1561	40.00	54.96
CYCLIC HYDROCARBON	461	68168	544	40.00	53.07

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
1,4-Dichlorobenzene-d4	367	979259	1
Naphthalene-d8	544	51379	14
Acenaphthene-d10	792	36255	28
Phenanthrene-d10	996	55104	47
Chrysene-d12	1371	102807	57
Perylene-d12	1561	180876	64

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DATA FILE: GI887
RF FILE: GI875
DATE: 07/21/92
TLI PROJ #: 21145

SAMPLE ID: CS-BB1/1MM5/0606/1A-
TLI ID: 57.61.1A-E
DILUTION FACTOR: 1
ANALYSIS DATE: 07/14/92

M E T H O D 8 2 7 0 Q U A N T I T A T I O N R E P O R T

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	1,4-Dichlorobenzene-d4	4693		599	1		IS	
2	Phenol	0	2.5838	0	1	.07	ND	10
3	bis(2-Chloroethyl)ether	0	1.7567	0	1	.10	ND	10
4	2-Chlorophenol	0	1.5660	0	1	.11	ND	10
5	1,3-Dichlorobenzene	0	1.6700	0	1	.10	ND	10
6	1,4-Dichlorobenzene	0	1.7076	0	1	.10	ND	10
7	Benzyl alcohol	0	1.0703	0	1	.16	ND	10
8	1,2-Dichlorobenzene	0	1.6579	0	1	.10	ND	10
9	2-Methylphenol	0	1.4561	0	1	.12	ND	10
10	bis(2-Chloroisopropyl)ether	0	2.4729	0	1	.07	ND	10
11	4-Methylphenol	0	1.5795	0	1	.11	ND	10
12	N-Nitroso-di-n-propylamine	0	1.2131	0	1	.14	ND	10
13	Hexachloroethane	0	.6864	0	1	.25	ND	10
14	Naphthalene-d8	21086		779	14		IS	
15	Nitrobenzene	0	.4955	0	14	.08	ND	10
16	Isophorone	0	.8709	0	14	.04	ND	
17	2-Nitrophenol	0	.1798	0	14	.21	ND	
18	2,4-Dimethylphenol	0	.3672	0	14	.10	ND	10
19	Benzoic acid	0	.1789	0	14	.21	ND	10
20	bis(2-Chloroethoxy)methane	0	.4780	0	14	.08	ND	1
21	2,4-Dichlorophenol	0	.2808	0	14	.14	ND	10
22	1,2,4-Trichlorobenzene	0	.2725	0	14	.14	ND	10
23	Naphthalene	14775	1.0923	782	14	25.66	D	1
24	4-Chloroaniline	0	.4930	0	14	.08	ND	10
25	Hexachlorobutadiene	0	.1190	0	14	.32	ND	10
26	4-Chloro-3-methylphenol	0	.3573	0	14	.11	ND	1
27	2-Methylnaphthalene	417	.6907	885	14	1.15	E	1
28	Acenaphthene-d10	11664		1041	28		IS	
29	Hexachlorocyclopentadiene	0	.2042	0	28	.33	ND	10
30	2,4,6-Trichlorophenol	0	.3259	0	28	.21	ND	1
31	2,4,5-Trichlorophenol	0	.3953	0	28	.17	ND	10
32	2-Chloronaphthalene	0	1.1203	0	28	.06	ND	10
33	2-Nitroaniline	0	.5575	0	28	.12	ND	1
34	Dimethylphthalate	0	1.1864	0	28	.06	ND	1
35	Acenaphthylene	0	2.0174	0	28	.03	ND	10
36	3-Nitroaniline	0	.3743	0	28	.18	ND	1
37	Acenaphthene	0	1.1926	0	28	.06	ND	1
38	2,4-Dinitrophenol	0	.0642	0	28	1.05	ND	10
39	4-Nitrophenol	0	.1435	0	28	.47	ND	10
40	Dibenzofuran	917	1.6674	1072	28	1.85	E	1
41	2,4-Dinitrotoluene	0	.3990	0	28	.17	ND	
42	2,6-Dinitrotoluene	0	.3097	0	28	.22	ND	
43	Diethylphthalate	0	1.2912	0	28	.05	ND	1

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

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801 Capitola Drive
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Telephone: (919) 544-5729

DATA FILE: GI887
RF FILE: GI875
DATE: 07/21/92
TLI PROJ #: 21145

SAMPLE ID: CS-8B1/1MM5/0606/1A-E
TLI ID: 57.61.1A-E
DILUTION FACTOR: 1
ANALYSIS DATE: 07/14/92

METHOD 8270 QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
44	4-Chlorophenyl-phenylether	0	.5169	0	28	.13	ND	10
45	Fluorene	0	1.4402	0	28	.05	ND	10
46	4-Nitroaniline	0	.4120	0	28	.16	ND	10
47	Phenanthrene-d10	21092		1264	47		IS	
48	4,6-Dinitro-2-methylphenol	0	.0796	0	47	.48	ND	10
49	N-Nitrosodiphenylamine(1)	0	.5397	0	47	.07	ND	10
50	4-Bromophenyl-phenylether	0	.1803	0	47	.21	ND	10
51	Hexachlorobenzene	0	.2159	0	47	.18	ND	10
52	Pentachlorophenol	0	.1127	0	47	.34	ND	10
53	Phenanthrene	708	1.2386	1268	47	1.08	E	10
54	Anthracene	0	1.2811	0	47	.03	ND	10
55	Di-n-butylphthalate	8482	1.4555	1361	47	11.05	D	10
56	Fluoranthene	0	1.3072	0	47	.03	ND	10
57	Chrysene-d12	28555		1678	57		IS	
58	Pyrene	0	1.7657	0	57	.02	ND	10
59	Butylbenzylphthalate	9382	.8944	1589	57	14.69	D	10
60	3,3'-Dichlorobenzidine	0	.4741	0	57	.06	ND	10
61	Benzo(a)anthracene	0	1.6076	0	57	.02	ND	10
62	Chrysene	0	1.6572	0	57	.02	ND	10
63	bis(2-Ethylhexyl)phthalate	0	1.1151	0	57	.03	ND	10
64	Perylene-d12	17047		2001	64		IS	
65	Di-n-octylphthalate	0	1.1642	0	64	.04	ND	10
66	Benzo(b)fluoranthene	0	1.4302	0	64	.03	ND	10
67	Benzo(k)fluoranthene	0	1.7013	0	64	.03	ND	10
68	Benzo(a)pyrene	0	1.2599	0	64	.04	ND	10
69	Indeno(1,2,3-cd)pyrene	0	.5135	0	64	.09	ND	10
70	Dibenz(a,h)anthracene	0	.5953	0	64	.08	ND	10
71	Benzo(g,h,i)perylene	0	.7619	0	64	.06	ND	10

SURROGATE SUMMARY		AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
72	Nitrobenzene-d5	15447	.4567	676	14	64.16	D	64.2
73	2-Fluorobiphenyl	25269	1.1046	942	28	77.13	D	77.1
75	Phenol-d5	2019	1.8294	551	1	9.41	D	9.4
77	2,4,6-Tribromophenol	3369	.1234	1159	28	92.07	D	92.1
81	1,4-Dibromobenzene-d4	4928	.6021	787	1	69.76	D	69.8
82	1,3,5-Trichlorobenzene-d3	6928	.2520	725	14	52.16	D	52.2
83	Anthracene-d10	41399	1.0760	1273	47	72.97	D	73.0
84	Pyrene-d10	53216	1.3469	1479	57	55.34	D	55.3

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

WESTON

Section 6.4 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - SHELDON | Source: Bark Boiler w/ Sludge w/ Cond. | FIN: 5200
Source Code: CS-BB1/1 | Date: 6/6/92 | EPN: E40 | CIN: EC22, EC21

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1339			
Flow Data				
Stack Temperature, °F	154			154
Moisture Content, %	27.5			27.5
Oxygen Concentration, %	9.5			9.5
Carbon Dioxide Concentration, %	8.5			8.5
Volumetric Flow Rate, x10^3 ACFM	73.3			73.3
Volumetric Flow Rate, x10^3 DSCFM	46.4			46.4
Process Operating Conditions				
Production Rate, x 10^6 BTU/hr	240.0			240.0
Miscellaneous Parameters				
Formaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acetaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.2 *			0.2 *
Acetone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.2 *			0.2 *
Acetophenone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.4 *			0.4 *
2-Butanone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.3 *			0.3 *
Methyl isobutyl ketone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.4 *			0.4 *
Acrolein				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.2 *			0.2 *
Benzaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.4 *			0.4 *
Hydrogen chloride				
Concentration, ppmvd	1.3			1.3
Emission Rate, lb/hr	0.3			0.3

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - SHELDON	Source:	Bark Boiler w/ Sludge w/ Cond.		FIN:	5200
Source Code: CS-BB1/1	Date:	6/8/92	EPN: E40	CIN:	EC22, EC21

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1344			
Flow Data				
Stack Temperature, °F	152			152
Moisture Content, %	26.4			26.4
Oxygen Concentration, %	10.0			10.0
Carbon Dioxide Concentration, %	10.0			10.0
Volumetric Flow Rate, x10^3 ACFM	73.2			73.2
Volumetric Flow Rate, x10^3 DSCFM	46.8			46.8
Process Operating Conditions				
Production Rate, x 10^6 BTU/hr	275.0			275.0
Miscellaneous Parameters				
Formaldehyde				
Concentration, ppmvd	1.1			1.1
Emission Rate, lb/hr	0.2			0.2
Acetaldehyde				
Concentration, ppmvd	1.8			1.8
Emission Rate, lb/hr	0.6			0.6
Acetone (Impinger)				
Concentration, ppmvd	2.0			2.0
Emission Rate, lb/hr	0.8			0.8
Acetophenone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.4 *			0.4 *
2-Butanone (Impinger)				
Concentration, ppmvd	0.7			0.7
Emission Rate, lb/hr	0.4			0.4
Methyl isobutyl ketone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.4 *			0.4 *
Acrolein				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.2 *			0.2 *
Benzaldehyde				
Concentration, ppmvd	0.6			0.6
Emission Rate, lb/hr	0.5			0.5
Hydrogen chloride				
Concentration, ppmvd	2.2			2.2
Emission Rate, lb/hr	0.6			0.6

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - SHELDON | Source: Bark Boiler w/ Sludge w/ Cond. | FIN: 5200
Source Code: CS-BB1/1 | Date: 6/17/92 | EPN: E40 | CIN: EC22, EC21

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	951	1050	1156	
Flow Data				
Stack Temperature, °F			153	153
Moisture Content, %			30.3	30.3
Oxygen Concentration, %			10.5	10.5
Carbon Dioxide Concentration, %			11.0	11.0
Volumetric Flow Rate, x10^3 ACFM			73.8	73.8
Volumetric Flow Rate, x10^3 DSCFM			44.8	44.8
Process Operating Conditions				
Production Rate, x 10^6 BTU/hr	260.0	260.0	256.0	258.7
Miscellaneous Parameters				
Sulfuric Acid Mist (Impinger)				
Concentration, lb/dscf	2.64E-07	7.40E-08	7.40E-08	1.37E-07
Emission Rate, lb/hr	7.10E-01 *	1.99E-01 *	1.99E-01 *	3.69E-01 *

* One or more values were less than the detection limit.

WESTON

Section 6.5 Emission Test Results - Metals

Mill: Champion-Sheldon
Source: CS-BB1/1

Run 1

Sample volume (DSCF)--------- 37.14
Source Vol Flow (DSCFM)------ 44800

		FH+BH Amt (ug)	Conc (lb/DSCF)	Mass Rt. (lb/hr)	Detection Limit(ug)	Det Limit (lb/DSCF)	Det Limit (lb/hr)
Antimony	Sb	*	0.0E+00	0.0E+00	5	3.0E-10	8.0E-04
Arsenic	As	6	3.6E-10	9.6E-04	5	3.0E-10	8.0E-04
Barium	Ba	*	0.0E+00	0.0E+00	4000	2.4E-07	6.4E-01
Beryllium	Be	*	0.0E+00	0.0E+00	5	3.0E-10	8.0E-04
Cadmium	Cd	12	7.1E-10	1.9E-03	5	3.0E-10	8.0E-04
Chromium	Cr	*	0.0E+00	0.0E+00	10	5.9E-10	1.6E-03
Copper	Cu	88	5.2E-09	1.4E-02	5	3.0E-10	8.0E-04
Lead	Pb	40	2.4E-09	6.4E-03	10	5.9E-10	1.6E-03
Manganese	Mn	44	2.6E-09	7.0E-03	10	5.9E-10	1.6E-03
Mercury	Hg	*	0.0E+00	0.0E+00	5	3.0E-10	8.0E-04
Nickel	Ni	*	0.0E+00	0.0E+00	5	3.0E-10	8.0E-04
Phosphorus	P	879	5.2E-08	1.4E-01	100	5.9E-09	1.6E-02
Silver	Ag	6	3.6E-10	9.6E-04	5	3.0E-10	8.0E-04
Selenium	Se	*	0.0E+00	0.0E+00	5	3.0E-10	8.0E-04
Thallium	Tl	*	0.0E+00	0.0E+00	5	3.0E-10	8.0E-04

Run 2

Sample volume (DSCF)--------- 36.5
Source Vol Flow (DSCFM)------ 44000

		FH+BH Amt (ug)	Conc (lb/DSCF)	Mass Rt. (lb/hr)	Detection Limit(ug)	Det Limit (lb/DSCF)	Det Limit (lb/hr)
Antimony	Sb	*	0.0E+00	0.0E+00	5	3.0E-10	8.0E-04
Arsenic	As	6	3.6E-10	9.6E-04	5	3.0E-10	8.0E-04
Barium	Ba	*	0.0E+00	0.0E+00	4000	2.4E-07	6.4E-01
Beryllium	Be	*	0.0E+00	0.0E+00	5	3.0E-10	8.0E-04
Cadmium	Cd	12	7.2E-10	1.9E-03	5	3.0E-10	8.0E-04
Chromium	Cr	29	1.8E-09	4.6E-03	10	6.0E-10	1.6E-03
Copper	Cu	69	4.2E-09	1.1E-02	5	3.0E-10	8.0E-04
Lead	Pb	35	2.1E-09	5.6E-03	10	6.0E-10	1.6E-03
Manganese	Mn	54	3.3E-09	8.6E-03	10	6.0E-10	1.6E-03
Mercury	Hg	*	0.0E+00	0.0E+00	5	3.0E-10	8.0E-04
Nickel	Ni	29	1.8E-09	4.6E-03	5	3.0E-10	8.0E-04
Phosphorus	P	613	3.7E-08	9.8E-02	100	6.0E-09	1.6E-02
Silver	Ag	*	0.0E+00	0.0E+00	5	3.0E-10	8.0E-04
Selenium	Se	*	0.0E+00	0.0E+00	5	3.0E-10	8.0E-04
Thallium	Tl	*	0.0E+00	0.0E+00	5	3.0E-10	8.0E-04

METALS CALCULATIONS

Client: TPIEC
Location: Champion-Sheldon
WESTON Project No.: 6848-01-01
Source: BB1/1

INPUT DATA

Run Number		1	2	3	Mean
Date		6/17/92	6/17/92		---
Time Began		1700	1850		---
Time Ended		1815	2000		---
Sampling Time, min	(Theta)	60	60		60
Stack Dimensions, in.	(Square)	58x58	58x58	58x58	0
Barometric Pressure, in. Hg	(Pb)	29.98	29.98		29.98
Static Pressure, in. H2O	(Pg)	4.10	4.00		4.05
Pitot Tube Coefficient	(Cp)	0.84	0.84		0.84
Meter Correction Factor	(Y)	1.010	1.010		1.010
Nozzle Diameter, in.	(Dn)	0.250	0.250		0.250
Meter Volume, ft^3	(Vm)	39.704	38.675		39.190
Meter Temperature, |F	(tm)	113	108		111
Meter Orifice Pressure, in. H2O	(Delta H)	1.610	1.542		1.576
Volume H2O Collected, mL	(Vlc)	342.7	344.6		343.7
CO2 Concentration, %	(CO2)	11.0	10.5		10.8
O2 Concentration, %	(O2)	10.5	9.5		10.0
Average Sq Rt Velo Head, (in. H2O)^*	((Delta P)^*)avg	0.8387	0.8262		0.8325
Stack Temperature, |F	(ts)	153	152		153
Total Metals Collected, ug					ERR
Moisture Fraction (at Saturation)	(Bws)	NA	NA	NA	

CALCULATED DATA

Stack Area, ft^2	(As)	23.36	23.36	0.00	15.57
Stack Pressure, in. Hg	(Ps)	30.28	30.27	0.00	20.19
Standard Meter Volume, ft^3	(Vmstd)	37.144	36.500	0.000	24.548
Standard Water Volume, ft^3	(Vwstd)	16.131	16.220	0.000	10.784
Moisture Fraction (Measured)	(Bws)	0.303	0.308	ERR	ERR
Moisture Fraction (lower sat/meas)	(Bws)	0.303	0.308	ERR	ERR
Mol. Wt. of Stack Gas, lb/lb-mole	(Ms)	26.5	26.3	ERR	ERR
Average Stack Gas Velocity, ft/sec	(Vs)	52.7	52.0	ERR	ERR
Stack Gas Flow @ Stack Cond, ft^3/min	(Qa)	7.38E+04	7.29E+04	ERR	ERR
Stack Gas Flow @ Std Cond, ft^3/min	(Qs)	4.48E+04	4.40E+04	ERR	ERR
Isokinetic Sampling Rate, %	(%I)	95	95	ERR	ERR
Metals Concentration, lb/ft^3		0.00E+00	0.00E+00	ERR	ERR

j:\a503\standard\metals.wk1

Blanks for the Multimetals Train. Three blanks were collected during the study. One was collected at Champion-Lufkin and two at Champion-Sheldon. These blanks were used to correct all samples.

		CL Blank Front(ug)	CS Blk 1 Front(ug)	CS Blk 2 Front(ug)	Front Blk(ug)
Antimony	Sb	0.7	0.5 *	0.5 *	0 *
Arsenic	As	3.9	0.8	0.8	1
Barium	Ba	2476	2 *	3742	2073
Beryllium	Be	0.2	0.2 *	0.3	0 *
Cadmium	Cd	0.5	0.4 *	1.4	0 *
Chromium	Cr	9.4	1.2 *	9.3	6.4
Copper	Cu	1.6	1.5 *	1.5 *	0 *
Lead	Pb	10.8	0.3	5.2	5.4
Manganese	Mn	4.4	1 *	4.5	3.1
Mercury	Hg	0.4 *	0.4 *	0.4 *	0 *
Nickel	Ni	2 *	2 *	2 *	0 *
Phosphorus	P	22.6	50 *	53.4	34.7
Silver	Ag	8.3	0.7 *	0.7 *	0 *
Selenium	Se	0.5	0.4 *	0.4 *	0 *
Thallium	Tl	1	0.5	0.7	0 *

The * beside a value means that the analytical value was less than the detection limit for the analysis. The front and the back blank (right column) was developed from the average for most metals. The 8.3 ug from the CL blank was not used because it was unexplainably high.

		CL Blank Back(ug)	CS Blk 1 Back(ug)	CS Blk 2 Back(ug)	Back Blk(ug)
Antimony	Sb	1 *	1 *	0.7 *	0 *
Arsenic	As	1 *	0.5	0.3 *	0 *
Barium	Ba	3.8 *	0.4 *	2.6 *	0 *
Beryllium	Be	0.4 *	0.4 *	0.3 *	0 *
Cadmium	Cd	0.8	1.4	1	1
Chromium	Cr	2.3 *	2.4 *	1.6 *	0 *
Copper	Cu	2.9 *	3 *	2 *	0 *
Lead	Pb	1.5	0.4 *	0.6	0.8
Manganese	Mn	1.9 *	2 *	1.3 *	0 *
Mercury	Hg	0.8 *	0.8 *	1.1	0 *
Nickel	Ni	3.8 *	4 *	2.6 *	0 *
Phosphorus	P	188	100 *	26 *	100 *
Silver	Ag	1.3 *	1.4 *	0.9 *	0 *
Selenium	Se	1 *	0.8 *	0.5 *	0 *
Thallium	Tl	1.9 *	0.4 *	0.3 *	0 *

BAF 9/7/92

TRIANGLE LABORATORIES of RTP, INC.

PO BOX 13485
RTP, NC 27709

Project: 21259 Date in: 06-Jul-92
Weston Date out: 04-Aug-92

CASE NARRATIVE

Overview

This project involves the analysis of 4 Multi-Metals Trains, for Ag, As, Ba, Be, Cd, Cr, Cu, Hg, Mn, Na, Ni, P, Pb, Sb, Se, and Tl. The Multi-Metal analysis was conducted according to the protocol described in sections 5-7 of the EPA Draft Document *"Methodology for the Determination of Metals Emissions in Exhaust Gases from Hazardous Waste Incineration and Similar Combustion Processes."*

Preparation

MMTL samples were prepared by microwave and hotplate digestion, as required by the contract. Detailed flow charts of the sample preparation are included with this report.

Analysis

Ag, Ba, Be, Cd, Cr, Cu, Mn, Ni, and P concentrations were determined by Inductively Coupled Plasma (ICP) Emission Spectroscopy. As, Pb, Sb, Se, and Tl concentrations were determined by Graphite Furnace AA (GFAA). Those analytes which failed the postdigestion spike requirement during GFAA analysis were redetermined by MSA. Hg concentrations were determined by Cold Vapor AA (CVAA). Na concentrations were determined by Flame AA.

Results

There were two results that were unobtainable for this project due to sample matrix interference. Se and As for sample 1METL-2BH. This sample was analyzed by MSA several times for these two analytes. A dilution of the sample would not help due to the fact that the sample absorption is already at zero.

%RPD:

All of the applicable %RPD were within control limits of 25% except 1metl-1 bh for Ag, Cd, and P. However in these cases the %RPD is not considered a valid parameter because the concentration of the sample and duplicate is less than four times the instrument detection limit.

%REC:

Any postdigestion spike results that were less than 75%REC result in all samples related to that spike being reanalyzed by Method of Standard Addition (MSA).

Hg:

All of the Hg %RPD and %REC were within control limits except the %RPD for 1METL-2 5A. In this case the Hg was detected in the sample but not in the duplicate. This QC parameter is not considered valid since the Hg concentration in the sample is less than four times the detection limit. The undetected result for the duplicate is the reported result.

The Raw data for this report is filed with TLI Project #21359.

BB1/1 = 1METL -1
-2 (6/17/92)

BB1/2 = 2METL - 1
- 2
(6/18/92)

TRIANGLE LABORATORIES of RTP, INC.
PO BOX 13485
RTP, NC 27709

INORGANICS ANALYSIS REPORT

TLI PROJECT #: 21259
CLIENT: WESTON
DATE RECIEVED: 07/06/92
DATE REPORTED: 08/04/92

RESULTS REPORTED IN TOTAL ug

CLIENT SAMPLE ID	Ag	As	Ba	Be	Cd	Cr	Cu	Mn	Na	Ni	P	Pb	Sb	Se	Tl
1METL-1 FH	5.38	6.69	3,178	<.200	13.4	4.43	87.1	45.3	42,300	<2.00	884	44.9	.910	<.400	.720
1METL-1 BH	<1.04	<.297	< 2.97	<.297	1.44	5.88	<2.23	1.72	51.4	<2.97	34.8	<.297	<.743	<.594	.490
1METL-2 FH	1.72	6.61	3,732	<.200	13.0	34.5	87.6	56.5	41,400	27.9	598	40.2	1.42	<.400	.750
1METL-2 BH	<.976	*	< 2.79	<.279	<.557	<1.67	<2.09	<1.39	57.1	<2.79	55.0	<.279	<.697	*	.376
2METL-1 FH	3.20	2.58	3,888	.283	1.41	14.2	14.1	29.8	47,200	<2.00	216	18.9	.870	<.400	.360
2METL-1 BH	<.903	.451	< 2.58	<.258	<.516	<1.55	<1.93	6.80	121	<2.58	29.1	.400	<.645	<.516	<.258
2METL-2 FH	4.18	2.36	3,823	.224	1.15	17.3	13.1	33.0	51,800	3.55	190	24.4	1.15	<.400	.250
2METL-2 BH	<.917	<.262	< 2.62	<.262	.650	<1.57	<1.96	13.4	130	<2.62	<26.2	.485	<.655	<.524	.445

QC SUMMARY: %RPD or %REC

CLIENT SAMPLE ID	Ag	As	Ba	Be	Cd	Cr	Cu	Mn	Na	Ni	P	Pb	Sb	Se	Tl
1METL-1 FH(D)	8.84%	N/A	3.15%	N/A	1.74%	16.2%	2.30%	.65%	N/A	N/A	1.77%	N/A	N/A	N/A	N/A
1METL-1 BH(D)	200%	N/A	N/A	N/A	200%	14.8%	N/A	8.14%	N/A	N/A	74.8%	N/A	N/A	N/A	N/A
1METL-1 FH(S)	N/A	49.0%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	34.0%	112%	N/A	80.7%
1METL-1 BH(S)	N/A	73.0%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	69.8%	81.4%	N/A	34.7%

INORGANICS ANALYSIS REPORT

Hg RESULTS

	1METL-1 FH	1METL-1 BH	1-METL-1 5A	1-METL-1 5B	1-METL-1 5C
AVG TOTAL ug	.780	<1.22	<.400	<1.38	<.920
%RPD	10.3%	N/A	N/A	N/A	N/A

	1METL-2 FH	1METL-2 BH	1-METL-2 5A	1-METL-2 5B	1-METL-2 5C
AVG TOTAL ug	.560	<1.42	<.460	1.68	<.880
%RPD	7.14%	N/A	N/A	9.52%	N/A

	2METL-1 FH	2METL-1 BH	2-METL-1 5A	2-METL-1 5B	2-METL-1 5C
AVG TOTAL ug	.570	<1.78	<.420	1.31	<.840
%RPD	10.5%	N/A	N/A	9.52%	N/A

	2METL-2 FH	2METL-2 BH	2-METL-2 5A	2-METL-2 5B	2-METL-2 5C
AVG TOTAL ug	.720	<1.69	<.400	<1.60	<.920
%RPD	5.56%	N/A	N/A	N/A	N/A

	%REC
1-METL1 BH(S)	104%

DESCRIPTION OF ABBREVIATIONS

ICV=Initial Calibration Verification
ICB=Initial Calibration Blank
CCV=Continuing Calibration Verification
CCB=Continuing Calibration Blank
PBW=Preparation Blank Water
PBS=Preparation Blank Soil
LCS=Laboratory Control Spike
ICSA=Interference Check Sample(Solution A)   I=Initial F=Final
ICSAB=Interference Check Sample(Solution AB) I=Initial F=Final
Solution A contains common interferents, while Solution AB contains the interferents plus the analyte in question.
CRDL=Contract Required Detection Limit (for CLP)
IDL=Instrument Detection Limit
CRI=CRDL Standard for ICP I=Initial F=Final
CRA=CRDL Standard for AA   I=Initial F=Final
%RPD=Relative Percent Difference
%REC=% Recovery
SPK=Spike
AMT=Amount
BLK=Blank
MSA=Method of Standard Additions

CALCULATIONS

MMTL TRAINS:

ICP & GFAA

$$\text{FH \& BH TOTAL ug} = \frac{[\text{ug/L}] * (\text{mL TV/mL USED}) * (\text{mL FV} * \text{DF})}{1000}$$

FLAA

FH & BH TOTAL ug = [ug/L] * (mL TV/mL USED) * (mL FV * DF)

FV=FINAL VOLUME   DF=DILUTION FACTOR
WT=WEIGHT   TV=TOTAL VOLUME
BV=BEGINNING VOLUME

<u>Hg</u>

MMTL Trains:

FH TOTAL ug = [ug/L] * (ml FV/ml aliquot) * MPV * (DF)

BH TOTAL ug = [ug/L] * (ml TV/ml aliquot) * MPV * (DF)

MMTL Impingers:

TOTAL ug = [ug/L] * (ml TV/ml aliquot) * MPV * (DF)

MPV = Mercury Preparation Volume, which is always 0.1L

$$\%RPD = \frac{|SR - DR|}{(SR + DR)/2} * 100$$

$$\%REC = \frac{SSR - SR}{SA} * 100$$

SR=SAMPLE RESULT   DR=DUPLICATE RESULT
SSR=SPIKE SAMPLE RESULT   SA=SPIKE ADDED

Metals Data

Mill CS | Run no 1 | Sample Volume (DSCF) 37.14

Source BB1/1 | Run Date 6/17/92 | Source Vol Flow (DSCFM) 44,800

		MEAS FH (ug)	FH Blk Corr (ug)	FH Corr Amt (ug)	Meas BH (ug)	BH Blk Corr (ug)	BH Corr Amt (ug)	FH + BH Amt (ug)	Detection Limit (ug)
Antimony	Sb	0.9	0	0.9	<0.7	0	<0.7	1	5
Arsenic	As	6.7	1.0	5.7	<0.3	0	<0.3	6	5
Barium	Ba	3178	2073	1105	<3.0	0	<3.0	1107	4000
Beryllium	Be	<0.2	0	<0.2	<0.3	0	<0.3	<1	5
Cadmium	Cd	13.4	1.4	12.0	1.4	1.0	0.4	12	5
Chromium	Cr	4.4	6.4	<6.0	5.7	0	5.7	9	10
,	+6								
Copper	Cu	87.1	0	87.1	<2.2	0	<2.2	88	5
Lead	Pb	44.9	5.4	39.5	<0.3	0.8	<0.8	40	10
Manganese	Mn	45.3	3.1	42.2	1.7	0	1.7	44	10
Mercury	Hg	0.7	0	0.7	2.0	0	2.0	3	5
Nickel	Ni	<2.0	0	<2.0	<3.0	0	<3.0	<3	5
Phosphorus	P	864	34.7	829.3	34.8	100	<100	879	100
Silver	Ag	5.4	0	5.4	<1.0	0	<1.0	6	5
Selenium	Se	0.9	0	0.9	<0.7	0	<0.7	1	5
Thallium	Tl	0.7	0	0.7	0.5	0	0.5	1	5

Blank is a mean of 3 blanks for project
See notes by Bruce dated 9/3/92.

Metals Data

Mill CS — Run no 2 — Sample Volume (DSCF) 36.50

Source BB1/1 — Run Date 6/17/92 — Source Vol Flow (DSCFM) 44,000

		MEAS FH (ug)	FH Blk Corr (ug)	FH Corr Amt (ug)		meas BH (ug)	BH Blk corr (ug)	BH Corr Amt (ug)		FH + BH Amt (ug)	Detection Limit (ug)
Antimony	Sb	1.4	0	1.4		<0.7	0	<0.7		2	5
Arsenic	As	6.6	1.0	5.6		—	0	—		6	5
Barium	Ba	3732	2073	1659		<2.8	0	<2.8		1660	4000
Beryllium	Be	<0.2	0	<0.2		<0.3	0	<0.3		<1	5
Cadmium	Cd	13.0	1.4	11.6		<0.6	1.0	<1.0		12	5
Chromium	Cr	34.5	6.4	28.1		<1.7	0	<1.7		29	10
	+6										
Copper	Cu	67.6	0	67.6		<2.1	0	<2.1		69	5
Lead	Pb	40.2	5.4	34.8		<0.3	0.8	<0.8		35	10
Manganese	Mn	56.5	3.1	53.4		<1.4	0	<1.4		54	10
Mercury	Hg	0.6	0	0.6		3.1	0	3.1		4	5
Nickel	Ni	27.9	0	27.9		<2.8	0	<2.8		29	5
Phosphorus	P	598.0	34.7	563.3		55	100	<100		613	100
Silver	Ag	1.7	0	1.7		<1.0	0	<1.0		3	5
Selenium	Se	<0.4	0	<0.4		—	0	—		<1	5
Thallium	Tl	0.8	0	0.8		0.4	0	0.4		<1	5

Blank is a mean of 3 blanks for project
See notes by B[illegible] dated 9/3/92.

Mill: Champion-Sheldon
Source: Bark Boiler with Sludge

Run 1

Sample volume (DSCF)------ --- 56.198
Source Vol Flow (DSCFM)--- ---5.45E+04

		Amt (ug)	Conc (lb/DSCF)	Mass Rt. (lb/hr)	Detection Limit(ug)	Det Limit (lb/DSCF)	Det Limit (lb/hr)
Hexavalent Cr	Cr(VI)	1.74	6.8E-11	2.2E-04	1	3.9E-11	1.3E-04

1

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95 1-22 W

HEXAVALENT CHROMIUM CALCULATIONS

Client: TPIEC
Location: Champion-Sheldon
WESTON Project No.: 6848-01-01
Source: BB1/1

INPUT DATA

Run Number		1	2	3	Mean
Date		08/21/92			---
Time Began		816			---
Time Ended		1008			---
Sampling Time, min	(Theta)	112			112
Stack Dimensions, in.	(Square)	58x58	58x58		0
Barometric Pressure, in. Hg	(Pb)	30.05			30.05
Static Pressure, in. H2O	(Pg)	0.64			0.64
Pitot Tube Coefficient	(Cp)	0.84			0.84
Meter Correction Factor	(Y)	1.010			1.010
Nozzle Diameter, in.	(Dn)	0.247			0.247
Meter Volume, ft^3	(Vm)	57.573			57.573
Meter Temperature, °F	(tm)	91			91
Meter Orifice Pressure, in. H2O	(Delta H)	2.216			2.216
Volume H2O Collected, mL	(Vlc)	411.8			411.8
CO2 Concentration, %	(CO2)	8.2			8.2
O2 Concentration, %	(O2)	10.6			10.6
Average Sq Rt Velo Head, (in. H2O)^½	((Delta P)^½)avg	0.9625			0.9625
Stack Temperature, °F	(ts)	152			152
Total Metals Collected, ug		1.7			1.7
Moisture Fraction (at Saturation)	(Bws)	NA	NA	NA	

CALCULATED DATA

Stack Area, ft^2	(As)	23.36	23.36	0.00	15.57
Stack Pressure, in. Hg	(Ps)	30.10	0.00	0.00	10.03
Standard Meter Volume, ft^3	(Vmstd)	56.198	0.000	0.000	18.733
Standard Water Volume, ft^3	(Vwstd)	19.383	0.000	0.000	6.461
Moisture Fraction (Measured)	(Bws)	0.256	ERR	ERR	ERR
Moisture Fraction (lower sat/meas)	(Bws)	0.256	ERR	ERR	ERR
Mol. Wt. of Stack Gas, lb/lb-mole	(Ms)	26.7	ERR	ERR	ERR
Average Stack Gas Velocity, ft/sec	(Vs)	60.3	ERR	ERR	ERR
Stack Gas Flow @ Stack Cond, ft^3/min	(Qa)	8.45E+04	ERR	ERR	ERR
Stack Gas Flow @ Std Cond, ft^3/min	(Qs)	5.45E+04	ERR	ERR	ERR
Isokinetic Sampling Rate, %	(%I)	65	ERR	ERR	ERR
Metals Concentration, lb/ft^3		6.82E-11	ERR	ERR	ERR

j:\a503\standard\metals.wk1

SB
1-22-93

RTI Project No. : 4848-02Q

Samples : Impinger Samples
Company : Weston Analytics (W.O No. 6848-01-01)
Analyte : Cr(VI)
Methods of Analysis : Ion Chromatography / Post Column Reaction
Samples Received : 8-24-92
Report Date : 9-9-92

Sample	Total Volume mL	Cr(VI) ug/mL	Total Cr(VI) ug
CHMP-BB1-CR6-R1-A (w/o sludge)	840	0.00273	2.29
CHMP-BB1-CR6-R1-B	304	0.00177	0.54
CHMP-BB1-CR6-R2-A (with sludge)	672	0.00358	2.41
CHMP-BB1-CR6-R2-B	734	0.00302	2.22
CHMP-BB1-BLK-KOH	697	0.00205	1.43
CHMP-BB1-BLK-DIW	819	ND	ND

Detection Limit 0.0015

ND : Non-detectable; less than detection limit

Total Cr(VI), ug = Cr(VI), ug/mL * Total Volume, mL

RTI Project No. : 4848-02Q

Samples : QC for Impinger Samples
Company : Weston Analytics (W.O No. 6848-01-01)
Analyte : Cr(VI)
Methods of Analysis : Ion Chromatography / Post Column Reaction
Samples Received : 8-24-92
Report Date : 9-9-92

Calibration Check Sample

Sample	Cr(VI) ug/mL Measured	Cr(VI) ug/mL Expected
QC	0.00985	0.0100

Results of Blank, Duplicate, and Spike Analysis

Sample	Cr(VI) ug/mL Measured	Spike Cr(VI) ug/mL Measured	Spike Cr(VI) ug/mL Expected	Spike Cr(VI) % Recovery
RTI DIW Blk	ND	--	--	--
CHMP-BB1-CR6-R1-B Dup	0.00201	--	--	--
CHMP-BB1-CR6-R2-A Spk	ND	0.0108	0.0100	108

Section 6.6 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

SOURCE CS-BB1/1

QUALITY CONTROL SUMMARY
METHOD 25A

1. CALIBRATION

THEOR	6/6/92		6/8/92	
ppm	ppm	%ERR	ppm	%ERR
0.0	-1.0	-0.4	0.0	0.0
1.0	-1.0	-0.8	0.0	-1.1
36.0	41.0	2.0	37.6	1.8
91.0	88.0	-1.3	90.5	-0.8
CORR COEFF	0.9973		0.9996	

2. PROPANE LINE RECOVERY

	DATE	6/6/92		DATE	6/8/92	
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	86.0	85.0	98.8%	90.0	89.0	98.9%
AFTER	90.0	89.0	98.9%	92.3	92.3	100.0%

3. LINE BLANK

	6/6/92	6/8/92
	ppm	ppm
BEFORE	0.0	1.4
AFTER	0.0	*

* Not performed

SOURCE CS-BB1/1

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR ppm	DATE 6/6/92 ppm	%REC	DATE 6/8/92 ppm	%REC
ethanol	52.0	47.8	92.0%	48.9	94.0%
acetone	41.6	38.2	92.0%	39.9	96.1%
isopropanol	39.9	37.1	93.1%	37.5	94.1%
dimethyl sulfide	9.1	8.5	93.4%	8.9	97.8%
benzene	34.2	31.7	92.8%	33.2	97.2%
bromodichloromethane	18.8	17.7	94.1%	17.7	94.1%
dimethyl disulfide	33.9	31.4	92.5%	31.2	92.0%
toluene	28.7	26.7	92.8%	27.4	95.5%
ethyl benzene	24.9	23.4	93.8%	22.9	91.7%
m-xylene	49.8	46.8	94.0%	45.2	90.8%
o-xylene	25.0	23.8	95.1%	22.4	89.4%
cumene	21.9	20.9	95.2%	20.2	91.9%
alpha-pinene	19.2	17.9	93.4%	18.6	97.2%
beta-pinene	19.2	17.9	93.0%	17.2	89.4%
3-carene	19.3	17.6	91.4%	16.4	84.9%
p-cymene	19.6	18.0	91.9%	16.5	84.2%

2. PROPANE RESPONSE

	THEOR		%REC		%REC
BEFORE	36.0	38.6	107.2%	38.2	106.1%
AFTER	36.0	37.8	105.0%	38.0	105.6%

3. METHANOL LINE RECOVERY

	6/6/92 GC	6/6/92 LINE	6/6/92 %REC	6/8/92 GC	6/8/92 LINE	6/8/92 %REC
BEFORE	9.9	8.5	85.6%	10.4	11.1	106.7%
AFTER	10.6	11.3	106.6%	10.4	10.0	96.2%

4. LINE BLANK

	[-------------FILE REF-------------]	
BEFORE	F5A2005	F8A2009
AFTER	F6A2007	F9A2005

Section 6.7 Process Operating Data

POWER BOILERS - PROCESS OPERATING CONDITIONS

Mill: Sheldon Mill
Source: No.1 Power Boiler
FIN: 5200

Source: No.1 Power Boiler
Date: 6-6-92
EPN: E40
CIN: EC22,EC21

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		10:13	11:07	12:02	
Boiler Type		B&W Traveling Grate			
Fuel Type		Bark and Sludge			0.00
Fuel Firing Rate	MMBTU/hr	230	230	240	0.00
Excess Air	%	9.4	9.4	8.5	0.00
Fuel BTU Content	BTU/lb	4500.0	4500.0	4500.0	0.00
Fuel Moisture Content	%	50.000	50.000	50.000	0.00
Emission Data					
O2 Concentration		9.4	9.4	8.5	0.00
CO2 Concentration					0.00
CO Concentration					0.00
SO2 Concentration					0.00
NOX Concentration					0.00
Sludge Burning	yes or no	YES	YES	YES	
Sludge Burning Rate	lb/hr	5700	5700	5700	0.00
Sludge Moisture Content	%	55	55	55	0.00

POWER BOILERS - PROCESS OPERATING CONDITIONS

Mill: Sheldon Mill
Source: No.1 Power Boiler
FIN: 5200

Source:No.1 Power Boiler
Date:6-06-92
EPN:E40
CIN: EC22, EC21

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		12:56			
Boiler Type					
Fuel Type					0.00
Fuel Firing Rate	MMBTU/hr	240			0.00
Excess Air	%	8.5			0.00
Fuel BTU Content	BTU/lb	4500.0			0.00
Fuel Moisture Content	%	50.000			0.00
Emission Data					
O2 Concentration		8.5			0.00
CO2 Concentration					0.00
CO Concentration					0.00
SO2 Concentration					0.00
NOX Concentration					0.00
Sludge Burning	yes or no	YES			
Sludge Burning Rate	lb/hr	5700			0.00
Sludge Moisture Content	%	55			0.00

POWER BOILERS - PROCESS OPERATING CONDITIONS

Mill: Sheldon Mill
Source: No.1 Power Boiler
FIN: 5200

Source: No.1 Power Boiler
Date: 6-8-92
EPN: E40 CIN: EC22,EC21

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		12:08*	13:09	14:10	
Boiler Type			B&W Traveling Grate		
Fuel Type			Bark and Sludge		0.00
Fuel Firing Rate	MMBTU/hr	294	275	275	0.00
Excess Air	%	7.0	9.7	9.7	0.00
Fuel BTU Content	BTU/lb	4500.0	4500.0	4500.0	0.00
Fuel Moisture Content	%	50.000	50.000	50.000	0.00
Emission Data					
O2 Concentration		7	9.7	9.7	0.00
CO2 Concentration					0.00
CO Concentration					0.00
SO2 Concentration					0.00
NOX Concentration					0.00
Sludge Burning	yes or no	YES	YES	YES	
Sludge Burning Rate	lb/hr	7400	7400	7400	0.00
Sludge Moisture Content	%	55	55	55	0.00

Notes : * Dirty condensate was not used as scrubber liquid

POWER BOILERS - PROCESS OPERATING CONDITIONS

Mill: Sheldon Mill
Source: No.1 Power Boiler
FIN: 5200

Source:No.1 Power Boiler
Date:6-9-92
EPN:E40
CIN: EC22, EC21

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		9:11*			
Boiler Type					
Fuel Type					0.00
Fuel Firing Rate	MMBTU/hr	255			0.00
Excess Air	%	9.3			0.00
Fuel BTU Content	BTU/lb	4500.0			0.00
Fuel Moisture Content	%	50.000			0.00
Emission Data					
O2 Concentration		9.3			0.00
CO2 Concentration					0.00
CO Concentration					0.00
SO2 Concentration					0.00
NOX Concentration					0.00
Sludge Burning	yes or no	YES			
Sludge Burning Rate	lb/hr	6000			0.00
Sludge Moisture Content	%	55			0.00

Notes : * Dirty condensate was not used

POWER BOILERS - PROCESS OPERATING CONDITIONS

Mill: Sheldon Mill
Source: No.1 Power Boiler
FIN: 5200

Source: No.1 Power Boiler
Date: 6-17-92
EPN: E40 CIN: EC22,EC21

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		9:51	10:50	11:56	
Boiler Type		B&W Traveling Grate			
Fuel Type		Bark and Sludge			0.00
Fuel Firing Rate	MMBTU/hr	260	260	256	0.00
Excess Air	%	9.5	9.5	8.9	0.00
Fuel BTU Content	BTU/lb	4500.0	4500.0	4500.0	0.00
Fuel Moisture Content	%	50.000	50.000	50.000	0.00
Emission Data					
O2 Concentration		9.5	9.5	8.9	0.00
CO2 Concentration					0.00
CO Concentration					0.00
SO2 Concentration					0.00
NOX Concentration					0.00
Sludge Burning	yes or no	YES	YES	YES	
Sludge Burning Rate	lb/hr	5700	6600	6600	0.00
Sludge Moisture Content	%	55	55	55	0.00

POWER BOILERS - PROCESS OPERATING CONDITIONS

Mill: Sheldon Mill
Source: No.1 Power Boiler
FIN: 5200

Source: No.1 Power Boiler
Date: 6-17-92
EPN: E40
CIN: EC22,EC21

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		17:00	18:50		
Boiler Type		B&W Traveling Grate			
Fuel Type		Bark and Sludge			0.00
Fuel Firing Rate	MMBTU/hr	254	270		0.00
Excess Air	%	9.0	8.9		0.00
Fuel BTU Content	BTU/lb	4500.0	4500.0		0.00
Fuel Moisture Content	%	50.000	50.000		0.00
Emission Data					
O2 Concentration		9	8.9		0.00
CO2 Concentration					0.00
CO Concentration					0.00
SO2 Concentration					0.00
NOX Concentration					0.00
Sludge Burning	yes or no	YES	YES		
Sludge Burning Rate	lb/hr	6600	6600		0.00
Sludge Moisture Content	%	55	55		0.00

POWER BOILERS - PROCESS OPERATING CONDITIONS

Mill: Sheldon Mill
Source: No.1 Power Boiler
FIN: S200

Source: No.1 Power Boiler
Date: 8-21-92
EPN: E40 CIN: EC22,EC21

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		8:16	10:0		
Boiler Type		B&W Traveling Grate			
Fuel Type		Bark and Sludge			0.00
Fuel Firing Rate	MMBTU/hr	243	238		0.00
Excess Air	%	9.9	9.6		0.00
Fuel BTU Content	BTU/lb	4500.0	4500.0		0.00
Fuel Moisture Content	%	50.000	50.000		0.00
Emission Data					
O2 Concentration		9.9	9.6		0.00
CO2 Concentration					0.00
CO Concentration					0.00
SO2 Concentration					0.00
NOX Concentration					0.00
Sludge Burning	yes or no				
Sludge Burning Rate	lb/hr	4000	4000		0.00
Sludge Moisture Content	%	40	40		0.00

SECTION 7

NO. 1 BARK BOILER WITHOUT SLUDGE

(CS-BB1/2)

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SECTION 7
NO. 1 BARK BOILER WITHOUT SLUDGE
(CS-BB1/2)

The Bark Boiler without sludge was tested on two different days, once with condensate and once without, for volatile organic compounds by M25A, and M18, and once for VOST (with condensate). This source was also tested for semivolatiles (without condensate), chloroform, aldehydes and ketones, hydrogen chloride, sulfuric acid mist and metals.

Total Hydrocarbons (M25A)

Figures 7.1 and 7.2 present the THC trends for the test periods on 6/6/92 and 6/8/92. The THC levels were consistent throughout the testing period, with emissions in the 60-70 ppm range. THC values were much lower when the unit was operated without condensate.

Volatile Organic Compounds (M16 and M18)

Tables 7.1A and 7.1B summarizes the results for the Method 18 target compounds, and Section 7.1 is a tabulation of the data. TRS was not analyzed. The volumetric flow was measured during sampling with a pitot tube. With condensate, methanol was present along with traces of ethanol. Without condensate, all target compounds were non-detectable.

Volatile Organic Sampling Train (VOST)

Table 7.2 summarizes the result of the VOST sample collected on 6/6/92. Section 7.2 tabulates the results for target compounds and tentatively identified compounds (TIC). By this method, the predominant target compounds were DMS and n-hexane, both at levels below those reported by M18.

Semivolatile Organic Compounds (MM5)

Table 7.3 summarizes the result of the semivolatile organic compounds sample collected using the Modified Method 5 (MM5) train on 6/8/92. Section 7.3 tabulates the results of the target compounds and the tentatively identified compounds (TICs) from the gas chromatography-mass spectrometry (GC-MS) analysis. a-Pinene was the predominant target compound found. Naphthalene and benzoic acid are background contaminants in XAD-2 resin.

Miscellaneous Parameters

Tables 7.4A and 7.4B summarize the results of testing for aldehydes, hydrogen chloride, chloroform, and sulfuric acid mist. Section 7.4 tabulates the results for each compound. The aldehydes and ketones were non-detectable without condensate. A trace amount of formaldehyde was present at the limit of detection. Chloroform, hydrogen chloride and sulfuric acid mist were non-detectable with and without condensate.

Metals

Tables 7.5A and 7.5B summarize the results of the samples collected for metals and hexavalent chromium analyses, respectively. Section 7.5 tabulates the results for each compound. The most predominant metal found was phosphorus at 35 x 10^{-3} lb/hr. Other metals found were manganese, lead, copper, with traces of chromium. Hexavalent chromium was not detected.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 7.6. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 7.7 includes the process operating data as recorded and provided by mill personnel.

FIGURE 7.1
THC TREND ANALYSIS (6/6/92)
BARK BOILER WITHOUT SLUDGE WITH
EVAPORATOR CONDENSATE (CS-BB1/2)

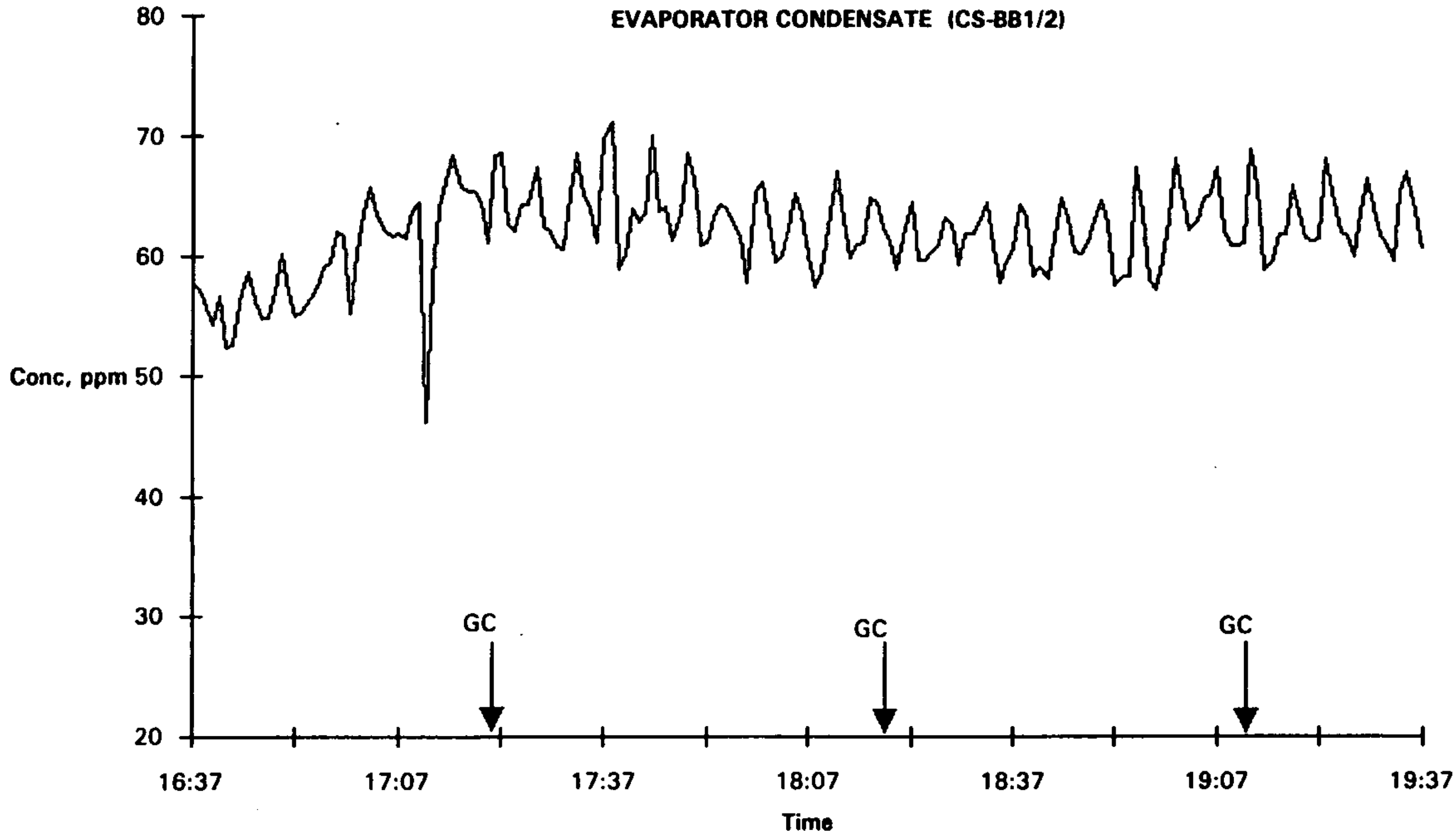

FIGURE 7.2.
THC TREND ANALYSIS (6/08/92)
BARK BOILER WITHOUT SLUDGE WITHOUT
EVAPORATOR CONDENSATE (CS-BB1/2)

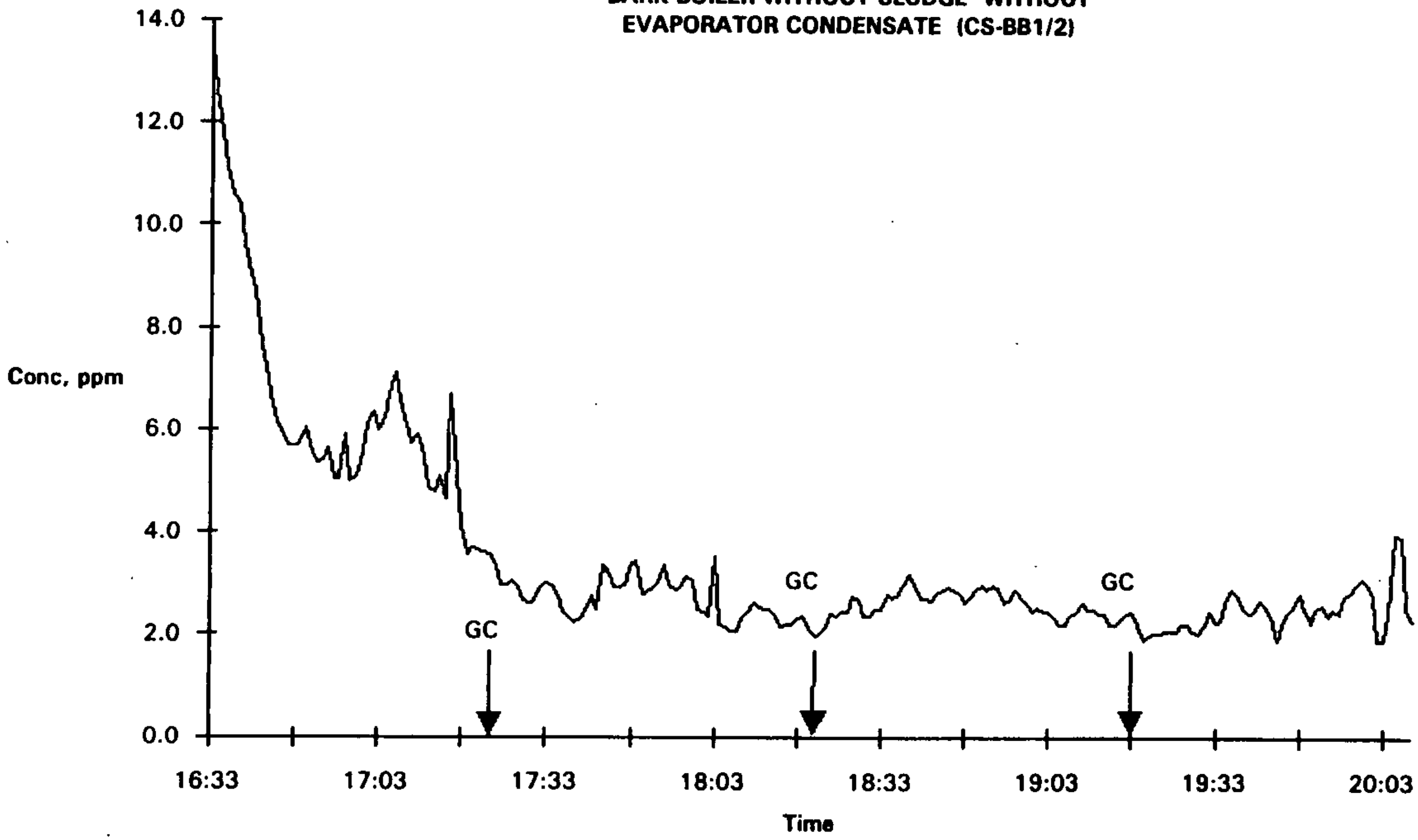

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TABLE 7.1A SUMMARY OF VOC RESULTS

Mill: CHAMPION - SHELDON
Source: Bark Boiler w/o Sludge w/Condensate

Source Code: CS-BB1/2
Test Dates: 6/6/92

FIN: 5200 CIN: EC22,EC21
EPN: E40

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	154	154	154	
Volumetric Flow Rate, x10^3 DSCFM	46.1	46.1	46.1	
Process Operating Conditions				
Production Rate, x 10^6 BTU/hr	270.0	275.0	271.7	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.2
Dimethyl sulfide				0.2
Carbon disulfide				0.3
Dimethyl disulfide				0.3
Method 18 Data, lb/hr				
Methanol	27.5	35.7	30.9	0.6
Ethanol	0.5	0.8	0.6	0.2
Acetone	ND	ND	ND	0.3
2-Propanol	ND	ND	ND	0.3
2-Butanone	ND	ND	ND	0.4
Chloroform	ND	ND	ND	1.2
Benzene	ND	ND	ND	0.4
Bromodichloromethane	ND	ND	ND	1.6
Toluene	ND	ND	ND	0.5
Ethyl benzene	ND	ND	ND	0.5
m-, p-Xylene	ND	ND	ND	0.5
o-Xylene	ND	ND	ND	0.5
Cumene	ND	ND	ND	0.6
alpha-Pinene	ND	ND	ND	0.7
beta-Pinene	ND	ND	ND	0.7
3-Carene	ND	ND	ND	0.7
Terpenes (Unspecified)	ND	ND	ND	0.7
p-Cymene	ND	ND	ND	0.7
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	7.8	10.0	8.7	0.1
Unknowns as C, lb/hr	0.1	0.2	0.2	0.1
Sum of Compounds as C, lb/hr	7.9	10.2	8.8	0.1

ND=Not Detected
DL=Detection Limit

TABLE 7.1B SUMMARY OF VOC RESULTS

Mill: CHAMPION - SHELDON

Source: Bark Boiler w/o Sludge w/o Condensate

Source Code: CS-BB1/4

Test Dates: 6/8/92

FIN: 5200 CIN: EC22,EC21

EPN: E40

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	152	152	152	
Volumetric Flow Rate, x10^3 DSCFM	46.7	46.7	46.7	
Process Operating Conditions				
Production Rate, x 10^6 BTU/hr	267.0	275.0	269.7	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.2
Dimethyl sulfide				0.2
Carbon disulfide				0.3
Dimethyl disulfide				0.3
Method 18 Data, lb/hr				
Methanol	ND	0.6	0.4	0.6
Ethanol	ND	ND	ND	0.2
Acetone	ND	ND	ND	0.3
Isopropanol	ND	ND	ND	0.3
Methyl ethyl ketone	ND	ND	ND	0.4
Chloroform	ND	ND	ND	1.2
Benzene	ND	ND	ND	0.4
Bromodichloromethane	ND	ND	ND	1.6
Toluene	ND	ND	ND	0.5
Ethyl benzene	ND	ND	ND	0.5
m-, p-Xylene	ND	ND	ND	0.5
o-Xylene	ND	ND	ND	0.5
Cumene	ND	ND	ND	0.6
alpha-Pinene	ND	ND	ND	0.7
beta-Pinene	ND	ND	ND	0.7
3-Carene	ND	ND	ND	0.7
Terpenes (Unspecified)	ND	ND	ND	0.7
p-Cymene	ND	ND	ND	0.7
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	ND	ND	ND	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	ND	ND	ND	0.1

ND=Not Detected
DL=Detection Limit

TABLE 7.2 SUMMARY OF VOST RESULTS

Mill: CHAMPION-SHELDON

Source: No. 1 Bark Boiler w/o Sludge w/Condensate

Source Code: CS-BB1/2

Test Dates: 6/6/92

FIN: 5200 EPN: E40

CIN: EC22,EC21

TIME	1808
Volumetric Flow Data	
Stack Temperature, °F	154
Volumetric Flow Rate, x 10^3 DSCFM	46.1
Process Operating Conditions	
Production Rate, x 10^6 BTU/hr	270.0
Target Compounds, ppm	
Chloromethane	0.051
Methylene Chloride	0.023
Acetone	0.086
Carbon Disulfide	0.003
Chloroform	0.011
Dimethyl disulfide	0.031
Dimethyl sulfide	0.223
n-Hexane	0.103
2-Butanone (MEK)	0.025
1,1,1-Trichloroethane	0.002
Bromodichloromethane	0.000
Benzene	0.034
Dibromomethane	0.000
Toluene	0.009
Styrene	0.002
m-/p-Xylene	0.001
Acrolein	0.040
A-Pinene	0.028
B-Pinene	0.018
p-Cymene	0.001

TABLE 7.3 SUMMARY OF SEMIVOLATILE RESULTS

Mill: CHAMPION-SHELDON

Source Code: CS-BB1/2
FIN: 5200 EPN: E40

Source: No. 1 Bark Boiler w/o Sludge w/o Condensate
Test Dates: 6/8/92
CIN: EC22,EC21

TIME	1900
Volumetric Flow Data	
Stack Temperature, °F	152
Volumetric Flow Rate, x 10^3 DSCFM	46.7
Process Operating Conditions	
Production Rate, x 10^6 BTU/hr	275.0
Target Compounds, ppm	
a-Pinene	0.019
B-Pinene	0.009
p-Cymene	0.001
Acetophenone	0.001
a-Terpineol	0.001
Naphthalene	0.002
Di-n-butylpphthalate	0.001
Phenanthrene	0.000
Butylbenzylphthalate	0.000
Dimethylphthalate	0.000
Phenol	0.001
Benzoic Acid	0.010
Diethylphthalate	0.001

WESTON. MANAGERS DESIGNERS/CONSULTANTS

TABLE 7.4A SUMMARY OF MISCELLANEOUS RESULTS

Mill: CHAMPION-SHELDON

Source: No. 1 Bark Boiler w/o Sludge w/Condensate

Source Code: CS-BB1/2

Test Dates: 6/6/92 6/19/92

FIN: 5200 EPN: E40

CIN: EC22, EC21

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	154	154	154	
Volumetric Flow Rate, x 10^3 DSCFM	44.6	46.1	45.4	
Process Operating Conditions				
Production Rate, x 10^6 BTU/hr	267.0	270.0	267.8	
Emission Rate, lb/hr		RUN 1		
Formaldehyde		0.1		0.1
Acetaldehyde		ND		0.2
Acetone		ND		0.2
Acetophenone		ND		0.4
Methyl isobutyl ketone		ND		0.3
Acrolein		ND		0.4
Benzaldehyde		ND		0.2
Chloroform		ND		0.4
Hydrogen chloride		ND		0.1
Sulfuric Acid Mist		ND		0.1

ND = Not Detected

DL = Detection Limit

TABLE 7.4B SUMMARY OF MISCELLANEOUS RESULTS

Mill: CHAMPION-SHELDON

Source: No. 1 Bark Boiler w/o Sludge w/o Condensate

Source Code: CS-BB1/2

Test Dates: 6/8/92

FIN: 5200 EPN: E40

CIN: EC22, EC21

	RUN 1	DL
Volumetric Flow Data		
Stack Temperature, °F	152	
Volumetric Flow Rate, x 10^3 DSCFM	46.7	
Process Operating Conditions		
Production Rate, x 10^6 BTU/hr	267.0	
Emission Rate, lb/hr		
Formaldehyde	ND	0.1
Acetaldehyde	ND	0.2
Acetone	ND	0.2
Acetophenone	ND	0.4
Methyl isobutyl ketone	ND	0.3
Acrolein	ND	0.4
Benzaldehyde	ND	0.2
Chloroform	ND	0.4
Hydrogen chloride	ND	0.1

ND = Not Detected
DL = Detection Limit

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TABLE 7.5A SUMMARY OF METALS EMISSIONS

Mill: CHAMPION-SHELDON

Source: No. 1 Bark Boiler w/o Sludge w/o Condensate

Source Code: CS-BB1/2

Test Dates: 6/18/92

FIN: 5200 EPN: E40

CIN: EC22, EC21

	RUN 1	RUN 2	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	154	155	154	
Volumetric Flow Rate, x 10^3 DSCFM	44.8	44.4	44.6	
Process Operating Conditions				
Production Rate, x 10^6 BTU/hr	206.0	221.0	213.5	
Metals Emission Rate, x 10^{-3} lb/hr				
Antimony (Sb)	ND	ND	ND	0.8
Arsenic (As)	ND	ND	ND	0.8
Barium (Ba)	ND	ND	ND	630
Beryllium (Be)	ND	ND	ND	0.8
Cadmium (Cd)	ND	ND	ND	0.8
Chromium (Cr)	ND	1.9	1.4	1.6
Copper (Cu)	2.4	2.2	2.3	0.8
Lead (Pb)	2.2	3.0	2.6	1.6
Manganese (Mn)	5.4	6.7	6.1	1.6
Mercury (Hg)	ND	ND	ND	0.8
Nickel (Ni)	ND	ND	ND	0.8
Phosphorus (P)	37.0	32.0	34.5	16
Silver (Ag)	ND	ND	ND	0.8
Selenium (Se)	ND	ND	ND	0.8
Thallium (Tl)	ND	ND	ND	0.8

ND = Not Detected
DL = Detection Limit

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TABLE 7.5B SUMMARY OF HEXAVALENT CHROMIUM EMISSIONS

Mill: CHAMPION-SHELDON

Source: No. 1 Bark Boiler w/o Sludge w/o Condensate

Source Code: CS-BB1/2

Test Dates: 8/20/92

FIN: 5200 EPN: E40

CIN: EC22, EC21

	RUN 1	DL
Volumetric Flow Data		
Stack Temperature, °F	149	
Volumetric Flow Rate, x 10^3 DSCFM	50.7	
Process Operating Conditions		
Production Rate, x 10^6 BTU/hr	381.0	
Emission Rate, x 10^4 lb/hr		
Hexavalent Chromium	ND	1

ND = Not Detected

DL = Detection Limit

Section 7.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Bark Boiler w/o Sludge w/ Cond. | FIN: 5200
Source Code: CS-BB1/2 | Date: 6/6/92 | EPN: E40 | CIN: EC22, EC21

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1636	1736	1836	
Flow Data				
Stack Temperature, °F		154		154
Moisture Content, %		27.5		27.5
Oxygen Concentration, %		10.5		10.5
Carbon Dioxide Concentration, %		10.8		10.8
Volumetric Flow Rate, x10^3 ACFM		72.9		72.9
Volumetric Flow Rate, x10^3 DSCFM		46.1		46.1
Process Operating Conditions				
Production Rate, x 10^6 BTU/hr	270.0	270.0	275.0	271.7
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	128.0	155.3	119.6	134.3
Emission Rate, lb/hr	29.5	35.7	27.5	30.9
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	1.8	2.3	1.7	1.9
Emission Rate, lb/hr	0.6	0.8	0.5	0.6
Acetone				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
2-Propanol				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Bark Boiler w/o Sludge w/ Cond. | FIN: 5200
Source Code: CS-BB1/2 | Date: 6/6/92 | EPN: E40 | CIN: EC22, EC21

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Chloroform				
Concentration, ppmvd	1.4 *	1.4 *	1.4 *	1.4 *
Emission Rate, lb/hr	1.2 *	1.2 *	1.2 *	1.2 *
Benzene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Bromodichloromethane				
Concentration, ppmvd	1.4 *	1.4 *	1.4 *	1.4 *
Emission Rate, lb/hr	1.6 *	1.6 *	1.6 *	1.6 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Ethyl benzene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
m-, p-Xylene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
o-Xylene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Cumene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.6 *	0.6 *	0.6 *	0.6 *
alpha-Pinene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
beta-Pinene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
3-Carene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *

*One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Bark Boiler w/o Sludge w/ Cond. | FIN: 5200
Source Code: CS-BB1/2 | Date: 6/6/92 | EPN: E40 | CIN: EC22, EC21

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
Knowns as Carbon				
Concentration, ppmvd	96.0	116.0	89.9	100.6
Unknowns as Carbon				
Concentration, ppmvd	1.8	2.1	1.5	1.8
Sum M18 as Carbon, lb/hr	8.4	10.2	7.9	8.8
Unknown Compounds % of Total	1.8%	1.8%	1.7%	1.7%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	84.1	86.9	85.5	85.5
Emission Rate, lb/hr as C	7.3	7.5	7.4	7.4

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Bark Boiler w/o Sludge w/o Cond. | FIN: 5200
Source Code: CS-BB1/4 | Date: 6/8/92 | EPN: E40 | CIN: EC22, EC21

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1632	1732	1832	
Flow Data				
Stack Temperature, °F			152	152
Moisture Content, %			26.4	26.4
Oxygen Concentration, %			10.1	10.1
Carbon Dioxide Concentration, %			11.7	11.7
Volumetric Flow Rate, x10^3 ACFM			72.9	72.9
Volumetric Flow Rate, x10^3 DSCFM			46.7	46.7
Process Operating Conditions				
Production Rate, x 10^6 BTU/hr	267.0	267.0	275.0	269.7
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	2.7 *	2.7 *	2.7	1.8
Emission Rate, lb/hr	0.6 *	0.6 *	0.6	0.4
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Acetone				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Isopropanol				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON   Source: Bark Boiler w/o Sludge w/o Cond.   FIN: 5200
Source Code: CS-BB1/4   Date: 6/8/92   EPN: E40   CIN: EC22, EC21

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl ethyl ketone				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Chloroform				
Concentration, ppmvd	1.4 *	1.4 *	1.4 *	1.4 *
Emission Rate, lb/hr	1.2 *	1.2 *	1.2 *	1.2 *
Benzene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Bromodichloromethane				
Concentration, ppmvd	1.4 *	1.4 *	1.4 *	1.4 *
Emission Rate, lb/hr	1.6 *	1.6 *	1.6 *	1.6 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Ethyl benzene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
m-, p-Xylene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
o-Xylene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Cumene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.6 *	0.6 *	0.6 *	0.6 *
alpha-Pinene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
beta-Pinene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
3-Carene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Bark Boiler w/o Sludge w/o Cond. | FIN: 5200

Source Code: CS-BB1/4 | Date: 6/8/92 | EPN: E40 | CIN: EC22, EC2'

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
Knowns as Carbon				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	8.0	3.5	3.4	5.0
Emission Rate, lb/hr as C	0.7	0.3	0.3	0.4

* One or more values were less than the detection limit.

Section 7.2 Emission Test Results - VOST

EMISSION TEST RESULTS - VOST

Mill CHAMPION - SHELDON   Source: No. 1 Bark Boiler without Sludge   Condition 2
Source Code: CS-BB1/2   EPN: E40   FIN: 5200   CIN: 2, EC21

Date: 6/6/92

Compound	BB1/2-T (µg)	BB1/2-TC (µg)	BB1/2-C (µg/L)	Total µg	CS-BB1/2 (µg/m3)	Conc. (ppm)
TARGET COMPOUNDS						
Chloromethane		0.529		0.53	106.22	0.051
Bromomethane						
Methylene Chloride	0.215	0.054	3.17	0.41	81.42	0.023
Acetone	0.711	0.034	6.63	1.03	206.80	0.086
Carbon Disulfide	0.040			0.04	8.03	0.003
Chloroform	0.092	0.040	3.43	0.28	56.16	0.011
Dimethyl disulfide	0.589	0.013	0.24	0.61	122.98	0.031
Dimethyl sulfide	2.840		0.77	2.87	576.90	0.223
Iodomethane						
n-Hexane	0.627	1.218		1.85	370.48	0.103
2-Butanone (MEK)	0.355	0.015		0.37	74.30	0.025
1,1,1-Trichloroethane		0.022	0.63	0.05	9.85	0.002
Bromodichloromethane	0.004		0.28	0.02	3.25	0.000
Benzene	0.553			0.55	111.04	0.034
Dibromomethane			0.36	0.02	3.09	0.000
Toluene	0.138	0.030		0.17	33.73	0.009
Styrene	0.030	0.003	0.44	0.05	10.43	0.002
m-/p-Xylene	0.012	0.003		0.02	3.01	0.001
Acrolein	0.465			0.47	93.37	0.040
Acrylonitrile						
A-Pinene	0.762	0.014		0.78	155.82	0.028
B-Pinene	0.497			0.50	99.80	0.018
p-Cymene	0.029			0.03	5.82	0.001
TENTATIVELY IDENTIFIED CMPDS.						
Aromatic HC		0.013		0.01	2.61	
Branched bicyclic HC	0.127			0.13	25.50	
Branched cyclic, C10H16	0.462			0.46	92.77	
Branched HC, C13H28, #1		0.008		0.01	1.61	
Branched HC, C13H28, #2						
Branched HC		0.126		0.13	25.30	
Branched HC		0.003		0.00	0.60	
Branched HC, C13H28, #3						
Branched HC	0.060			0.06	12.05	
Branched HC	0.049			0.05	9.84	
Branched HC	0.159			0.16	31.93	
Branched HC						
Branched HC						
Butene		0.006		0.01	1.20	
Cyclohexane		0.035		0.04	7.03	
Dimethyl trisulfide	0.085			0.09	17.07	
Furan	0.159			0.16	31.93	
Hydrocarbon	0.103			0.10	20.68	
Siloxane	0.094			0.09	18.88	
Subst'd Alcohol						
Subst'd HC	0.222	0.045		0.27	53.61	

EMISSION TEST RESULTS - VOST

Mill CHAMPION - SHELDON | Source: No. 1 Bark Boiler without Sludge | Condition 2
Source Code: CS-BB1/2 | EPN: E40 | FIN: 5200 | CIN: 2, EC21

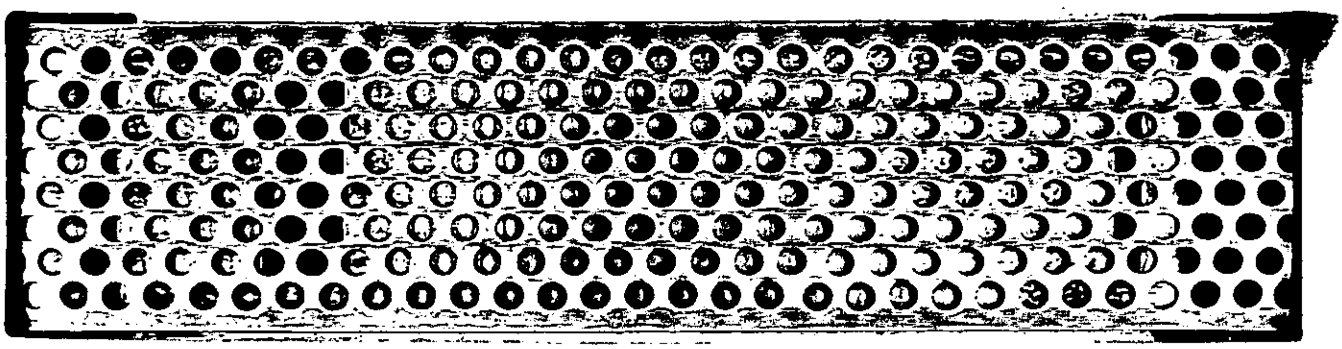
Date: 6/6/92

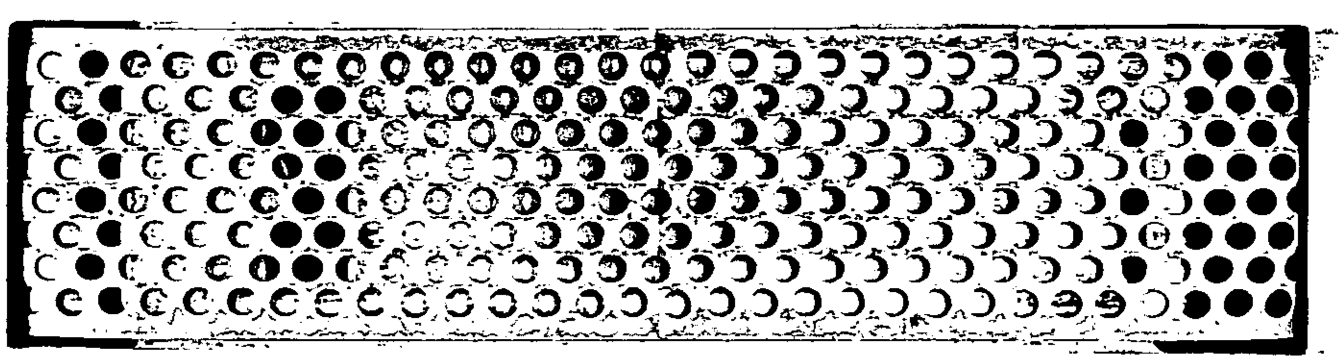
Compound	BB1/2-T (μg)	BB1/2-TC (μg)	BB1/2-C (μg/L)	Total μg	CS-BB1/2 (μg/m3)	Conc. (ppm)
SURROGATE STDS						
(% Recovery)						
Toluene-d8	98.6	98.1	106.0			
1,2-Dichloroethane-d4	88.3	89.5	82.9			
Benzene-d6	95.0	93.7	99.9			

NOTES:
- -T=Tenax
- -TC=Tenax/Charcoal
- -C = Condensate

Air Volume = 0.00498 cu.m.

Condensate Vol. 43.0 mL





EMISSION TEST RESULTS - VOST

Mill CHAMPION - SHELDON | Source: No. 1 Bark Boiler without Sludge | Condition 2

Source Code: CS-BB1/2 EPN: E40 FIN: 5200 CIN: 2, EC21

Date: 6/6/92

Compound	BB1/2-T (μg)	BB1/2-TC (μg)	BB1/2-C (μg/L)	Total μg	CS-BB1/2 (μg/m3)	Conc. (ppm)
SURROGATE STDS						
(% Recovery)						
Toluene-d8	98.6	98.1	106.0			
1,2-Dichloroethane-d4	88.3	89.5	82.9			
Benzene-d6	95.0	93.7	99.9			

NOTES:

-T=Tenax

-TC=Tenax/Charcoal

-C = Condensate

Air Volume = 0.00498 cu.m.

Condensate Vol. 43.0 mL

Triangle Laboratories of RTP, Inc.	FILE NAME: HH979	SAMPLE ID:	CS-BB1-2VOST-
801 Capitola Drive	RF FILE: HH969		0606-18 T
Durham, N.C. 27713	DATE: 11/13/91	TLI ID:	57.62.4
Telephone: (919) 544-5729	TLI PROJ #: 21146	ANAL DATE:	06/18/92

QUANTITATION REPORT VOST METHOD 8240

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	5882		775	1		IS	
3	Chloromethane	0	.802	0	1	.001	ND	.05
4	Bromomethane	0	1.006	0	1	.001	ND	.05
5	Vinyl chloride	0	1.258	0	1	.001	ND	.05
6	Methylene chloride	7706	1.520	583	1	.215	D	.05
7	Acetone	8894	.532	532	1	.711	D	.05
8	Carbon disulfide	4386	4.650	499	1	.040	E	.05
9	1,1-Dichloroethene	0	1.433	0	1	.001	ND	.05
10	1,1-Dichloroethane	0	4.122	0	1	.001	ND	.05
11	Chloroform	8516	3.947	794	1	.092	D	.05
12	1,2-Dichloroethane	0	2.613	0	1	.001	ND	.05
13	1,4-Difluorobenzene	26211		908	13		IS	
14	2-Butanone	1227	.033	762	13	.355	D	.05
15	1,1,1-Trichloroethane	0	.813	0	13	.001	ND	.05
16	Carbon tetrachloride	0	.640	0	13	.001	ND	.05
17	Vinyl acetate	0	.685	0	13	.001	ND	.05
18	Bromodichloromethane	297	.723	1007	13	.004	E	.05
19	1,2-Dichloropropane	0	.659	0	13	.001	ND	.05
20	trans-1,3-Dichloropropene	0	.845	0	13	.001	ND	.05
21	Trichloroethene	0	.568	0	13	.001	ND	.05
22	1,1,2-Trichloroethane	0	.380	0	13	.001	ND	.05
23	Benzene	84438	1.457	847	13	.553	D	.05
24	cis-1,3-Dichloropropene	0	.845	0	13	.001	ND	.05
25	Bromoform	0	.290	0	13	.001	ND	.05
26	Chlorobenzene-d5	31603		1350	26		IS	
29	4-Methyl-2-pentanone	0	.225	0	26	.001	ND	.05
30	Tetrachloroethene	0	.362	0	26	.001	ND	.05
31	1,1,2,2-Tetrachloroethane	0	.334	0	26	.001	ND	.05
32	Toluene	13902	.796	1119	26	.138	D	.05
33	Chlorobenzene	0	.998	0	26	.001	ND	.05
34	Ethylbenzene	0	.508	0	26	.001	ND	.05
35	Styrene	4100	1.099	1487	26	.030	E	.05
36	m-/p-Xylene	990	.657	1409	26	.012	E	.05
37	o-Xylene	340	.642	1481	26	.004	E	.05
38	Acrolein	1192	.109	493	1	.465	D	.05
39	Acrylonitrile	0	.337	0	1	.003	ND	.05
40	Iodomethane	0	2.463	0	1	.001	ND	.05
41	1,4-Dichloro-2-butene	0	.122	0	13	.002	ND	.05
44	n-Hexane	42226	2.861	662	1	.627	D	.05
45	Tert-Butyl methyl ether	0	3.625	0	1	.001	ND	.05
46	1,3-butadiene	3146	1.273	227	1	.105	D	.05
47	Dibromomethane	0	.290	0	1	.003	ND	.05
48	Vinyl Bromide	0	1.397	0	1	.001	ND	.05
49	Isooctane	481	10.750	868	1	.002	E	.05

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard (VOST_PCV)

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, N.C. 27713
Telephone: (919) 544-5729

FILE NAME: HH979
RF FILE: HH969
DATE: 11/13/91
TLI PROJ #: 21146

SAMPLE ID: CS-BB1-2VOST-0606-1B T
TLI ID: 57.62.4
ANAL DATE: 06/18/92

QUANTITATION REPORT VOST METHOD 8240

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
50	Allyl chloride	0	.919	0	1	.001	ND	.05
51	Cumene (isopropylbenzene)	0	1.538	0	26	.001	ND	.05
52	Dimethyl sulfide	113793	1.703	511	1	2.840	D	.05
53	Dimethyl disulfide	52799	3.813	1073	1	.589	D	.05
54	A-Pinene	109392	1.135	1552	26	.762	D	.05
55	B-Pinene	74069	1.179	1698	26	.497	D	.05
56	P-Cymene	6486	1.774	1933	26	.029	E	.05

	SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	% RECOVERY
2	1,2-Dichloroethane-d4	13707	2.638	844	1	.221	D	88.3
28	Toluene-d8	43883	1.408	1109	26	.247	D	98.8
42	Benzene-d6	38324	1.539	842	13	.238	D	95.0

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard (VOST_PCV)

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801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

DATA FILE:HH979
DATE: 07/14/92
TLI PROJECT NO. 21146
ANALYSIS DATE: 06/18/92

SAMPLE ID: CS-BB1-2VOST-0606-1B T
TLI ID: 57.62.4

TENTATIVELY IDENTIFIED COMPOUND REPORT — METHOD 8240

	NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
1	BRANCHED CYCLIC HYDROCARBON C10H16	1909	222400	1350	.25	.462
2	SUBSTITUTED HYDROCARBON	1308	106668	1350	.25	.222
3	FURAN	468	27595	775	.25	.159
4	BRANCHED HYDROCARBON	360	27491	775	.25	.159
5	BRANCHED BICYCLIC HYDROCARBON C10H16	1602	61146	1350	.25	.127
6	SATURATED HYDROCARBON C13H28	1619	49759	1350	.25	.103
7	SILOXANE	1235	45061	1350	.25	.094
8	DIMETHYL TRISULFIDE	1739	40827	1350	.25	.085
9	BRANCHED HYDROCARBON	1261	28867	1350	.25	.060
10	BRANCHED HYDROCARBON	1334	23809	1350	.25	.049

INTERNAL STANDARD	IS SCAN	IS AREA
Bromochloromethane	775	43283
1,4-Difluorobenzene	908	71906
Chlorobenzene-d5	1350	120305

Triangle Laboratories of RTP, Inc.	FILE NAME: HH977	SAMPLE ID:	CS-881-2VOST-
801 Capitola Drive	RF FILE: HH969		0606-18 TC
Durham, N.C. 27713	DATE: 11/13/91	TLI ID:	57.62.5
Telephone: (919) 544-5729	TLI PROJ #: 21146	ANAL DATE:	06/18/92

QUANTITATION REPORT VOST METHOD 8240

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	6905		773	1		IS	
3	Chloromethane	11721	.802	166	1	.529	D	.05
4	Bromomethane	0	1.006	0	1	.001	ND	.05
5	Vinyl chloride	0	1.258	0	1	.001	ND	.05
6	Methylene chloride	2278	1.520	581	1	.054	D	.05
7	Acetone	497	.532	523	1	.034	E	.05
8	Carbon disulfide	0	4.650	0	1	.001	ND	.05
9	1,1-Dichloroethene	0	1.433	0	1	.001	ND	.05
10	1,1-Dichloroethane	0	4.122	0	1	.001	ND	.05
11	Chloroform	4356	3.947	792	1	.040	E	.05
12	1,2-Dichloroethane	0	2.613	0	1	.001	ND	.05
13	1,4-Difluorobenzene	30428		906	13		IS	
14	2-Butanone	61	.033	758	13	.015	E	.05
15	1,1,1-Trichloroethane	2157	.813	801	13	.022	E	.05
16	Carbon tetrachloride	0	.640	0	13	.001	ND	.05
17	Vinyl acetate	0	.665	0	13	.001	ND	.05
18	Bromodichloromethane	0	.723	0	13	.001	ND	.05
19	1,2-Dichloropropane	0	.659	0	13	.001	ND	.05
20	trans-1,3-Dichloropropene	0	.645	0	13	.001	ND	.05
21	Trichloroethene	0	.568	0	13	.001	ND	.05
22	1,1,2-Trichloroethane	0	.380	0	13	.001	ND	.05
23	Benzene	0	1.457	0	13	.001	ND	.05
24	cis-1,3-Dichloropropene	0	.845	0	13	.001	ND	.05
25	Bromoform	0	.290	0	13	.001	ND	.05
26	Chlorobenzene-d5	36654		1348	26		IS	
29	4-Methyl-2-pentanone	0	.225	0	26	.001	ND	.05
30	Tetrachloroethene	0	.362	0	26	.001	ND	.05
31	1,1,2,2-Tetrachloroethane	0	.334	0	26	.001	ND	.05
32	Toluene	3466	.796	1118	26	.030	E	.05
33	Chlorobenzene	0	.998	0	26	.001	ND	.05
34	Ethylbenzene	81	.508	1383	26	.001	E	.05
35	Styrene	473	1.099	1484	26	.003	E	.05
36	m-/p-Xylene	273	.657	1407	26	.003	E	.05
37	o-Xylene	0	.642	0	26	.001	ND	.05
38	Acrolein	0	.109	0	1	.007	ND	.05
39	Acrylonitrile	0	.337	0	1	.002	ND	.05
40	Iodomethane	0	2.463	0	1	.001	ND	.05
41	1,4-Dichloro-2-butene	0	.122	0	13	.001	ND	.05
44	n-Hexane	96280	2.861	662	1	1.218	D	.05
45	Tert-Butyl methyl ether	0	3.625	0	1	.001	ND	.05
46	1,3-butadiene	0	1.273	0	1	.001	ND	.05
47	Dibromomethane	0	.290	0	1	.002	ND	.05
48	Vinyl Bromide	0	1.397	0	1	.001	ND	.05
49	Isooctane	18355	10.750	865	1	.062	D	.05

Triangle Laboratories of RTP, Inc.	FILE NAME: HH977	SAMPLE ID:	CS-881-2VOST-0606-1B TC
801 Capitola Drive	RF FILE: HH969		
Durham, N.C. 27713	DATE: 11/13/91	TLI ID:	57.62.5
Telephone: (919) 544-5729	TLI PROJ #: 21146	ANAL DATE:	06/16/92

QUANTITATION REPORT VOST METHOD 8240

NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
50 Allyl chloride	0	.919	0	1	.001	ND	.05
51 Cumene (isopropylbenzene)	0	1.538	0	26	.001	ND	.05
52 Dimethyl sulfide	0	1.703	0	1	.001	ND	.05
53 Dimethyl disulfide	1378	3.813	1071	1	.013	E	.05
54 A-Pinene	2338	1.135	1549	26	.014	E	.05
55 B-Pinene	0	1.179	0	26	.001	ND	.05
56 P-Cymene	0	1.774	0	26	.001	ND	.05

S U R R O G A T E S U M M A R Y	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	% RECOVERY
2 1,2-Dichloroethane-d4	16308	2.636	842	1	.224	D	89.5
28 Toluene-d8	50654	1.408	1108	26	.245	D	98.1
42 Benzene-d6	43882	1.539	841	13	.234	D	93.7

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard (VOST_PCV)

TRIANGLE LABORATORIES OF RTP, INC.
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Telephone: (919) 544-5729

DATA FILE:HH977
DATE: 07/14/92
TLI PROJECT NO. 21146
ANALYSIS DATE: 06/18/92

SAMPLE ID: CS-881-2VOST-0606-1B TC
TLI ID: 57.62.5

TENTATIVELY IDENTIFIED COMPOUND REPORT

METHOD 8240

	NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
1	BRANCHED HYDROCARBON	865	41672	907	.25	.126 ✓
2	SUBSTITUTED HYDROCARBON	359	9056	773	.25	.045 ✓
3	CYCLOHEXANE	727	7046	773	.25	.035 ✓
4	UNKNOWN	1785	6852	1348	.25	.014
5	SUBSTITUTED AROMATIC HYDROCARBON	1624	6003	1348	.25	.013 ✓
6	BRANCHED HYDROCARBON C13H28	2139	4042	1348	.25	.008 ✓
7	BUTENE	205	1209	773	.25	.006 ✓
8	UNKNOWN	256	632	773	.25	.003
9	BRANCHED HYDROCARBON	1439	1231	1348	.25	.003

INTERNAL STANDARD	IS SCAN	IS AREA
Bromochloromethane	773	50080
1,4-Difluorobenzene	907	82464
Chlorobenzene-d5	1348	119433

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FILE NAME: AC7973
RF FILE: AC793
DATE: 07/13/92
ANALYSIS DATE: 06/22/92
TLI Project Number: 21146

SAMPLE ID: CS-881-2VOST-0606-18
DILUTION FACTOR 1
TLI Sample ID: 57.62.6
SAMPLE VOL: .005 L

QUANTITATION REPORT METHOD 8240

	NAME	AREA	RF	SCAN	ISID	AMT,ug/L	CODE	QUAN LIMIT
1	Bromochloromethane	2801		779	1		IS	
3	Chloromethane	0	1.281	0	1	.279	ND	10
4	Bromomethane	0	1.353	0	1	.264	ND	10
5	Vinyl chloride	0	1.646	0	1	.217	ND	10
6	Methylene chloride	375	2.108	584	1	3.174	E	10
7	Acetone	608	1.638	527	1	6.625	E	10
8	Carbon disulfide	0	5.327	0	1	.067	ND	10
9	1,1-Dichloroethene	0	1.816	0	1	.197	ND	10
10	1,1-Dichloroethane	0	4.724	0	1	.076	ND	10
11	Chloroform	884	4.593	798	1	3.434	E	10
12	1,2-Dichloroethane	0	3.736	0	1	.096	ND	10
13	1,4-Difluorobenzene	12426		913	1		IS	
14	2-Butanone	0	.079	0	13	1.013	ND	10
15	1,1,1-Trichloroethane	120	.769	807	13	.629	E	10
16	Carbon tetrachloride	0	.550	0	13	.146	ND	10
17	Vinyl acetate	0	.902	0	13	.089	ND	10
18	Bromodichloromethane	58	.827	1012	13	.283	E	10
19	1,2-Dichloropropane	0	.852	0	13	.094	ND	10
20	trans-1,3-Dichloropropene	0	.994	0	13	.081	ND	10
21	Trichloroethene	0	.495	0	13	.162	ND	10
22	1,1,2-Trichloroethane	0	.566	0	13	.142	ND	10
23	Benzene	0	1.466	0	13	.055	ND	10
24	cis-1,3-Dichloropropene	0	.893	0	13	.090	ND	10
25	Bromoform	0	.443	0	13	.182	ND	10
26	Chlorobenzene-d5	14381		1358	13		IS	
29	4-Methyl-2-pentanone	0	.690	0	26	.101	ND	10
30	Tetrachloroethene	0	.370	0	26	.188	ND	10
31	1,1,2,2-Tetrachloroethane	0	.839	0	26	.083	ND	10
32	Toluene	0	.971	0	26	.072	ND	10
33	Chlorobenzene	0	1.038	0	26	.067	ND	10
34	Ethylbenzene	0	.630	0	26	.110	ND	10
35	Styrene	148	1.168	1494	26	.441	E	10
36	m-/p-Xylene	0	.673	0	26	.103	ND	10
37	o-Xylene	0	.753	0	26	.092	ND	10
38	Acrolein	0	.431	0	1	.827	ND	10
39	Acrylonitrile	0	.979	0	1	.365	ND	10
40	Iodomethane	0	1.958	0	1	.182	ND	10
41	1,4-Dichloro-2-butane	0	.339	0	13	.237	ND	10
44	n-Hexane	0	4.119	0	1	.087	ND	10
45	Tert-Butyl methyl ether	0	5.332	0	1	.067	ND	10
46	1,3-butadiene	0	2.008	0	1	.178	ND	10
47	Dibromomethane	41	2.036	983	1	.358	E	10
48	Vinyl Bromide	0	1.394	0	1	.256	ND	10
49	Isooctane	0	13.863	0	1	.026	ND	10

Triangle Laboratories of RTP, Inc.
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FILE NAME:AC7973 SAMPLE ID: CS-881-2VOST-0606-18
RF FILE: AC793
DATE: 07/13/92 DILUTION FACTOR 1
ANALYSIS DATE: 06/22/92
TLI Project Number:21146 TLI Sample ID: 57.62.6
SAMPLE VOL: .005 L

QUANTITATION REPORT METHOD 8240

	NAME	AREA	RF	SCAN	ISID	AMT,ug/L	CODE	QUAN LIMIT
50	Allyl chloride	0	1.038	0	1	.344	ND	10
51	Cumene (isopropylbenzene)	0	1.904	0	26	.037	ND	10
52	Dimethyl sulfide	105	2.445	513	1	.766	E	10
53	Dimethyl disulfide	68	5.017	1081	1	.243	E	10
54	A-Pinene	0	1.277	0	26	.054	ND	10
55	B-Pinene	0	1.390	0	26	.050	ND	10
56	P-Cymene	0	1.990	0	26	.035	ND	10

	SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT,ug/L	CODE	% RECOVERY
2	1,2-Dichloroethane-d4	6840	2.945	848	1	41.5	D	82.9
28	Toluene-d8	20727	1.360	1116	26	53.0	D	106.0
42	Benzene-d6	18867	1.520	847	13	50.0	D	99.9

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard (VCON_PCV)

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DATA FILE:AC7973
DATE: 07/14/92
TLI PROJECT NO. 21146
ANALYSIS DATE: 06/22/92

SAMPLE ID: CS-BB1-2VOST-0606-18
SAMPLE VOL. .005 L
TLI ID: 57.62.6

TENTATIVELY IDENTIFIED COMPOUND REPORT METHOD 8240

	NAME	Scan	Area	Scan # IS	Amt IS	Conc, ug/L
1	UNKNOWN	339	498	779	.25	.9
2	UNKNOWN	1400	465	1358	.25	.4
3	UNKNOWN	1191	371	1358	.25	.3
4	UNKNOWN	567	106	779	.25	.2
5	UNKNOWN	1552	176	1358	.25	.2
6	BUTANONE	764	85	779	.25	.2

INTERNAL STANDARD	IS SCAN	IS AREA
Bromochloromethane	779	27496
1,4-Difluorobenzene	913	36072
Chlorobenzene-d5	1358	54251

Section 7.3 Emission Test Results - SEMI-VOST

EMISSION TEST RESULTS - SEMI-VOST

Mill CHAMPION - SHELDON Source: No. 1 Bark Boiler without Sludge Condition 2
Source Code: CS-BB1/2 EPN: E40 FIN: 5200 CIN: EC22, EC21

Compound	CS-BB1/2 (µg)	Date: 6/8/92 CS-BB1/2 (µg/m3)	Conc. (ppm)
TARGET COMPOUNDS			
a-Pinene	117.40	106.80	0.019
B-Pinene	58.54	53.25	0.009
p-Cymene	4.15	3.78	0.001
Acetophenone	3.29	2.99	0.001
a-Terpineol	4.16	3.78	0.001
Naphthalene	13.55	12.33	0.002
Di-n-butyl phthalate	11.96	10.88	0.001
2-Methylnaphthalene			
Dibenzofuran			
Phenanthrene	0.35	0.32	0.000
Butylbenzylphthalate	3.38	3.07	0.000
Dimethylphthalate	0.78	0.71	0.000
Phenol	3.28	2.98	0.001
Benzoic Acid	53.96	49.09	0.010
Diethylphthalate	6.28	5.71	0.001
TENTATIVELY IDENTIFIED CMPDS.			
Phthalate	647.15	588.69	
Halogenated HC			
Siloxane	145.53	132.38	
Cyclic HC	98.14	89.27	
Acidic subst'd HC	146.96	133.69	
Subst'd Hexanedioic acid			
Subst'd HC	131.87	119.96	
Hexanol			
Siloxane			
Cyclic HC			
Subst'd HC	46.68	42.46	
Subst'd HC	45.61	41.49	
Acidic subst'd HC	38.72	35.22	
Acidic Ester	38.20	34.75	
Branched Heptene	92.30	83.96	
SURROGATE STDS (% Recovery)			
Nitrobenzene-d5	76.2		
1,3,5-Trichlorobenzene-d3	60.0		
1,4-Dibromobenzene-d4	60.9		
2-Fluorobiphenyl	76.3		
2,4,6-Tribromophenol	45.8		
Anthracene-d10	64.9		
Pyrene-d10	72.9		

EMISSION TEST RESULTS - SEMI-VOST

Mill	CHAMPION - SHELDON		Source:	No. 1 Bark Boiler without Sludge				Condition 2
	Source Code:	CS-BB1/2	EPN:	E40	FIN:	5200	CIN:	EC22, EC21

Compound	CS-BB1/2 (µg)	Date: 6/8/92 CS-BB1/2 (µg/m3)	Conc. (ppm)

NOTES:

Air Volume = 1.09930 cu.m.

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
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DATA FILE: GI888
RF FILE: GI875
DATE: 07/21/92
TLI PROJ #: 21145

SAMPLE ID: CS-881/2MM5/0608/1A-E
TLI ID: 57.81.3A-E
DILUTION FACTOR: 1
ANALYSIS DATE: 07/14/92

METHOD 8270 QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	1,4-Dichlorobenzene-d4	4260		598	1		IS	
2	Phenol	902	2.5838	553	1	3.28	E	10
3	bis(2-Chloroethyl)ether	0	1.7567	0	1	.11	ND	10
4	2-Chlorophenol	0	1.5660	0	1	.12	ND	10
5	1,3-Dichlorobenzene	0	1.6700	0	1	.11	ND	10
6	1,4-Dichlorobenzene	0	1.7076	0	1	.11	ND	10
7	Benzyl alcohol	0	1.0703	0	1	.18	ND	10
8	1,2-Dichlorobenzene	0	1.6579	0	1	.11	ND	10
9	2-Methylphenol	0	1.4561	0	1	.13	ND	10
10	bis(2-Chloroisopropyl)ether	0	2.4729	0	1	.08	ND	10
11	4-Methylphenol	0	1.5795	0	1	.12	ND	10
12	N-Nitroso-di-n-propylamine	0	1.2131	0	1	.15	ND	10
13	Hexachloroethane	0	.6864	0	1	.27	ND	10
14	Naphthalene-d8	18154		779	14		IS	
15	Nitrobenzene	0	.4955	0	14	.09	ND	10
16	Isophorone	0	.8709	0	14	.05	ND	10
17	2-Nitrophenol	0	.1798	0	14	.25	ND	10
18	2,4-Dimethylphenol	0	.3672	0	14	.12	ND	10
19	Benzoic acid	4380	.1789	746	14	53.96	D	10
20	bis(2-Chloroethoxy)methane	0	.4780	0	14	.09	ND	10
21	2,4-Dichlorophenol	0	.2808	0	14	.16	ND	10
22	1,2,4-Trichlorobenzene	0	.2725	0	14	.16	ND	10
23	Naphthalene	6668	1.0923	782	14	13.45	D	10
24	4-Chloroaniline	0	.4930	0	14	.09	ND	10
25	Hexachlorobutadiene	0	.1190	0	14	.37	ND	10
26	4-Chloro-3-methylphenol	0	.3573	0	14	.12	ND	10
27	2-Methylnaphthalene	0	.6907	0	14	.06	ND	10
28	Acenaphthene-d10	11329		1041	28		IS	
29	Hexachlorocyclopentadiene	0	.2042	0	28	.35	ND	10
30	2,4,6-Trichlorophenol	0	.3259	0	28	.22	ND	10
31	2,4,5-Trichlorophenol	0	.3953	0	28	.18	ND	10
32	2-Chloronaphthalene	0	1.1203	0	28	.06	ND	10
33	2-Nitroaniline	0	.5575	0	28	.13	ND	10
34	Dimethylphthalate	315	1.1864	1005	28	.94	E	10
35	Acenaphthylene	0	2.0174	0	28	.04	ND	10
36	3-Nitroaniline	0	.3743	0	28	.19	ND	10
37	Acenaphthene	0	1.1926	0	28	.06	ND	10
38	2,4-Dinitrophenol	0	.0642	0	28	1.10	ND	10
39	4-Nitrophenol	0	.1435	0	28	.49	ND	10
40	Dibenzofuran	0	1.6674	0	28	.04	ND	10
41	2,4-Dinitrotoluene	0	.3990	0	28	.18	ND	10
42	2,6-Dinitrotoluene	0	.3097	0	28	.23	ND	10
43	Diethylphthalate	2296	1.2912	1112	28	6.28	E	10

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

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Durham, NC 27713
Telephone: (919) 544-5729

DATA FILE: GI888
RF FILE: GI875
DATE: 07/21/92
TLI PROJ #: 21145

SAMPLE ID: CS-6B1/2MM5/0608/1A-E
TLI ID: 57.61.3A-E
DILUTION FACTOR: 1
ANALYSIS DATE: 07/14/92

METHOD 8270 QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
44	4-Chlorophenyl-phenylether	0	.5169	0	28	.14	ND	10
45	Fluorene	0	1.4402	0	28	.05	ND	10
46	4-Nitroaniline	0	.4120	0	28	.17	ND	10
47	Phenanthrene-d10	19069		1264	47		IS	
48	4,6-Dinitro-2-methylphenol	0	.0796	0	47	.53	ND	10
49	N-Nitrosodiphenylamine(1)	0	.5397	0	47	.08	ND	10
50	4-Bromophenyl-phenylether	0	.1803	0	47	.23	ND	10
51	Hexachlorobenzene	0	.2159	0	47	.19	ND	10
52	Pentachlorophenol	0	.1127	0	47	.37	ND	10
53	Phenanthrene	207	1.2386	1268	47	.35	E	10
54	Anthracene	0	1.2811	0	47	.03	ND	10
55	Di-n-butylphthalate	10491	1.4555	1361	47	15.12	D	10
56	Fluoranthene	0	1.3072	0	47	.03	ND	10
57	Chrysene-d12	27207		1678	57		IS	
58	Pyrene	0	1.7657	0	57	.02	ND	10
59	Butylbenzylphthalate	1707	.8944	1589	57	2.81	E	
60	3,3'-Dichlorobenzidine	0	.4741	0	57	.06	ND	10
61	Benzo(a)anthracene	0	1.6078	0	57	.02	ND	10
62	Chrysene	0	1.6572	0	57	.02	ND	10
63	bis(2-Ethylhexyl)phthalate	0	1.1151	0	57	.03	ND	10
64	Perylene-d12	19371		2000	64		IS	
65	Di-n-octylphthalate	0	1.1642	0	64	.04	ND	10
66	Benzo(b)fluoranthene	0	1.4302	0	64	.03	ND	10
67	Benzo(k)fluoranthene	0	1.7013	0	64	.02	ND	10
68	Benzo(a)pyrene	0	1.2599	0	64	.03	ND	10
69	Indeno(1,2,3-cd)pyrene	0	.5135	0	64	.08	ND	10
70	Dibenz(a,h)anthracene	0	.5953	0	64	.07	ND	10
71	Benzo(g,h,i)perylene	0	.7619	0	64	.05	ND	10

	SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
72	Nitrobenzene-d5	13458	.4567	676	14	64.93	D	64.9
73	2-Fluorobiphenyl	20921	1.1046	942	28	66.87	D	66.9
75	Phenol-d5	13486	1.8294	551	1	69.13	D	69.1
77	2,4,6-Tribromophenol	3152	.1234	1159	28	90.20	D	90.2
81	1,4-Dibromobenzene-d4	4475	.6021	787	1	69.80	D	69.8
82	1,3,5-Trichlorobenzene-d3	6141	.2520	724	14	53.71	D	53.7
83	Anthracene-d10	32292	1.0760	1273	47	62.95	D	63.0
84	Pyrene-d10	44528	1.3469	1479	57	48.60	D	4P

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

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DATA FILE:	FH729	SAMPLE ID:	CS-BB1/2MM5/0608/1A-E
RF FILE:	FH721	TLI SAMPLE ID:	57.61.3A-E
DATE:	07/17/92	DILUTION FACTOR:	1
TLI PROJ:	21145	ANALYSIS DATE:	06/25/92

METHOD 8270 QUANTITATION REPORT

	NAME	AREA	RF	SCAN		AMT, ug	CODE	QUAN LIMIT
59	2,3-Dichlorophenol	0	.447	0	3	.27	ND	10
60	2,6-Dichlorophenol	0	.531	0	3	.23	ND	10
61	3,5-Dichlorophenol	0	.691	0	3	.18	ND	10
62	3,4-Dichlorophenol	0	.600	0	3	.20	ND	10
63	Biphenyl	0	1.220	0	3	.10	ND	10
64	Dimethylphthalate	144	1.136	778	3	.78	E	10
65	2,4-Dinitrotoluene	0	.413	0	3	.30	ND	10
66	2,4-Dinitrophenol	0	.154	0	3	.80	ND	10
67	4,6-Dinitro-2-methylphenol	0	.229	0	3	.53	ND	10
68	Dibenzofuran	0	1.827	0	3	.07	ND	10
69	4-Nitrophenol	0	.353	0	3	.35	ND	10
70	Trifluralin	0	.182	0	3	.67	ND	10
71	Hexachlorobenzene	0	.173	0	4	.35	ND	10
72	4-Aminobiphenyl	0	.833	0	4	.07	ND	10
73	Pentachlorophenol	0	.156	0	4	.39	ND	10
74	Pentachloronitrobenzene	0	.063	0	4	.95	ND	10
75	4-Nitrobiphenyl	0	.485	0	4	.12	ND	10
76	Di-n-butylphthalate	7253	1.831	1117	4	11.96	D	10
77	Pyrene	0	1.003	0	5	.04	ND	10
78	Benzidine	0	.663	0	5	.06	ND	10
79	4,4'-Methylenedianiline	0	.327	0	5	.11	ND	10
80	Dimethylaminoazobenzene	0	.377	0	5	.10	ND	10
81	Butylbenzylphthalate	1165	.645	1324	5	3.38	E	10
82	3,3'-Dimethylbenzidine	0	.733	0	5	.05	ND	10
83	Methylene bis-chloroaniline	0	.231	0	5	.16	ND	10
84	Chrysene	0	1.053	0	5	.04	ND	10
85	3,3'-Dichlorobenzidine	0	.478	0	5	.08	ND	10
86	bis(2-Ethylhexyl)phthalate	0	1.583	0	5	.02	ND	10
87	3,3'-Dimethoxybenzidine	0	.324	0	5	.12	ND	10

	SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
10	Phenol-d5	6526	1.722	352	1	61.97	D	31.0
12	Nitrobenzene-d5	7711	.412	448	2	76.21	D	76.2
13	1,3,5-Trichlorobenzene-d3	3772	.256	496	2	59.99	D	60.0
14	1,4-Dibromobenzene-d4	2641	.709	548	1	60.89	D	60.9
15	2-Fluorobiphenyl	12803	1.029	707	3	76.35	D	76.3
16	2,4,6-Tribromophenol	1652	.111	904	3	91.64	D	45.8
17	Anthracene-d10	23432	1.090	1002	4	64.86	D	64.9
18	Pyrene-d10	29988	.771	1192	5	72.87	D	72.9

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

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Telephone: (919) 544-5729

FILE NAME: FH729
DATE: 07/09/92
TLI PROJ #: 21145

SAMPLE ID: CS-BB1/2MM5/0608/3A-E
TLI ID: 57.61.3A-E
DILN FACTOR: 1
ANAL DATE: 06/25/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
PHTHALATE	1432	2473893	1370	40.00	647.15
ACIDIC SUBSTITUTED HYDROCARBON	403	145267	366	40.00	146.96
SILOXANE	1529	538585	1559	40.00	145.53
SUBSTITUTED HYDROCARBON	1408	504123	1370	40.00	131.87
CYCLIC HYDROCARBON	359	97013	366	40.00	98.14
BRANCHED HEPTENE	410	91236	366	40.00	92.30
SUBSTITUTED HYDROCARBON	1451	178448	1370	40.00	46.68
SUBSTITUTED HYDROCARBON	417	45089	366	40.00	45.61
ACIDIC SUBSTITUTED HYDROCARBON	1098	39772	995	40.00	38.72
ACIDIC ESTER	1299	146037	1370	40.00	38.20

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
1,4-Dichlorobenzene-d4	366	39540	1
Naphthalene-d8	543	37486	14
Acenaphthene-d10	791	32712	28
Phenanthrene-d10	995	41088	47
Chrysene-d12	1370	152911	57
Perylene-d12	1559	148030	64

Section 7.4 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - SHELDON   Source: Bark Boiler w/o Sludge w/ Cond.   FIN: 5200
Source Code: CS-BB1/2   Date: 6/6/92   EPN: E40   CIN: EC22, EC21

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1705			
Flow Data				
Stack Temperature, °F	154			154
Moisture Content, %	27.5			27.5
Oxygen Concentration, %	10.5			10.5
Carbon Dioxide Concentration, %	10.8			10.8
Volumetric Flow Rate, x10^3 ACFM	72.9			72.9
Volumetric Flow Rate, x10^3 DSCFM	46.1			46.1
Process Operating Conditions				
Production Rate, x 10^6 BTU/hr	270.0			270.0
Miscellaneous Parameters				
Formaldehyde				
Concentration, ppmvd	0.5			0.5
Emission Rate, lb/hr	0.1			0.1
Acetaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.2 *			0.2 *
Acetone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.2 *			0.2 *
Acetophenone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.4 *			0.4 *
2-Butanone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.3 *			0.3 *
Methyl isobutyl ketone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.4 *			0.4 *
Acrolein				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.2 *			0.2 *
Benzaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.4 *			0.4 *
Hydrogen chloride				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - SHELDON | Source: Bark Boiler w/o Sludge w/ Cond. | FIN: 5200
Source Code: CS-BB1/2 | Date: 6/19/92 | EPN: E40 | CIN: EC22, EC21

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	700	800	845	
Flow Data				
Stack Temperature, °F	154			154
Moisture Content, %	30.8			30.8
Oxygen Concentration, %	10.1			10.1
Carbon Dioxide Concentration, %	10.8			10.8
Volumetric Flow Rate, x10^3 ACFM	74.6			74.6
Volumetric Flow Rate, x10^3 DSCFM	44.6			44.6
Process Operating Conditions				
Production Rate, x 10^6 BTU/hr	267.0	267.0	267.0	267.0
Miscellaneous Parameters				
Sulfuric Acid Mist (Impinger)				
Concentration, lb/dscf	7.40E-08	7.40E-08	7.40E-08	7.40E-08
Emission Rate, lb/hr	1.98E-01 *	1.98E-01 *	1.98E-01 *	1.98E-01 *

COMMENTS

Velocity data taken from the average of metals tested on 6/18/92 for 6/19/92.

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - SHELDON | Source: Bark Boiler w/o Sludge w/o Cond. | FIN: 5200
Source Code: CS-BB1/4 | Date: 6/8/92 | EPN: E40 | CIN: EC22, EC21

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1810			
Flow Data				
Stack Temperature, °F	152			152
Moisture Content, %	26.4			26.4
Oxygen Concentration, %	10.1			10.1
Carbon Dioxide Concentration, %	11.7			11.7
Volumetric Flow Rate, x10^3 ACFM	72.9			72.9
Volumetric Flow Rate, x10^3 DSCFM	46.7			46.7
Process Operating Conditions				
Production Rate, x 10^6 BTU/hr	267.0			267.0
Miscellaneous Parameters				
Formaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acetaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.2 *			0.2 •
Acetone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.2 *			0.2 *
Acetophenone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.4 *			0.4 *
2-Butanone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.3 *			0.3 *
Methyl isobutyl ketone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.4 *			0.4 *
Acrolein				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.2 *			0.2 *
Benzaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.4 *			0.4 *
Hydrogen chloride				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

• One or more values were less than the detection limit.

Section 7.5 Emission Test Results - Metals

Mill: Champion-Sheldon
Source: CS-BB1/2

Run 1

Sample volume (DSCF)--------- 37.4
Source Vol Flow (DSCFM)------ 44800

		FH+BH Amt (ug)	Conc (lb/DSCF)	Mass Rt. (lb/hr)	Detection Limit(ug)	Det Limit (lb/DSCF)	Det Limit (lb/hr)
Antimony	Sb	*	0.0E+00	0.0E+00	5	2.9E-10	7.9E-04
Arsenic	As	*	0.0E+00	0.0E+00	5	2.9E-10	7.9E-04
Barium	Ba	*	0.0E+00	0.0E+00	4000	2.4E-07	6.3E-01
Beryllium	Be	*	0.0E+00	0.0E+00	5	2.9E-10	7.9E-04
Cadmium	Cd	*	0.0E+00	0.0E+00	5	2.9E-10	7.9E-04
Chromium	Cr	*	0.0E+00	0.0E+00	10	5.9E-10	1.6E-03
Copper	Cu	15	8.8E-10	2.4E-03	5	2.9E-10	7.9E-04
Lead	Pb	14	8.3E-10	2.2E-03	10	5.9E-10	1.6E-03
Manganese	Mn	34	2.0E-09	5.4E-03	10	5.9E-10	1.6E-03
Mercury	Hg	*	0.0E+00	0.0E+00	5	2.9E-10	7.9E-04
Nickel	Ni	*	0.0E+00	0.0E+00	5	2.9E-10	7.9E-04
Phosphorus	P	231	1.4E-08	3.7E-02	100	5.9E-09	1.6E-02
Silver	Ag	*	0.0E+00	0.0E+00	5	2.9E-10	7.9E-04
Selenium	Se	*	0.0E+00	0.0E+00	5	2.9E-10	7.9E-04
Thallium	Tl	*	0.0E+00	0.0E+00	5	2.9E-10	7.9E-04

Run 2

Sample volume (DSCF)--------- 37.24
Source Vol Flow (DSCFM)------ 44000

		FH+BH Amt (ug)	Conc (lb/DSCF)	Mass Rt. (lb/hr)	Detection Limit(ug)	Det Limit (lb/DSCF)	Det Limit (lb/hr)
Antimony	Sb	*	0.0E+00	0.0E+00	5	3.0E-10	7.8E-04
Arsenic	As	*	0.0E+00	0.0E+00	5	3.0E-10	7.8E-04
Barium	Ba	*	0.0E+00	0.0E+00	4000	2.4E-07	6.3E-01
Beryllium	Be	*	0.0E+00	0.0E+00	5	3.0E-10	7.8E-04
Cadmium	Cd	*	0.0E+00	0.0E+00	5	3.0E-10	7.8E-04
Chromium	Cr	12	7.1E-10	1.9E-03	10	5.9E-10	1.6E-03
Copper	Cu	14	8.3E-10	2.2E-03	5	3.0E-10	7.8E-04
Lead	Pb	19	1.1E-09	3.0E-03	10	5.9E-10	1.6E-03
Manganese	Mn	43	2.5E-09	6.7E-03	10	5.9E-10	1.6E-03
Mercury	Hg	*	0.0E+00	0.0E+00	5	3.0E-10	7.8E-04
Nickel	Ni	*	0.0E+00	0.0E+00	5	3.0E-10	7.8E-04
Phosphorus	P	205	1.2E-08	3.2E-02	100	5.9E-09	1.6E-02
Silver	Ag	*	0.0E+00	0.0E+00	5	3.0E-10	7.8E-04
Selenium	Se	*	0.0E+00	0.0E+00	5	3.0E-10	7.8E-04
Thallium	Tl	*	0.0E+00	0.0E+00	5	3.0E-10	7.8E-04

METALS CALCULATIONS

Client: TPIEC
Location: Champion-Sheldon
WESTON Project No.: 6848-01-01
Source: B81/2

INPUT DATA

Run Number		1	2	3	Mean
Date		6/18/92	6/18/92		---
Time Began		1200	1400		---
Time Ended		1315	1515		---
Sampling Time, min	(Theta)	60	60		60
Stack Dimensions, in.	(Square)	58x58	58x58	58x58	0
Barometric Pressure, in. Hg	(Pb)	29.80	29.80		29.80
Static Pressure, in. H2O	(Pg)	4.00	4.10		4.05
Pitot Tube Coefficient	(Cp)	0.84	0.84		0.84
Meter Correction Factor	(Y)	1.010	1.010		1.010
Nozzle Diameter, in.	(Dn)	0.250	0.250		0.250
Meter Volume, ft^3	(Vm)	40.019	40.020		40.020
Meter Temperature, |F	(tm)	110	113		112
Meter Orifice Pressure, in. H2O	(Delta H)	1.596	1.604		1.600
Volume H2O Collected, mL	(Vlc)	349.7	356.2		353.0
CO2 Concentration, %	(CO2)	10.0	11.5		10.8
O2 Concentration, %	(O2)	9.3	11.0		10.1
Average Sq Rt Velo Head, (in. H2O)^.5	((Delta P)^.5)avg	0.8420	0.8438		0.8429
Stack Temperature, |F	(ts)	154	155		154
Total Metals Collected, ug					ERR
Moisture Fraction (at Saturation)	(Bws)	NA	NA	NA	

CALCULATED DATA

Stack Area, ft^2	(As)	23.36	23.36	0.00	15.57
Stack Pressure, in. Hg	(Ps)	30.09	30.10	0.00	20.07
Standard Meter Volume, ft^3	(Vmstd)	37.396	37.235	0.000	24.877
Standard Water Volume, ft^3	(Vwstd)	16.460	16.766	0.000	11.076
Moisture Fraction (Measured)	(Bws)	0.306	0.310	ERR	ERR
Moisture Fraction (lower sat/meas)	(Bws)	0.306	0.310	ERR	ERR
Mol. Wt. of Stack Gas, lb/lb-mole	(Ms)	26.3	26.5	ERR	ERR
Average Stack Gas Velocity, ft/sec	(Vs)	53.2	53.2	ERR	ERR
Stack Gas Flow @ Stack Cond, ft^3/min	(Qa)	7.46E+04	7.46E+04	ERR	ERR
Stack Gas Flow @ Std Cond, ft^3/min	(Qs)	4.48E+04	4.44E+04	ERR	ERR
Isokinetic Sampling Rate, %	(%I)	95	96	ERR	ERR
Metals Concentration, lb/ft^3		0.00E+00	0.00E+00	ERR	ERR

Blanks for the Multimetals Train. Three blanks were collected during the study. One was collected at Champion-Lufkin and two at Champion-Sheldon. These blanks were used to correct all samples.

		CL Blank Front(ug)	CS Blk 1 Front(ug)	CS Blk 2 Front(ug)	Front Blk(ug)
Antimony	Sb	0.7	0.5 *	0.5 *	0 *
Arsenic	As	3.9	0.8	0.8	1
Barium	Ba	2476	2 *	3742	2073
Beryllium	Be	0.2	0.2 *	0.3	0 *
Cadmium	Cd	0.5	0.4 *	1.4	0 *
Chromium	Cr	9.4	1.2 *	9.3	6.4
Copper	Cu	1.6	1.5 *	1.5 *	0 *
Lead	Pb	10.8	0.3	5.2	5.4
Manganese	Mn	4.4	1 *	4.5	3.1
Mercury	Hg	0.4 *	0.4 *	0.4 *	0 *
Nickel	Ni	2 *	2 *	2 *	0 *
Phosphorus	P	22.6	50 *	53.4	34.7
Silver	Ag	8.3	0.7 *	0.7 *	0 *
Selenium	Se	0.5	0.4 *	0.4 *	0 *
Thallium	Tl	1	0.5	0.7	0 *

The * beside a value means that the analytical value was less than the detection limit for the analysis. The front and the back blank (right column) was developed from the average for most metals. The 8.3 ug from the CL blank was not used because it was unexplainably high.

		CL Blank Back(ug)	CS Blk 1 Back(ug)	CS Blk 2 Back(ug)	Back Blk(ug)
Antimony	Sb	1 *	1 *	0.7 *	0 *
Arsenic	As	1 *	0.5	0.3 *	0 *
Barium	Ba	3.8 *	0.4 *	2.6 *	0 *
Beryllium	Be	0.4 *	0.4 *	0.3 *	0 *
Cadmium	Cd	0.8	1.4	1	1
Chromium	Cr	2.3 *	2.4 *	1.6 *	0 *
Copper	Cu	2.9 *	3 *	2 *	0 *
Lead	Pb	1.5	0.4 *	0.6	0.8
Manganese	Mn	1.9 *	2 *	1.3 *	0 *
Mercury	Hg	0.8 *	0.8 *	1.1	0 *
Nickel	Ni	3.8 *	4 *	2.6 *	0 *
Phosphorus	P	188	100 *	26 *	100 *
Silver	Ag	1.3 *	1.4 *	0.9 *	0 *
Selenium	Se	1 *	0.8 *	0.5 *	0 *
Thallium	Tl	1.9 *	0.4 *	0.3 *	0 *

BAF 9/7/92

TRIANGLE LABORATORIES of RTP, INC.
PO BOX 13485
RTP, NC 27709

Project: 21259 Date in: 06-Jul-92
Weston Date out: 04-Aug-92

CASE NARRATIVE

Overview

This project involves the analysis of 4 Multi-Metals Trains, for Ag, As, Ba, Be, Cd, Cr, Cu, Hg, Mn, Na, Ni, P, Pb, Sb, Se, and Tl. The Multi-Metal analysis was conducted according to the protocol described in sections 5-7 of the EPA Draft Document *"Methodology for the Determination of Metals Emissions in Exhaust Gases from Hazardous Waste Incineration and Similar Combustion Processes."*

Preparation

MMTL samples were prepared by microwave and hotplate digestion, as required by the contract. Detailed flow charts of the sample preparation are included with this report.

Analysis

Ag, Ba, Be, Cd, Cr, Cu, Mn, Ni, and P concentrations were determined by Inductively Coupled Plasma (ICP) Emission Spectroscopy. As, Pb, Sb, Se, and Tl concentrations were determined by Graphite Furnace AA (GFAA). Those analytes which failed the postdigestion spike requirement during GFAA analysis were redetermined by MSA. Hg concentrations were determined by Cold Vapor AA (CVAA). Na concentrations were determined by Flame AA.

Results

There were two results that were unobtainable for this project due to sample matrix interference. Se and As for sample 1METL-2BH. This sample was analyzed by MSA several times for these two analytes. A dilution of the sample would not help due to the fact that the sample absorption is already at zero.

%RPD:
All of the applicable %RPD were within control limits of 25% except 1metl-1 bh for Ag, Cd, and P. However in these cases the %RPD is not considered a valid parameter because the concentration of the sample and duplicate is less than four times the instrument detection limit.

%REC:
Any postdigestion spike results that were less than 75%REC resulted in all samples related to that spike being reanalyzed by Method of Standard Addition (MSA).

Hg:

All of the Hg %RPD and %REC were within control limits except the %RPD for 1METL-2 5A. In this case the Hg was detected in the sample but not in the duplicate. This QC parameter is not considered valid since the Hg concentration in the sample is less than four times the detection limit. The undetected result for the duplicate is the reported result.

The Raw data for this report is filed with TLI Project #21359.

BB1/1 = 1METL -1 -2 (6/17/92)

BB1/2 = 2METL -1 -2 (6/18/92)

TRIANGLE LABORATORIES of RTP, INC.
PO BOX 13485
RTP, NC 27709

INORGANICS ANALYSIS REPORT

TLI PROJECT #: 21259
CLIENT: WESTON
DATE RECIEVED: 07/06/92
DATE REPORTED: 08/04/92

RESULTS REPORTED IN TOTAL ug

CLIENT SAMPLE ID	Ag	As	Ba	Be	Cd	Cr	Cu	Mn	Na	Ni	P	Pb	Sb	Se	Tl
1METL-1 FH	5.38	6.69	3,178	<.200	13.4	4.43	67.1	45.3	42,300	<2.00	864	44.9	.910	<.400	.720
1METL-1 BH	<1.04	<.297	< 2.97	<.297	1.44	5.86	<2.23	1.72	51.4	<2.97	34.8	<.297	<.743	<.594	.490
1METL-2 FH	1.72	6.61	3,732	<.200	13.0	34.5	67.6	56.5	41,400	27.9	598	40.2	1.42	<.400	.750
1METL-2 BH	<.976	*	< 2.79	<.279	<.557	<1.67	<2.09	<1.39	57.1	<2.79	55.0	<.279	<.697	*	.376
2METL-1 FH	3.20	2.58	3,888	.283	1.41	14.2	14.1	29.8	47,200	<2.00	216	18.9	.870	<.400	.360
2METL-1 BH	<.903	.451	< 2.58	<.258	<.516	<1.55	<1.93	6.80	121	<2.58	29.1	.400	<.645	<.516	<.258
2METL-2 FH	4.18	2.36	3,823	.224	1.15	17.3	13.1	33.0	51,800	3.55	190	24.4	1.15	<.400	.250
2METL-2 BH	<.917	<.262	< 2.62	<.262	.650	<1.57	<1.96	13.4	130	<2.62	<26.2	.485	<.655	<.524	.445

QC SUMMARY: %RPD or %REC

CLIENT SAMPLE ID	Ag	As	Ba	Be	Cd	Cr	Cu	Mn	Na	Ni	P	Pb	Sb	Se	Tl
1METL-1 FH(D)	8.84%	N/A	3.15%	N/A	1.74%	18.2%	2.30%	.65%	N/A	N/A	1.77%	N/A	N/A	N/A	N/A
1METL-1 BH(D)	200%	N/A	N/A	N/A	200%	14.6%	N/A	8.14%	N/A	N/A	74.6%	N/A	N/A	N/A	N/A
1METL-1 FH(S)	N/A	49.0%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	34.0%	112%	N/A	80.7%
1METL-1 BH(S)	N/A	73.0%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	69.6%	81.4%	N/A	34.7%

INORGANICS ANALYSIS REPORT
PAGE 2 OF 2

Hg RESULTS

	1METL-1 FH	1METL-1 BH	1-METL-1 5A	1-METL-1 5B	1-METL-1 5C
AVG TOTAL ug	.780	<1.22	<.400	<1.38	<.920
%RPD	10.3%	N/A	N/A	N/A	N/A

	1METL-2 FH	1METL-2 BH	1-METL-2 5A	1-METL-2 5B	1-METL-2 5C
AVG TOTAL ug	.560	<1.42	<.460	1.68	<.880
%RPD	7.14%	N/A	N/A	9.52%	N/A

	2METL-1 FH	2METL-1 BH	2-METL-1 5A	2-METL-1 5B	2-METL-1 5C
AVG TOTAL ug	.570	<1.78	<.420	1.31	<.840
%RPD	10.5%	N/A	N/A	9.52%	N/A

	2METL-2 FH	2METL-2 BH	2-METL-2 5A	2-METL-2 5B	2-METL-2 5C
AVG TOTAL ug	.720	<1.69	<.400	<1.60	<.920
%RPD	5.56%	N/A	N/A	N/A	N/A

	%REC
1-METL1 BH(S)	104%

DESCRIPTION OF ABBREVIATIONS

ICV=Initial Calibration Verification
ICB=Initial Calibration Blank
CCV=Continuing Calibration Verification
CCB=Continuing Calibration Blank
PBW=Preparation Blank Water
PBS=Preparation Blank Soil
LCS=Laboratory Control Spike
ICSA=Interference Check Sample(Solution A) I=Initial F=Final
ICSAB=Interference Check Sample(Solution AB) I=Initial F=Final
Solution A contains common interferents, while Solution AB contains the interferents plus the analyte in question.
CRDL=Contract Required Detection Limit (for CLP)
IDL=Instrument Detection Limit
CRI=CRDL Standard for ICP I=Initial F=Final
CRA=CRDL Standard for AA I=Initial F=Final
%RPD=Relative Percent Difference
%REC=% Recovery
SPK=Spike
AMT=Amount
BLK=Blank
MSA=Method of Standard Additions

CALCULATIONS

MMTL TRAINS:

ICP & GFAA

$$\text{FH \& BH TOTAL ug} = \frac{[\text{ug/L}] * (\text{mL TV/mL USED}) * (\text{mL FV} * \text{DF})}{1000}$$

FLAA

$$\text{FH \& BH TOTAL ug} = [\text{ug/L}] * (\text{mL TV/mL USED}) * (\text{mL FV} * \text{DF})$$

FV=FINAL VOLUME DF=DILUTION FACTOR
WT=WEIGHT TV=TOTAL VOLUME
BV=BEGINNING VOLUME

Hg

MMTL Trains:

FH TOTAL ug = [ug/L] * (ml FV/ml aliquot) * MPV * (DF)

BH TOTAL ug = [ug/L] * (ml TV/ml aliquot) * MPV * (DF)

MMTL Impingers:

TOTAL ug = [ug/L] * (ml TV/ml aliquot) * MPV * (DF)

MPV = Mercury Preparation Volume, which is always 0.1L

$$\%RPD = \frac{|SR - DR|}{(SR + DR)/2} * 100$$

$$\%REC = \frac{SSR - SR}{SA} * 100$$

SR=SAMPLE RESULT DR=DUPLICATE RESULT
SSR=SPIKE SAMPLE RESULT SA=SPIKE ADDED

Metals Data

Mill CS Run no 1 Sample Volume (DSCF) 37.40

Source BB1/2 Run Date 6/18/92 Source Vol Flow (DSCFM) 44,800

		MEAS FH (µg)	FH Blk Corr (µg)	FH Corr Amt (µg)	meas BH (µg)	BH Blk Corr (µg)	BH Corr Amt (µg)	FH + BH Amt (µg)	Detection Limit (µg)
Antimony	Sb	0.9	0	0.9	<0.6	0	<0.6	1	5
Arsenic	As	2.6	1.0	1.6	0.5	0	0.5	2	5
Barium	Ba	3888	2073	1815	<2.6	0	<2.6	1816	4000
Beryllium	Be	0.3	0	0.3	<0.3	0	<0.3	<1	5
Cadmium	Cd	1.4	1.4	0	<0.5	1.0	<1.0	<1	5
Chromium	Cr	14.2	6.4	7.8	<1.6	0	<1.6	9	10
,	+6								
Copper	Cu	14.1	0	14.1	<1.9	0	<1.9	15	5
Lead	Pb	18.9	5.4	13.5	0.4	0.8	<0.8	14	10
Manganese	Mn	29.8	3.1	26.7	6.8	0	6.8	34	10
Mercury	Hg	0.6	0	0.6	2.8	0	2.8	3	5
Nickel	Ni	<2.0	0	<2.0	<2.6	0	<2.6	<2	5
Phosphorus	P	216	34.7	181.3	29.1	100	<100	231	100
Silver	Ag	3.2	0	3.2	<0.9	0	<0.9	4	5
Selenium	Se	<0.4	0	<0.4	<0.5	0	<0.5	<1	5
Thallium	Tl	0.4	0	0.4	<0.3	0	<0.3	<1	5

Blank is ~ mean of 3 blanks for project
See notes by Brue dated 9/3/92.

Metals Data

Mill CS Run no 2 Sample Volume (DSCF) 37.24

Source BB1/2 Run Date 6/18/92 Source Vol Flow (DSCFM) 44,000

		MEAS FH (ug)	FH Blk Corr (ug)	FH Corr Amt (ug)		Meas BH (ug)	BH Blk Corr (ug)	BH Corr Amt (ug)		FH + BH Amt (ug)	Detection Limit (ug)
Antimony	Sb	1.2	0	1.2		<0.7	0	<0.7		2	5
Arsenic	AS	2.4	1.0	1.4		<0.3	0	<0.3		2	5
Barium	Ba	3823	2073	1750		<2.6	0	<2.6		1751	4000
Beryllium	Be	0.2	0	0.2		<0.3	0	<0.3		<1	5
Cadmium	Cd	1.2	1.4	<1.4		0.7	1.0	<1.0		<1	5
Chromium	Cr	17.3	6.4	10.9		<1.6	0	<1.6		12	10
,	+6										
Copper	Cu	13.1	0	13.1		<2.0	0	<2.0		14	5
Lead	Pb	24.4	5.4	19.0		0.5	0.8	<0.8		19	10
Manganese	Mn	33.0	3.1	30.0		13.4	0	13.4		43	10
Mercury	Hg	0.7	0	0.7		2.3	0	2.3		3	5
Nickel	Ni	3.6	0	3.6		<2.6	0	<2.6		5	5
Phosphorus	P	190	34.7	155		<26.2	100	<100		205	100
Silver	Ag	4.2	0	4.2		<0.9	0	<0.9		5	5
Selenium	Se	<0.4	0	<0.4		<0.5	0	<0.5		<1	5
Thallium	Tl	0.3	0	0.3		0.4	0	0.4		1	5

Blank is a mean of 3 blanks for project
See notes by Bruce dated 9/3/92.

Mill: Champion-Sheldon
Source: Bark Boiler without Sludge

Run 1
Sample volume (DSCF)------ --- 49.368
Source Vol Flow (DSCFM)--- ---5.07E+04

		Amt (ug)	Conc (lb/DSCF)	Mass Rt. (lb/hr)	Detection Limit(ug)	Det Limit (lb/DSCF)	Det Limit (lb/hr)
Hexavalent Cr	Cr(VI)	0.57	2.5E-11	7.7E-05	1	4.5E-11	1.4E-04

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HEXAVALENT CHROMIUM CALCULATIONS

Client: TPIEC
Location: Champion-Sheldon
WESTON Project No.: 6848-01-01
Source: BB1/2

INPUT DATA

		1	2	3	Mean
Run Number		1	2	3	Mean
Date		08/20/92			---
Time Began		1423			---
Time Ended		1609			---
Sampling Time, min	(Theta)	106			106
Stack Dimensions, in.	(Square)	58x58	58x58	58x58	0
Barometric Pressure, in. Hg	(Pb)	30.01			30.01
Static Pressure, in. H2O	(Pg)	0.64			0.64
Pitot Tube Coefficient	(Cp)	0.84			0.84
Meter Correction Factor	(Y)	1.010			1.010
Nozzle Diameter, in.	(Dn)	0.247			0.247
Meter Volume, ft^3	(Vm)	51.107			51.107
Meter Temperature, °F	(tm)	96			96
Meter Orifice Pressure, in. H2O	(Delta H)	1.729			1.729
Volume H2O Collected, mL	(Vlc)	328.9			328.9
CO2 Concentration, %	(CO2)	6.9			6.9
O2 Concentration, %	(O2)	12.9			12.9
Average Sq Rt Velo Head, (in. H2O)^½	((Delta P)^½)avg	0.8747			0.8747
Stack Temperature, °F	(ts)	149			149
Total Metals Collected, ug		0.6			0.6
Moisture Fraction (at Saturation)	(Bws)	NA	NA	NA	

CALCULATED DATA

Stack Area, ft^2	(As)	23.36	23.36	0.00	15.57
Stack Pressure, in. Hg	(Ps)	30.06	0.00	0.00	10.02
Standard Meter Volume, ft^3	(Vmstd)	49.368	0.000	0.000	16.456
Standard Water Volume, ft^3	(Vwstd)	15.481	0.000	0.000	5.160
Moisture Fraction (Measured)	(Bws)	0.239	ERR	ERR	ERR
Moisture Fraction (lower sat/meas)	(Bws)	0.239	ERR	ERR	ERR
Mol. Wt. of Stack Gas, lb/lb-mole	(Ms)	26.8	ERR	ERR	ERR
Average Stack Gas Velocity, ft/sec	(Vs)	54.6	ERR	ERR	ERR
Stack Gas Flow @ Stack Cond, ft^3/min	(Qa)	7.65E+04	ERR	ERR	ERR
Stack Gas Flow @ Std Cond, ft^3/min	(Qs)	5.07E+04	ERR	ERR	ERR
Isokinetic Sampling Rate, %	(%I)	65	ERR	ERR	ERR
Metals Concentration, lb/ft^3		2.54E-11	ERR	ERR	ERR

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1-22-93

RTI Project No. : 4848-02Q

Samples : Impinger Samples
Company : Weston Analytics (W.O No. 6848-01-01)
Analyte : Cr(VI)
Methods of Analysis : Ion Chromatography / Post Column Reaction
Samples Received : 8-24-92
Report Date : 9-9-92

Sample	Total Volume mL	Cr(VI) ug/mL	Total Cr(VI) ug
CHMP-BB1-CR6-R1-A (w/o sludge)	840	0.00273	2.29
CHMP-BB1-CR6-R1-B	304	0.00177	0.54
CHMP-BB1-CR6-R2-A (with sludge)	672	0.00358	2.41
CHMP-BB1-CR6-R2-B	734	0.00302	2.22
CHMP-BB1-BLK-KOH	697	0.00205	1.43
CHMP-BB1-BLK-DIW	819	ND	ND

Detection Limit 0.0015

ND : Non-detectable; less than detection limit

Total Cr(VI), ug = Cr(VI), ug/mL • Total Volume, mL

RTI Project No. : 4848-02Q

Samples : QC for Impinger Samples
Company : Weston Analytics (W.O No. 6848-01-01)
Analyte : Cr(VI)
Methods of Analysis : Ion Chromatography / Post Column Reaction
Samples Received : 8-24-92
Report Date : 9-9-92

Calibration Check Sample

Sample	Cr(VI) ug/mL Measured	Cr(VI) ug/mL Expected
QC	0.00985	0.0100

Results of Blank, Duplicate, and Spike Analysis

Sample	Cr(VI) ug/mL Measured	Spike Cr(VI) ug/mL Measured	Spike Cr(VI) ug/mL Expected	Spike Cr(VI) % Recovery
RTI DIW Blk	ND	--	--	--
CHMP-BB1-CR6-R1-B Dup	0.00201	--	--	--
CHMP-BB1-CR6-R2-A Spk	ND	0.0108	0.0100	108

Section 7.6 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

SOURCE CS-BB1/2

QUALITY CONTROL SUMMARY
METHOD 25A

1. CALIBRATION

THEOR	6/6/92		6/8/92	
ppm	ppm	%ERR	ppm	%ERR
0.0	-1.0	-0.4	0.0	0.0
1.0	-1.0	-0.8	0.0	-1.1
36.0	41.0	2.0	37.6	1.8
91.0	88.0	-1.3	90.5	-0.8
CORR COEFF	0.9960		0.9996	

2. PROPANE LINE RECOVERY

	DATE	6/6/92		DATE	6/8/92	
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	88.0	88.0	100.0%	92.3	92.3	100.0%
AFTER	90.0	89.0	98.9%	92.9	91.6	98.6%

3. LINE BLANK

	6/6/92	6/8/92
	ppm	ppm
BEFORE	0.0	*
AFTER	1.4	1.1

*Not performed

SOURCE CS-BB1/2

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR	DATE	6/6/92	DATE	6/8/92
	ppm	ppm	%REC	ppm	%REC
ethanol	52.0	47.8	92.0%	48.9	94.0%
acetone	41.6	38.2	92.0%	39.9	96.1%
isopropanol	39.9	37.1	93.1%	37.5	94.1%
dimethyl sulfide	9.1	8.5	93.4%	8.9	97.8%
benzene	34.2	31.7	92.8%	33.2	97.2%
bromodichloromethane	18.8	17.8	94.7%	17.7	94.1%
dimethyl disulfide	33.9	31.4	92.5%	31.2	92.0%
toluene	28.7	26.7	92.8%	27.4	95.5%
ethyl benzene	24.9	23.4	93.8%	22.9	91.7%
m-xylene	49.8	46.8	94.0%	45.2	90.8%
o-xylene	25.0	23.8	95.1%	22.4	89.4%
cumene	21.9	20.9	95.2%	20.2	91.9%
alpha-pinene	19.2	17.9	93.4%	18.6	97.2%
beta-pinene	19.2	17.9	93.0%	17.2	89.4%
3-carene	19.3	17.6	91.4%	16.4	84.9%
p-cymene	19.6	18.0	91.9%	16.5	84.2%

2. PROPANE RESPONSE

	THEOR		%REC		%REC
BEFORE	36.0	37.8	105.0%	38.0	105.6%
AFTER	36.0	38.2	106.1%	37.5	104.2%

3. METHANOL LINE RECOVERY

	6/6/92			6/8/92		
	GC	LINE	%REC	GC	LINE	%REC
BEFORE	10.6	11.3	106.6%	10.4	10.0	96.2%
AFTER	10.7	11.1	103.7%	9.7	8.2	84.5%

4. LINE BLANK

	[-------------FILE REF-------------]	
BEFORE	F6A2007	F8A2005
AFTER	F8A2005	F9A2005

Section 7.7 Process Operating Data

POWER BOILERS - PROCESS OPERATING CONDITIONS

Mill: Sheldon Mill
Source: No.1 Power Boiler
FIN: S200

Source: No.1 Power Boiler
Date: 6-6-92
EPN: E40 CIN: EC22,EC21

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		17:20	18:15	19:11	
Boiler Type		B&W Traveling Grate			
Fuel Type		Bark and Sludge			0.00
Fuel Firing Rate	MMBTU/hr	270	275	275	0.00
Excess Air	%	8.2	7.6	7.6	0.00
Fuel BTU Content	BTU/lb	4500.0	4500.0	4500.0	0.00
Fuel Moisture Content	%	50.000	50.000	50.000	0.00
Emission Data					
O2 Concentration		8.2	7.6	7.6	0.00
CO2 Concentration					0.00
CO Concentration					0.00
SO2 Concentration					0.00
NOX Concentration					0.00
Sludge Burning	yes or no	NO	NO	NO	
Sludge Burning Rate	lb/hr				0.00
Sludge Moisture Content	%				0.00

POWER BOILERS - PROCESS OPERATING CONDITIONS

Mill: Sheldon Mill
Source: No.1 Power Boiler
FIN: 5200

Source: No.1 Power Boiler
Date: 6-8-92
EPN: E40   CIN: EC22,EC21

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		16:25"	17:24"	18:22"	
Boiler Type			B&W Traveling Grate		
Fuel Type			Bark and Sludge		0.00
Fuel Firing Rate	MMBTU/hr	267	267	275	0.00
Excess Air	%	9.0	9.0	10.0	0.00
Fuel BTU Content	BTU/lb	4500.0	4500.0	4500.0	0.00
Fuel Moisture Content	%	50.000	50.000	50.000	0.00
Emission Data					
O2 Concentration		9	9	10	0.00
CO2 Concentration					0.00
CO Concentration					0.00
SO2 Concentration					0.00
NOX Concentration					0.00
Sludge Burning	yes or no	NO	NO	NO	
Sludge Burning Rate	lb/hr				0.00
Sludge Moisture Content	%				0.00

POWER BOILERS - PROCESS OPERATING CONDITIONS

Mill: Sheldon Mill
Source: No.1 Power Boiler
FIN: 5200

Source: No.1 Power Boiler
Date: 6-8-92
EPN: E40 CIN: EC22,EC21

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		19:19			
Boiler Type		B&W Traveling Grate			
Fuel Type		Bark and Sludge			0.00
Fuel Firing Rate	MMBTU/hr	265			0.00
Excess Air	%	9.7			0.00
Fuel BTU Content	BTU/lb	4500.0			0.00
Fuel Moisture Content	%	50.000			0.00
Emission Data					
O2 Concentration		9.7			0.00
CO2 Concentration					0.00
CO Concentration					0.00
SO2 Concentration					0.00
NOX Concentration					0.00
Sludge Burning	yes or no	NO			
Sludge Burning Rate	lb/hr				0.00
Sludge Moisture Content	%				0.00

POWER BOILERS - PROCESS OPERATING CONDITIONS

Mill: Sheldon Mill
Source: No.1 Power Boiler
FIN: 5200

Source: No.1 Power Boiler
Date: 6-18-92
EPN: E40 CIN: EC22,EC21

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		12:0	14:00		
Boiler Type				B&W Traveling Grate	
Fuel Type				Bark and Slud	0.00
Fuel Firing Rate	MMBTU/hr	206	221		0.00
Excess Air	%	11.3	11.7		0.00
Fuel BTU Content	BTU/lb	4500.0	4500.0		0.00
Fuel Moisture Content	%	50.000	50.000		0.00
Emission Data					
O2 Concentration		11.3	11.7		0.00
CO2 Concentration					0.00
CO Concentration					0.00
SO2 Concentration					0.00
NOX Concentration					0.00
Sludge Burning	yes or no			n	
Sludge Burning Rate	lb/hr				0.00
Sludge Moisture Content	%				0.00

POWER BOILERS - PROCESS OPERATING CONDITIONS

Mill: Sheldon Mill
Source: No.1 Power Boiler
FIN: 5200

Source: No.1 Power Boiler
Date: 6-19-92
EPN: E40 CIN: EC22,EC21

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		7:00	8:00	8:45	
Boiler Type				B&W Traveling Grate	
Fuel Type				Bark and Slud	0.00
Fuel Firing Rate	MMBTU/hr	234	234	n/a	0.00
Excess Air	%	9.8	9.8	n/a	0.00
Fuel BTU Content	BTU/lb				0.00
Fuel Moisture Content	%	50.000	50.000	50.000	0.00
Emission Data					
O2 Concentration		9.8	9.8	n/a	0.00
CO2 Concentration					0.00
CO Concentration					0.00
SO2 Concentration					0.00
NOX Concentration					0.00
Sludge Burning	yes or no			n	
Sludge Burning Rate	lb/hr				0.00
Sludge Moisture Content	%				0.00

POWER BOILERS - PROCESS OPERATING CONDITIONS

Mill: Sheldon Mill
Source: No.1 Power Boiler
FIN: 5200

Source: No.1 Power Boiler
Date: 8-20-92
EPN: E40 CIN: EC22,EC21

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		14:2	16:0		
Boiler Type		B&W Traveling Grate			
Fuel Type		Bark and Sludge			0.00
Fuel Firing Rate	MMBTU/hr	301	230		0.00
Excess Air	%	7.8	9.4		0.00
Fuel BTU Content	BTU/lb	4500.0	4500.0		0.00
Fuel Moisture Content	%	50.000	50.000		0.00
Emission Data					
O2 Concentration		7.8	8.3		0.00
CO2 Concentration					0.00
CO Concentration					0.00
SO2 Concentration					0.00
NOX Concentration					0.00
Sludge Burning	yes or no				
Sludge Burning Rate	lb/hr				0.00
Sludge Moisture Content	%				0.00

* Run was conducted without condensate in the scrubber water.

TEXAS EMISSIONS SPECIATION STUDY
EMISSION TEST RESULTS
INLAND-ORANGE
ORANGE, TEXAS

VOLUME 4 OF 6

Prepared For:

TEXAS PAPER INDUSTRY ENVIRONMENTAL COMMITTEE

CHAMPION INTERNATIONAL CORPORATION: LUFKIN, TX
CHAMPION INTERNATIONAL CORPORATION: SHELDON, TX
INLAND-ORANGE, INC.: ORANGE, TX
SIMPSON PASADENA PAPER COMPANY: PASADENA, TX
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(L) WWC 18 December 1992

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This volume of the report presents the results of the sources tested at the Inland-Orange mill in Orange, Texas. Volume 1 describes the objectives of the study, methodology used to collect the data, and the quality control results which are applicable to the entire study at the five mills. A copy of the project work plan is also included as an Appendix to Volume 1.

The table on the following page summarizes the sources tested for the various parameters. The testing was conducted during the time period of 8 July through 24 July by a WESTON test team led by Mr. Gary Lloyd. Mr. Tom Noble of Inland-Orange was responsible for collection of process operating data and coordination of testing activities with mill operations.

Data is presented by source as sections in this volume. Each section includes a brief narrative SOURCE SUMMARY, a tabular SUMMARY OF RESULTS, a graphic THC TREND PLOT (if applicable), and exhibits for all source data, quality control data and process operating conditions. Supporting data (chromatograms, calibration data, field data sheets, etc.) will remain on file for a period of three years.

SOURCES TESTED AT INLAND - ORANGE

SOURCE TESTED	SOURCE CODE	Phase 2 M16 TRS	M18 M25A	VOST	MM5	CH2O	Metals	Cr+6	HCl	Acid Mist	Chloro-form
INLAND - ORANGE											
TPIEC-POOLED SOURCES											
Lime Kiln w/ NCGs	IO-LK/1	Y	Y	Y							
Lime Kiln w/o NCGs	IO-LK/2	Y	Y								
MILL-SPECIFIC SOURCES											
Bark Boiler	IO-BB		Y	Y	Y	Y			Y		
"B" Brown Stock Washer Hood Vent	IO-BSWBHV	Y	Y	Y							
"B" Brown Stock Washer Filtrate Vent	IO-BSWBFV	Y	Y								
NCG System at Lime Kiln (a)	IO-NCGLK	Y	Y								
NCG Blow Heat Recovery Vent (b)	IO-NCGBHR	Y	Y								
NCG Multi-Effect Evap Hotwell Vent (c)	IO-NCGEHV	Y	Y								
NCG Chemiwasher Filtrate Tank Vent	IO-NCGCFT	Y	Y								
NCG Chemiwasher Hood Vent	IO-NCGCHV	Y	Y								
Tall Oil Reactor Stack	IO-TORV	Y	Y								

Note a: T-ABLOW/T-BBLOW/T-TURDE/T-COMBC/P-MEEC
Note b: T-ABLOW/T-BBLOW/T-TURDE
Note c: T-COMBC/P-MEEC

WESTON
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1. IO-LK/1

SECTION 1

LIME KILN WITH NCGs

(IO-LK/1)

SECTION 1
LIME KILN WITH NCGs
(IO-LK/1)

The Lime Kiln with NCGs was tested on two different days for volatile organic compounds by Methods 25A, 16, 18 and VOST.

Total Hydrocarbons (M25A)

Figures 1.1, 1.2, and 1.3 present the THC trends for the test periods on 7/15/92 and 7/21/92. After two hours the testing period on 7/15/92 was interrupted to allow the process to come back up to full load. Total hydrocarbon concentrations were 20 to 30 ppm on both days with trends following the rise and fall of the mud load.

Volatile Organic Compounds (M16 and M18)

Table 1.1 summarizes the results for the Method 16 and Method 18 target compounds, and Section 1.1 is a tabulation of the data. The volumetric flow was measured during sampling with a pitot tube. The reduced sulfur compounds detected were hydrogen sulfide (approximately 0.8 lb/hr) and methyl mercaptan (detection limit). The reduced sulfur compounds detected. Methanol was the only compound of the Method 18 target list at concentrations above the detection limit. Percentage unknowns were unusually high in run 1 on 7/15/92 and in all runs on 7/21/92. Retention times shifted on 7/21/92 but chromatograms showed a consistent peak pattern.

Volatile Organic Sampling Train (VOST)

Table 1.2 summarizes the result of the VOST sample collected on 7/21/92. Section 1.2 tabulates the results for target compounds and tentatively identified compounds (TIC). A high level VOST analysis was performed which showed both acetone and benzene present in the 3-4 ppm range. These compounds were not detected by Method 18 analysis.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 1.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 1.4 includes the process operating data as recorded and provided by mill personnel. Process data were not given for all run times. The data with the closest run time was used.

FIGURE 1.1
THC TREND ANALYSIS (7/15/92) (a)
LIME KILN WITH NCGs (IO-LK/1)

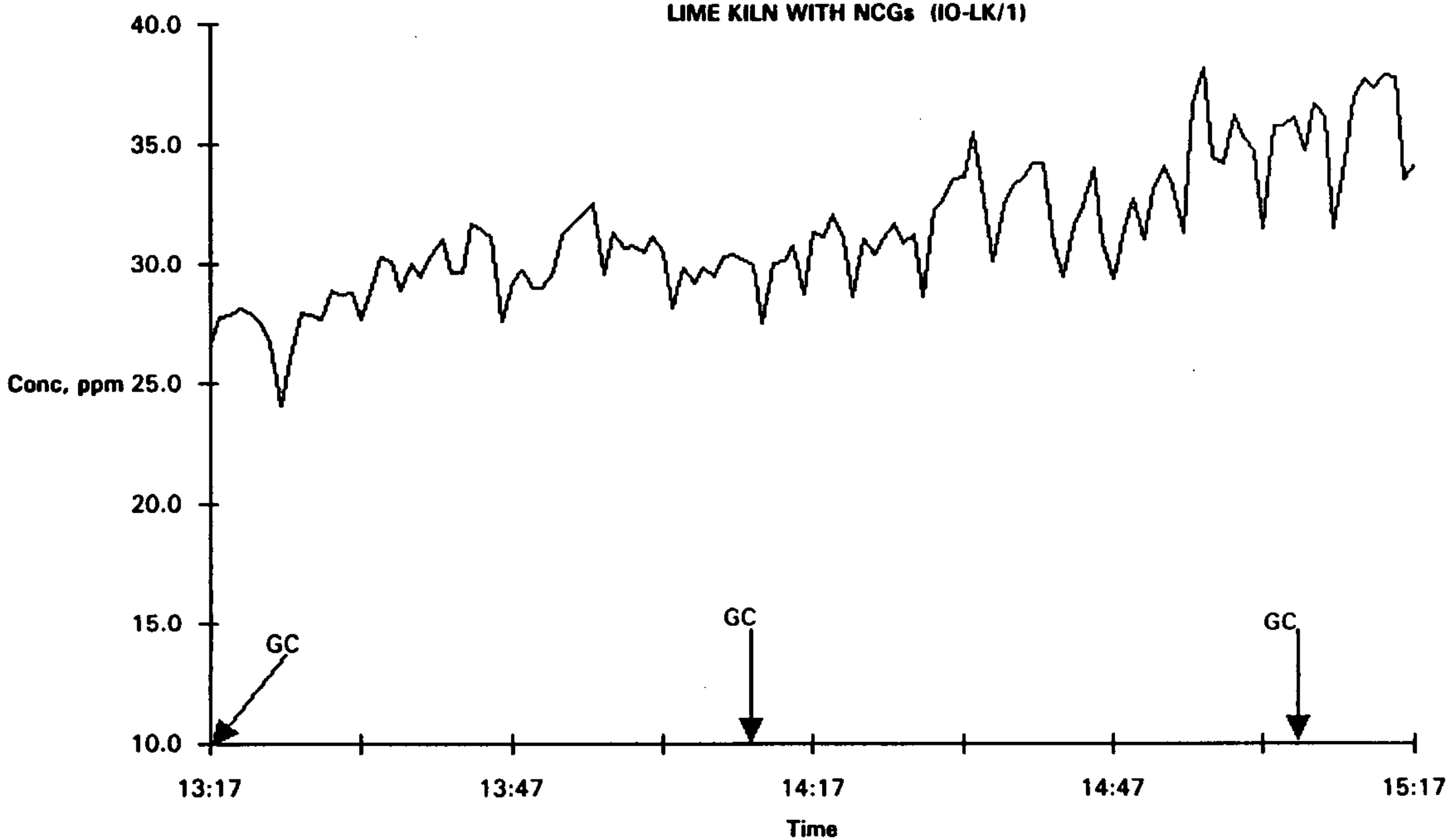

FIGURE 1.2
THC TREND ANALYSIS (7/15/92) (b)
LIME KILN WITH NCGs (IO-LK/1)

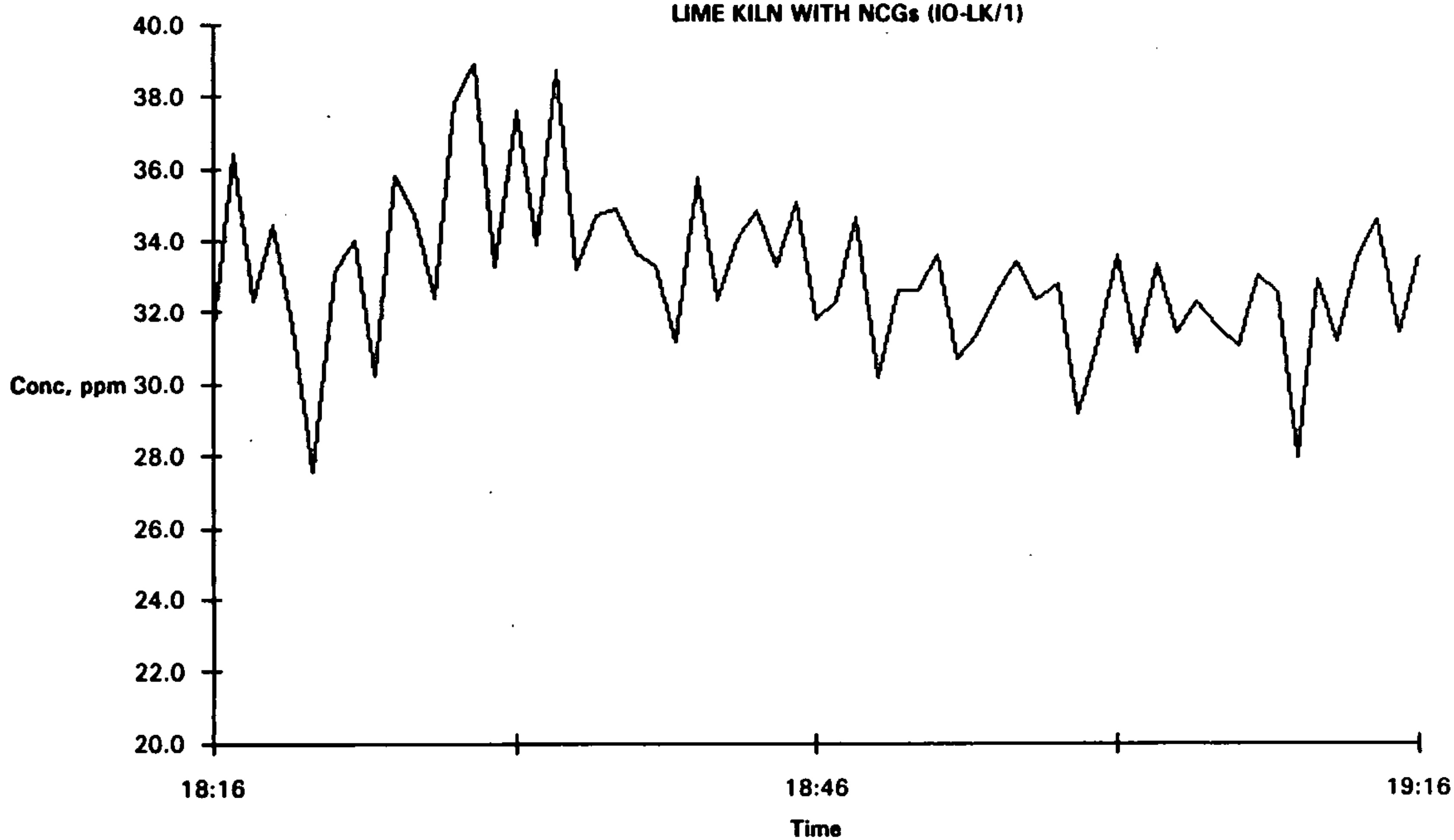

FIGURE 1.3
THC TREND ANALYSIS (7/21/92)
LIME KILN WITH NCGs (IO-LK/1)

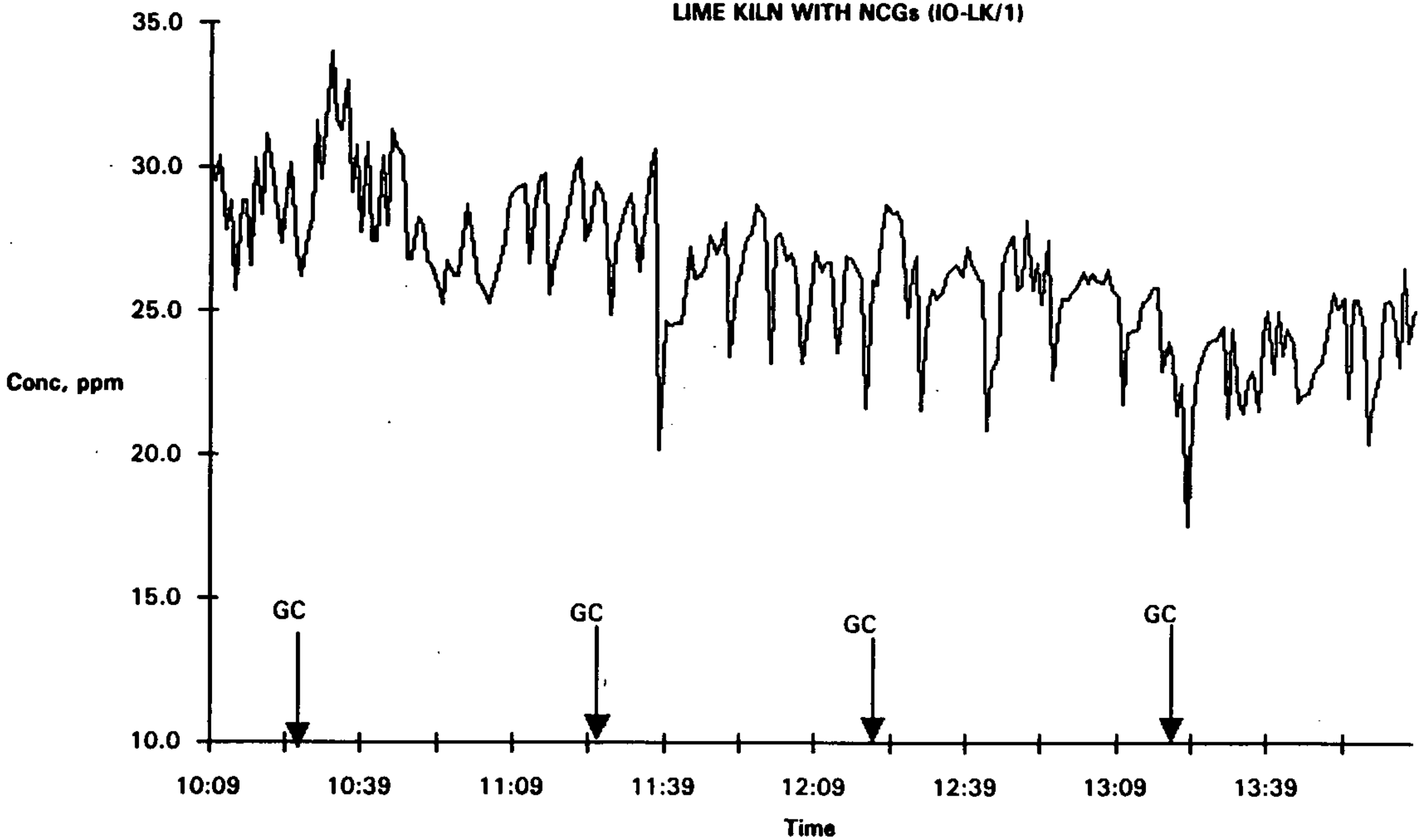

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TABLE 1.1 SUMMARY OF VOC RESULTS

Mill: INLAND - ORANGE
Source Code: IO-LK/1
FIN: P-LIMK CIN: C-28, C-29

Source: Lime Kiln with NCGs
Test Dates: 7/15/92 7/21/92
EPN: 11

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	170	171	171	
Volumetric Flow Rate, x10^3 DSCFM	17.1	17.1	17.1	
Process Operating Conditions				
Production Rate, T CaO/hr	10.6	12.3	11.5	
Method 16 Data, lb/hr				
Hydrogen sulfide	0.7	0.8	0.8	0.1
Methyl mercaptan	ND	0.1	0.1	0.1
Dimethyl sulfide	ND	ND	ND	0.1
Carbon disulfide	ND	ND	ND	0.1
Dimethyl disulfide	ND	ND	ND	0.1
Method 18 Data, lb/hr				
Methanol	ND	1.1	0.7	0.3
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.2
Chloroform	ND	ND	ND	0.5
Benzene	ND	ND	ND	0.2
Bromodichloromethane	ND	ND	ND	0.7
Toluene	ND	ND	ND	0.2
Ethyl benzene	ND	ND	ND	0.2
m-, p-Xylene	ND	ND	ND	0.2
o-Xylene	ND	ND	ND	0.2
Cumene	ND	ND	ND	0.3
alpha-Pinene	ND	ND	ND	0.3
beta-Pinene	ND	ND	ND	0.3
3-Carene	ND	ND	ND	0.3
Terpenes (Unspecified)	ND	ND	ND	0.3
p-Cymene	ND	ND	ND	0.3
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	0.2	0.5	0.3	0.1
Unknowns as C, lb/hr	ND	0.2	0.1	0.1
Sum of Compounds as C, lb/hr	0.2	0.6	0.4	0.1

ND=Not Detected
DL=Detection Limit

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TABLE 1.2 SUMMARY OF VOST RESULTS

Mill: INLAND-ORANGE
Source Code: IO-LK/1
FIN: P-LIMK EPN: 11

Source: Lime Kiln with NCGs
Test Dates: 7/21/92
CIN: C-28, C-29

TIME	1030
Volumetric Flow Data	
Stack Temperature, °F	171
Volumetric Flow Rate, x 10^3 DSCFM	17.1
Process Operating Conditions	
Production Rate, T CaO/hr	12.3
Target Compounds, ppm	
Bromomethane	0.001
Methylene Chloride	0.136
Acetone	3.983
Carbon Disulfide	0.020
Acrolein	0.018
Dibromomethane	0.000
2-Butanone (MEK)	0.011
Benzene	4.454
Toluene	0.069
Styrene	0.001

WESTON
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Section 1.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: Lime Kiln with NCGs | FIN: P-LIMK
Source Code: IO-LK/1 | Date: 7/15/92 | EPN: 11 | CIN: C-28, C-29

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1316	1416	1816	
Flow Data				
Stack Temperature, °F		170		170
Moisture Content, %		41.0		41.0
Oxygen Concentration, %		8.0		8.0
Carbon Dioxide Concentration, %		16.0		16.0
Volumetric Flow Rate, x10^3 ACFM		34.5		34.5
Volumetric Flow Rate, x10^3 DSCFM		17.1		17.1
Process Operating Conditions				
Production Rate, T CaO/hr	10.6	10.6	10.6	10.6
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	9.1	8.1	7.8	8.3
Emission Rate, lb/hr	0.8	0.7	0.7	0.8
Methyl mercaptan				
Concentration, ppmvd	0.9	0.9	0.9	0.9
Emission Rate, lb/hr	0.1	0.1	0.1	0.1
Dimethyl sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Method 18 Data				
Methanol				
Concentration, ppmvd	9.8	12.5	9.3	10.6
Emission Rate, lb/hr	0.8	1.1	0.8	0.9
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: Lime Kiln with NCGs | FIN: P-LIMK
Source Code: IO-LK/1 | Date: 7/15/92 EPN: 11 | CIN: C-28, C-29

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Chloroform				
Concentration, ppmvd	1.7 *	1.7 *	1.7 *	1.7 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Benzene				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Bromodichloromethane				
Concentration, ppmvd	1.7 *	1.7 *	1.7 *	1.7 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Ethyl benzene				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
m-, p-Xylene				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
o-Xylene				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Cumene				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
alpha-Pinene				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
beta-Pinene				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
3-Carene				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: Lime Kiln with NCGs | FIN: P-LIMK

Source Code: IO-LK/1 | Date: 7/15/92 | EPN: 11 | CIN: C-28, C-29

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Knowns as Carbon				
Concentration, ppmvd	8.1	9.8	7.5	8.5
Unknowns as Carbon				
Concentration, ppmvd	1.7	0.7	0.0	0.8
Sum M18 as Carbon, lb/hr	0.3	0.3	0.2	0.3
Unknown Compounds % of Total	17.2%	6.5%	0.0%	7.9%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	49.8	56.3	56.1	54.1
Emission Rate, lb/hr as C	1.6	1.8	1.8	1.7

COMMENTS :

Method 18 run 3 injection took place during Method 25A run 2 time.

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: Lime Kiln with NCGs | FIN: P-LIMK
Source Code: IO-LK/1 | Date: 7/21/92 EPN: 11 | CIN: C-28, C-29

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1008	1108	1208	
Flow Data				
Stack Temperature, °F			171	171
Moisture Content, %			42.0	42.0
Oxygen Concentration, %			7.0	7.0
Carbon Dioxide Concentration, %			17.0	17.0
Volumetric Flow Rate, x10^3 ACFM			35.1	35.1
Volumetric Flow Rate, x10^3 DSCFM			17.1	17.1
Process Operating Conditions				
Production Rate, T CaO/hr	12.3	12.3	12.3	12.3
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	9.2	9.2	8.7	9.0
Emission Rate, lb/hr	0.8	0.8	0.8	0.8
Methyl mercaptan				
Concentration, ppmvd	0.5	0.5 *	0.5 *	0.3
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Method 18 Data				
Methanol				
Concentration, ppmvd	10.0	7.1	3.4 *	6.3
Emission Rate, lb/hr	0.9	0.6	0.3 *	0.5
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.9 *	0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.9 *	0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.9 *	0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE   Source: Lime Kiln with NCGs   FIN: P-LIMK
Source Code: IO-LK/1   Date: 7/21/92   EPN: 11   CIN: C-28, C-29

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.9 *	0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Chloroform				
Concentration, ppmvd	1.7 *	1.7 *	1.7 *	1.7 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Benzene				
Concentration, ppmvd	0.9 *	0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Bromodichloromethane				
Concentration, ppmvd	1.7 *	1.7 *	1.7 *	1.7 *
Emission Rate, lb/hr	0.8 *	0.8 *	0.8 *	0.8 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.9 *	0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Ethyl benzene				
Concentration, ppmvd	0.9 *	0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
m-, p-Xylene				
Concentration, ppmvd	0.9 *	0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
o-Xylene				
Concentration, ppmvd	0.9 *	0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Cumene				
Concentration, ppmvd	0.9 *	0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
alpha-Pinene				
Concentration, ppmvd	0.9 *	0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
beta-Pinene				
Concentration, ppmvd	0.9 *	0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
3-Carene				
Concentration, ppmvd	0.9 *	0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.9 *	0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: Lime Kiln with NCGs | FIN: P-LIMK
Source Code: IO-LK/1 | Date: 7/21/92 | EPN: 11 | CIN: C-28, C-29

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.9 *	0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Knowns as Carbon				
Concentration, ppmvd	14.7	7.5	7.1	9.7
Unknowns as Carbon				
Concentration, ppmvd	3.8	2.2	7.4	4.5
Sum M18 as Carbon, lb/hr	0.6	0.3	0.5	0.5
Unknown Compounds % of Total	20.6%	22.3%	51.2%	31.3%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	49.1	46.9	44.7	46.9
Emission Rate, lb/hr as C	1.6	1.5	1.4	1.5

COMMENTS :

Method 18 run 3 injection took place during Method 25A run 2 time.

* One or more values were less than the detection limit.

WESTON
MANAGERS DESIGNERS/CONSULTANTS

Section 1.2 Emission Test Results - VOST

EMISSION TEST RESULTS - VOST

Mil INLAND - ORANGE Source: Lime Kiln with NCGs
Source Code: IO-LK/1 EPN: 11 FIN: P-LIMK CIN: 28, C-29
HIGH-LEVEL VOST

Date: 7/21/92

Compound	LK/1-T (μg)	LK/1-TC (μg)	LK/1-C ($\mu g/L$)	Total μg	IO-LK/1 ($\mu g/m3$)	Conc. (ppm)
TARGET COMPOUNDS						
Chloromethane						
Bromomethane			0.67	0.03	2.96	0.001
Vinyl Chloride						
Methylene Chloride	0.730	2.071	44.03	4.69	482.46	0.136
Acetone	53.707	27.238	296.01	93.67	9627.28	3.983
Carbon Disulfide		0.616		0.62	63.31	0.020
Chloroform						
Acrolein			9.39	0.40	41.50	0.018
Dibromomethane			0.49	0.02	2.17	0.000
Dimethyl disulfide						
Dimethyl sulfide						
n-Hexane						
2-Butanone (MEK)			7.15	0.31	31.60	0.011
Benzene	140.805			140.81	14471.22	4.454
Toluene	2.483		2.21	2.58	264.96	0.069
Styrene			0.60	0.03	2.65	0.001
A-Pinene						
B-Pinene						
TENTATIVELY IDENTIFIED CMPDS.						
Siloxane/Silane	1042.020	284.088	962.22	1367.48	140543.01	
Sulfur Dioxide			6.44	0.28	28.46	
Pinene-related compounds						
Subst'd HC						
Cyclic HC						
Acidic Ester						
SURROGATE STDS (% Recovery)						
Toluene-d8	184.4	147.5	116.0			
1,2-Dichloroethane-d4	86.0	104.2	86.9			
Benzene-d6	120.0	125.8	115.0			

NOTES:
- -T=Tenax
- -TC=Tenax/Charcoal
- -C = Condensate

Air Volume = 0.00973 cu.m.

Condensate Vol. 43.0 mL

Triangle Laboratories of RTP, Inc.
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FILE NAME: 8C203
RF FILE: 8C196
DATE: 08/25/92
TLI PROJ #: 21509

SAMPLE ID: IO-LK1-1VOST-0721-3A T
TLI ID: 58.116.11
ANALYSIS DATE: 07/31/92

9.12

METHOD 8240--HIGH LEVEL VOST QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	465		857	1		IS	
2	Chloromethane	0	.495	0	1	1.085	ND	5
3	Bromomethane	0	.927	0	1	.579	ND	5
4	Vinyl Chloride	0	.508	0	1	1.058	ND	5
5	Chloroethane	0	.737	0	1	.729	ND	5
6	Methylene Chloride	73	2.670	657	1	.730	E	5
7	Acetone	920	.460	600	1	53.707	D	5
8	Carbon Disulfide	0	4.939	0	1	.109	ND	5
9	1,1-Dichloroethene	0	1.727	0	1	.311	ND	5
10	1,1-Dichloroethane	0	5.348	0	1	.100	ND	5
11	trans-1,2-Dichloroethene	0	2.590	0	1	.207	ND	5
12	Chloroform	0	6.093	0	1	.088	ND	5
13	1,2-Dichloroethane	0	2.676	0	1	.201	ND	5
43	Trichlorofluoromethane	0	1.099	0	1	.489	ND	5
47	cis-1,2-Dichloroethene	0	3.264	0	1	.165	ND	5
57	Allyl chloride	0	1.362	0	1	.394	ND	5
62	Dimethyl disulfide	0	5.245	0	1	.102	ND	5
63	Dimethyl sulfide	0	1.814	0	1	.296	ND	5
65	Iodomethane	0	3.230	0	1	.166	ND	5
66	Isooctane	0	10.516	0	1	.051	ND	5
68	Tert-Butyl methyl ether	0	4.492	0	1	.120	ND	5
69	Vinyl Bromide	0	1.157	0	1	.464	ND	5
70	n-Hexane	0	2.594	0	1	.207	ND	5
14	1,4-Difluorobenzene	2730		1000	14		IS	
15	2-Butanone	0	.022	0	14	4.190	ND	5
16	1,1,1-Trichloroethane	0	.551	0	14	.166	ND	5
17	Carbon Tetrachloride	0	.493	0	14	.186	ND	5
18	Vinyl Acetate	0	.543	0	14	.169	ND	5
19	Bromodichloromethane	0	.631	0	14	.145	ND	5
20	1,2-Dichloropropane	0	.569	0	14	.161	ND	5
21	cis-1,3-Dichloropropene	0	.616	0	14	.149	ND	5
22	Trichloroethene	0	.488	0	14	.188	ND	5
23	Dibromochloromethane	0	.456	0	14	.201	ND	5
24	1,1,2-Trichloroethane	0	.300	0	14	.305	ND	5
25	Benzene	32134	1.045	935	14	140.805	E	5
26	trans-1,3-Dichloropropene	0	.559	0	14	.164	ND	5
27	Bromoform	0	.225	0	14	.406	ND	5
54	1,4-Dichloro-2-butene	0	.087	0	14	1.055	ND	5
60	Dibromomethane	0	.221	0	14	.414	ND	5
28	Chlorobenzene-d5	2777		1472	28		IS LOW	
29	4-Methyl-2-Pentanone	0	.200	0	28	.449	ND	5
30	2-Hexanone	0	.162	0	28	.555	ND	5
31	Tetrachloroethene	0	.292	0	28	.308	ND	5
33	Toluene	316	.573	1229	28	2.483	E	5
34	Chlorobenzene	0	.698	0	28	.129	ND	5
35	Ethylbenzene	0	.425	0	28	.212	ND	5
36	Styrene	0	.660	0	28	.136	ND	5
37	o-Xylene	0	.454	0	28	.198	ND	5

Triangle Laboratories of RTP, Inc.
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FILE NAME: 8C203
RF FILE: 8C196
DATE: 08/25/92
TLI PROJ #: 21509

SAMPLE ID: IO-LK1-1VOST-0721-3A T
TLI ID: 58.116.11
ANALYSIS DATE: 07/31/92

METHOD 8240--HIGH LEVEL VOST QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
38 m-/p-Xylene	0	.402	0	28	.224	ND	5
49 1,2 Dichlorobenzene	0	.334	0	28	.270	ND	5
50 1,2,3-Trichloropropane	0	.154	0	28	.583	ND	5
51 1,3 Dichlorobenzene	0	.520	0	28	.173	ND	5
53 1,4 Dichlorobenzene	0	.403	0	28	.223	ND	5
56 A-Pinene	0	.695	0	28	.130	ND	5
58 B-Pinene	0	.746	0	28	.121	ND	5
59 Cumene (isopropylbenzene)	0	.894	0	28	.101	ND	5
64 Ethyl methacrylate	0	.296	0	28	.304	ND	5
67 P-Cymene	0	.935	0	28	.096	ND	5

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	889	2.223	932	1	10.75	D	86.0
48 Benzene-d6	3711	1.133	931	14	14.99	D	120.0
39 Toluene-d8	4461	.871	1217	28	23.05	D	184.4

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FILE NAME: 8C203
DATE: 08/13/92
TLI PROJ #: 21509

SAMPLE ID: IO-LK1-1VOST-0721-3A T
TLI ID: 58.116.11
ANALYSIS DATE: 07/31/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
SILOXANE\SILANE	1336	217950	1472	12.5	247.320
SILOXANE\SILANE	1438	162565	1472	12.5	184.471
SILOXANE\SILANE	953	106038	1000	12.5	180.350
SILOXANE\SILANE	1222	92481	1000	12.5	157.291
SILOXANE\SILANE	1905	106810	1472	12.5	121.203
SILOXANE\SILANE	1504	54885	1472	12.5	62.281
SILOXANE\SILANE	1816	38422	1472	12.5	43.599
SILOXANE\SILANE	870	7436	857	12.5	26.287
SILOXANE\SILANE	888	4155	857	12.5	14.687
SILOXANE\SILANE	906	1282	857	12.5	4.532

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	857	3536	1
1,4-Difluorobenzene	1000	7349	14
Chlorobenzene-d5	1472	11016	28

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FILE NAME: 8C211
RF FILE: 8C208
DATE: 08/12/92
TLI PROJ #: 21509

SAMPLE ID: IO-LK1-1VOST-0721-38 TC
TLI ID: 58.118.12
ANALYSIS DATE: 08/03/92

METHOD 8240--HIGH LEVEL VOST QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	432		860	1		IS	
2	Chloromethane	0	.495	0	1	1.168	ND	5
3	Bromomethane	0	.927	0	1	.624	ND	5
4	Vinyl Chloride	0	.508	0	1	1.139	ND	5
5	Chloroethane	0	.737	0	1	.785	ND	5
6	Methylene Chloride	191	2.870	659	1	2.071	E	5
7	Acetone	433	.460	605	1	27.238	D	5
8	Carbon Disulfide	105	4.939	578	1	.616	E	5
9	1,1-Dichloroethene	0	1.727	0	1	.335	ND	5
10	1,1-Dichloroethane	0	5.348	0	1	.108	ND	5
11	trans-1,2-Dichloroethene	0	2.590	0	1	.223	ND	5
12	Chloroform	0	6.093	0	1	.095	ND	5
13	1,2-Dichloroethane	0	2.676	0	1	.216	ND	5
43	Trichlorofluoromethane	0	1.099	0	1	.527	ND	5
47	cis-1,2-Dichloroethene	0	3.264	0	1	.177	ND	5
57	Allyl chloride	0	1.362	0	1	.425	ND	5
62	Dimethyl disulfide	0	5.245	0	1	.110	ND	5
63	Dimethyl sulfide	0	1.814	0	1	.319	ND	5
65	Iodomethane	0	3.230	0	1	.179	ND	5
66	Isooctane	0	10.516	0	1	.055	ND	5
68	Tert-Butyl methyl ether	0	4.492	0	1	.129	ND	5
69	Vinyl Bromide	0	1.157	0	1	.500	ND	5
70	n-Hexane	0	2.594	0	1	.223	ND	5
14	1,4-Difluorobenzene	2562		1004	14		IS	
15	2-Butanone	0	.022	0	14	4.465	ND	5
16	1,1,1-Trichloroethane	0	.551	0	14	.177	ND	5
17	Carbon Tetrachloride	0	.493	0	14	.198	ND	5
18	Vinyl Acetate	0	.543	0	14	.180	ND	5
19	Bromodichloromethane	0	.631	0	14	.155	ND	5
20	1,2-Dichloropropane	0	.569	0	14	.172	ND	5
21	cis-1,3-Dichloropropene	0	.616	0	14	.158	ND	5
22	Trichloroethene	0	.488	0	14	.200	ND	5
23	Dibromochloromethane	0	.456	0	14	.214	ND	5
24	1,1,2-Trichloroethane	0	.300	0	14	.325	ND	5
25	Benzene	0	1.045	0	14	.093	ND	5
26	trans-1,3-Dichloropropene	0	.559	0	14	.174	ND	5
27	Bromoform	0	.225	0	14	.433	ND	5
54	1,4-Dichloro-2-butene	0	.087	0	14	1.125	ND	5
60	Dibromomethane	0	.221	0	14	.442	ND	5
28	Chlorobenzene-d5	3167		1478	28		IS	
29	4-Methyl-2-Pentanone	0	.200	0	28	.394	ND	5
30	2-Hexanone	0	.162	0	28	.487	ND	5
31	Tetrachloroethene	0	.292	0	28	.270	ND	5
33	Toluene	0	.573	0	28	.138	ND	5
34	Chlorobenzene	0	.698	0	28	.113	ND	5
35	Ethylbenzene	0	.425	0	28	.186	ND	5
36	Styrene	0	.660	0	28	.120	ND	5
37	o-Xylene	0	.454	0	28	.174	ND	5

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FILE NAME: 8C211
RF FILE: 8C206
DATE: 08/12/92
TLI PROJ #: 21509

SAMPLE ID: IO-LK1-1VOST-0721-38 TC
TLI ID: 58.116.12
ANALYSIS DATE: 08/03/92

METHOD 8240--HIGH LEVEL VOST QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
38 m-/p-Xylene	0	.402	0	28	.196	ND	5
49 1,2 Dichlorobenzene	0	.334	0	28	.237	ND	5
50 1,2,3-Trichloropropane	0	.154	0	28	.511	ND	5
51 1,3 Dichlorobenzene	0	.520	0	28	.152	ND	5
53 1,4 Dichlorobenzene	0	.403	0	28	.196	ND	5
56 A-Pinene	0	.695	0	28	.114	ND	5
58 B-Pinene	0	.746	0	28	.106	ND	5
59 Cumene (isopropylbenzene)	0	.894	0	28	.088	ND	5
64 Ethyl methacrylate	0	.296	0	28	.267	ND	5
67 P-Cymene	0	.935	0	28	.084	ND	5

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	1001	2.223	937	1	13.02	D	104.2
48 Benzene-d6	3653	1.133	934	14	15.73	D	125.8
39 Toluene-d8	4071	.871	1224	28	18.44	D	147.5

TRIANGLE LABORATORIES OF RTP, INC.
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FILE NAME: 8C211
DATE: 08/13/92
TLI PROJ #: 21509

SAMPLE ID: IO-LK1-1VOST-0721-38 TC
TLI ID: 58.116.12
ANALYSIS DATE: 08/03/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
SILOXANE\SILANE	957	77870	1004	12.5	162.124
SILOXANE\SILANE	1340	49639	1478	12.5	56.108
SILICON CONTAINING HYDROCARBON	1443	48756	1478	12.5	55.110
SILOXANE\SILANE	692	3410	861	12.5	5.760
SILOXANE\SILANE	1511	3004	1478	12.5	3.395
UNKNOWN	254	1137	861	12.5	1.920 X
SILICON CONTAINING HYDROCARBON	912	490	861	12.5	.828
SUBSTITUTED HYDROCARBON	1030	366	1004	12.5	.763

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	861	7401	1
1,4-Difluorobenzene	1004	6004	14
Chlorobenzene-d5	1478	11059	28

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FILE NAME: AC9454
RF FILE: AC940
DATE: 08/12/92
TLI PROJ #: 21509

SAMPLE ID: IO-LK1-1VOST-0721-3C
TLI ID: 58.116.24
SAMPLE VOL: .005 L
ANALYSIS DATE: 07/28/92
DILUTION FACTOR: 1

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	CONC, ug/L	CODE	QUAN LIMIT
1 Bromochloromethane	2448		761	1		IS	
2 Chloromethane	0	2.136	0	1	.19	ND	10
3 Bromomethane	58	1.702	312	1	.67	E	10
4 Vinyl Chloride	0	2.393	0	1	.17	ND	10
5 Chloroethane	0	1.579	0	1	.28	ND	10
6 Methylene Chloride	4910	2.278	585	1	44.03	D	10
7 Acetone	24129	1.665	528	1	296.01	E	10
8 Carbon Disulfide	0	6.283	0	1	.07	ND	10
9 1,1-Dichloroethene	0	2.001	0	1	.20	ND	10
10 1,1-Dichloroethane	0	4.708	0	1	.09	ND	10
11 trans-1,2-Dichloroethene	0	2.432	0	1	.17	ND	10
12 Chloroform	0	4.473	0	1	.09	ND	10
13 1,2-Dichloroethane	0	3.804	0	1	.11	ND	10
43 Trichlorofluoromethane	0	1.673	0	1	.24	ND	10
45 Acrolein	249	.541	495	1	9.39	E	10
46 Acrylonitrile	0	.942	0	1	.43	ND	10
47 cis-1,2-Dichloroethene	0	2.619	0	1	.16	ND	10
52 1,3-butadiene	0	2.896	0	1	.14	ND	10
55 2-Chloro-1,3-Butadiene	0	1.511	0	1	.27	ND	10
57 Allyl chloride	0	1.144	0	1	.36	ND	10
60 Dibromomethane	60	2.508	987	1	.49	E	10
61 Dichlorodifluoromethane	0	3.033	0	1	.13	ND	10
62 Dimethyl disulfide	0	5.464	0	1	.07	ND	10
63 Dimethyl sulfide	0	2.716	0	1	.15	ND	10
65 Iodomethane	0	2.346	0	1	.17	ND	10
66 Isooctane	0	15.486	0	1	.03	ND	10
68 Tert-Butyl methyl ether	0	6.646	0	1	.06	ND	10
69 Vinyl Bromide	0	1.902	0	1	.21	ND	10
70 n-Hexane	0	5.071	0	1	.08	ND	10
14 1,4-Difluorobenzene	11569		916	14		IS	
15 2-Butanone	151	.091	765	14	7.15	E	10
16 1,1,1-Trichloroethane	0	.695	0	14	.12	ND	10
17 Carbon Tetrachloride	0	.656	0	14	.13	ND	10
18 Vinyl Acetate	0	1.232	0	14	.07	ND	10
19 Bromodichloromethane	0	.805	0	14	.11	ND	10
20 1,2-Dichloropropane	0	.772	0	14	.11	ND	10
21 cis-1,3-Dichloropropene	0	1.387	0	14	.06	ND	10
22 Trichloroethene	0	.475	0	14	.18	ND	10
23 Dibromochloromethane	0	.642	0	14	.13	ND	10
24 1,1,2-Trichloroethane	0	.592	0	14	.15	ND	10
25 Benzene	0	1.589	0	14	.05	ND	10
26 trans-1,3-Dichloropropene	0	.409	0	14	.21	ND	10
27 Bromoform	0	.566	0	14	.15	ND	10
42 2-Chloroethylvinylether	0	.320	0	14	.27	ND	10
54 1,4-Dichloro-2-butene	0	.382	0	14	.23	ND	10
28 Chlorobenzene-d5	14671	1.000	1364	28		IS	
29 4-Methyl-2-Pentanone	0	.690	0	28	.10	ND	10

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FILE NAME: AC9454
RF FILE: AC940
DATE: 08/12/92
TLI PROJ #: 21509

SAMPLE ID: IO-LK1-1VOST-0721-3C
TLI ID: 58.116.24
SAMPLE VOL: .005 L
ANALYSIS DATE: 07/28/92
DILUTION FACTOR: 1

M E T H O D 8 2 4 0 Q U A N T I T A T I O N R E P O R T

	NAME	AREA	RF	SCAN	ISID	CONC, ug/L	CODE	QUAN LIMIT
30	2-Hexanone	0	.892	0	28	.10	ND	10
31	Tetrachloroethene	0	.437	0	28	.15	ND	10
32	1,1,2,2-Tetrachloroethane	0	.949	0	28	.07	ND	10
33	Toluene	822	.949	1131	28	2.21	E	10
34	Chlorobenzene	0	1.073	0	28	.06	ND	10
35	Ethylbenzene	0	.716	0	28	.09	ND	10
36	Styrene	218	1.220	1500	28	.60	E	10
37	o-Xylene	0	.806	0	28	.08	ND	10
38	m-/p-Xylene	0	1.457	0	28	.05	ND	10
49	1,2 Dichlorobenzene	0	1.062	0	28	.06	ND	10
50	1,2,3-Trichloropropane	0	.686	0	28	.10	ND	10
51	1,3 Dichlorobenzene	0	1.116	0	28	.06	ND	10
53	1,4 Dichlorobenzene	0	1.098	0	28	.06	ND	10
56	A-Pinene	0	1.487	0	28	.05	ND	10
58	B-Pinene	0	1.550	0	28	.04	ND	10
59	Cumene (isopropylbenzene)	0	2.029	0	28	.03	ND	10
64	Ethyl methacrylate	0	.804	0	28	.08	ND	10
67	P-Cymene	0	2.052	0	28	.03	ND	10

	S U R R O G A T E S U M M A R Y	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
39	Toluene-d8	22605	1.310	1121	28	.290	D	116.0
41	1,2-Dichloroethane-d4	5982	2.812	851	1	.217	D	86.9
48	Benzene-d6	20167	1.516	849	14	.287	D	115.0

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: AC9454
DATE: 08/13/92
TLI PROJ #: 21509

SAMPLE ID: IO-LK1-1VOST-0721-3C
TLI ID: 58.116.24
SAMPLE VOL: .005 L
ANALYSIS DATE: 07/28/92
DILUTION FACTOR: 1

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	SCAN	AREA	IS SCAN #	IS AMT	CONC, ug/L
SILOXANE\SILANE	881	449274	916	.25	600.17
SILOXANE\SILANE	623	93695	781	.25	197.53
SILOXANE\SILANE	1344	78942	1364	.25	63.81
SILOXANE\SILANE	796	19950	781	.25	42.06
SILOXANE\SILANE	1136	31025	916	.25	41.45
UNKNOWN	598	14464	781	.25	30.49 X
SILOXANE\SILANE	261	4459	781	.25	9.40
SULFUR DIOXIDE	343	3057	781	.25	6.44
SILOXANE\SILANE	1411	5700	1364	.25	4.61
SILOXANE\SILANE	506	1513	781	.25	3.19

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	781	23717	1
1,4-Difluorobenzene	916	37429	14
Chlorobenzene-d5	1364	61862	28

Section 1.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

SOURCE IO-LK/1

QUALITY CONTROL SUMMARY
METHOD 25A

1. CALIBRATION

THEOR ppm	7/15/92 ppm	7/15/92 %ERR	7/21/92 ppm	7/21/92 %ERR
0.0	1.3	1.4	-0.1	-0.1
9.0	7.6	-1.5	6.5	2.7
36.0	35.8	-0.2	39.8	4.0
94.2	94.3	0.1	92.9	-1.4
CORR COEFF	0.9997		0.9979	

2. PROPANE LINE RECOVERY

	DATE 7/15/92 INST	LINE	%REC	DATE 7/21/92 INST	LINE	%REC
BEFORE	* 34.9	35.6	102.0%	94.2	82.1	87.2%
AFTER	94.2	82.1	87.2%	*	*	

3. LINE BLANK

	7/15/92 ppm	7/21/92 ppm
BEFORE	**	0.1
AFTER	0.1	*

* Not performed

SOURCE IO-LK/1

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR ppm	DATE 7/15/92 ppm	%REC	DATE 7/21/92 ppm	%REC
ethanol	41.9	18.8	44.9%	21.5756	51.4%
acetone	33.5	23.3	69.5%	20.2845	60.5%
isopropanol	32.2	29.8	92.7%	31.6753	98.5%
benzene	27.5	29.5	107.3%	27.8523	101.1%
bromodichloromethane	29.7	26.6	89.3%	28.1252	94.5%
toluene	23.2	21.8	94.1%	22.1951	95.8%
ethyl benzene	20.1	19.0	94.7%	18.8658	93.9%
m-xylene	20.1	19.9	99.4%	19.4513	96.9%
o-xylene	20.2	19.0	94.1%	19.1923	95.2%
cumene	17.7	16.7	94.4%	16.0189	90.5%
alpha-pinene	15.4	15.5	100.3%	14.7816	95.7%
beta-pinene	15.5	15.3	98.3%	14.3978	92.8%
3-carene	15.5	22.7	145.8%	13.2758	85.4%
p-cymene	15.8	13.2	83.7%	12.869	81.6%

2. PROPANE RESPONSE

	THEOR		%REC		%REC
BEFORE	36.0	34.3	95.3%	35.5	98.6%
AFTER	36.0	32.3	89.7%	31.1	86.4%

3. METHANOL LINE RECOVERY

	7/15/92 GC	7/15/92 LINE	7/15/92 %REC	7/21/92 GC	7/21/92 LINE	7/21/92 %REC
BEFORE	10.6	8.8	83.0%	9.0	8.1	90.0%
AFTER	8.8	7.7	87.5%	*	9.0	

4. LINE BLANK

	[------------FILE REF------------]	
BEFORE	GFA2003	GLA2004
AFTER	*	*

* Not performed - will run a line blank before resuming testing.

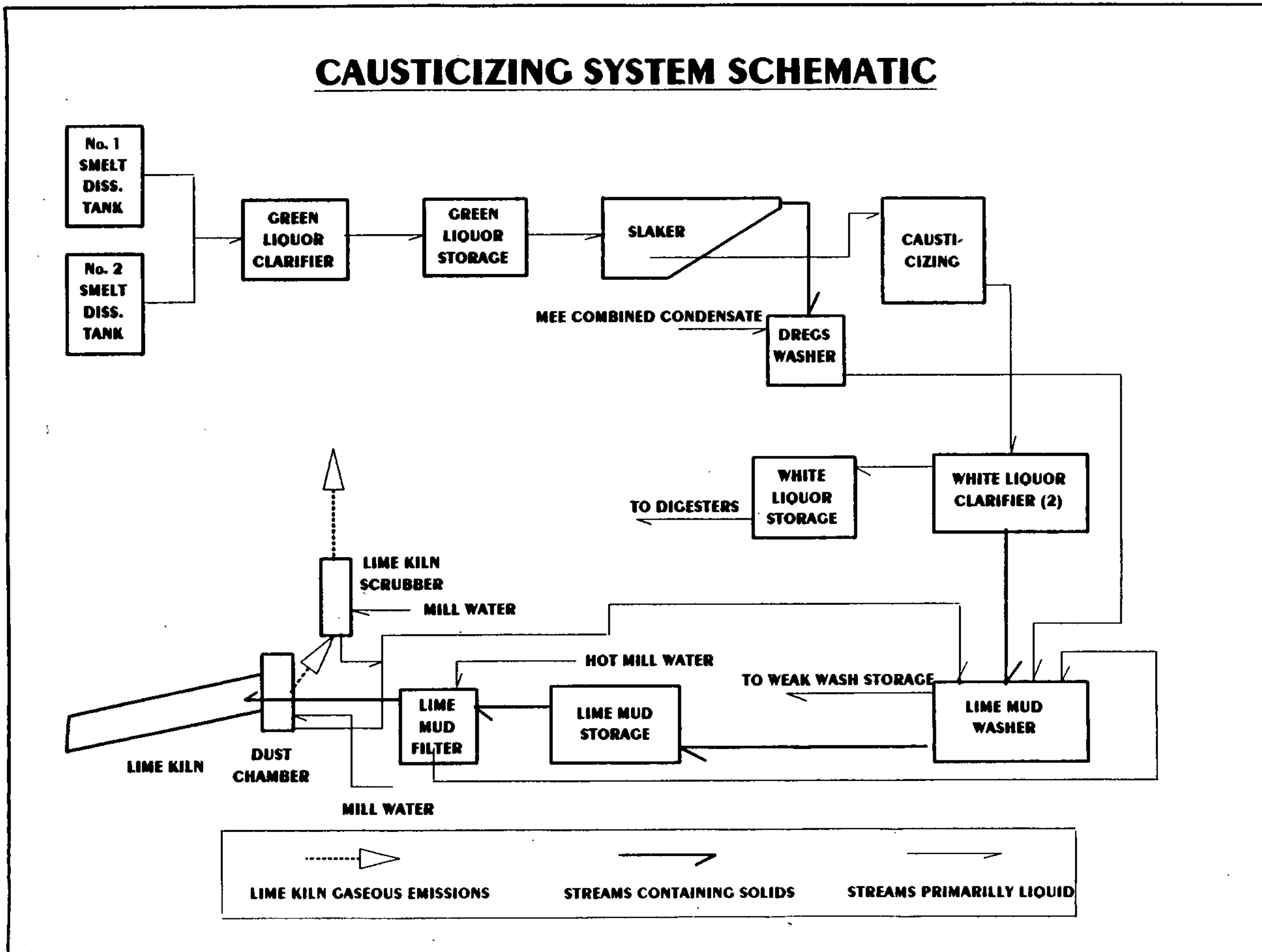
SOURCE IO-LK/1

QUALITY CONTROL SUMMARY
METHOD 16

1. CALIBRATION

ANALYTE	LO ppm	MED ppm	HI ppm	CORR COEFF
7/15/92				
hydrogen sulfide	1.7	4.3	10.6	0.9987
methyl mercaptan	1.6	3.9	9.8	0.9996
dimethyl sulfide	2.2	5.5	13.7	0.9999
carbon disulfide	0.7	1.7	4.3	0.9989
dimethyl disulfide	0.9	2.4	5.9	0.9996
7/21/92				
hydrogen sulfide	2.2	3.2	8.2	0.9996
methyl mercaptan	2.0	2.9	7.6	0.9998
dimethyl sulfide	2.8	4.1	10.6	0.9999
carbon disulfide	0.9	1.3	3.3	0.9999
dimethyl disulfide	1.2	1.8	4.6	0.9999

Section 1.4 Process Operating Data


CAUSTICIZING SYSTEM SCHEMATIC
No. 1 SMELT DISS. TANK
No. 2 SMELT DISS. TANK
GREEN LIQUOR CLARIFIER
GREEN LIQUOR STORAGE
SLAKER
CAUSTI-CIZING
MEE COMBINED CONDENSATE
DREGS WASHER
WHITE LIQUOR CLARIFIER (2)
WHITE LIQUOR STORAGE
TO DIGESTERS
LIME KILN SCRUBBER
MILL WATER
HOT MILL WATER
TO WEAK WASH STORAGE
LIME MUD WASHER
LIME MUD STORAGE
LIME MUD FILTER
DUST CHAMBER
LIME KILN
MILL WATER
LIME KILN GASEOUS EMISSIONS
STREAMS CONTAINING SOLIDS
STREAMS PRIMARILLY LIQUID

LIME KILN

The lime kiln is a rotary kiln manufactured by Traylor and began operation in 1967. The kiln is 12 ft. in diameter and 260 ft. long. The kiln has a chain section and is fired on natural gas. Non-condensable gases from the pulp mill (UEL and LEL) are burned in the kiln. The kiln produces 283 tons/day CaO (1,400 TPD of unbleached pulp). Fresh mill water is used in the kiln scrubber and dust chamber. Mill hot water is used at the lime mud filter. Hot water is obtained from the liquor coolers (heat exchangers) at the digesters.

Particulate emissions are controlled with a scrubber disk (essentially a variable throat venturi). A precoat drum washer, which is 10 ft. long and also has a diameter of 10 ft., is used for mud washing.

Representative Process Conditions

Production rate (tons lime (CaO)/hr):

7/13/92	15.5
7/14/92	13.0
7/15/92	10.6
7/21/92	12.3

Fuel type and firing rate: Natural Gas firing rates not available

Btu/ton product: Not Available

Hot and cold end temperatures (deg F):

	Cold End	Hot End
7/13/92	768	2,312
7/14/92	721	2,284
7/15/92	735	2,353
7/21/92	753	2,425

Oxygen content in the kiln (%):

7/13/92	6.3
7/14/92	4.9
7/15/92	5.8
7/21/92	5.4

NO_x levels in vent gases at 8% O_2: No data

Solids content of mud (%):

7/13/92	74.4
7/14/92	70.6
7/15/92	69.6
7/21/92	69.4

Sodium content of mud (%):

7/13/92	8.3
7/14/92	12.8
7/15/92	12.2
7/21/92	No Data

Sulfide content of mud (%):

7/13/92	No Data
7/14/92	No Data
7/15/92	No Data
7/21/92	0.25

LIME KILN - PROCESS OPERATING CONDITIONS

Mill:	INLAND-ORANGE	Source:	LIME KILN WITH NCGs
Source:	IO-LK/I	Date:	JULY 15,1992
FIN:	P-LIMK	EPN:	11 CIN: C-28 AND C-29

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		1420			
Fuel Data					
Fuel Type	gas or oil	GAS			0.00
Fuel Firing Rate	GPM or CFM	CFM			0.00
Production Data					
Production Rate	tons CaO/hr	10.6			0.00
Solid Contents of Mud	%	69.6			0.00
NA2S Content	%				0.00
Soda Content	%	12.19			0.00
Hot End Temperature	degree F	2353			0.00
Cold End Temperature	degree F	735			0.00
NCG Burning	yes or no	YES			
Kiln Oxygen Content	%	2.1			0.00
Kiln DAta					
Length	ft	260.0			0.00
Diameter	ft	12.0			0.00
Manufacturer		TRAYLOR			
Particluate Control Device		SCRUBBER			
Scrubber Water Make-up Source		MILL WATER			
Scrubber Make-up Rate	GPM	68			0.00
Scrubber Pressure Drop	GPM	14 in. W.C. MINIMUM			0.00
Scrubber Recirculation Rate	in. H2O	379GPM			0.00
Emission Data					
Carbon Dioxide	%				0.00
Oxygen	%	5.84			0.00
Carbon Monoxide	PPM				0.00
TRS (O2 Concentration)	PPM	5.17			0.00
Nitrogen Oxide	PPM				0.00
Sulfer Dioxide	PPM				0.00

DIGESTERS - PROCESS OPERATING CONDITIONS

Mill:	INLAND-ORANGE	Source:	LIME KILN WITH NCGs
Source:	A-KAMYR DIGESTER	Date:	JULY 15, 1992
FIN:	P-DIGA	EPN:	11 CIN: C-21,C-36 C-28,C-29

INPUT DATA	Unit	Run 1	Run 2	Run 3	Average
Beginning Time		1300			
Batch or Continuous	btch or cont	CONT			
Wood Species	SOFTWOOD				
Production Rate	ADT/day	950			
Active Alkali	% by wt				
Sulfidity	% by wt	28.4			
Temperature	degree F	306.0			
Pressure	PSIG	287			
Kappa No.		103.6			
Kappa No. Meas. Loc.	A" REFINER				

DIGESTERS - PROCESS OPERATING CONDITIONS

Mill:	INLAND-ORANGE	Source:	LIME KILN WITH NCGs
Source:	B-KAMYR DIGESTER	Date:	JULY 15, 1992
FIN:	P-DIGB	EPN:	11 CIN: C-21,C-36 C-28,C-29

INPUT DATA	Unit	Run 1	Run 2	Run 3	Average
Beginning Time		1300			
Batch or Continuous	btch or cont	CONT			
Wood Species	SOFTWOOD				
Production Rate	ADT/day	590			
Active Alkali	% by wt				
Sulfidity	% by wt	28.4			
Temperature	degree F	308.0			
Pressure	PSIG	293			
Kappa No.		82			
Kappa No. Meas. Loc.	B" REFINER				

LIME KILN - PROCESS OPERATING CONDITIONS

Mill:	INLAND-ORANGE	Source:	LIME KILN WITH NCGs
Source:	IO-LK/I	Date:	JULY 21,1992
FIN:	P-LIMK	EPN:	11 CIN: C-28 AND C-29

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		1100	1700		
Fuel Data					
Fuel Type	gas or oil	GAS	GAS		0.00
Fuel Firing Rate	GPM or CFM	CFM	CFM		0.00
Production Data					
Production Rate	tons CaO/hr	12.3	12.3		0.00
Solid Contents of Mud	%	69.4	69.5		0.00
NA2S Content	%	0.3	0.2		0.00
Soda Content	%				0.00
Hot End Temperature	degree F	2425.0	2429.0		0.00
Cold End Temperature	degree F	753.0	774.0		0.00
NCG Burning	yes or no	YES	YES		
Kiln Oxygen Content	%	1.9	2.1		0.00
Kiln DAta					
Length	ft	260.0	260.0		0.00
Diameter	ft	12.0	12.0		0.00
Manufacturer		TRAYLOR	TRAYLOR		
Particluate Control Device		SCRUBBER DI	SCRUBBER DISK		
Scrubber Water Make-up Source		MILL WAT	MILL WATER		
Scrubber Make-up Rate	GPM	68.0	68		0.00
Scrubber Pressure Drop	GPM	14 in. W.C.	MINIMUN		0.00
Scrubber Recirculation Rate	in. H2O	379 GPM	379 GPM		0.00
Emission Data					
Carbon Dioxide	%				0.00
Oxygen	%	4.9	5.39		0.00
Carbon Monoxide	PPM				0.00
TRS (O2 Concentration)	PPM	5.96	5.27		0.00
Nitrogen Oxide	PPM				0.00
Sulfer Dioxide	PPM				0.00

DIGESTERS - PROCESS OPERATING CONDITIONS

Mill:	INLAND-ORANGE	Source:	LIME KILN WITH NCGs
Source:	A-KAMYR DIGESTER	Date:	JULY 21, 1992
FIN:	P-DIGA	EPN:	11 CIN: C-21, C-36 C-28, C-29

INPUT DATA	Unit	Run 1	Run 2	Run 3	Average
Beginning Time		1000			
Batch or Continuous	btch or cont	CONT			
Wood Species	SOFTWOOD	SOFTWOOD			
Production Rate	ADT/day	950			
Active Alkali	% by wt	.056			
Sulfidity	% by wt	31.3			
Temperature	degree F	313.0			
Pressure	PSIG	160			
Kappa No.		96.7			
Kappa No. Meas. Loc.	A" REFINER				

DIGESTERS - PROCESS OPERATING CONDITIONS

Mill:	INLAND-ORANGE	Source:	LIME KILN WITH NCGs
Source:	B-KAMYR DIGESTER	Date:	JULY 21, 1992
FIN:	P-DIGB	EPN:	11 CIN: C-21,C-36 C-28,C-29

INPUT DATA	Unit	Run 1	Run 2	Run 3	Average
Beginning Time		1000			
Batch or Continuous	btch or cont	CONT			
Wood Species	SOFTWOOD				
Production Rate	ADT/day	650			
Active Alkali	% by wt	.056			
Sulfidity	% by wt	31.3			
Temperature	degree F	313.0			
Pressure	PSIG	160			
Kappa No.		96.7			
Kappa No. Meas. Loc.	B" REFINER	B" REFINER			

LIME KILN

KILN DATA

- LENGTH 260 ft.
- DIAMETER 12 ft.
- MANUFACTURER Traylor
- PARTICULATE CONTROL DEVICE Scrubber disk
- SCRUBBER WATER MAKE-UP SOURCE Mill water
- SCRUBBER MAKE-UP RATE 68 GPM
- SCRUBBER PESSURE DROP 14 in. W.C. Minimum
- RECIRCULATION RATE 370 GPM

FUEL Natural Gas

PRODUCTION DATA

- SOLIDS CONTENT OF MUD (On other sheet)
- HOT END TEMP. (log sheets)
- COLD END TEMP. (log sheets)
- O2 CONTENT (log sheets)

research analyses consultation

EFEH & ASSOCIATES

10919 SAGEWIND DRIVE • HOUSTON, TEXAS 77089 • TELEPHONE (713) 996-5031

July 28, 1992

Mr. Tom Noble
Inland Orange, Inc.
P.O. Box 2500
Orange, Texas 77630

Dear Mr. Noble:

Following are the results of the lime mudd samples submitted to our laboratory for analyses on July 20, 1992:

P.O. #: 92-45197

SAMPLE I.D.	Precoat Filter 7/13/92 14:15	Precoat Filter 7/13/92 15:15	Precoat Filter 7/13/92 16:05
LAB NO.	F-5082	F-5083	F-5084
Sodium, mg/kg	7.90	8.45	8.54
SAMPLE I.D.	Precoat Filter 7/14/92 11:30 AM	Precoat Filter 7/14/92 12:30 PM	Precoat Filter 7/14/92 1:30 PM
LAB NO.	F-5085	F-5086	F-5087
Sodium, mg/kg	14.94	9.96	13.53
SAMPLE I.D.	Precoat Filter 7/15/92 14:20	Precoat Filter 7/15/92 15:20	Precoat Filter 7/15/92 16:15
LAB NO.	F-5088	F-5089	F-5090
Sodium, mg/kg	10.32	14.41	11.85

METHOD: Flame Photometer

EFEH & ASSOCIATES

Please contact me if you have any questions concerning these results.

Sincerely,

Edwin B. Smith, Jr. PhD

INLAND-ORANGE, INC. - LABORATORY
REPORT OF ANALYSIS

DATE:

ANALYSIS OF: LIME MUD

FROM: PRECOAT FILTER

FOR: WESTON

DEPARTMENT:

SPECIAL INSTRUCTIONS:

REPORT IN TERMS OF: (UNLESS OTHERWISE NOTED).

DATE	TIME	% SOLIDS	
7/13/92	14:15	76.7	
	15:15	75.1	
	16:05	72.5	
7/14/92	11:30	69.7	
	12:30	70.4	
	13:30	71.7	
7/15/92	14:20	71.6	
	15:20	67.3	
	16:15	69.8	

WORK BY: APPROVED BY:

WP/FORMS/TECH/ANALYSIS

INLAND-ORANGE, INC. - LABORATORY
REPORT OF ANALYSIS

DATE:

ANALYSIS OF: LIME MUD

FROM: PRECOAT FILTER

FOR: WESTON

DEPARTMENT:

SPECIAL INSTRUCTIONS:

REPORT IN TERMS OF: (UNLESS OTHERWISE NOTED).

DATE	TIME	% SOLIDS	% Na
7/21/92	11:10	69.9	0.22
	12:10	70.0	0.30
	13:10	68.1	0.16
	14:10	69.5	0.33
	17:30	68.0	~~0.23~~ 0.14
	18:30	70.9	~~0.##~~ 0.24

WORK BY: APPROVED BY:

WP/FORMS/TECH/ANALYSIS

INLAND- ORANGE INC.

7-12-92

Kiln

Time	LIME KILN — FIRING END — Gas. Flow	TRS PPM	% O_2	Draft Inches Hood	Temperatures °F Front	Chain	Feed End	Pressures Prim.	Sec.	FEED END — Scrubber Disc.	Position	Damper	Travel	Pre-Coat Filter Speed	Flow	Density	Feed Conv. Amps.	I.D. FAN — Vib. Monitor In BD.	Out BD.	#1 SLAKER — G.L. Flow	°F G.L. Temp.	Re-Burn Lime	New Lime	°F Slaker Temp.
6 AM	72600	96	.07	-10	2405	976	739	50	0	54	23	56	N	3/58	160	52	38			500	192	17		219
7	72540	7.5	.07	-10	2464	974	739	50	0	54	23	56	N	3/58	160	52	38			500	192	17		21[illegible]
8	72580	7.8	.07	-10	2407	978	742	50	0	54	23	56	N	3/58	160	53	38			500	192	17		219
9	72240	7.6	.08	-10	2414	976	742	50	0	54	23	56	N	3/58	160	54	38			500	192	17		21[illegible]
10	72240	7.8	.08	-10	2424	976	742	50	0	54	23	56	N	3/58	160	54	38			500	192	17		218
11	72690	7.8	.08	-10	2441	976	742	50	0	54	23	56	N	3/58	160	54	38			500	192	17		21[illegible]
12	72900	7.5	0.8	-10	2429	977	732	50	0	54	23	58	N	3/58	160	54	38			500	192	17		21[illegible]
1 PM	72830	69	.10	-10	2460	972	731	50	0	54	23	58	N	3/58	160	54	38			500	192	17		21[illegible]
2	73240	72	.08	-10	2431	972	726	50	0	54	23	58	N	3/58	160	64	38			500	192	17		21[illegible]
3	72920	80	.08	-10	2459	976	713	50	0	54	23	58	N	3/58	160	69	38			500	192	17		219
4	73160	8.5	.08	-10	2474	975	717	50	0	54	23	58	N	3/58	160	74	38			500	192	17		21[illegible]
5	73240	8.2	.08	-10	2462	976	716	50	0	54	23	58	N	3/58	160	74	38			500	192	17		219
6	72280	8.3	1.8	-10	2385	969	726	50/	25/	50/	22	58/	dn	3d/52	165	74/	35/			500	196	16		
7	72690	6.0	1.8	-11	2383	967	731	52/	25/	52/	21	58/	dn	3d/53	165	74/	34/			500	198	14		220
8	72990	5.9	1.9	-11	2391	969	765	52/	25/	52/	22	58/	dn	3d/55	165	70/	35/			500	198	14		[illegible]
9	72770	6.3	1.8	-10	2398	970	756	50/	20/	52/	21	58/		3d/58	170	64	35/			500	198	12		[illegible]
10	72840	5.9	1.7	-10	2392	971	720	50	20/	52/	22	58/		3d/60	170	62/	35/			500	198	12		[illegible]
11	73100	5.9	1.7	-10	2377	967	736	50/	20/	52/	21	58/		3d/60	170	59/	35/			500	196	12		[illegible]
12	72980	6.1	1.6	-10	2372	967	718	50/	20/	52/	22	58/		3d/58	170	56/	38/			500	194	12		[illegible]
1 AM	72620	6.1	1.6	-10	2354	968	730	50/	20/	52/	22	58/		3d/58	170	58/	36/			500	194	12		21[illegible]
2	72550	6.0	1.6	-10	2370	969	756	50/	20	52/	22	58/		3d/60	170	58/	36/			500	194	12		[illegible]
3	72240	6.0	1.8	-10	2326	964	774	50/	20/	52/	22	58/		3d/60	170	56/	36/			500	194	12		[illegible]
4	72240	6.0	1.8	-10	2324	969	759	50/	20/	52/	21	56		3d/58	170	54/	36/			500	194	12		[illegible]
5 AM																								

164 61 500

INTEGRATOR READINGS

INVENTORIES

	Gas Integrator	% Sulf.	% Caust.	CD 308 Stroke	% CD 308	White Liquor E/W Ft.	White Liquor #4 %	White Liquor #5 %	Green Liquor E/W Ft.	Green Liquor No. 3 Ft.	Weak Wash	Mud Ft.	Lime Ft.	Auxiliary Engine Check OK / NO	Com 6 AM – [illegible]
6 AM Finish	753[illegible]	19	14	A	76	40	47	37	14	E	25	24	10½		E[illegible]
6 PM	771191	19	14	A	76	44	47	37	15	E	21	28	10	OK	
6 AM Start	705091	19	[illegible]	A	76	44	[illegible]	[illegible]	[illegible]	E	26	22	9½		

...c Log

...um ...me	New Lime	°F Slaker Temp.	$CaCO_3$ TEST	M of L SETTLING TEST	CLARIFIER RAKE POSITION: Mud Washer	No. 1 W.L. Clarifier	No. 2 W.L. Clarifier	No. 3 W.L. Clarifier	AGITATORS MUD TANKS: No. 1 Amps.	No. 2 Amps.	Synthetic In Out	TESTS: GREEN LIQUOR: G.L. Clarif. Rake Amps.	From Recovery: Total Alk.	% Sulf.	WEAK WASH: Level	Sewer Pump	#5 CAUSTICIZER WHITE LIQUOR: A	B	C	% Sulf.	% Caust.	Time
				550	531	531	86		34	64	out	1.9/88			24	[illegible]	107	77	94	31.7%	82%	6 AM
				550	531	592	72		34	64	out	1.9/88			24	[illegible]	107	77	94		82%	7
				540	587	684	72		34	64	out	1.9/88	110	25.4%	24	[illegible]	107	73	89	29.9%	76%	8
				550	331	272	312		34	64	out	1.9/88			24	[illegible]	105	75	93		72%	9
				520	334	270	310		34	64	out	1.9/88			24	[illegible]	105	75	93	34.2%	82%	10
				550	7	3	3		34	64	out	1.9/88			24	[illegible]	110	77	94		78%	11
				550	245	292	243		34	64	out	1.9/89			24	[illegible]	110	77	94	30.9%	78%	12
				600	593	419	290		34	64	out	1.9/88			24	[illegible]	109	77	94		80%	1 PM
				600	524	281	295		34	64	out	1.9/87			24	[illegible]	104	73	88	28.8%	78%	2
				600	7	3	3		34	64	out	1.9/87	108	29.6%	24	[illegible]	103	73	89		80%	3
				620	95	431	82		34	64	out	1.9/85			21	[illegible]	105	74	89	28.5%	78%	4
					97	265	82		34	64	out	1.9/85			21	[illegible]						5
				600	364	265	346		34	64	out	1.9/89			22	dn/dn	107	74	92	33.6	78	6
				600	364	265	159		34	64	"	1.9/89	1.08	29.6	23	dn/dn	1.07	74	92		76	7
				600	7	3	3		34	64	"	1.9/88			23	dn/dn	105	73	89	30.5	78	8
				600	122	369	355		34	65	"	1.9/88			23	dn/dn	107	74	90		77	9
				600	122	369	355		34	65	"	1.9/88			22	dn/dn	107	74	90	29.9	77	10
				600	7	3	3		34	65		1.9/89			24	dn/ff	108	75	91		77	11
				610	497	501	535		34	65		1.9/91			24	dn/ff	1.08	75	91	29.6	77	12
				620					34	65		1.9/89			24	dn/ff	1.08	75	91		77	1 AM
				670	7	3	3		34	65		1.9/87			24	dn/ff	1.07	71	87	29.9	73	2
				660	160	304	50		34	65		1.9/86			24	dn/ff	1.07	72	88		74	3
				630	7	3	3		34	65		1.9/86	1.0	30.9	24	dn/ff	1.07	72	88	29.9	74	4
																						5 AM

C

78%

Sewer pump locked up Down @ 6³⁰, #1 W/L Clarif ... Oil Bad.

... with Sewer pump, ... @ 0³⁰ AM

Date:		
Shift	C – Operator	D – Operator
6 AM – 6 PM	Dixon	Wotherington
6 PM – 6 AM	BRANTLEY	DAVID

INLAND-ORANGE INC.

7-13-92

Kiln

	LIME KILN																			#1 SLAKER				
	FIRING END									FEED END								I.D. FAN						
	Gas	TRS		Draft Inches	Temperatures °F			Pressures		Scrubber				Pre-Coat Filter				Vib. Monitor						
Time	Flow	PPM	% O_2	Hood	Front	Chain	Feed End	Prim.	Sec.	Disc.	Position	Damper	Travel	Speed	Flow	Density	Feed Conv. Amps.	In BD.	Out BD.	G.L. Flow	°F G.L. Temp.	Re-Burn Lime	New Lime	°F Slaker Temp.
6 AM	22,400	9.0	2.0	.10	2321	967	777	50%	20%	50%	21	60%	dn	3/57	170	52%	37%			500	194	12		21
7	22,400	5.7	1.9	-.02	2329	967	793	50%	20%	50%	21	60%	dn	3/57	170	53%	37%			500	194	12		21
8	22,28	5.8	1.9	.10	2364	968	763	50%	20%	50%	21	60%	dn	3/57	170	52%	35%			500	194	12		217
9	22,390	5.9	2.0	.10	2281	966	767	50%	20%	50%	21	60%	dn	3/57	170	52%	35%			500	194	12		21
10	22550	5.8	2.1	-.12	2331	965	761	50%	20%	50%	21	60%	dn	3/57	170	52%	30%			500	194	12		217
11	22,630	5.5	2.3	-.12	2313	965	770	50%	20%	50%	21	60%	dn	3/55	170	54%	35%			500	194	12		2
12	22,720	5.1	2.2	-.12	2321	965	776	50%	20%	50%	21	60%	dn	3/57	170	54%	35%			500	194	12		216
1 PM	22,[illegible]	5.1	2.3	-.12	2311	965	777	50%	20%	50%	21	60%	dn	3/57	170	55%	35%			500	194	12		21
2	22,610	5.1	2.2	-.12	2319	966	774	50%	20%	50%	21	60%	dn	3/58	170	55%	35%							
3	22,700	5.3	2.1	-.12	2338	966	773	50%	20%	50%	21	60%	dn	3/57	170	60%	35%							
4	22,720	5.2	2.3	-.12	2285	965	752	53%	20%	50%	21	60%	dn	3/57	170	65%	35%							
5	22,670	5.3	2.0	.10	2283	965	757	50%	20%	50%	21	60%	dn	3/57	170	65%	35%							
6	72610	5.5	1.9	-10	2300	966	743	50%	30%	50%	21	58%	dn	3rd/56	170	65%	35%							
7	72670	5.4	1.8	-09	2326	966	748	50%	30%	50%	21	58%	"	3rd/56	170	64%	35%			500	196	12		205
8	72630	5.5	1.8	-10	2337	966	736	50%	20%	50%	21	58%	"	3rd/55	170	62%	34%		-	500	194	13		21
9	72500	5.5	1.8	-09	2329	968	726	50%	25%	50%	21	59%	"	3rd/54	170	60%	34%			500	194	14		5
10	73410	7.3	1.8	-09	2368	966	725	50%	30%	52%	23	58%	"	3rd/55	170	58%	33%			500	194	15		21
11	73300	5.1	2.2	-09	2272	965	757	53%	30%	53%	22	60%		3rd/58	170	56%	34%			500	196	16		216
12	73310	5.1	2.5	-10	2271	965	734	50	30%	54%	21	60%		3rd/56	170	55%	34%			500	196	16		215
1 AM	73310	5.0	2.3	-09	2338	965	765	50%	30%	54%	22	62%	"	3rd/56	170	53%	34%			500	194	16		2
2	73270	5.0	2.3	-10	2323	965	736	50%	30%	54%	22	60%	"	3rd/56	170	52%	34%			500	194	16		
3	73270	4.9	2.3	-10	2315	965	734	50%	30%	54%	22	60%		3rd/57	170	52%	34%			500	196	16		2
4	73410	4.9	2.4	-10	2316	965	732	50%	30%	55%	22	60%	"	3rd/56	170	53%	34%			500	195	16		2
5 AM																								

INTEGRATOR READINGS

INVENTORIES

	Gas Integrator	% Sulf.	% Caust.	CD 308 Stroke	% CD 308	White Liquor E/W Ft.	White Liquor #4 %	White Liquor #5 %	Green Liquor E/W Ft.	Green Liquor No. 3 Ft.	Weak Wash	Mud Ft.	Lime Ft.	Auxiliary Engine Check OK / NO	Comments 6 AM – 6
6 AM Finish	800385	29	56	4	74	38	47	37	20	F	20	12	15	ok	
6 PM	781121	28	24	A	75½	40	47	37	11	F	20	22	13	ok	
6 AM Start	783030	19	14	A	76	40	47	37	14	F	25	24	10½	ok	

7-13-92

7-13-92

c Log

[illegible]					CLARIFIER				AGITATORS MUD TANKS			TESTS										
[illegible]aker			$CaCO_3$ TEST	M of L SETTLING TEST	RAKE POSITION						Synthetic	GREEN LIQUOR			WEAK WASH		#5 CAUSTICIZER WHITE LIQUOR					
[illegible]												G.L. Clarif. Rake Amps.	From Recovery									
[illegible]m [illegible]he	New Lime	°F Slaker Temp.			Mud Washer	No. 1 W.L. Clarifier	No. 2 W.L. Clarifier	No. 3 W.L. Clarifier	No. 1 Amps.	No. 2 Amps.	In Out		Total Alk.	% Sulf.	Level	Sewer Pump	A	B	C	% Sulf.	% Caust.	Time
				580	400	270	363		35%	65%	out	1.9/.86			25	off/off	1.05	.70	.86	30.0%	72%	6 AM
				600	7	3	3		35%	65%	out	1.9/.86	1.07	30.6%	25	off/off	1.05	.69	.84		72%	7
				650	76	280	430		35%	65%	out	1.9/.86			23½	off/off	1.05	.63	.84	30.5%	71%	8
				660	160	261	80		35%	65%	out	1.9/.89			25	off/off	1.06	.69	.85		71%	9
				560	221	260	141		35%	65%	out	1.9/.87			24½	off/off	1.05	.70	.86	30.5%	73%	10
				560	7	3	3		35%	65%	out	[illegible]			23	off/off	1.07	.70	.85		71%	11
				560	201	250	330		35%	65%	out	1.9/.86			23	off/off	1.05	.69	.83	26.7%	71%	12
			-	550	330	250	330		35%	65%	out	1.9/.87			20	off/off	1.06	.70	.85		72%	1 PM
	[illegible]	183			7	3	3		35%	65%	out	1.9/[illegible]	1.10	30.9%	21½	off/off	1.06	.69	.85	30.2%	71%	2
	[illegible]	183			360	500	2[illegible]		35%	65%	out	[illegible]			22½	off/off						3
	45	115			200	270	250		35%	65%	out	1.9/.86			21	off/off	.96	.55	.62	26.5%	58%	4
	50	201			7	3	3		35%	65%	out	1.9/.86			21	off/off						5
		301		670	141	443	106		31%	63%	out	1.9/.86			22	off/off	1.02	58	74	31.4%	60%	6
[illegible]	[illegible]				7	3	3		31%	63%		1.7/.86	1.11	28.3	22	off/off						7
				700	248	296	102		31%	63%		1.7/.88			22	off/off	1.04	.62	.78	30.8%	63%	8
				700	259	296	102		31%	62%		1.9/.87			21	off/off	1.08	.79	.95		82%	9
				690	140	296	102		31%	64%		1.9/.86			21	off/off	1.08	.79	.95	29.6	82%	10
				680	140	260	200		34%	63%		1.9/.87			21	off/off	1.12	.74	.91		73%	11
				660	90	213	219		32%	63%		1.9/.87			20	off/off	1.12	.74	.91	30.4%	73%	12
				700	7	3	3		32%	63%		1.9/.86			21	off/off	1.10	.78	.95		80%	1 AM
				750	8.8	360	333		32%	62%		1.9/.86			20	off/off	1.10	.78	.95	30.9%	80%	2
				750	8.8	361	333		32%	62%		1.9/.87	1.09	29.4%	20	off/off	1.10	.78	.95		80%	3
				740	7	3	3		32%	62%		1.9/.88			20	off/off	1.07	.75	.91	29.9%	78%	4
																						5 AM

[illegible] @ 2:30 [illegible] 1:20 [illegible]

[illegible] @ 4:15

[illegible] #2 slaker down @ 6:15 [illegible] 6-Caustic [illegible]

Date:	July 13, 1992	
Shift	C – Operator	D – Operator
6 AM - 6 PM	LISTER	BELLARD
6 PM - 6 AM	BRAN[illegible]	DAVID

7-14-92

INLAND ORANGE INC.

Kiln

Time	LIME KILN – FIRING END – Gas Flow	TRS PPM	% O_2	Draft Inches Hood	Temperatures °F Front	Chain	Feed End	Pressures Prim.	Sec.	FEED END – Scrubber Disc.	Position	Damper	Travel	Pre-Coat Filter Speed	Flow	Density	Feed Conv. Amps.	I.D. FAN Vib. Monitor In BD.	Out BD.	#1 SLAKER G.L. Flow	°F G.L. Temp.	Re-Burn Lime	New Lime	°F Slaker Temp.
6 AM	7334	7.6	2.2	.10	2361	964	727	50%	25%	45%	21	60%	N	3rd/60	170	53%	32%			500	194	16		217
7	7340	4.7	2.5	.10	2277	965	724	50%	25%	45%	21	60%	N	3rd/57	170	53%	32%			500	194	16		21[illegible]
8	7332	4.8	2.5	[illegible]	2330	965	722	50%	25%	45%	21	60%	N	3/57	170	53%	32%			500	194	16		216
9	7341	4.9	2.4	.10	2327	965	708	50%	25%	45%	21	60%	N	3/58	170	54%	32%			500	194	16		21[illegible]
10	7341	4.9	2.0	-.12	2274	964	694	50%	25%	45%	21	60%	N	3/58	170	54%	32%			500	194	16		215
11	7334	5.7	2.7	-.12	2266	965	702	50%	25%	45%	21	60%	N	3/58	170	54%	32%			500	196	16		[illegible]
12	7349	4.2	3.1	-.14	2252	964	698	50%	25%	45%	21	60%	N	3/58	170	55%	32%			500	196	16		21[illegible]
1 PM	73,850	5.0	2.8	-.14	2273	964	734	50%	25%	45%	21	60%	N	3/58	170	52%	32%			500	196	16		21[illegible]
2	7375	4.8	2.3	-.12	2323	965	751	50%	25%	45%	21	60%	N	3/57	170	50%	32%			500	196	16		21[illegible]
3	73[illegible]	5.0	2.2	.10	2325	965	754	50%	25%	45%	21	60%	N	3/57	170	52%	32%			500	196	16		214
4	7333	5.1	2.3	-.12	2267	965	744	50%	25%	45%	21	60%	N	3/58	170	53%	32%			500	196	16		21[illegible]
5	73[illegible]	5.3	2.5	-.1[illegible]	2267	964	757	50%	25%	45%	21	60%	N	3/58	170	53%	32%			500	196	16		[illegible]
6	73500	6.5	2.3	-.12	2267	963	741	50	30	45	21	60	N	3/58	170	54	32			500	194	16		[illegible]
7	73510	5.7	2.2	-.12	2290	965	773	45	20	45	21	58	N	3/58	170	54	32			500	194	16		21[illegible]
8	73270	10.6	1.2	-.12	2361	964	740	45	15	50	21	58	N	3/58	140	54	32			500	194	16		21[illegible]
9	73180	7.2	1.2	-.12	2367	965	740	45	15	50	22	58	N	3/58	140	54	32			500	194	16		21[illegible]
10	71910	7.1	1.2	-.12	2301	966	784	45	0	50	23	55	N	3/58	135	54	32			500	194	16		216
11	70590	6.3	1.8	-.12	2305	965	753	45	0	50	23	55	N	3/58	135	54	32			500	194	16		[illegible]
12	70520	6.1	1.9	-.12	2293	966	709	45	0	50	23	60	N	3/58	135	54	32			500	194	16		21[illegible]
1 AM	70220	6.3	2.1	-.12	2302	966	729	45	0	50	23	60	N	3/58	135	54	32			500	194	16		[illegible]
2	70130	5.8	1.9	-.12	2366	966	760	40	0	50	23	60	N	3/58	135	54	32			500	194	16		[illegible]
3	70210	5.7	1.8	-.12	2343	967	771	40	0	50	22	60	N	3/58	135	52	32			500	194	16		[illegible]
4	70030	5.7	1.7	-.12	2372	96[illegible]	771	40	0	50	22	60	N	3/58	135	52	32			500	194	16		[illegible]
5 AM	70110		1.7	-.12	23[illegible]	965	771	40	0	50	22	60	N	3/58	135	52	32			500	19[illegible]	16		[illegible]

INTEGRATOR READINGS

INVENTORIES

	Gas Integrator	% Suff.	% Caust.	CD 308 Stroke	% CD 308	White Liquor E/W Ft.	White Liquor #4 %	White Liquor #5 %	Green Liquor E/W Ft.	Green Liquor No. 3 Ft.	Weak Wash	Mud Ft.	Lime Ft.	Auxiliary Engine Check OK / NO
6 AM Finish	811967	25	11	4	24	34	44	50	21	E	20	16	15'	
6 PM	810[illegible]	33	32	A	24½	30	46	51	22	E	18	14	15	ok
6 AM Start	800[illegible]	29	56	A	24	33	47	[illegible]	[illegible]	E	20	15	15	ok

7-14-92

7-14-92

Log

New Lime	°F Slaker Temp.	$CaCO_3$ Test	M of L Settling Test	Clarifier Rake Position: Mud Washer	No. 1 W.L. Clarifier	No. 2 W.L. Clarifier	No. 3 W.L. Clarifier	Agitators Mud Tanks: No. 1 Amps.	No. 2 Amps.	Synthetic In / Out	Green Liquor: G.L. Clarif. Rake Amps.	From Recovery: Total Alk.	% Sulf.	Weak Wash: Level	Sewer Pump	#5 Causticizer White Liquor: A	B	C	% Sulf.	% Caust.	Time
			640	150	230	110	[illegible]	30%	62%	out	1.9/.87			19½	on/off	1.07	.75	.90	28.5%	77%	6 AM
			630	151	300	57		30%	62%	out	1.9/.86	1.05	30.5%	19	off/off	[illegible]	.75	.91		77%	7
			620	7	3	3		30%	62%	out	1.9/.85			17	off/off	1.06	.73	.88	28.3%	76%	8
			650	251	220	70		30%	62%	out	1.9/.87			18½	off/off	1.06	.72	.88		72%	9
			670	251	220	70		30%	62%	out	1.9/.85			19	off/off	1.05	.73	.89	29.6%	75%	10
			610	251	220	140		30%	62%	out	1.9/.87			17½	off/off	1.10	.75	.91		75%	11
			550	7	3	3		30%	62%	out	1.9/.87			16	off/off	[illegible]	.74	.91	31.2%	76%	12
			540	90	650	51		30%	62%	out	1.9/.85			12	off/off	1.07	.73	.90		76%	1 PM
			530	90	650	51		30%	62%	out	1.9/.86	1.06	32.2%	11	off/off	1.10	.72	.90	32.7%	72%	2
			530	90	65	51		30%	60%	out	1.9/.85			10	on/off	1.06	.71	.87		75%	3
			510	90	340	81		30%	62%	out	1.9/.85			18	on/off	1.07	.71	.86	28.0%	72%	4
				7	3	3		30%	62%	out	1.9/.85			20	on/off						5
			500	200	601	310		32	62	IN	1.9/.86			18	on/off	107	73	89	29.9%	76%	6
			500	113	570	567		32	62	IN	1.9/.86	101	27.1%	18	on/off	106	72	88		75%	7
			520	7	3	3		32	62	IN	1.9/.86			18	on/off	107	73	89	29.9%	76%	8
			500	224	199	83		32	62	IN	1.9/.86			18	on/off	109	73	89		74%	9
			500	224	228	83		32	62	IN	1.9/.86			18	on/off	112	78	94	[illegible]	77%	10
			450	223	224	230		32	62	IN	1.9/.86			18	on/off	112	78	95		78%	11
			450	223	226	336		32	62	IN	1.9/.86			18	on/off	106	71	88	[illegible]	75%	12
			520	222	160	357		32	62	out	1.9/.89			19	on/off	107	[illegible]	52		77%	1 AM
			480	[illegible]	162	90		32	62	out	1.9/.90	106	26.4%	20	on/off	[illegible]	[illegible]	[illegible]	30.7%	[illegible]	2
			450	148	398	86		32	62	out	1.9/.89			20	on/off	108	74	89		75%	3
			450	144	58	86		32	62	out	1.9/.85			20	[illegible]	1.11	75	91	20.8%	74%	4
								32	62	out	1.9/.85			20	on/off						5 AM

[illegible] 6:15 [illegible] 910 [illegible]

- 6 W.L. [illegible]

W.L. truck Loaded out - Pumping from pond all Shift

[illegible] filter,

Date:	July 14, 1992	
Shift	C – Operator	D – Operator
6 AM – 6 PM	Lister	Bellard
6 PM – 6 AM	Dixon	Wetherington

INLAND ORANGE INC.

7-15-92

Kiln

	LIME KILN																			#1 SLAKER				
	FIRING END									FEED END								I. D. FAN						
	Gas	TRS	%	Draft Inches	Temperatures °F			Pressures		Scrubber				Pre-Coat Filter				Vib. Monitor						
Time	Flow	PPM	O_2	Hood	Front	Chain	Feed End	Prim.	Sec.	Disc.	Position	Damper	Travel	Speed	Flow	Density	Feed Conv. Amps.	In BD.	Out BD.	G. L. Flow	°F G. L. Temp.	Re-Burn Lime	New Lime	Slaker Temp.
6 AM	70,140	8.4	1.8	.10	2339	967	769	40%	0%	50%	21	60%	N	3/57	135	53%	38%			500	196	16		21
7	70,140	5.8	1.7	.10	2334	967	766	40%	0	50%	21	60%	N	3/57	135	56%	38%			500	[illegible]	16		21
8	70,180	5.8	1.9	.11	2372	966	769	40%	0	50%	21	60%	N	3/57	135	52%	38%			500	190	16		214
9	70440	5.4	2.0	-.12	2383	966	741	40%	0	50%	21	60%	UP	3/57	135	50%	35%			500	194	16		21
10	70,360	5.5	1.7	-.12	2445	967	775	40%	0	50%	21	60%	UP	3/57	135	52%	35%			500	194	16		213
11	70,450	5.6	1.8	-.12	2359	967	787	40%	0	50%	21	60%	UP	3/57	135	52%	40%			500	194	16		21
12	70,410	5.4	1.9	-.12	2384	967	780	40%	0	50%	21	60%	UP	3/57	135	52%	43%			500	194	16		214
1 PM	70,630	5.5	1.6	-.12	2363	967	775	40%	0	50%	21	60%	UP	3/57	135	51%	40%			500	194	16		21
2	70,450	5.4	1.8	-.12	2360	967	770	40%	0	50%	21	60%	N	3/58	150	48%	41%			500	194	16		21
3	70,310	5.1	2.2	-.11	2360	967	746	40%	20%	50%	21	60%	N	3/58	150	48%	32%			500	194	16		213
4	70,230	5.2	2.1	.10	2362	966	722	45%	20%	50%	22	60%	N	3/58	150	50%	36%			500	194	16		21
5	70,240	5.1	2.2	.10	2328	966	730	40%	20%	50%	22	60%	dn	3/58	150	50%	36%			500	194	16		213
6	70440	5.1	2.2	-12	2354	965	729	40	20	50	22	60	dn	3/58	150	48	38			500	194	16		
7	70310	5.0	2.1	-12	2381	965	739	40	20	50	22	60	dn	3/58	150	44	38			500	194	18		212
8	70290	5.0	2.0	-12	2324	966	729	40	20	50	22	60	dn	3/58	150	48	38			500	194	18		21
9	70310	5.0	2.3	-12	2364	966	726	40	20	50	22	60	dn	3/58	150	48	38			500	194	18		21
10	70400	4.9	2.3	-12	2324	966	685	40	20	50	22	60	dn	3/58	150	48	38			500	192	18	32	2
11	72650	5.1	1.7	-12	2352	965	655	40	20	50	22	60	N	3/58	150	48	38			500	192	18	32	21
12	72700	5.2	1.8	-12	2350	965	689	40	20	50	22	60	N	3/58	150	48	38			500	192	18	32	218
1 AM	72830	5.3	1.8	-.12	2326	966	695	40	20	50	22	60	N	3/58	150	48	38			500	192	18	32	2
2	73410	5.5	1.8	-12	2355	966	692	45	20	50	23	60	N	3/58	150	46	38			500	192	18	30	218
3	73270	5.9	1.6	-12	2382	965	693	45	20	50	23	60	N	3/58	150	46	38			500	192	18	30	21
4	73320	5.9	1.6	-12	2417	965	694	45	20	50	23	60	N	3/58	150	46	38			500	192	18	30	219
5 AM	73610		1.3	-12	2420	966	697	45	20	50	23	60	N	3/58	150	46	38			500	192	18	30	21

INTEGRATOR READINGS

INVENTORIES

	Gas Integrator	% Sulf.	% Caust.	CD 308 Stroke	% CD 308	White Liquor E/W Ft.	White Liquor #4 %	White Liquor #5 %	Green Liquor E/W Ft.	Green Liquor No. 3 Ft.	Weak Wash	Mud Ft.	Lime Ft.	Auxiliary Engine Check OK / NO	Con... 6 AM – ...
6 AM Finish	834354	32	22	A	72½	31	42	32	18	E	21	16	14	OK	
6 PM	826700	25	16	A	73½	36	44	35	20	E	21½	16	15½	OK	
6 AM Start	817967	25	16	A	74	34	44	50	21	E	20	16	15'	OK	

7-15

7-15-92

ic Log

Burn Lime	New Lime	°F Slaker Temp.	$CaCO_3$ Test	M of L Settling Test	Clarifier Rake Position: Mud Washer	No. 1 W.L. Clarifier	No. 2 W.L. Clarifier	No. 3 W.L. Clarifier	Agitators Mud Tanks: No. 1 Amps.	No. 2 Amps.	Synthetic In / Out	Green Liquor: G.L. Clarif. Rake Amps.	From Recovery: Total Alk.	From Recovery: % Sulf.	Weak Wash: Level	Weak Wash: Sewer Pump	#5 Causticizer White Liquor: A	B	C	% Sulf.	% Caust.	Time
				600	146	324	192		32%	62%	OUT	1.9/.86			20½	on/off	1.07	.72	.87	28.0%	74%	6 AM
				580	328	149	200		32%	62%	out	1.9/.84	1.04	28.3%	21½	on/off	1.05	.72	.87		76%	7
				600	7	3	3		32%	62%	out	1.9/.84			22	on/off	1.05	.71	.86	28.6%	74%	8
				580	288	148	204		32%	62%	out	1.9/.87			21½	on/off	1.05	.68	.83		70%	9
				550	241	287	317		32%	62%	out	1.9/.85			21	on/off	1.06	.69	.84	28.3%	71%	10
				550	241	330	318		32%	62%	out	1.9/.86			21½	on/off	1.04	.68	.83		71%	11
				530	163	406	321		32%	62%	out	1.9/.89			21½	on/off	1.07	.68	.83	28.0%	68%	12
				550	144	328	219		32%	62%	out	1.9/.91			21½	on/off	1.05	.70	.85		73%	1 PM
				580	7	3	3		32%	62%	out	1.9/.89	1.07	30.0%	21½	on/off	1.06	.69	.83	26.4%	70%	2
				580	207	375	369		32%	62%	out	1.9/.89			21½	on/off	1.08	.69	.83		68%	3
				550	267	370	359		32%	62%	out	1.9/.89			21½	on/off	1.04	.70	.84	26.9%	73%	4
					7	3	3		32%	62%	out	1.9/.89			21½	on/off						5
				550	192	285	254		32	62	out	1.9/.86			25	on/off	106	73	86	24.5%	75%	6
				500	7	3	3		32	62	out	1.9/.86	110	18.1%	26	on/off	105	68	84		71%	7
				480	416	149	57		32	62	out	1.9/.86			26	on/off	106	71	88	32.1%	75%	8
				450	413	149	57		32	62	out	1.9/.86			26	on/off	105	68	84		71%	9
				450	291	188	57		32	62	out	1.9/.86			26	on/off	109	71	87	29.3%	71%	10
				550	110	381	92		32	62	out	1.9/.85			20	on/off	113	82	99		82%	11
				550	110	478	165		32	62	out	1.9/.85			20	on/off	107	77	93	29.9%	81%	12
				600	160	606	376		32	62	out	1.9/.84	105	22.8%	20	on/off	110	82	98		79%	1 AM
				600	7	3	3		32	62	out	1.9/.85			21	on/off	108	76	93	31.4%	79%	2
				650	104	280	170		32	62	out	1.9/.88			21	on/off	113	82	100		83%	3
				640	90	280	170		32	62	out	1.9/.88			21	on/off	111	79	97	32.4%	81%	4
					211	325	170		32	62	out	1.9/.86			21	on/off						5 AM

... Weak Wash [illegible]

White Liquor truck loaded out, TK Caustic truck

... up Pump not Working, EAST W/C Clarif Mud Pump

Bad UP TO 2 gals a Shift.

Date:	July 15, 1992	
Shift	C – Operator	D – Operator
6 AM – 6 PM	Litter	BELLARD
6 PM – 6 AM	DIXON	Wetherington

INLAND ORANGE INC.

7-21

Kiln

Time	Gas Flow	TRS PPM	% O_2	Draft Inches Hood	Temp. °F Front	Temp. °F Chain	Temp. °F Feed End	Pressures Prim.	Pressures Sec.	Scrubber Disc.	Scrubber Position	Scrubber Damper	Travel	Pre-Coat Filter Speed	Pre-Coat Filter Flow	Pre-Coat Filter Density	Feed Conv. Amps.	I.D. Fan Vib. Monitor In BD.	I.D. Fan Vib. Monitor Out BD.	#1 Slaker G.L. Flow	°F G.L. Temp.	Re-Burn Lime	New Lime	°F Slaker Temp.
6 AM	76270	8.9	2.5	-.1	2378	964	692	50	45	45	23	63	N	3/63	170	50	33							
7	76900	7.3	2.2	-.1	2439	965	678	50	45	45	23	63	N	3/63	170	50	33							
8	76700	2.0	2.2	-.1	2440	965	750	50	45	45	23	63	N	3/63	170	50	33							
9	76700	5.6	2.1	-.1	2425	965	750	50	45	45	23	63	N	3/63	170	50	33							
10	76740	5.8	2.0	-.1	2469	965	768	50	45	45	22	63	N	3/63	170	50	33							
11	76880	6.4	1.9	-.1	24[illegible]	965	758	50	45	45	22	63	N	3/63	170	50	33			525	190	12	50	
12	76990	6.4	1.9	-.1	2420	965	750	50	45	45	22	63	N	3/63	170	50	33			258	190	12	—	22[illegible]
1 PM	76850	6.0	1.9	-.1	2405	965	755	50	45	45	22	63	N	3/63	170	50	33			258	190	12	—	22[illegible]
2	77260	5.7	1.9	-.1	[illegible]	965	748	50	45	45	22	63	N	3/63	170	50	33			235	190	12	-	22[illegible]
3	76730	5.6	1.8	-.1	2448	965	761	50	45	45	22	63	N	3/63	170	50	53			313	190	12	-	222
4	76860	5.7	2.1	-.1	2444	965	760	50	45	45	22	63	N	3/63	170	50	33			470	190	12	-	28[illegible]
5	76990		2.1	-.1	24[illegible]	965	758	50	45	45	22	63	N	3/63	170	50	33			470	190	12	-	196
6	76650	5.2	[illegible]	-.11	24[illegible]	964	7[illegible]	50	45	45	21	63	N	3/60	170	42	33			550	190	14		
7	76600	5.1	1.7	-.12	24[illegible]	964	785	50	45	45	21	63	N	3/60	170	44	33			550	190	14		211
8	76880	5.6	1.2	-.10	2452	966	740	50	45	45	22	63	N	3/60	170	46	33			550	190	15		211
9	77780	5.8	1.7	-.12	2433	965	791	50	45	45	22	63	N	3/60	170	46	33			550	196	15		214
10	76610	5.5	1.6	-.12	2409	965	787	50	45	45	21	65	N	3/60	170	44	33			550	190	16		212
11	75600	5.5	1.7	-.11	2446	965	771	50	45	45	21	65	N	3/60	170	46	33			550	194	16		214
12	75860	5.6	1.7	-.10	2454	965	776	50	45	45	21	65	N	3/60	170	47	33			550	194	16		214
1 AM	75870	5.6	1.7	-.10	2417	965	775	50	45	45	21	65	N	3/60	170	46	33			550	196	16		21[illegible]
2	71090	7.4	1.8	-.09	2425	962	803	50	45	45	21	65	N	3/60	170	44	33			550	196	16		217
3	75130	12.5	1.8	-.10	24[illegible]	961	761	50	45	45	21	65	N	3/60	170	46	33			550	196	16		215
4	73010	5.3	1.8	-.10	24[illegible]	961	784	50	45	45	21	65	N	3/60	170	46	33			550	196	16	32	212
5 AM																								

INTEGRATOR READINGS

INVENTORIES

	Gas Integrator	% Sulf.	% Caust.	CD 300 Stroke	% CD 300	White Liquor E/W Ft.	White Liquor #4 %	White Liquor #5 %	Green Liquor E/W Ft.	Green Liquor No. 3 Ft.	Weak Wash	Mud Ft.	Lime Ft.	Auxiliary Engine Check OK / NO	Comments 6 AM – 6
6 AM Finish	940409	30	96	A	70	39	100	35	15	0	23	24	13		
6 PM	~~940409~~	30	98	A	70½	40	100	35	20	0	25	24	12		
6 AM Start	922043	21	100	A	71	52	100	35	12	0	21	24	11		

7/21

Log

					CLARIFIER RAKE POSITION				AGITATORS MUD TANKS			TESTS: GREEN LIQUOR					#5 CAUSTICIZER WHITE LIQUOR					
[SLAKER]	New Lime	°F Slaker Temp.	$CaCO_3$ TEST	M of L SETTLING TEST	Mud Washer	No. 1 W.L. Clarifier	No. 2 W.L. Clarifier	No. 3 W.L. Clarifier	No. 1 Amps.	No. 2 Amps.	Synthetic In / Out	G.L. Clarif. Rake Amps.	From Recovery Total Alk.	From Recovery % Sulf.	WEAK WASH Level	WEAK WASH Sewer Pump	A	B	C	% Sulf.	% Caust.	Time
	55	208		620	199	390	188		34	64	out	1.9/84			24	on/off	108	79	99	37.0%	86%	6 AM
	55	208		640	7 183	3 330	3 187		34	64	out	1.9/84			25	on/off	106	77	94		83%	7
	55	208		640	7	3	3		34	64	out	1.9/82	107	336	26	on/off	BZ Maint on			%	%	8
	55	208		650	557	563	100		34	64	out	1.9/82			26	on/off	#1 Slaker [illegible]				%	9
	55	193		650	557	563	66		34	64	out	1.9/82			26	on/off	BZ, fan #1			%	%	10
				BZ	93	491	201		34	64	out	1.9/84			23	on/off	105	75	92		81%	11
		2::			8 100	5 491	3 201		34	64	out	1.9/84			23	on/off		BZ [illegible]				12
					100	491	201		34	64	out	1.9/84			23	on/off	106	61	78		61%	1 PM
				500	93	490	200		34	64	out	1.9/84			23	on/off	102	65	81	31.3%	70%	2
				BZ	7	13	3		34	64	out	1.9/84			23	on/off		BZ				3
					88	383	412		34	64	out	1.9/85	103	29.1%	25	on/off		BZ				4
					88	383	412		34	64	out	1.9/85			25	on/off						5
				640	210	427	380		34	64	out	1.9/.86			27	on/off	1.05	.76	.93	32.3	83	6
				640	7	5	4		34	64	out	1.9/.86			27	on/off	1.06	.75	.90		78	7
				640	96	324	158		34	64	out	1.9/.86			27	off/off	1.06	.73	.89	30.1	79	8
				600	100	264	121		34	64	out	1.9/.85			27	off/off	1.06	.70	.86		72	9
				600	102	229	121		34	64	out	1.9/.86			27	off/off	1.06	.70	.86	30.1	72	10
				570	161	158	254		34	64	out	1.9/.86			27	off/off	1.06	.69	.86		72	11
				520	7	3	3		34	64	out	1.9/.87	105	28.5	27	off/off	1.06	.68	.85	32.3	71	12
				600	161	166	254		34	64	out	1.9/.87			26	off/off	1.06	.70	.86		72	1 AM
				600	190	203	254		34	64	out	1.9/.87			25	off/off	1.05	.70	.85	28.5	73	2
				600	190	280	255		34	64	out	1.9/.86			25	off/off	1.03	.69	.84		73	3
				600	7	3	3		34	64	out	1.9/.86			24	off/off	1.03	.66	.83	29.1	71	4
																						5 AM

1 Sulf [illegible]

Maint Repaired East W/L [illegible] Mud Pump, Several Leaks on W/L

...s At 6⁰⁰ AM FOR TEST Will Hold for Two DAYS, #2 Slaker Screw

@ 10⁵⁶ #1 Slaker Can't Get flow to Caustic Room Down @ 10⁵⁶ ... up @ 11³⁹

... Per Tom Noble, CAUSTIC Room Down @ 4⁰⁰ up @ 4²⁰

... @ 7:02

Date:	7-21-92	
Shift	C – Operator	D – Operator
6 AM - 6 PM	Dixon	Wetherington
6 PM - 6 AM	David	Smith

A. 7-15

INLAND

DIGESTER

PRODUCTION RATE			WHITE LIQUOR				TOP CIRCULATION				UPPER COOKING CIRCULATION ZONE			LOWER COOKING CIRCULATION ZONE					EXTRACTION ZONE					
Chip Screw Used	Prod. Rate T/D	Chip Meter RPM	WL Ea. 1 Wood	WL Flow GPM	WL B Test	Est. Res. E.A.	S.V. Press. PSI	Top Circ. Flow GPM	Top Circ. Temp. °F	H.P.F. Amps & Setting	Upper Cooking Cir. Fl. GPM	Heater Temp. Hot	Heater Temp. Cold	Lower Cooking Cir. Fl. GPM	Heater Temp. Hot Comp.	Heater Temp. Hot Actual	Heater Temp. Cold	H/F	Dilut. Factor Actual	Ext. Flow GPM	Ext. Temp. °F	Wash Flow GPM	White Liquor Solids	Filtrate Tank Level
Fl	5c	11.c	14.2	316	71/72	27.7	15	4643	234	28	193-	275	26-	27-	3-5	3-5	301	1.9	1.6	879	259	225	0	53
Fl	9cc	1c.9	14.3	363	72	.072	15	4c8c	235	3c	1919	275	268	2244	305	3cc	292	1.9	1.5	892	259	223		55
Fl	9cc	1c.c	14.2	339	72/73	29.4	15	4c73	234	28	1952	225	261	225-	3-5	3-5	29-	1.9	1.7	864	29-	227	0	53
Fl	95	11	14.2	346	74		15	465-	234	3c	1918	225	263	226	3-	3-	29-	1.9	1.6	868	29-	224		53
Fl	95c	11.3	14.1	338	72/71	28.0	15	4695	234	3c	1917	228	262	22-	3-	3-	29-	1.9	1.7	865	29-	222	.0	55
Fl	95c	12.9	14.2	394	74	.072	15	4632	229	26	1949	229	268	2239	309	303	295	1.9	1.6	978	29-	233		49
Fl	95-	13	14.2	38-	71/75	29.4	15	4644	231	28	195-	229	267	223-	309	305	303	1.9	1.5	97c	294	227	0	5c
Fl	95c	13	14.1	391	75		15	412c	23c	29	195-	28c	266	2216	31c	3c7	3c2	1.9	1.6	977	293	22-		5-
Fl	95c	12.9	14.c	354	74/75	29.4	15	4655	23c	26	1937	279	261	224-	3-9	311	29-	1.9	1.8	1cc5	294	22-	0	4c
Fl	95	12.9	14.c	359	75		15	412-	22c	27	195c	26-	269	22-	31c	312	29-	1.9	1.7	1c15	295	227		47
Fl	11cc	5.c	1-8	173	75		15	46-	224	4c	1913	268	261	2235	3-	3-	29-	1.9	1.8	1169	25-	224		57
EW	950	12.C	14.0	377	72/75	27.4	15	4051	231	26	1935	277	260	2745	309	307	292	1.9	1.6	983	284	221	.0	59
EW	950	12.6	13.9	375	74	.068	15	4017	232	26	1944	279	266	2735	309	308	293	↓	1.6	970	295	226		57
EW	950	12.6	14.0	381	73/74	27.4	15	4110	232	27	1210	279	262	2745	309	307	293		1.6	975	294	226	.0	[illegible]
EW	950	12.6	14.0	381	74		15	4075	231	28	1266	279	260	2752	309	306	292		1.6	983	295	226		46
EW	950	12.9	14.1	395	71/74	29.7	15	4067	231	15	1457	279	265	2740	309	304	292		1.6	982	296	229	.0	49
EW	950	12.9	14.1	396	74	.064	15	4046	231	26	1257	279	264	2736	309	313	298		1.6	969	297	230		45
EW	950	12.7	14.0	391	71/73	27.7	15	4050	231	28	1780	279	268	2750	309	309	297		1.6	980	297	227	.0	49
EW	950	12.7	14.0	391	73		15	4092	232	29	1748	279	269	2749	309	308	298		1.6	994	296	228		56
EW	950	12.7	14.1	393	72/73	27.7	15	4118	232	28	1827	279	269	2736	309	312	296		1.6	1019	294	230	.0	60
EW	950	12.8	14.0	394	73	.072	15	4092	233	29	1896	279	270	2773	309	306	301		1.6	1000	295	225		65
EW	950	12.8	14.1	396	71/73	27.4	15	4011	233	15	1899	279	263	2769	309	307	304		1.6	1002	295	229	.0	6-
EW	950	12.8	14.1	400	72		15	4042	232	28	1934	279	26-	2870	309	3--	299		1.6	978	295	22-		6-

28.3

INTEGRATOR READINGS

	HIGH PRESS. STEAM	LOW PRESS. STEAM	WHITE LIQUOR	CHIP METER	WEIGHTOMETER
6 AM FINISH	3896--	474420	531229	12358	
6 AM START					
DIFFERENCE					

6-AM Controller ... 7-3
[illegible]
Thru ... [illegible]
[illegible]
Conductivity Meter Bad

Piping Machine [illegible]
[illegible]
Capacitor Level 49

E INC. 7-15 A DIG.

110

Cold Blow Flow GPM	Dig. Press. PSI	Cold Blow to O.D. Flow	O.D. RPM	O.D. Amps	Computer Dig. Level %	Top Sep. Amps	Dig. Blow Rate GPM	Dig. Blow Valve %	Dig. Blow Temp.	Blow Line No	Solids	B.T. Level	Pre-Refiner Amp Load	Pre-Refiner Disc Press	No. 1 Screen Diff. Press	No. 2 Screen Diff. Press	Spare Screen Diff. Press		Reject Refiner Amp Load	Reject Refiner Disc Press	Washer Shower Flow	Washer Shower Temp.	To H.D. & Time	Base H.D. Level	Top H.D. Level	TIME
BLOW DIG. PRESS.			OUTLET DEVICE		TOP SEPARATOR		DIGESTER BLOW RATE			KAPPA & SOLIDS		HOT STOCK SCREENS									B. S. WASHER			HIGH DENSITY STORAGE		
8	151	185	4.9	75	28	23	960	38	163	106.2	16.2	17	593		0.5	0.5	0.5		58		990	179		71	57	6 AM
141	150	071	4.8	50	31	24	950	37	163			16	580		0.3	0.5	0.4		58		971	174		73	55	7
15	150	20	5.[illegible]	78	22	22	[illegible]	40	163	107.0	16.6	15	591		0.9	0.9	0.6		58		1000	175		76	56	8
16	150	299	57	72	57	71	910	42	163			15	591		0.5	0.6	0.5		56		981	172		75	55	9
0	150	325	55	72	30	24	929	42	162	113.2	14.8	13	56[illegible]		0.6	0.6	0.6		59		1011	172		77	56	10
35	149	152	65	60	29	24	1130	40	162			21	601		0.0	0.4	0.0	0.0	611		1027	175		78	53	11
82	150	30	53	69	22	22	11[illegible]	4[illegible]	160	1058	16.8	20	6[illegible]		1.1	1.3	0.4	3.7	545		961	175		50	54	12
30	151	340	55	70	28	23	1001	45	160			23	700		1.8	1.2	0.6	39	56		1000	179		84	55	1 PM
01	151	25	60	65	30	23	113[illegible]	45	161	1009	15.9	23	[illegible]		1.2	1.9	0.5	37	55		931	172		85	55	2
0	150	25	62	67	29	23	11[illegible]	45	160			20	[illegible]		1.2	1.3	0.4	35	55		1000	175		86	55	3
9	154	395	30	89	22	25	485	28	155			17	395		0.0	0.0	0.0	D	342		803	145		82	58	4
																										5
50	150	19	6.7	51	48	23	1190	46	155	1063	17.6	24	780		1.4	1.2	.7		698		1100	181		79	61	6
4	2	32	7.0	62	55	22	1151	46	157			25	779		1.0	.8	.3		701		1100	180		82	64	7
0	150	110	6.0	60	45	23	1155	44	157	[illegible]	17.5	26	740		1.1	1.3	.7		700		1050	180		82	67	8
8	150	380	5.8	56	36	24	1160	42	158			29	784		1.2	1.2	.6		677		1050	179		83	70	9
2	150	528	5.6	81	27	24	1126	41	158	100.6	17.6	30	738		.8	.2	.2	3.5	699		1050	180		85	72	10
82	150	400	5.6	72	30	22	1148	43	159			18	720		1.4	.9	.4	4.1	718		1050	178		88	73	11
6	150	110	6.5	71	33	23	1140	43	159	11[illegible]	16.7	16	715		1.7	1.6	.5	39	700	9 [illegible]	1050	178		87	75	12
31	150	79	7.0	76	35	24	1130	44	159			13	722		1.8	2.1	[illegible]	3.6	6[illegible]	250/350	750	172		87	79	1 A
1	150	27	7.0	75	36	24	1117	41	159	1157	17.0	12	670		1.7	2.0	.4	41	698	300/360	750	170		86	81	2
8	150	92	6.8	66	30	23	1156	39	159			13	720		1.4	1.1	.4	3.6	621	250/350	700	171		88	83	3
8	150	140	6.6	64	30	25	1127	45	159	1[illegible]	17.[illegible]	12	627		1.6	1.1	.4	42	6[illegible]	260/350	650	170		88	83	4
5	150	20	6.5	6.7	34	25	1160	43	159			1[illegible]	[illegible]33		1.1	.5	.2	[illegible]	6[illegible]	[illegible]	651	174		88	8[illegible]	5 AM

E — INSTRUCTIONS — REMARKS

9:20 11:3[illegible] [illegible] Check [illegible]
12:35 On Heater [illegible] 3:30
[illegible] 3:45 [illegible] on Sec[illegible]
[illegible] AE 133c [illegible] AE 133c
(Atm [illegible] Change [illegible])
(12:38) (Emergency Drag [illegible] 1:48 [illegible] 1:53
[illegible] 2 times)

DATE	7-15-92	
	A OPERATOR	B
6 AM — 6 PM	S[illegible]	[illegible]
6 PM — 6 AM	Russell [illegible]	[illegible]

-R6 7-15

INLAND

DIGESTER

PRODUCTION RATE			WHITE LIQUOR				TOP CIRCULATION				UPPER COOKING CIRCULATION ZONE			LOWER COOKING CIRCULATION ZONE					EXTRACTION ZONE					
Chip Screw Used	Prod. Rate T/O	Chip Meter RPM	WL. Ea. 1 Wood	WL. Flow GPM	WL. B Test	Ext. Res. E.A.	S.V. Press. PSI	Top Circ. Flow GPM	Top Circ. Temp. °F	H.P.F. Amps & Setting	Upper Cooking Cir. Fl. GPM	Heater Temp. Hot	Heater Temp Cold	Lower Cooking Cir. Fl. GPM	Heater Temp Hot Comp.	Heater Temp Hot Actual	Heater Temp Cold	HPF	Dilut. Factor Actual	Ext. Flow GPM	Ext. Temp °F	Wash Flow GPM	White Liquor Solids	Filtrate Tank Level
EW	600	8.8	13.5	258	72/76	277	15	4061	228	29	2160	[illegible]	279	[illegible]	308	310	305	[illegible]	1.6	741	278	311	0	49
EW	600	8.9	13.5	267	72	054	15	4056	236	29	2169	287	262	2261	307	[illegible]	297	3.2	1.6	667	283	308		50
EW	600	9.2	13.5	263	72	274	15	4156	226	26	2163	280	266	2261	307	306	292	[illegible]	1.6	683	282	311	[illegible]	50
EW	600	8.8	13.4	257	72		15	4017	222	66	[illegible]	287	279	[illegible]	309	312	305	3.2	1.6	624	276	316		[illegible]
EW	650	9.1	13.3	261	74	2.0	15	4099	236	34	2157	282	275	2282	307	309	303	4.0	1.6	697	281	312	.0	47
EW	650	9.1	13.3	265	74	[illegible]	15	4025	234	28	2133	285	269	2274	308	304	297	4.0	1.6	671	281	309		46
EW	650	9.1	13.3	259	74	[illegible]	15	4055	233	25	2135	288	277	2360	308	308	298	4.0	1.6	682	281	312	[illegible]	41
EW	650	9.4	13.3	267	75		15	4119	236	[illegible]	[illegible]	280	275	2267	308	310	301	4.0	1.6	690	280	311		42
EW	650	9.2	13.3	262	72	[illegible]	[illegible]	4058	[illegible]	23	2152	284	278	2272	308	311	305	4.0	1.6	696	275	312	0	44
EW	650	9.2	13.3	[illegible]	75		15	4060	235	26	2150	285	278	2260	308	311	305	4.0	1.6	700	277	308		46
EW	400	6.1	13.3	171	74		15	4059	239	31	2177	279	276	2281	301	302	300	4.0	1.6	469	278	308		[illegible]
EW	600	8.8	13.3	255	74		15	4056	234	32	2176	277	268	2318	306	307	296	4.0	1.6	706	279	309		59
E/W	650	9.1	13.4	262	72	[illegible]	15	4408	233	23	2159	284	266	2324	309	312	304		1.6	685	280	308	0	56
E/W	650	9.1	15.4	262	77	064	15	4415	233	26	2178	284	266	2327	309	312	304	4.0	1.6	685	280	308		56
E/W	650	9.1	13.4	262	72	[illegible]	15	4467	233	24	2165	284	266	2365	309	312	304		1.6	680	280	308	[illegible]	[illegible]
E/W	650	9.3	13.4	271	72		15	4129	234	27	2165	283	279	2393	308	310	300	4.1	1.6	706	284	310		41
E/W	650	9.3	13.4	271	72	[illegible]	15	4175	234	25	2165	283	279	2394	308	310	300		1.6	698	284	310	[illegible]	41
E/W	650	9.3	13.4	271	72	069	15	4124	234	26	2171	283	279	2386	308	310	300	4.1	1.6	697	284	310		41
E/W	650	9.2	13.3	267	72	[illegible]	15	4074	233	26	2157	283	278	2377	308	310	302		1.6	693	284	309		44
E/W	650	9.2	13.3	267	72		15	4086	233	26	2143	283	278	2368	308	310	302	4.1	1.6	695	284	308		44
E/W	650	[illegible]	13.4	273	71	277	15	4074	234	30	2156	[illegible]	262	[illegible]	[illegible]	305	[illegible]		1.6	675	[illegible]	[illegible]	0	[illegible]
E/W	650	[illegible]	13.4	273	[illegible]	[illegible]	15	4061	234	26	[illegible]	[illegible]	261	[illegible]	[illegible]	305	[illegible]	[illegible]	1.6	675	276	[illegible]		[illegible]
E/W	650	[illegible]	13.4	[illegible]	71	[illegible]	15	[illegible]	[illegible]	26	2150	[illegible]	[illegible]	[illegible]						622	[illegible]	305		[illegible]
E/W	650	[illegible]	13.4	273	72		15	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	305	[illegible]		1.6	[illegible]	[illegible]	[illegible]		[illegible]

INTEGRATOR READINGS

	HIGH PRESS. STEAM	LOW PRESS. STEAM	WHITE LIQUOR	CHIP METER	WEIGHTOMETER
6 AM FINISH	[illegible]	[illegible]	[illegible]	[illegible]	
6 AM START					
DIFFERENCE					

6AM [illegible]

INC. 7-15 B DIG.

Flow GPM	Dig. Press PSI	Cold Blow to O.D. Flow	O.D. RPM	O.D. Amps	Computer Dig Level %	Top Sep. Amps	Dig. Blow Rate GPM	Dig Blow Valve %	Dig. Blow Temp	Blow Line No	Solids	B.T. Level	Pre-Refiner Amp Load	Pre-Refiner Disc. Press	No 1 Screen Diff Press	No 2 Screen Diff Press	Spare Screen Diff Press		Reject Refiner Amp Load	Reject Refiner Disc Press	Washer Shower Flow	Washer Shower Temp	To H.D. & Time	Base H.D. Level	Top H.D. Level	TIME
[illegible]	172	[illegible]	3.2	69	9	35	594	[illegible]	[illegible]	92.1	14.7	11	577		5.0	4.5					520 520	[illegible]	—	71	56	6 AM
[illegible]	162	291	2.6	75	11	35	578	33	162			12	526		4.9	4.4					520	[illegible]	T	72	56	7
[illegible]	18	192	2.7	76	15	34	573	34	161	81.0	15.5	15	572		4.7	4.3					500		—	74	52	8
[illegible]	161	54	3.0	75	60	34	601	30	161			12	5.6		4.6	4.2					500	[illegible]	—	76	56	9
[illegible]	12	42	3.2	65	57	32	595	35	161	76.7	15.8	19	548		4.7	4.1					500	[illegible]	T	79	54	10
[illegible]	156	76	3.8	65	48	33	592	36	160			26	[illegible]		5.0	4.8					500	162	—	[illegible]	52	11
[illegible]	159	88	3.2	62	43	36	598	36	160	79.1	15.5	22	528		5.5	5.0					[illegible]	157	—	72	50	12
[illegible]	161	185	[illegible]	66	14	38	561	34	159			12	719		5.2	4.7					502	162	T	74	[illegible]	1 PM
[illegible]	160	301	4.0	54	52	34	565	36	160	[illegible]	[illegible]	18	679		5.0	[illegible]					550	169	T	75	56	2
[illegible]	159	249	4.0	56	26	38	572	37	160			18	668		4.4	4.6					550 570	170	—	80	56	3
26	159	549	3.0	68	8	31	395	30	154			16	513		4.4	3.5					550	[illegible]	T	82	57	4
[illegible]	[illegible]	279	29	63	20	31	463	35	154			11	597		5.2	3.7					500 500	168	T	80	57	5
[illegible]	160	100	3.5	68	41	32	626	42	155	83.5	16.5	28	556		4.6	3.8					500 500	190 168	T	79	61	6
[illegible]	160	110	3.5	61	41	32	619	42	155			24	687		5.8	3.8					500 503	190 [illegible]	T	81	62	7
	[illegible]	100	3.5	61	41	32	619	42	154	-	-	16	673		5.4	4.2					500 500	191 170	T	84	66	8
32	160	230	3.2	63	23	35	554	35	157			12	682		5.3	4.6					600 600	185 172	T	83	69	9
[illegible]	160	230	3.2	63	23	35	558	35	157	[illegible]	[illegible]	15	573		5.3	3.8					600 600	182 166	T	84	71	10
21	160	230	3.2	63	23	35	557	35	157			22	554		4.8	4.2					600 600	189 167	T	85	72	11
[illegible]	160	54	3.5	74	23	33	573	37	157	[illegible]	[illegible]	26	[illegible]		4.8	[illegible]					600 600	187 167	T	[illegible]	[illegible]	12
[illegible]	160	54	3.5	74	23	33	[illegible]	37	157			12	628		[illegible]	[illegible]					[illegible]	183 [illegible]	T	[illegible]	--	1 A
	[illegible]	211	3.2	67	[illegible]	[illegible]	[illegible]	36	[illegible]	[illegible]	[illegible]	15	[illegible]		[illegible]	4.4					[illegible]	[illegible]	—	[illegible]	-	2
	[illegible]	211	3.2	67	[illegible]	[illegible]	[illegible]	36	[illegible]			16	[illegible]		[illegible]	[illegible]					[illegible]	[illegible]	—	[illegible]	[illegible]	3
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	36	[illegible]	[illegible]	158	[illegible]	[illegible]	23	572		5.2	4.3					450 450	183 152	T	88	23	4
	[illegible]	[illegible]	[illegible]	68	30	35	587	36	[illegible]			23	572		5.2	4.3					450 450	183 [illegible]	T	[illegible]	[illegible]	5 AM

E — INSTRUCTIONS — REMARKS

[illegible]

DATE	7/15/72
	A OPERATOR B
6 AM — 6 PM	[illegible] Guy
6 PM — 6 AM	Pannell [illegible]

A

DIGESTER

7/21

INLAND

PRODUCTION RATE			WHITE LIQUOR				TOP CIRCULATION				UPPER COOKING CIRCULATION ZONE			LOWER COOKING CIRCULATION ZONE					EXTRACTION ZONE					
Chip Screw Used	Prod. Rate T/D	Chip Meter RPM	Wt. Ba. 1 Wood	Wt. Flow GPM	Wt. B Test	Ext. Res. EA	S.V. Press. PSI	Top Circ. Flow GPM	Top Circ. Temp. °F	H.P.F. Amps & Setting	Upper Cooking Cir. Fl. GPM	Heater Temp. Hot	Heater Temp. Cold	Lower Cooking Cir. Fl. GPM	Heater Temp. Hot Comp.	Heater Temp. Hot Actual	Heater Temp. Cold	HPF	Dilut. Factor Actual	Ext. Flow GPM	Ext. Temp °F	Wash Flow GPM	White Liquor Solids	Filtrate Tank Level
E-1/	600/950	12.7	13.7	256	72/74	31.4	15	4153	239	31	2017	276	268	2650	306	303	294	2.1	1.6	705	277	233	.0	49
E-1/	600/950	12.7	13.7	256	74	052	15	4121	238	29	2133	280	276	2651	310	308	302	↓	1.6	710	284	235		49
E-1/	950	12.9	13.4	374	72/74	31.4	15	4153	234	29	2160	280	274	2650	310	308	300		1.6	950	290	235	.0	49
E-1/	950	12.9	13.4	375	74		15	4100	233	28	2200	280	272	2670	310	309	299		1.6	975	292	234		48
E-1/	950	12.9	13.4	374	73/74	31.4	15	4082	233	27	2420	280	260	2682	310	311	294		1.6	980	294	236	.0	46
E-1/	950	12.9	13.3	371	74	056	15	4015	234	15	1609	279	263	2678	309	308	304		1.6	940	295	236		43
E-1/	950	13.0	13.3	370	74/75	31.1	15	4033	234	15	2057	279	266	2661	309	310	303		1.6	968	297	231	.0	45
E-1/	950	13.0	13.2	368	74	056	15	4029	234	15	2250	279	266	2688	309	312	295		1.6	903	295	235		46
E-1/	950	12.9	13.1	362	74/75	31.1	15	3993	234	15	2382	279	269	2677	309	305	295		1.6	929	295	234	.0	47
E-1/	950	12.8	13.0	358	74	060	15	4015	234	15	2549	279	264	2688	309	310	305		1.6	866	295	237		45
E-1/	950	12.8	13.0	358	73/74	31.1	15	4180	234	26	Inop	279	263	2693	309	310	304		1.6	900	296	236	.0	45
E-1/	950	12.9	13.0	361	74		15	4094	235	26	2330	279	267	2680	309	308	295		1.6	969	298	236		47
E/E	950	12.8	12.9	355	74/75	27.7	15	4053	233	27	2182	279	264	2687	309	312	305	2.1	1.6	915	293	234	0	47
E/E	950	12.8	12.9	355	75	052	15	4032	233	28	2148	279	267	2671	309	307	302		1.6	951	294	237		46
E/E	950	12.6	12.8	346	74/74	27.7	15	4114	234	26	2177	279	293	2681	309	306	295	2.1	1.6	903	293	232	0	[illegible]
E/E	950	12.6	12.8	348	74		15	4128	234	27	2156	279	274	2671	309	305	300		1.6	960	296	237		44
E/E	950	12.7	12.9	352	74		15	3989	232	26	2172	279	263	2675	309	311	304	2.1	1.6	949	294	232		45
E/E	950	12.7	12.8	351	74		15	4082	233	15	2090	279	266	2687	309	312	300		1.6	876	294	239		4[illegible]
E/E	950	12.6	12.8	347	74/74	27.7	15	4007	233	26	1892	279	267	2676	309	312	305	2.1	1.6	890	297	239	.0	4[illegible]
E/E	950	12.6	12.9	349	74		15	4053	232	26	I.Nop	280	272	2666	310	306	294		1.6	959	297	239		4[illegible]
E/E	950	12.5	13.0	352	74/74	27.7	15	4169	233	27	I.Nop	280	270	2664	310	306	296	2.1	1.6	947	296	236	.0	45
E/E	950	12.6	13.0	355	74	056	15	4110	234	15	"	281	272	2667	311	311	295		1.6	885	297	237		45
E/E	950	12.5	13.1	358	73/74	28.0	15	4021	234	26	"	281	268	2606	311	314	293	2.1	1.6	963	299	234	0	45
E/E	950	12.6	13.1	358	74		15	4094	233	30	"	282	267	2662	312	312	308		1.6	945	298	234		4[illegible]

29.7

INTEGRATOR READINGS

	HIGH PRESS. STEAM	LOW PRESS. STEAM	WHITE LIQUOR	CHIP METER	WEIGHTOMETER
6 AM FINISH	358385	464977	507371	17958	
6 AM START					
DIFFERENCE					

6-4PM (Rate Change to 7[illegible]
(on [illegible] Heat[illegible]
Exhaust Fan) (Dele[illegible]

6-PM Defoamer Level 20,660 [illegible]

22 66?

E INC. 7/21 A Dig

110

…low …PM	Dig. Press PSI	Cold Blow to O D Flow	O.D. RPM	O.D. Amps	Computer Dig. Level %	Top Sep. Amps	Dig. Blow Rate GPM	Dig. Blow Valve %	Dig. Blow Temp.	Blow Line No.	Solids	S.T Level	Pre-Refiner Amp Load	Pre-Refiner Disc. Press.	No. 1 Screen Diff. Press	No. 2 Screen Diff Press	Spare Screen Diff. Press.	Surg	Reject Refiner Amp Load	Reject Refiner Disc. Press.	Washer Shower Flow	Washer Shower Temp.	To H.D. & Time	Base H.D. Level	Top H.D. Level	TIME
…0	150	97	6.5	100	25	23	830	32	160	122.3	14.2	24	698		2.2		.6	4.7	741		750	163		24	47	6 AM
…1	150	71	6.1	102	26	24	790	34	160			14	680		2.5	.1	.7	4.6	731		750	164		24	41	7
…0	150	30	6.9	100	25	22	1150	36	160	122.0	15.1	14	700		2.5	1.0	.6	4.7	716		850	164		24	38	8
…0	150	22	6.9	90	27	23	1180	35	160			14	720		2.6	1.0	.6	4.6	700		925	165		24	35	9
…50	150	31	6.8	75	26	24	1207	35	160	120.0	16.9	15	739		2.7	1.2	.8	4.6	729		925	161		27	31	10
…1	150	114	6.5	61	28	24	1204	45	160			17	745		1.7	.5	.5	4.3	731		925	140		30	30	11
…76	150	49	6.6	86	25	23	1010	34	158	11.5	17.1	18	750		1.4	.5	.6	4.5	745		925	143		33	30	12
…7	150	252	5.7	72	26	23	1194	39	157			15	721		1.6	.8	.4	3.9	748		900	135		34	29	1 PM
…8	150	202	6.0	73	27	24	1141	44	156	115.2	17.3	17	695		1.6	.5	.5	4.4	744		900	142		35	27	2
…8	150	130	6.0	77	28	23	1016	35	158			14	744		1.7	.7	.7	4.5	784		950	160		33	28	3
…7	150	124	5.7	66	31	24	1140	46	159	109.8	16.7	16	706		1.7	.2	.6	4.4	738		950	158		32	27	4
…1	150	108	5.1	63	28	23	1077	41	160			19	704		1.2	.4	.7	4.6	758		950	158		31	27	5
…3	150	54	4.8	79	29	25	1146	41.4	161	108.3	16.2	16	692		0.9	0.3	0.7	4.6	742		950	160		31	30	6
27	…1	59	4.9	78	32	23	1150	39.9	162			13	678		0.9	0.5	0.8	4.6	727		950	160		30	29	7
…	…1	37	5.8	72	35	23	1172	45.8	163	104.5	16.8	19	684		2.3	0.9	0.9	4.6	757		950	157		29	27	8
…2	157	90	6.0	68	40	23	1162	41.8	164			24	663		2.0	1.1	0.9	4.3	740		950	158		29	27	9
…6	148	209	5.9	75	33	24	1162	41.7	164			27	662		1.9	0.8	0.5	4.5	727		950	158		30	26	10
…8	150	228	5.1	69	40	24	1163	40.0	164			23	661		1.8	0.9	0.5	4.7	731		950	157		30	26	11
…5	150	192	5.7	69	50	26	1198	41.2	164	104.3	16.0	23	694		2.1	0.9	0.8	4.6	745		950	158		29	24	12
…3	152	34	5.8	82	36	24	1191	45.1	164			24	703		2.1	1.6	0.8	4.6	771		950	159		29	26	1 AM
…1	151	57	5.7	82	51	26	1244	46.3	164	115.9	16.9	24	771		2.4	2.1	1.1	4.8	794		950	159		30	28	2
…3	151	124	5.5	85	40	25	1178	42.1	164			25	734		2.3	2.0	1.0	4.8	786		950	162		30	28	3
…240	150	66	5.8	92	48	27	1203	43.8	164	113.6	15.5	23	764		2.5	2.5	1.0	4.6	806		950	163		29	30	4
…3	149	28	6.3	90	59	24	1247	44.2	164			24	767		2.9	2.8	0.9	5.3	813		950	163		29	30	5 AM

16.2

E — INSTRUCTIONS — REMARKS

7/?) (Fault [illegible] on East [illegible] Caustic)
(2 [illegible]) (Fault [illegible] on [illegible])
22 C.C. 66?)

DATE	July 21, 1992	
OPERATOR	A	B
6 AM — 6 PM	[illegible]	[illegible]
6 PM — 6 AM	Broussard	Brantley

B 7/21

DIGESTER

INLAND

PRODUCTION RATE			WHITE LIQUOR				TOP CIRCULATION				UPPER COOKING CIRCULATION ZONE			LOWER COOKING CIRCULATION ZONE				HPF	EXTRACTION ZONE					
Chip Screw Used	Prod. Rate T/D	Chip Meter RPM	WL Ea. 1 Wood	WL Flow GPM	WL % Test	Est. Res. EA	S.V. Press. PSI	Top Circ. Flow GPM	Top Circ. Temp. °F	H.P.F. Amps & Setting	Upper Cooking Cir. Fl. GPM	Heater Temp. Hot	Heater Temp. Cold	Lower Cooking Cir. Fl. GPM	Heater Temp. Hot Comp.	Heater Temp. Hot Actual	Heater Temp. Cold	4.2	Dilut. Factor Actual	Ext. Flow GPM	Ext. Temp. °F	Wash Flow GPM	White Liquor Solids	Filtrate Tank Level
E/W	450	6.6	12.7	181	72 71	31.4	14	4025	238	20	2051	283	276	2338	308	309	314	4.2	1.6	519	279	301	.0	43
E/W	450	6.6	12.7	181	71	060	14	4029	238	20	2060	283	276	2338	308	309	304	4.2	1.6	515	279	301		43
E/W	450	6.5	12.7	180	72	31.4	14	4015	238	22	2064	286	279	2329	311	315	307		1.6	520	274	300	.0	44
E/W	650	9.0	12.7	249	72		14	4039	235	23	2067	289	269	2350	314	313	304	4.2	1.6	651	281	301		42
E/W	650	9.0	12.7	249	73 72	31.4	14	4071	235	21	2067	289	269	2349	314	313	304		1.6	647	281	301	.0	42
E/W	650	9.2	12.6	250	73	056	14	4171	238	27	2058	288	277	2345	313	311	302	4.2	1.6	620	287	298		41
E/W	650	9.2	12.6	250	74 73	31.1	14	4129	238	27	2088	288	277	2348	313	311	302		1.6	623	287	298	.0	41
E/W	650	9.1	12.6	246	73	056	14	4042	236	26	2074	288	272	2363	313	315	308	4.2	1.6	686	287	299		43
E/W	650	9.1	12.6	246	74 73	31.1	14	4008	236	26	2069	288	272	2352	313	315	308		1.6	688	287	299	.0	43
E/W	650	9.3	12.5	250	74	048	14	4061	235	26	2066	288	272	2341	313	310	302	4.2	1.6	682	285	298		43
E/W	650	9.3	12.5	250	73 74	31.1	14	4044	235	26	2068	288	272	2339	313	310	302		1.6	683	285	298	.0	43
E/W	650	9.4	12.5	351	74		14	4073	235	20	2068	288	270	2350	313	314	306	4.2	1.6	689	282	301		42
E/W	700	10.1	12.4	267	74 75	27.7	14	4067	234	32	2063	289	276	2339	314	315	307	4.2	1.6	737	285	308	0	43
E/W	700	10.2	12.4	273	75	072	14	4106	235	17	2066	289	272	2339	314	315	305	'	1.6	755	286	309		42
E/W	700	10.3	12.3	271	74 74	27.7	14	4108	236	22	2072	289	280	2343	314	316	309	4.2	1.6	756	285	306	0	4
E/W	700	10.1	12.3	266	74		14	4057	236	28	2066	288	273	2353	313	310	302		1.6	770	285	306		41
E/W	700	10.0	12.3	266	74		14	4124	236	24	2064	291	281	2348	316	318	310	4.2	1.6	736	268	303		42
E/W	800	11.2	12.3	300	74		14	4057	233	29	2075	292	271	2353	317	318	307		1.6	832	290	307		42
E/W	800	11.2	12.3	299	74 74	27.7	14	4028	233	31	2056	292	270	2325	317	317	302	4.2	1.6	820	289	306	0	42
E/W	800	11.3	12.3	301	74		14	4060	233	32	2046	292	269	2350	316	313	301		1.6	816	292	304		42
E/W	800	11.3	12.3	301	74 74	27.7	14	4089	231	21	2066	292	271	2355	317	317	302	4.2	1.6	830	290	308	0	42
E/W	800	11.2	12.4	300	74	052	14	4140	233	25	2058	293	274	2338	318	316	302		1.6	833	291	306		42
E/W	800	11.5	12.4	310	74 74	26.0	14	4097	234	29	2063	292	270	2336	317	312	300	4.2	1.6	865	292	307	0	43
E/W	800	11.3	12.4	307	74		14	4120	231	19	2049	292	270	2342	317	316	302		1.6	828	293	301		42

INTEGRATOR READINGS

	HIGH PRESS. STEAM	LOW PRESS. STEAM	WHITE LIQUOR	CHIP METER	WEIGHTOMETER
6 AM FINISH	377039	378045	377803	14167	
6 AM START					
DIFFERENCE					

Rate Change entered @ 5:10 AM [illegible]
650 GPM [illegible]

6 AM 6 AM 800 T/D @ 9 75 [illegible] 48.2 mins

INC.

7/21 B Dig

90

CC OW	~~OW~~ PRESS. Dig. Press. PSI	Cold Blow to O.D. Flow	OUTLET DEVICE O.D. RPM	O.D. Amps	TOP SEPARATOR Computer Dig. Level %	Top Sep. Amps	DIGESTER BLOW RATE Dig. Blow Rate GPM	Dig. Blow Valve %	Dig. Blow Temp.	KAPPA & SOLIDS Blow Line No.	Solids	HOT STOCK SCREENS B.T. Level	Pre-Refiner Amp Load	Pre-Refiner Disc Press.	No 1 Screen Diff Press	No 2 Screen Diff. Press	Spare Screen Diff. Press		Reject Refiner Amp Load	Reject Refiner Disc Press.	B. S. WASHER Washer Shower Flow	Washer Shower Temp.	To H.D. & Time	HIGH DENSITY STORAGE Base H.D. Level	Top H.D. Level	TIME
	160	89	3.8	82	21	33	447	31	158	93.1	15.4	21	473		5.3				738		300 300	182 175	T	24	47	6 AM
7	160	89	3.8	82	21	33	411	31	158			18	478		5.6				755		300 300	182 174	T	24	42	7
	160	21	3.9	89	17	36	421	31	158	98.1	14.9	24	442		4.4	3.3			659		300 300	191 173	T	24	38	8
6	159	27	7.4	70	35	33	644	34	159			38	498		4.2	4.5			646		500 500	184 160	T	27	31	9
8	159	27	7.4	70	35	33	644	34	159	102.3	15.6	28	578		5.4	4.7			676		550 550	179 133	T	30	31	[illegible]
	160	22	7.6	69	24	34	571	34	157			30	589		5.8	4.6			657		550 550	177 131	T	30	30	[illegible]
	160	24	7.6	69	24	34	571	34	157	99.9	15.8	20	545		5.7	4.5			742		550 550	178 173	T	33	30	[illegible]
	160	253	7.8	60	34	35	608	37	155			19	442		5.1	4.3			691		550 550	171 179	T	34	29	[illegible]
3	160	253	7.8	60	34	35	608	37	155	87.9	16.6	18	535		4.9	4.0			739		550 550	192 159	T	35	28	2
	160	347	4.8	62	32	35	613	37	153			22	553		5.2	4.4			746		550 550	194 177	T	33	28	3
	160	347	4.8	62	32	35	613	37	153	88.3	15.8	22	560		5.3	4.4			785		550 550	196 180	T	32	28	4
	160	349	4.3	59	29	34	546	33	157			28	576		5.3	4.7			762		550 550	189 180	T	31	28	5
	160	61	4.6	74	30%	34	597	36.7	161	91.1	14.2	15	592		5.7	4.9					550 550	194 181	T	31	30	6
	11.2	283	4.0	62	32%	33	552	36.3	162			14	559		5.2	5.3					550 550	196 178	T	30	29	7
	[illegible]	345	4.2	54	24%	34	601	34.8	164	81.4	16.0	25	615		5.4	4.8					550 550	193 175	T	29	27	8
	160	350	3.2	57	26%	33	598	38.6	164			25	633		4.8	4.8					550 550	198 177	T	29	27	9
	160	347	3.0	58	46%	33	619	35.5	164			29	653		4.8	5.0					550 550	196 174	T	30	26	10
3	160	125	3.3	52	51%	34	708	42.1	164			27	632		5.1	4.4					550 550	195 175	T	30	25	11
	160	86	3.3	54	48%	34	712	42.4	164	78.9	16.1	28	680		5.0	4.5					550 550	196 175	T	29	24	12
7	161	249	3.1	60	42%	37	702	38.9	164			28	466		4.9	4.2					550 550	195 175	T	29	26	1 AM
	161	150	3.2	61	30%	36	728	40.5	163	78.1	16.2	26	474		5.3	4.9					550 550	195 177	T	30	28	2
	157	281	3.1	60	39%	34	719	42.5	164			24	535		4.8	4.4					550 550	197 181	T	30	28	3
9	163	346	3.0	54	32%	36	664	41.3	164	220	16.2	23	557		5.2	4.0					550 550	199 184	T	29	30	4
	159	349	2.8	67	49%	37	703	41.3	164			23	413		5.1	4.1					550 550	198 184	T	29	30	5 AM

— INSTRUCTIONS — REMARKS

s/Will be complete in 192 Mins

[illegible]

DATE	7-21-92	
	A	OPERATOR B
6 AM — 6 PM	Pennell	Templeton
6 PM — 6 AM	BROUSSARD	BRANTLEY

Evaporator Log

Date: 7-13-92

C-2 Operator 6 AM Floyd

6 PM Reid

Time	Weak Liquor Feed Total	Split Feed to 4th Eff.	Sweetening	Steam Flow to 1st Eff.	Steam Pressure	Vacuum	Feed Liquor Temperature	Feed Liquor pH	Feed Liquor % Solids	Product Liquor Temperature	Product Liquor % Solids	#1 Wk. Liquor Tank Level	#2 Wk. Liquor Tank Level	Swing Tank Level	#1 Heavy Liquor Tank Level	#2 Heavy Liquor Tank Level
6A	1764	346	72	114	41	24	212	-	19.5	214	51.7	61	61	73	75	82
7	1792	358	66	114	40	24	212	-	19.2	214	52	61	61	73	74	82
8	1760	357	49	114	40	24	209	-	19.0	214	51.6	60	60	73	75	82
9	1902	382	51	124	43	24	210	-	19.0	216	[illegible]	60	60	72	76	82
10	2003	448	60	145	49	24	209	-	19.1	218	49.9	59	59	72	77	82
11	2005	399	51	147	52	24	210	-	19.0	220	50.4	58	58	71	79	82
12	2005	396	72	148	53	24	210	-	19.2	220	50.0	57	57	70	81	82
1P	2001	401	93	145	53	24	210	-	19.3	221	50.6	56	56	70	83	82
2	2010	407	95	144	53	24	211	-	19.5	220	50.6	54	54	69	86	82
3	2008	405	106	141	53	24	211	-	19.2	220	5.5	54	54	68	87	81
4	1954	384	94	137	52	24	210	-	19.8	220	51.8	53	53	68	88	81
5	1802	358	69	119	44	24	210	-	19.1	215	51.7	52	52	68	88	81
6	1242	348	65	115	42	24	210	-	20.4	215	51.8	52	51	68	88	81
7	700	352	72	110	40	24	213	-	20.8	214	51.6	51	51	67	88	81
8	1410	326	60	113	40	24	212	-	20.2	213	51.2	51	51	67	88	81
9	1558	316	54	104	40	24	213	-	20.2	213	51.2	51	51	67	87	81
10	1550	311	50	58	38	24	214	-	20.6	212	51.8	52	52	67	86	81
11	1500	300	48	58	37	24	215	-	20.1	212	51.2	52	52	67	86	81
12	1508	302	43	92	36	24	214	-	20.2	211	52.0	53	53	66	85	81
1A	1500	300	44	92	37	24	214	-	20.2	211	52.4	53	53	66	84	81
2	1400	251	44	88	34	24	214	-	20.2	211	52.4	54	53	66	83	81
3	1354	278	43	83	31	24	215	-	20.2	208	52.4	55	55	66	82	81
4	1355	277	44	83	31	24	215	-	20.8	208	52.4	56	56	66	82	81
5	1356	275	37	78	29	24	215	-	20.9	208	52.4	56	56	66	80	81

Time	Ballout Tank Level	6th Eff. Dome Pressure	5th Eff. Dome Pressure	4th Eff. Dome Pressure	3rd Eff. Dome Pressure	2nd Eff. Dome Pressure	1st Eff. Dome Pressure	Boiling Point Rise	Steam to #1 Eff. Temperature	Clean Condensate Conductivity	Comp. Cond. Conductivity	Water to Cond. Temperature	Water from Cond. Temperature
6A	1	24	20	15	-5	2	13	-5.0	300	8	72	-	117
7	1	24	20	14	-5	2	13	-5.0	302	8	74	-	117
8	1	24	20	14	-5	2	13	-5.0	300	8	74	-	117
9	1	24	19	14	-4	2	13	-5.0	300	8	77	-	119
10	1	24	19	13	-3	4	14	-5.0	299	8	80	-	123
11	2	24	19	13	-2	5	16	-5.0	301	8	80	-	125
12	2	24	19	12	-2	5	17	-5.0	301	8	81	-	124
1P	3	24	19	12	-2	5	18	-5.0	300	8	81	-	124
2	7	24	19	13	-3	5	18	-5.0	296	8	83	-	124
3	7	24	19	13	-3	5	19	-5.0	302	8	83	-	123
4	7	24	19	13	-3	4	19	-5.0	300	8	82	-	123
5	7	24	20	14	-4	3	18	-5.0	299	8	80	-	120
6	7	24	20	14	-5	2	17	-	257	8	75	-	119
7	7	24	20	14	-5	2	15	-	258	8	77	-	118
8	7	24	20	15	-5	2	14	-	300	8	76	-	118
9	7	25	20	15	-6	1	13	-	300	8	74	-	117
10	7	24	20	15	-6	1	13	-	255	8	73	-	115
11	7	25	20	15	-6	0	12	-	301	8	71	-	115
12	7	25	21	16	-7	0	11	-	300	8	71	-	113
1A	7	25	21	15	-7	0	11	-	299	8	20	-	113
2	8	25	21	14	-7	0	11	-	252	8	70	-	112
3	2	25	21	16	-8	0	10	-	300	8	72	-	110
4	8	25	21	16	-6	0	10	-	301	8	72	-	110
5	8	25	21	16	-8	0	9	-	258	8	72	-	110

Time	Tall Oil Soap Storage Level	Evaporator Soap Storage Level	Soap Head Inches	Liquor Solids to Skimmer	Liquor Temp. to Skimmer	Skimming from which Effect	Skimmer Flow IN	Skimmer Flow OUT	Skimming from Weak Tanks	Skimming from Heavy Tanks	Secondary O_2	Tertiary (A) O_2	Tertiary (B) O_2	Sulf Mg / Lit.	Liquor Transfer East Pond To	East Pond From	West Pond To	West Pond From
6A	86	2	24"			3rd	854	850	✓	✓	1730		2660	.1				
7	82	6	"			3rd	857	832	✓	✓	1730		2664	.0				
8	83	6	"			"	866	889	✓	✓	1725		2642	.3				
9	84	9	"			"	1028	960	✓	✓								
10	85	24	18"			"	1000	1070	✓	✓	19720		2692	.2				
11	86	17	6"			"	1003	1029	✓	✓								
12	87	20	6"			"	1058	1049	✓	✓	1980		2281	.2				
1P	88	21	6"			"	1044	1041	✓	✓								
2	89	22	6"			"	1057	1039	✓	✓	19630		2591	.1				
3	90	22	6"			"	1077	1014	✓	✓								
4	91	22	6"			"	1047	973	✓	✓	19030		2640	.2				
5	92	22	6"			"	931	849	✓	✓								
6	87	21	6"			"	769	888	✓	✓	1510		2620	.3				
7	85	21	12"			"	753	845	✓	✓								
8	86	21	12"			✓	744	835	✓	✓	3200		2195	.2				
9	87	20	✓			✓	767	704	✓	✓								
10	88	18	✓			✓	652	657	✓	✓	15130		2622	.6				
11	89	17	✓			✓	734	673	✓	✓								
12	90	15	✓			✓	600	679	✓	✓	14230		2671	.0				
1A	90	14	✓			✓	653	625	✓	✓								
2	91	11	✓			✓	664	625	✓	✓	3220		2802	0				
3	93	8	✓			✓	552	577	✓	✓								
4	94	5	✓			✓	546	586	✓	✓	3700		2645	.1				
5	94	3	✓			✓	575	605	✓	✓								

1721

Remarks: 8:00 Am Sweetening from Swing Tank. 2:15 Am Sweetening from North Heavy tk.

TANK	FEET
North Heavy	47
South Heavy	47
Swing	54
North Weak	54
South Weak	54
Boil Out	35

Pond Levels

% Full	
East	West
100	Empty

Oxygen Integrator Reading

6 AM 0

6 PM

Evaporator Log

C-2 Operator 6 AM Lloyd

6 PM

Date: 7-14-92

Time	Weak Liquor Feed Total	3rd Feed to 4th Eff.	Sweetening	Steam Flow to 1st Eff.	Steam Pressure	Vacuum	Feed Liquid Temperature	Feed Liquid pH	Feed Liquid % Solids	Product Liquid Temperature	Product Liquid % Solids	#1 Wk. Liquid Tank Level	#2 Wk. Liquid Tank Level	Swing Tank Level	#1 Heavy Liquid Tank Level	#2 Heavy Liquid Tank Level	Boilout Tank Level
6A	1401	278	40	82	29	24	215	-	19.6	206	52.5	57	57	66	80	81	8
7	1453	291	42	84	29	24	214	-	19.5	206	51.7	58	58	66	79	81	8
8	1601	325	41	103	35	24	209	-	19.4	209	51	59	59	65	79	81	8
9	1750	344	44	117	44	24	208	-	19.2	216	50.7	59	58	65	80	81	8
10	1944	388	46	140	53	24	209	-	19.6	218	50	58	58	65	81	81	8
11	1939	387	38	142	54	24	211	-	19.5	219	50	57	57	64	83	81	8
12	1970	395	58	142	54	24	210	-	19.7	219	50.5	56	56	64	84	81	8
1P	1953	389	65	139	54	24	210	-	19.5	218	50.7	56	56	64	85	81	8
2	1962	391	63	139	54	24	212	-	19.6	218	50.8	55	55	64	87	81	8
3	1814	366	36	123	45	24	209	-	19.6	215	50.5	54	54	63	88	81	8
4	1816	379	35	122	44	24	209	-	19.4	215	50.4	54	54	63	89	81	8
5	1775	361	37	119	43	24	209	-	19.5	214	50.5	53	53	63	90	81	11
6	[illegible]	355	42	119	43	24	208		19.0	214	51.6	53	53	63	90	81	11
7	[illegible]	351	45	120	42	24	207		19.2	214	52.0	53	53	62	91	81	11
8	1762	360	49	121	42	24	208		19.2	214	51.8	52	52	62	91	81	11
9	1741	360	47	112	42	24	208		19.0	214	52.4	52	52	62	92	81	11
10	1715	341	47	111	42	24	208		19.4	214	52.1	52	52	62	91	81	11
11	1672	337	47	110	42	24	214		19.0	214	52.4	52	52	62	91	81	11
12	1682	340	48	112	41	24	210		18.0	213	52.2	53	52	62	91	81	11
1A	[illegible]	348	49	112	42	24	210		18.6	214	52.6	53	52	62	91	81	11
2	1720	347	49	115	42	24	211		18.0	213	52.0	53	52	62	91	81	11
3	1712	348	47	112	42	24	210		18.4	212	52.2	53	52	62	92	81	11
4	1661	330	41	112	42	24	210		18.6	211	52.4	53	53	62	92	81	11
5	[illegible]	[illegible]	39	112	41	25	210		19.4	213	52.6	53	51	62	92	81	11

Time	6th Eff. Dome Pressure	5th Eff. Dome Pressure	4th Eff. Dome Pressure	3rd Eff. Dome Pressure	2nd Eff. Dome Pressure	1st Eff. Dome Pressure	Boiling Point Rise	Steam to #1 Eff. Temperature	Clean Condensate Conductivity	Comb. Cond Conductivity	Water to Cond Temperature	Water from Cond Temperature
6A	25	21	16	-8	0	9	-5.0	300	8	73	-	109
7	25	21	16	-8	0	9	5.0	301	8	73	-	109
8	25	[illegible]	15	-7	1	9	-5.0	300	8	73	-	112
9	24	19	14	-4	3	10	-5.0	299	8	78		119
10	24	19	13	-3	4	13	-5.0	302	8	83	-	121
11	24	19	13	-3	4	16	-5.0	300	8	83	-	123
12	24	19	13	-3	5	16	-5.0	299	8	84	-	123
1P	24	19	14	-3	4	17	-5.0	299	7	82	-	12[illegible]
2	24	19	14	-3	4	18	-5.0	301	7	81	-	123
3	24	20	14	-4	3	17	-5.0	300	8	81	-	121
4	24	20	14	-4	3	17	-5.0	299	8	81	-	120
5	25	20	15	-5	2	15	-5.0	301	8	82	-	120
6	25	20	15	-5	2	15	-5	300	8	81	-	120
7	25	20	15	-5	2	15	-5	300	8	80	-	119
8	25	20	15	-5	2	14	-5	300	8	78	-	118
9	25	20	15	-5	2	13	-5	300	8	77	-	119
10	25	20	15	-5	2	13	-5	299	8	76	-	118
11	25	20	15	-5	2	13	-5	300	8	75	-	116
12	25	20	15	-5	2	13	-5	299	8	75	-	119
1A	24	20	15	-5	2	13	-5	300	8	74	-	118
2	25	20	15	-5	2	13	-5	301	8	74	-	113
3	25	20	15	-6	2	13	-5	301	8	74	-	119
4	25	20	15	-6	2	13	-5	300	8	79	-	118
5	25	20	15	-6	2	13	-5	300	8	75	-	119

Time	Soap Recovery: Tall Oil Soap Storage Level	Evaporator Soap Storage Level	Soap Head Inches	Liquor Solids to Skimmer	Liquor Temp to Skimmer	Skimming from which Effect	Skimmer Flow IN	Skimmer Flow OUT	Skimming from Weak Tanks	Skimming from Heavy Tanks	O_2 System: Secondary O_2	Tertiary (A) O_2	Tertiary (B) O_2	Sulf Mg/Lt	Liquor Transfer: East Pond To	East Pond From	West Pond To	West Pond From
6A	95	3	12"			3rd	601	632	✓	✓	3116		2959	.1				
7	93	3	-			"	653	630	✓	✓								
8	90	3	-			"	744	721		✓	13360		2682	.1				
9	82	4	-			"	939	799		✓								
10	81	4	-			"	940	920		✓	13500		2709	.1				
11	83	5	-			"	1050	[illegible]		✓								
12	83	4	-			"	1059	[illegible]		✓	[illegible]		2621	.6				
1P	53	3	✓			"	1190	1003		✓								
2	54	3	✓			"	974	1005		✓	16530		2616	.1				
3	77	3	✓			"	983	858		✓								
4	77	4	✓			"	900	872		✓	14950		2631	.0				
5	78	3	✓			"	805	579										
6	78	3	12"			3rd	527	664			13700		2671	.1				
7	72	3					562	864										
8	72	3					906	883			12800		2842	.1				
9	77	3					841	864										
10	72	3					625	781			14320		2216	.3				
11	72	3					799	782										
12	77	3					831	815			14180		2487	0				
1A	77	3					813	287										
2	77	3					784	[illegible]			14240		2280	.1				
3	77	3					790	833										
4	77	3					532	642			14200		2271	.1				
5	76	3					740	[illegible]										

1751

Remarks: 7 30 pm Sweetening from Swing.

TANK	FEET
North Heavy	47
South Heavy	47
Swing	54
North Weak	54
South Weak	54
Boil Out	35

Pond Levels

% Full	
East	West
100	n.T.

Oxygen Integrator Reading

6 AM

6 PM

7-15

Evaporator Log

Date: July 15, 92

C-2 Operator 6 AM Byrd
6 PM B[illegible]

Time	Weak Liquor Feed Total	Split Feed to 4th Eff.	Sweetening	Steam Flow to 1st Eff.	Steam Pressure	Vacuum	Feed Liquid Temperature	Feed Liquid pH	Feed Liquid % Solids	Product Liquid Temperature	Product Liquid % Solids	#1 Wk. Liquid Tank Level	#2 Wk. Liquid Tank Level	Swing Tank Level	#1 Heavy Liquid Tank Level	#2 Heavy Liquid Tank Level	Boilout Tank Level
6 A	1714	341	40	114	42	24	211	–	20	213	52.3	53	53	62	92	81	11
7	1613	317	28	97	36	24	210	–	19.8	210	52	53	53	62	92	81	11
8	1603	321	37	103	36	24	211	–	19.7	209	[illegible]	53	53	62	92	81	11
9	1603	301	38	102	36	24	210	–	19.5	210	51.9	53	53	62	92	81	11
10	1504	299	36	95	32	24	209	–	19.4	207	52	54	54	62	92	81	11
11	1490	297	36	94	31	24	212	–	19.4	207	51.8	55	55	62	91	81	11
12	1705	343	29	115	41	25	210	–	19.6	210	51.7	55	55	62	91	81	11
1 P	1915	389	49	134	51	24	207	–	19.5	217	51.9	55	55	62	91	81	11
2	1915	392	38	137	51	24	208	–	19.4	218	51.4	54	54	62	92	81	11
3	1905	387	41	136	51	24	209	–	19.5	215	51.6	54	54	62	93	81	11
4	1917	377	59	127	50	24	209	–	19.6	214	52	53	53	62	94	81	12
5	1915	380	53	127	49	24	208	–	19.5	215	51.5	52	52	62	94	81	12
6	1904	387	46	129	49	24	211	–	19.0	211	51.2	52	52	62	95	81	12
7	1926	384	52	129	49	24	212	–	18.4	215	51.8	51	51	62	94	81	12
8	1916	387	58	129	49	24	212		18.4	215	51.6	51	51	62	96	81	12
9	1850	350	50	121	47	24	214		18.6	210	52.0	51	51	63	95	81	12
10	1860	356	47	116	45	24	204		18.0	216	52.8	51	51	64	95	81	12
11	1722	348	44	110	42	24	207		18.6	211	52.2	51	51	65	94	81	12
12	1701	347	41	137	42	24	208		18.4	212	52.0	51	51	65	92	81	12
1 A	1610	324	27	102	37	24	207		18.6	208	52.0	52	52	66	91	81	12
2	1641	348	27	98	36	24	207		18.2	207	52.0	52	53	65	91	81	12
3	1578	315	36	98	36	24	208		18.0	207	52.4	54	53	65	91	81	13
4	1632	359	46	98	36	25	212		18.4	207	52.8	54	54	65	90	81	12
5	1582	314	35	98	33	24	207		18.6	208	52.8	55	55	65	90	81	12

1737

Time	6th Eff. Dome Pressure	5th Eff. Dome Pressure	4th Eff. Dome Pressure	3rd Eff. Dome Pressure	2nd Eff. Dome Pressure	1st Eff. Dome Pressure	Boiling Point Rise	Steam to #1 Eff. Temperature	Clean Condensate Conductivity	Comb. Cond Conductivity	Water to Cond. Temperature	Water from Cond. Temperature
6 A	25	20	15	-5	2	13	-5	301	8	74	–	117
7	25	21	16	-7	0	12	-5.	296	8	72		117
8	25	20	16	-6	1	12	-5.	300	8	72	–	117
9	24	20	15	-6	1	12	-5.	300	8	70	–	116
10	25	21	16	-7	0	11	-5.0	300	8	71	–	109
11	25	21	17	-8	0	9	-5.0	300	7	69	–	106
12	25	21	16	-6	1	9	5.0	303	8	87	–	109
1 P	24	19	15	-3	4	13	-5.0	301	7	76	–	113
2	24	20	15	-3	4	15	-5.0	300	7	79	–	115
3	25	20	15	-5	3	16	-5.0	300	7	79	.	113
4	25	19	15	-5	3	16	-5.0	301	7	75	–	111
5	25	20	16	-5	3	16	-5.0	301	7	74	–	110
6	25	20	15	-5	3	16	-5	301	7	72	–	111
7	25	20	15	-5	3	16	-5	300	7	75	–	111
8	25	20	15	-1	3	16	-5	300	7	74	–	111
9	25	20	15	-4	3	16	-5	301	7	73	–	108
10	25	20	15	-5	3	15	-5	300	7	76	–	107
11	25	20	15	-6	2	15	-5	301	7	68	–	107
12	25	20	15	-6	1	14	-5	298	7	68	+	103
1 A	25	20	15	-2	0	13	-5	301	7	67	–	105
2	25	20	16	-7	0	12	-5	299	7	67	–	106
3	25	20	15	-7	[illegible]	12	-5	301	7	67	–	[illegible]
4	25	20	15	-7	0	11	-5	300	7	67	–	107
5	25	20	16	-7	0	11	-5	299	8	68	–	107

Time	Soap Recovery: Tall Oil Soap Storage Level	Evaporator Soap Storage Level	Soap Head Inches	Liquor Solids to Skimmer	Liquor Temp to Skimmer	Skimming from which Effect	Skimmer Flow IN	Skimmer Flow OUT	Skimming from Weak Tanks	Skimming from Heavy Tanks	O_2 System: Secondary O_2	Tertiary (A) O_2	Tertiary (B) O_2	Sulf Mg / Lt.	Liquor Transfer: East Pond To	East Pond From	West Pond To	West Pond From
6 A	76	3	24"			3rd.	747	774				14270	2818	.2				
7	72	3	✓			"	709	834										
8	68	3	✓			"	761	761				13420	2693	.1				
9	66	3	✓			"	735	731										
10	66	3	✓			"	780	[illegible]				[illegible]	2735	.1				
11	67	3	✓			"	675	694										
12	66	3	✓			"	819	772				14200	2762	.1				
1 P	67	4	✓			"	999	972										
2	62	4	✓			"	955	979				5300	2813	.1				
3	58	4	✓			"	920	990										
4	59	3	✓			"	866	[illegible]				1570	2049	.2				
5	59	3	✓			"	1023	925										
6	59	3	24"			2nd	857	840				17920	2720		0			
7	60	3					625	892										
8	60	3					842	900				17380	2638		0			
9	60	3					810	821										
10	60	3					766	810				15520	2642		[illegible]			
11	61	3					720	741										
12	60	3					788	764				15260	2680		.1			
1 A	60	3					721	677										
2	60	3					725	683				12170	2486		.1			
3	60	3					784	687										
4	60	3					701	685				12820	2622		1			
5	61	3					650	701										

Remarks: West Product Liq. pump down for Maint. West Skimmer pump down for Maint.

TANK	FEET
North Heavy	47
South Heavy	47
Swing	54
North Weak	54
South Weak	54
Boil Out	35

Pond Levels

% Full	
East	West
100%	Lo [illegible]
100 %	m.T.

Oxygen Integrator Reading

6 AM -0-

6 PM

7/21

Evapora[illegible] Log

Date: 21 July 92

C-2 Operator 6 AM Vyson & Bull

6 PM

Time	Weak Liquor Feed Total	3rd Feed to 4th Eff.	Sweetening	Steam Flow to 1st Eff.	Steam Pressure	Vacuum	Feed Liquid Temperature	Feed Liquid pH	Feed Liquid % Solids	Product Liquid Temperature	Product Liquid % Solids	#1 Wk. Liquid Tank Level	#2 Wk. Liquid Tank Level	Swing Tank Level	#1 Heavy Liquid Tank Level	#2 Heavy Liquid Tank Level	Boilout Tank Level	6th Eff. Dome Pressure	5th Eff. Dome Pressure	4th Eff. Dome Pressure	3rd Eff. Dome Pressure	2nd Eff. Dome Pressure	1st Eff. Dome Pressure	Boiling Point Rise	Steam to #1 Eff. Temperature	Clean Condensate Conductivity	Comb. Cond. Conductivity	Water to Cond. Temperature	Water from Cond. Temperature
6A	1511	299	59	95	36	24	210		18.8	206	52.1	46	46	73	80	81	1	25	21	17	-7	1	12	-5.	300	7	67	-	99
7	1490	301	40	99	35	24	209		18.4	206	[illegible]	46	46	73	80	81	1	24	21	17	-7	1	12	-5.	299	8	67	-	99
8	1454	304	40	93	35	24	210		18.9	20[illegible]	[illegible]	47	46	73	80	81	1	24	21	17	-7	1	12	-5.	301	7	64	-	98
9	1462	291	40	93	35	24	214		18.8	[illegible]	[illegible]	47	47	72	80	81	1	24	20	17	-7	1	13	-5	300	7	66	—	99
10																													
11	[illegible]	289	43	68	35	25	210		18.4	218		48	48	72	75	81	51	25	16	5	3	4	11	-5	255	8	?	-	[illegible]
12																													
1P	1880	372	43	135	44	24	210		18.2	212	50.9	50	51	71	73	77	31	24	20	15	-3	3	13	+5.	298	7	158	-	109
2	1896	382	40	129	43	24	210		18.6	215	50.0	51	51	71	74	76	1	24	20	15	-4	3	15	-5.	300	7	101	-	107
3	1917	385	36	134	44	24	211		18.4	214	50.6	51	51	71	75	76	1	24	21	16	-4	3	15	-5.	300	7	94	-	109
4	1922	[illegible]	35	132	45	24	210		18.9	214	51.2	50	50	71	76	76	1	24	21	16	-4	2	16	-5	[illegible]	7	89	-	109
5	[illegible]	309	[illegible]	[illegible]	35	25	212		19.2	212	51.8	50	50	70	77	77	1	24	21	16	-5	2	16	-5	300	7	[illegible]		[illegible]
6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	211	214		18.8	[illegible]	51.6	50	50	[illegible]	[illegible]	[illegible]	1	[illegible]	21	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]		
7	1513	[illegible]	37	99	37	24	214		18.8	208	51.6	52	51	70	[illegible]	[illegible]	1	24	21	17	[illegible]	1	15	[illegible]	[illegible]	7	[illegible]	-	[illegible]
8	[illegible]	[illegible]	29	[illegible]	[illegible]	24	210		18.6	208	51.8	53	52	70	76	75	1	[illegible]	[illegible]	[illegible]	[illegible]	1	[illegible]	[illegible]	[illegible]	1	[illegible]	-	[illegible]
9	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	208		18.6	207	51.5	53	53	70	76	75	1	24	20	17	[illegible]	1	[illegible]	-5	[illegible]	7	[illegible]	-	[illegible]
10	[illegible]	[illegible]	[illegible]	[illegible]	37	24	200		18.8	207	51.8	54	54	70	76	75	1	24	20	17	6	1	12	-5	[illegible]	7	[illegible]	-	[illegible]
11	[illegible]	[illegible]	[illegible]	[illegible]	37	24	208		19.0	207	51.6	55	55	70	75	76	1	24	20	17	[illegible]	1	12	-5	301	[illegible]	[illegible]	-	[illegible]
12	[illegible]	[illegible]	27	93	37	24	209		19.0	208	52.0	56	56	70	75	76	1	24	20	17	-6	1	12	-5	301	7	55	-	10[illegible]
1A	[illegible]	[illegible]	[illegible]	[illegible]	41	24	206		19.0	[illegible]	52.0	56	56	70	75	76	1	24	20	15	[illegible]	1	12	-5	300	7	[illegible]	-	[illegible]
2	18[illegible]	[illegible]	[illegible]	[illegible]	42	24	205		19.6	[illegible]	51.4	56	56	69	76	76	1	24	20	16	[illegible]	1	13	-5	[illegible]	7	[illegible]	-	
3	[illegible]	[illegible]	[illegible]	112	43	24	208		19.2	212	52.0	57	57	69	77	76	1	24	20	16	-4	2	14	-5	[illegible]	7	[illegible]	-	[illegible]
4	1893	386	20	118	44	24	210		19.0	214	51.0	57	57	69	79	76	1	24	20	16	-4	4	16	-5.	299	7	69	—	105
5	1874	369	21	118	44	24	211		18.9	214	51.4	57	57	69	80	76	1	24	20	16	-4	3	16	-5.	301	7	68	-	105

Time	Soap Recovery: Tall Oil Soap Storage Level	Evaporator Soap Storage Level	Soap Head Inches	Liquor Solids to Skimmer	Liquor Temp to Skimmer	Skimming from which Effect	Skimmer Flow IN	Skimmer Flow OUT	Skimming from Weak Tanks	Skimming from Heavy Tanks	O_2 System: Secondary O_2	Tertiary (A) O_2	Tertiary (B) O_2	Sulf Mg / Lit.	Liquor Transfer East Pond: To	From	West Pond: To	From
6A	47	1	12"			3rd	693	690				7980	2018	.1				
7	47	1					584	723										
8	48	1					641	628				7870	2158	.0				
9	44	1					525	300				8400	2098	.1				
10																		
11	43	1					[illegible]	[illegible]				112[illegible]	2144	1.0				
12																		
1P	44	16					1101	926				11230	2102	1.4				
2	45	25					1022	913										
3	45	30					1017	970				11230	2116	1.0				
4	47	[illegible]																
5	[illegible]	[illegible]										[illegible]	[illegible]	.9				
6		[illegible]																
7	50	[illegible]					[illegible]	[illegible]				[illegible]	[illegible]	.6				
8	51	[illegible]																
9	51	[illegible]																
10	51	[illegible]										[illegible]	[illegible]	.7				
11	51	[illegible]											[illegible]	.6				
12	51	[illegible]																
1A	[illegible]	[illegible]												.6				
2		7																
3	[illegible]	[illegible]												.1				
4	52	2					1046	1001										
5	52	2					1076	961				10380	1000	.1				

1654

Remarks: 6a6p West Skimmer pump in service. East skimmer pump down for B/R. Lost East 3rd Eff pump several times.

TANK	FEET
North Heavy	47
South Heavy	47
Swing	54
North Weak	54
South Weak	54
Boil Out	35

Pond Levels

% Full	
East	West
89.9%	Empty

Oxygen Integrator Reading

6 AM 0

6 PM

Evaporator Log

Date: 12 July 92

C-2 Operator 6 AM Waddell

6 PM Steve

Time	Weak Liquor Feed Total	Split Feed to 4th Eff.	Sweetening	Steam Flow to 1st Eff.	Steam Pressure	Vacuum	Feed Liquid Temperature	Feed Liquid pH	Feed Liquid % Solids	Product Liquid Temperature	Product Liquid % Solids	#1 Wk. Liquid Tank Level	#2 Wk. Liquid Tank Level	Swing Tank Level	#1 Heavy Liquid Tank Level	#2 Heavy Liquid Tank Level
6A	1780	356	86	122	42	24	210	–	18.8	215	50.4	74	74	73	85	94
7	1860	357	92	122	42	24	210	–	16.0	215	[illegible]	74	74	73	85	94
8	1750	353	68	124	42	24	210	–	16.0	216	[illegible]	74	74	73	86	94
9	1810	362	66	121	42	24	211	–	15.0	215	50.4	74	74	73	86	94
10	1801	363	10	124	42	24	209	–	15.4	215	50.0	74	74	73	86	94
11	1810	360	66	127	42	24	210	–	15.4	215	50.1	74	74	73	87	94
12	1801	361	57	125	42	24	210	–	15.6	215	50.3	73	73	73	87	94
1P	1756	360	59	126	42	24	210	–	15.4	215	50.0	73	73	73	87	94
2																
3	1803	361	51	125	42	24	210	–	16.0	215	50.1	72	72	73	87	94
4	1780	348	56	124	42	24	211	–	18.8	216	50.5	72	72	75	85	94
5	1820	371	54	124	42	24	211	–	19.0	215	50.6	71	71	76	84	94
6	1796	356	62	122	42	24	211	–	18.8	215	51.4	70	70	76	84	94
7	1799	[illegible]	66	120	42	24	212	–	18.8	215	51.6	70	70	76	84	94
8	[illegible]	[illegible]	[illegible]	120	42	24	213	–	19.0	215	51.8	69	69	76	84	94
9	[illegible]	[illegible]	[illegible]	117	42	24	213	–	19.2	[illegible]	52.2	69	69	76	84	94
10	1791	[illegible]	54	117	42	24	213	–	19.6	215	51.1	68	68	76	84	94
11	[illegible]		[illegible]	117	[illegible]	24	[illegible]	–	19.3	[illegible]	51.8	[illegible]	68	[illegible]		94
12	1810	360	62	116	42	24	214	–	[illegible]	215	51.4	66	66	76	82	94
1A	1811	[illegible]	61	117	42	24	214	–	19.8	215	51.2	67	66	76	83	94
2	1796	[illegible]	60	118	42	24	214	–	19.6	215	51.4	66	67	76	83	94
3	[illegible]	[illegible]	60	118	42	24	214	–	19.6	215	51.2	66	66	76	83	94
4	1792	[illegible]	[illegible]	117	42	24	214	–	19.4	[illegible]	51.0	65	65	76	83	94
5	[illegible]	[illegible]	[illegible]	117	42	24	214	–	19.6	[illegible]	50.6	65	65	76	83	94
	1797	358	~~70~~	121					19.1		50.7					

Time	Boilout Tank Level	6th Eff. Dome Pressure	5th Eff. Dome Pressure	4th Eff. Dome Pressure	3rd Eff. Dome Pressure	2nd Eff. Dome Pressure	1st Eff. Dome Pressure	Boiling Point Rise	Steam to #1 Eff. Temperature	Clean Condensate Conductivity	Comb. Cond. Conductivity	Water to Cond. Temperature	Water from Cond. Temperature
6A	1	24	20	15	-4	2	14	-5	300	4	74	–	110
7	1	24	20	15	-4	2	14	-5	304	4	74	–	111
8	1	24	20	15	-4	2	15	-5	300	4	75	–	112
9	1	24	20	14	-4	2	15	-5	298	4	75	–	113
10	1	24	19	14	-4	2	15	-5	302	4	76	–	112
11	1	24	19	14	-3	3	15	-5	301	4	76	–	114
12	1	24	20	14	-4	2	15	-5	300	4	76	–	113
1P	2	24	20	14	-4	2	15	-5	305	4	78	–	113
2													
3	2	24	20	14	-4	2	15	-5	300	4	77	–	112
4	2	24	19	14	-3	2	15	-5	300	4	76	–	112
5	2	24	20	14	-4	2	15	-5	300	4	77	–	112
6	2	24	20	14	-4	2	14	-5	[illegible]	4	76	–	112
7	2	24	20	15	-4	2	14	-5	299	4	76	–	116
8	2	24	20	13	-4	2	13	-5	[illegible]	4	76	–	121
9	2	24	20	13	-4	2	13	-5	[illegible]	4	[illegible]	–	120
10	2	24	20	15	-4	2	13	-5	[illegible]	4	[illegible]	–	120
11	2	24	20	[illegible]	-4	2	13	-5	[illegible]	4	[illegible]	–	120
12	2	24	20	15	-4	2	13	-5	[illegible]	[illegible]	[illegible]	–	120
1A	2	24	20	15	-4	2	13	-5	[illegible]	4	[illegible]	–	120
2	2	24	20	14	[illegible]	2	13	-5	[illegible]	4	[illegible]	–	120
3	2	24	20	14	-5	2	13	-5	302	4	72	–	120
4	3	24	20	14	-4	2	13	-5	[illegible]	4	72	–	120
5	3	24	20	14	-4	2	13	-5	[illegible]	4	[illegible] 75	–	119

Time	Tall Oil Soap Storage Level	Evaporator Soap Storage Level	Soap Head Inches	Liquor Solids to Skimmer	Liquor Temp. to Skimmer	Skimming from which Effect	Skimmer Flow IN	Skimmer Flow OUT	Skimming from Weak Tanks	Skimming from Heavy Tanks	Secondary O_3	Tertiary (A) O_3	Tertiary (B) O_3	Sulf. Mg / Lit.	East Pond To	East Pond From	West Pond To	West Pond From
6A	65	2	18"			3rd	938	933			[illegible]		2049	1.9				
7	65	2					814	960										
8	65	2					938	920			9570		7	2.1				
9	64	2					985	877										
10	59	2					925	946			14070		1671	1.5				
11	58	2					705	858										
12	58	2					862	923			13570		1878	1.7				
1P	58	3					979	932										
2																		
3	58	3					959	857										
4	58	3					757	870			14670		1873	2.1				
5	59	3					861	868										
6	55	2	18"			3rd	[illegible]	[illegible]			[illegible]		1778	[illegible]				
7	58	2					[illegible]	[illegible]										
8	58	2					[illegible]	[illegible]			[illegible]		[illegible]	1.6				
9	58	2					[illegible]											
10	58	2									[illegible]		[illegible]	1.2				
11	58	2																
12	[illegible]	2					[illegible]	[illegible]			[illegible]		[illegible]	1.3				
1A	58	2					[illegible]	[illegible]										
2	58	[illegible]					[illegible]	[illegible]			[illegible]		[illegible]	[illegible]				
3	59	3					[illegible]	[illegible]										
4	59	3					[illegible]	[illegible]			[illegible]		[illegible]	1.4				
5	[illegible]	3						[illegible]										

Remarks: Pumping soap to tall oil. Maint on sec + tert. oxygen all day

TANK	FEET
North Heavy	47
South Heavy	47
Swing	54
North Weak	54
South Weak	54
Boil Out	35

Pond Levels

% Full	
East	West
100%	-0-
[illegible]	[illegible]

Oxygen Integrator Reading

6 AM

6 PM —

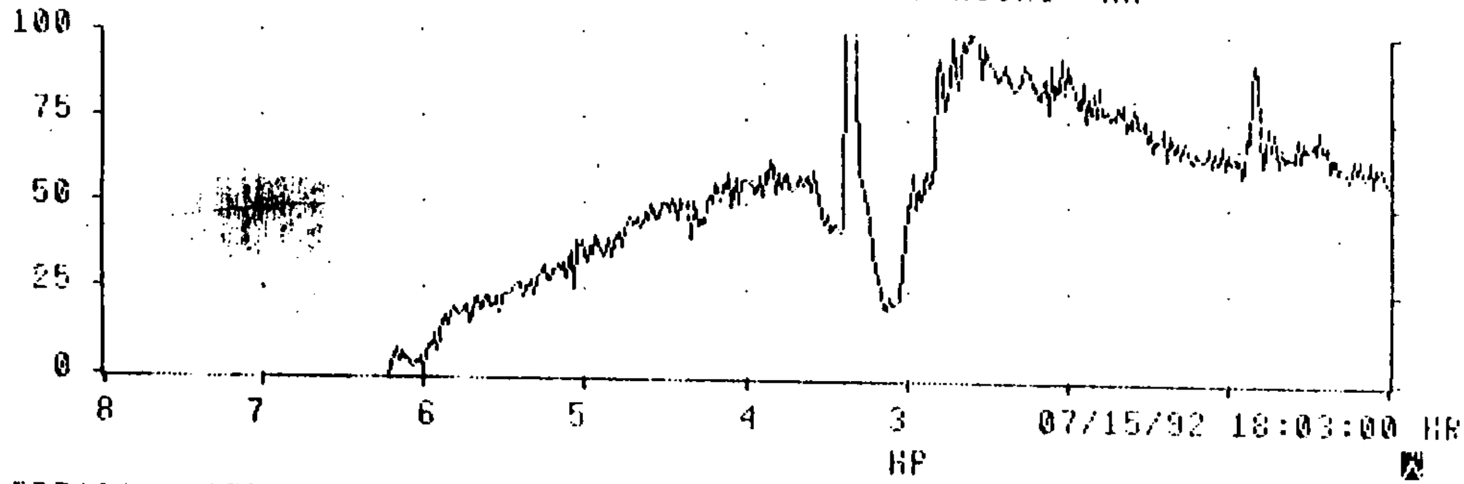
16 Jul 92 10:04:18 1

GROUP 368 EVAPORATOR CONDENSATE 8 HOURS HM

400 MICROMHO

AI7604

200 MICROMHO



	TI7191 DEG. F CLN COND	AI7229 MICROMHO CLN COND	HS7229 CLN DUMP	LC7262 PERCENT 6CMBCOND	LC7158 PERCENT COMBCOND	AI7263 MICROMHO COMBCOND	HS7263 COMBDUMP	AI7604 MICROMHO HOTWELL
SP	210.0	19.9		40.0	80.0v	500.0		0
PV	194.2	7.8		39.9	95.9	66.7	CLOSED	160
OP%			CLOSED	26.3	-5.0L		CLOSED	
			MAN	AUTO	AUTO		MAN	

AI7604 HOTWELL CONDUCTIVITY

PVSOURCE AUTO

16 Jul 92 10:03:28 1

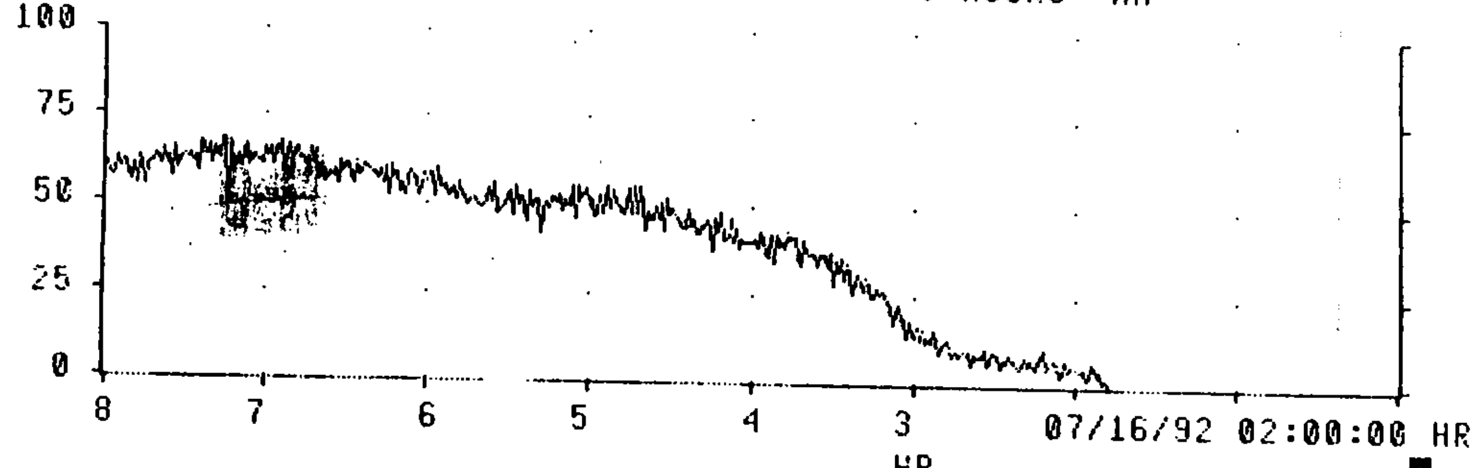
GROUP 368 EVAPORATOR CONDENSATE

8 HOURS HM

400 MICROMHO

AI7604

200 MICROMHO



	TI7191 DEG. F CLN COND	AI7229 MICROMHO CLN COND	HS7229 CLN DUMP	LC7262 PERCENT 6CMBCOND	LC7158 PERCENT COMBCOND	AI7263 MICROMHO COMBCOND	HS7263 COMBDUMP	AI7604 MICROMHO HOTWELL
SP	210.0	19.9		40.0	80.0v	500.0		0
PV	194.2	7.6		40.1	95.7	66.1	CLOSED	164
OP%			CLOSED	25.7	-5.0L		CLOSED	
			MAN	AUTO	AUTO		MAN	

AI7604 HOTWELL CONDUCTIVITY

PVSOURCE AUTO

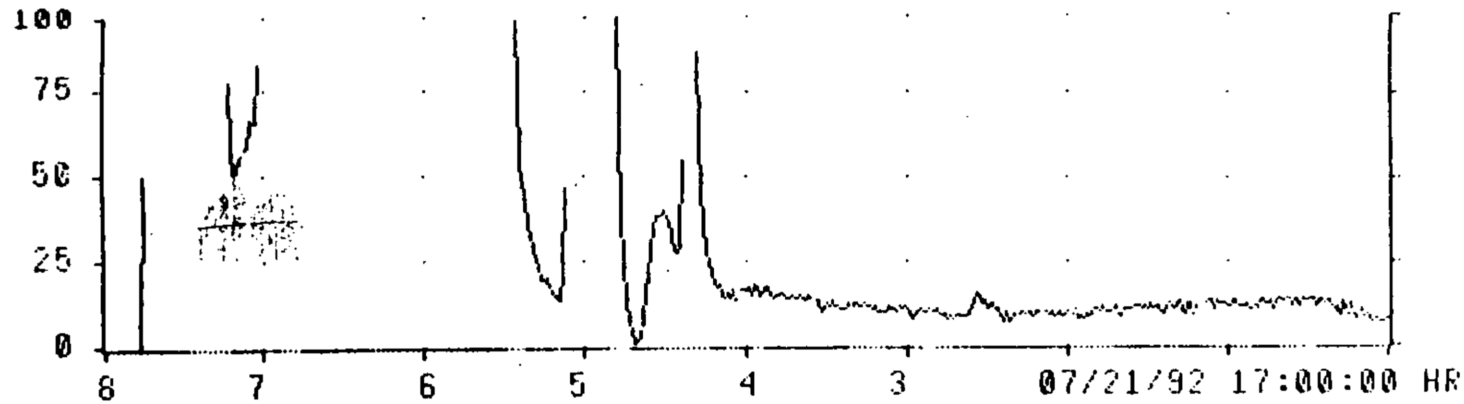
22 Jul 92 09:03:04 1

GROUP 371 EVAP SURFACE CONDENSER 8 HOURS HM

1000 MICROMHO

AI7604

200 MICROMHO



UNR

	PI7260	TI7001	AI7604	TI7197	TI7196	AI7603	PAL7269
	IN. HG.	DEG. F	MICROMHO	DEG. F	DEG. F	MICROMHO	
	SURFCOND	SURFCOND	HOTWELL	SFCONIN	SFCONOUT	MILL H20	SURFCOND
SP	22.0	0.0	0	95.0	115.0	-5.0	
PV	23.6	139.9	221	------ B	107.9	153.3	NORMAL
OP%							

AI7604 HOTWELL CONDUCTIVITY

PVSOURCE AUTO

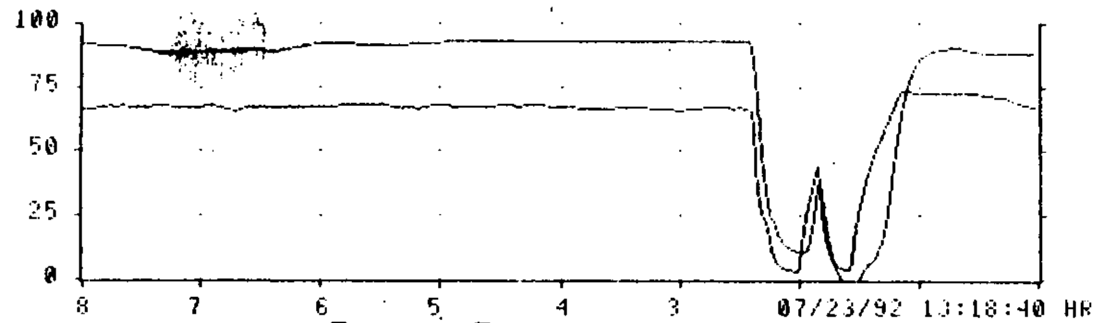
23 Jul 92 13:19:26 1

GROUP 357 PRODUCTION OVERVIEW 8 HOURS HM HM

1000
ADTPD

CUR_PR_B

400
ADTPD



	LI2377 PERCENT A-HDLVL	LI2370 PERCENT B-HDLVL	CUR_PR_A ADTPD THRUPUT	CUR_PR_B ADTPD THRUPUT	KAP_A KAPPAAVG	KAP_B KAPPBAVG	SD_A STD.DEVA	SD_B STD.DEVA
SP	85*	93*	950.0	800.0				
PV	61	56	928	799	109.5	81.1	3.1	2.0
OP%	-6.9L	-6.9L	84.9	76.3				
	MAN	MAN	CAS	CAS				

CUR_PR_B DIG b CURRENT PRODUCTION

SPTV	TVPROC	RAMPTIME
800.0	OFF	0.00000

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SECTION 2
LIME KILN WITHOUT NCGs
(IO-LK/2)

Section 2.1 Emission Test Results - VOC

Section 2.2 Quality Control Results

Section 2.3 Process Operating Data

2. IO-LK/2

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SECTION 2
LIME KILN WITHOUT NCGs
(IO-LK/2)

The Lime Kiln without NCGs was tested on two different days for volatile organic compounds by Methods 25A, 16, and 18. Due to the inconsistent Method 18 runs, a third period of testing was performed.

Total Hydrocarbons (M25A)

Figures 2.1, 2.2, and 2.3 present the THC trends for the test periods on 7/13/92, 7/14/92 and 7/21/92. Total hydrocarbon concentrations were fairly consistent, ranging from 35 to 40 ppm on 7/13/92 and 7/14/92, down to 26 ppm on 7/21/92.

Volatile Organic Compounds (M16 and M18)

Table 2.1 summarizes the results for the Method 16 and Method 18 target compounds, and Section 2.1 is a tabulation of the data. The volumetric flow was measured during sampling with a pitot tube. Hydrogen sulfide emissions were consistent at 0.6 to 0.8 lb/hr over the three testing periods. Methyl mercaptan was present at levels at or just above the detection limit. Of the Method 18 target compounds, only methanol was present at levels above the listed detection limits. Emission rates were consistent at 1.2 to 1.7 lb/hr. Note that Run 1, 7/13/92, was discarded due to interference.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 1.2. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 2.3 includes the process operating data as recorded and provided by mill personnel. Process data were not given for all run times. The data with the closest run time was used.

FIGURE 2.1
THC TREND ANALYSIS (7/13/92)
LIME KILN WITHOUT NCGs (IO-LK/2)

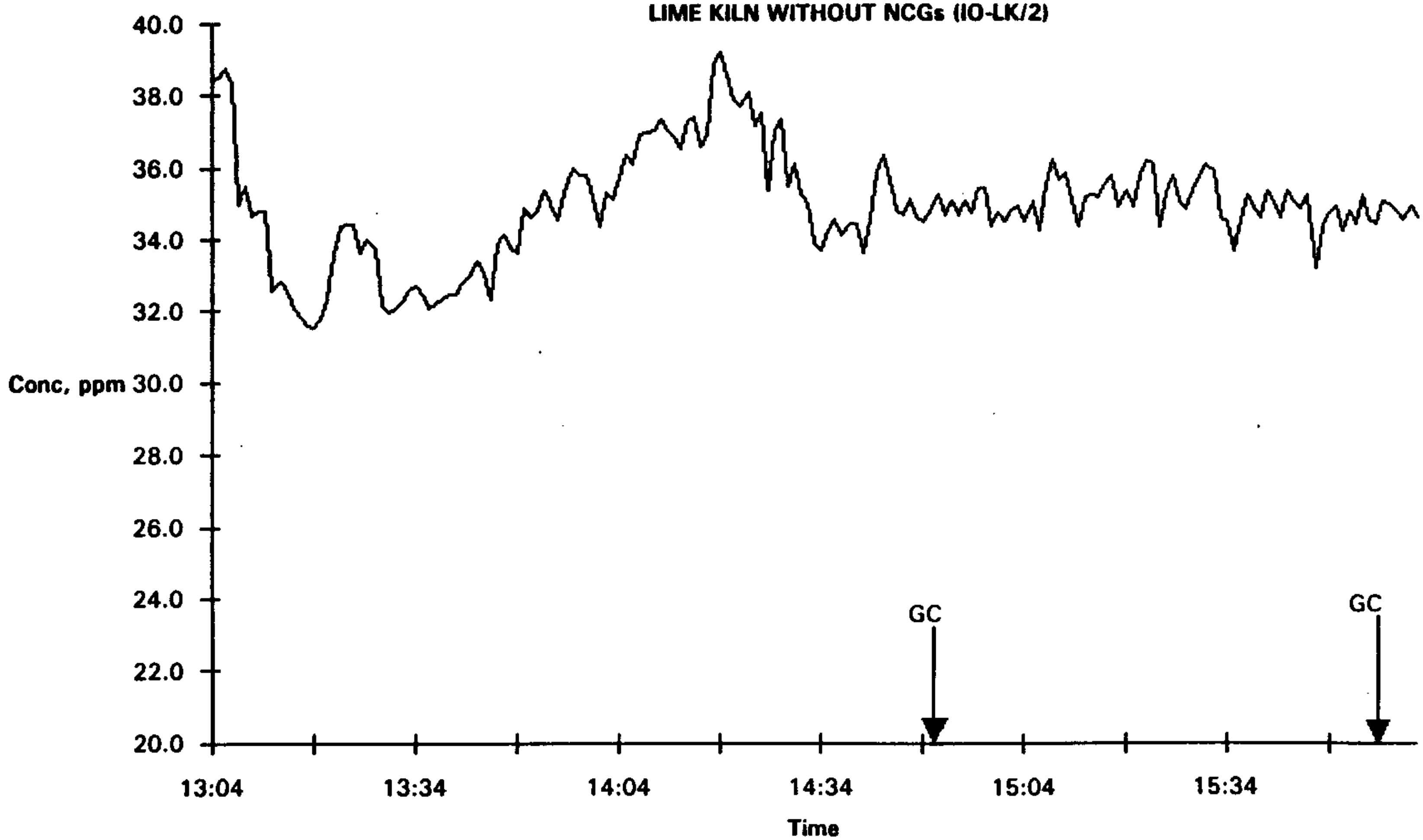


FIGURE 2.2
THC TREND ANALYSIS (7/14/92)
LIME KILN WITHOUT NCGs (IO-LK/2)

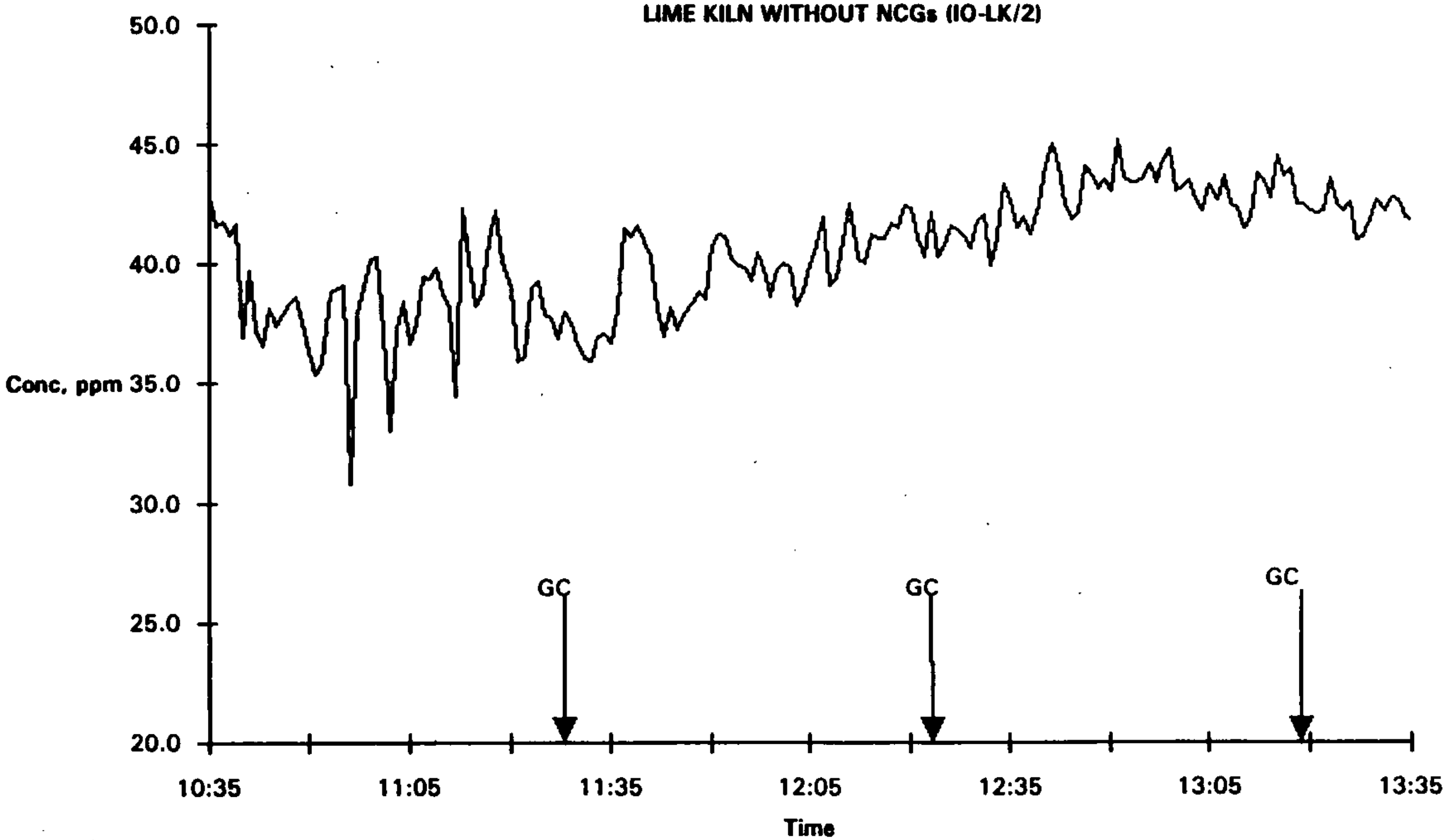
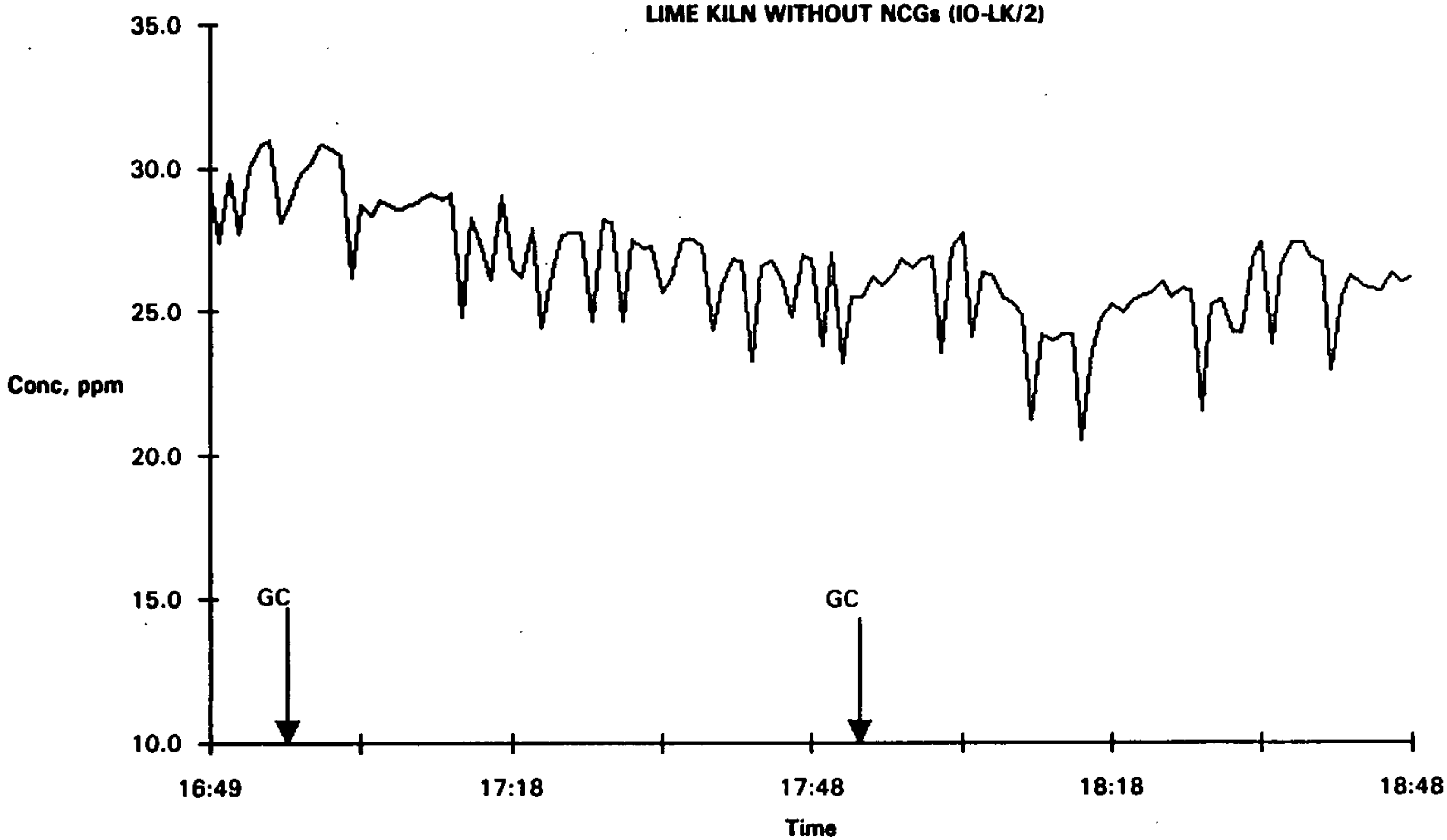


FIGURE 2.3
THC TREND ANALYSIS (7/21/92)
LIME KILN WITHOUT NCGs (IO-LK/2)



WESTON MANAGERS DESIGNERS CONSULTANTS

TABLE 2.1 SUMMARY OF VOC RESULTS

Mill: INLAND - ORANGE | Source: Lime Kiln Without NCGs
Source Code: IO-LK/2 | Test Dates: 7/13/92 7/14/92 7/21/92
FIN: P-LIMK CIN: C-28, C-29 | EPN: 11

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	171	173	172	
Volumetric Flow Rate, x10^3 DSCFM	16.5	19.4	17.9	
Process Operating Conditions				
Production Rate, T CaO/hr	13.0	15.5	13.9	
Method 16 Data, lb/hr				
Hydrogen sulfide	0.3	0.9	0.7	0.1
Methyl mercaptan	<0.1	0.1	0.1	0.1
Dimethyl sulfide	ND	ND	ND	0.1
Carbon disulfide	ND	ND	ND	0.1
Dimethyl disulfide	ND	ND	ND	0.1
Method 18 Data, lb/hr				
Methanol	1.2	1.7	1.5	0.3
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.2
Chloroform	ND	ND	ND	0.6
Benzene	ND	ND	ND	0.2
Bromodichloromethane	ND	ND	ND	0.8
Toluene	ND	ND	ND	0.2
Ethyl benzene	ND	ND	ND	0.3
m-, p-Xylene	ND	ND	ND	0.3
o-Xylene	ND	ND	ND	0.3
Cumene	ND	ND	ND	0.3
alpha-Pinene	ND	ND	ND	0.3
beta-Pinene	ND	ND	ND	0.3
3-Carene	ND	ND	ND	0.3
Terpenes (Unspecified)	ND	ND	ND	0.3
p-Cymene	ND	ND	ND	0.3
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	0.3	0.5	0.4	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	0.3	0.5	0.4	0.1

ND=Not Detected
DL=Detection Limit

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Section 2.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: Lime Kiln Without NCGs | FIN: P-LIMK
Source Code: IO-LK/2 | Date: 7/13/92 | EPN: 11 | CIN: C-28, C-29

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1303	1403	1503	
Flow Data				
Stack Temperature, °F	173			173
Moisture Content, %	43.7			43.7
Oxygen Concentration, %	7.0			7.0
Carbon Dioxide Concentration, %	16.0			16.0
Volumetric Flow Rate, x10^3 ACFM	35.0			35.0
Volumetric Flow Rate, x10^3 DSCFM	16.5			16.5
Process Operating Conditions				
Production Rate, T CaO/hr	15.5	15.5	15.5	15.5
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	3.4	7.4	8.4	6.4
Emission Rate, lb/hr	0.3	0.6	0.7	0.6
Methyl mercaptan				
Concentration, ppmvd	0.6	1.0	1.0	0.9
Emission Rate, lb/hr	0.1 *	0.1	0.1	0.1
Dimethyl sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Method 18 Data				
Methanol				
Concentration, ppmvd		20.8	20.6	20.7
Emission Rate, lb/hr		1.7	1.7	1.7
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd		0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd		0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd		0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE
Source Code: IO-LK/2
Source: Lime Kiln Without NCGs
Date: 7/13/92 EPN: 11
FIN: P-LIMK
CIN: C-28, C-29

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd		0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
Chloroform				
Concentration, ppmvd		1.8 *	1.8 *	1.8 *
Emission Rate, lb/hr		0.5 *	0.5 *	0.5 *
Benzene				
Concentration, ppmvd		0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
Bromodichloromethane				
Concentration, ppmvd		1.8 *	1.8 *	1.8 *
Emission Rate, lb/hr		0.7 *	0.7 *	0.7 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd		0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
Ethyl benzene				
Concentration, ppmvd		0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
m-, p-Xylene				
Concentration, ppmvd		0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
o-Xylene				
Concentration, ppmvd		0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
Cumene				
Concentration, ppmvd		0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr		0.3 *	0.3 *	0.3 *
alpha-Pinene				
Concentration, ppmvd		0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr		0.3 *	0.3 *	0.3 *
beta-Pinene				
Concentration, ppmvd		0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr		0.3 *	0.3 *	0.3 *
3-Carene				
Concentration, ppmvd		0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr		0.3 *	0.3 *	0.3 *
Terpenes (Unspecified)				
Concentration, ppmvd		0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr		0.3 *	0.3 *	0.3 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE   Source: Lime Kiln Without NCGs   FIN: P-LIMK
Source Code: IO-LK/2   Date: 7/13/92   EPN: 11   CIN: C-28, C-29

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd		0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr		0.3 *	0.3 *	0.3 *
Knowns as Carbon				
Concentration, ppmvd		14.9	14.7	14.8
Unknowns as Carbon				
Concentration, ppmvd		0.0	0.0	0.0
Sum M18 as Carbon, lb/hr		0.5	0.5	0.5
Unknown Compounds % of Total		0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	60.2	63.6	62.2	62.0
Emission Rate, lb/hr as C	1.9	2.0	1.9	1.9

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: Lime Kiln Without NCGs | FIN: P-LIMK
Source Code: IO-LK/2 | Date: 7/14/92 | EPN: 11 | CIN: C-28, C-29

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1034	1134	1234	
Flow Data				
Stack Temperature, °F	172			172
Moisture Content, %	42.7			42.7
Oxygen Concentration, %	6.4			6.4
Carbon Dioxide Concentration, %	17.0			17.0
Volumetric Flow Rate, x10^3 ACFM	40.4			40.4
Volumetric Flow Rate, x10^3 DSCFM	19.4			19.4
Process Operating Conditions				
Production Rate, T CaO/hr	13.0	13.0	13.0	13.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	7.1	8.3	8.5	8.0
Emission Rate, lb/hr	0.7	0.9	0.9	0.8
Methyl mercaptan				
Concentration, ppmvd	0.5	0.8	0.7	0.7
Emission Rate, lb/hr	0.1 *	0.1	0.1	0.1
Dimethyl sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Method 18 Data				
Methanol				
Concentration, ppmvd	14.8	15.9		15.4
Emission Rate, lb/hr	1.4	1.5		1.5
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Acetone				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.2 *	0.2 *		0.2 *
2-Propanol				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.2 *	0.2 *		0.2 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE
Source Code: IO-LK/2
Source: Lime Kiln Without NCGs
Date: 7/14/92 EPN: 11
FIN: P-LIMK
CIN: C-28, C-29

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.2 *	0.2 *		0.2 *
Chloroform				
Concentration, ppmvd	1.7 *	1.7 *		1.7 *
Emission Rate, lb/hr	0.6 *	0.6 *		0.6 *
Benzene				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.2 *	0.2 *		0.2 *
Bromodichloromethane				
Concentration, ppmvd	1.7 *	1.7 *		1.7 *
Emission Rate, lb/hr	0.9 *	0.9 *		0.9 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.2 *	0.2 *		0.2 *
Ethyl benzene				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.3 *	0.3 *		0.3 *
m-, p-Xylene				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.3 *	0.3 *		0.3 *
o-Xylene				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.3 *	0.3 *		0.3 *
Cumene				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.3 *	0.3 *		0.3 *
alpha-Pinene				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.4 *	0.4 *		0.4 *
beta-Pinene				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.4 *	0.4 *		0.4 *
3-Carene				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.4 *	0.4 *		0.4 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.4 *	0.4 *		0.4 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE	Source:	Lime Kiln Without NCGs		FIN:	P-LIMK
Source Code: IO-LK/2	Date:	7/14/92	EPN: 11	CIN:	C-28, C-29

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.4 *	0.4 *		0.4 *
Knowns as Carbon				
Concentration, ppmvd	10.6	11.3		11.0
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0		0.0
Sum M18 as Carbon, lb/hr	0.4	0.4		0.4
Unknown Compounds % of Total	0.0%	0.0%		0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	66.7	70.2	74.9	70.6
Emission Rate, lb/hr as C	2.4	2.5	2.7	2.6

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: Lime Kiln Without NCGs | FIN: P-LIMK
Source Code: IO-LK/2 | Date: 7/21/92 | EPN: 11 | CIN: C-28, C-29

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1648	1748		
Flow Data				
Stack Temperature, °F	171			171
Moisture Content, %	41.6			41.6
Oxygen Concentration, %	6.0			6.0
Carbon Dioxide Concentration, %	17.5			17.5
Volumetric Flow Rate, x10^3 ACFM	36.6			36.6
Volumetric Flow Rate, x10^3 DSCFM	17.9			17.9
Process Operating Conditions				
Production Rate, T CaO/hr	13.0	13.0		13.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	7.6	7.3		7.5
Emission Rate, lb/hr	0.7	0.7		0.7
Methyl mercaptan				
Concentration, ppmvd	0.5	0.5		0.5
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Dimethyl sulfide				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Method 18 Data				
Methanol				
Concentration, ppmvd	13.7	13.4		13.5
Emission Rate, lb/hr	1.2	1.2		1.2
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Acetone				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
2-Propanol				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: Lime Kiln Without NCGs | FIN: P-LIMK

Source Code: IO-LK/2 | Date: 7/21/92 | EPN: 11 | CIN: C-28, C-29

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.2 *	0.2 *		0.2 *
Chloroform				
Concentration, ppmvd	1.7 *	1.7 *		1.7 *
Emission Rate, lb/hr	0.6 *	0.6 *		0.6 *
Benzene				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.2 *	0.2 *		0.2 *
Bromodichloromethane				
Concentration, ppmvd	1.7 *	1.7 *		1.7 *
Emission Rate, lb/hr	0.8 *	0.8 *		0.8 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.2 *	0.2 *		0.2 *
Ethyl benzene				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.3 *	0.3 *		0.3 *
m-, p-Xylene				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.3 *	0.3 *		0.3 *
o-Xylene				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.3 *	0.3 *		0.3 *
Cumene				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.3 *	0.3 *		0.3 *
alpha-Pinene				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.3 *	0.3 *		0.3 *
beta-Pinene				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.3 *	0.3 *		0.3 *
3-Carene				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.3 *	0.3 *		0.3 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.3 *	0.3 *		0.3 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: Lime Kiln Without NCGs | FIN: P-LIMK
Source Code: IO-LK/2 | Date: 7/21/92 | EPN: 11 | CIN: C-28, C-29

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.3 *	0.3 *		0.3 *
Knowns as Carbon				
Concentration, ppmvd	10.4	9.6		10.0
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0		0.0
Sum M18 as Carbon, lb/hr	0.4	0.3		0.3
Unknown Compounds % of Total	0.0%	0.0%		0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	47.3	43.5		45.4
Emission Rate, lb/hr as C	1.6	1.5		1.5

* One or more values were less than the detection limit.

Section 2.2 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

SOURCE IO-LK/2

QUALITY CONTROL SUMMARY
METHOD 25A

1. CALIBRATION

THEOR	7/13/92		7/14/92	
ppm	ppm	%ERR	ppm	%ERR
0.0	0.1	0.1	1.3	1.4
9.0	8.3	-0.7	8.1	-1.0
36.0	36.7	0.7	34.9	-1.2
94.2	93.9	-0.3	94.6	0.4
CORR COEFF	0.9999		0.9996	

2. PROPANE LINE RECOVERY

	DATE	7/13/92		DATE	7/14/92	
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	91.9	92.8	101.0%	94.2	94.5	100.3%
AFTER	94.2	94.5	100.3%	34.9	35.6	102.0%

3. LINE BLANK

	7/13/92	7/14/92
	ppm	ppm
BEFORE	0.1	1.8
AFTER	1.8	*

* Not performed

SOURCE IO-LK/2

QUALITY CONTROL SUMMARY
METHOD 25A

1. CALIBRATION

THEOR ppm	7/21/92 ppm	%ERR	
0.0	-0.1	-0.1	
9.0	6.5	2.7	
36.0	39.8	4.0	
94.2	92.9	-1.4	
CORR COEFF	0.9979		

2. PROPANE LINE RECOVERY

	DATE INST	7/21/92 LINE	%REC	
BEFORE	*			
AFTER	*			

3. LINE BLANK

	7/21/92 ppm	
BEFORE	*	
AFTER	*	

* Not performed

SOURCE IO-LK/2

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR ppm*	DATE ppm*	7/13/92 %REC	DATE ppm **	7/14/92 %REC
ethanol	2.5	0.8	30.7%	25.6	61.0%
acetone	2.0	1.1	56.1%	24.7	73.6%
isopropanol	1.9	1.5	78.1%	29.4	91.5%
benzene	1.7	0.0	0.0%	27.6	100.4%
bromodichloromethane	1.8	1.3	71.3%	26.2	88.1%
toluene	1.4	0.9	66.2%	20.4	87.9%
ethyl benzene	1.2	1.4	118.3%	16.9	84.0%
m-xylene	1.2	0.9	72.5%	16.9	84.0%
o-xylene	1.2	0.8	67.5%	17.4	86.0%
cumene	1.1	1.0	92.2%	15.2	85.9%
alpha-pinene	0.9	0.8	88.5%	14.2	92.0%
beta-pinene	0.9	0.8	84.6%	14.1	91.2%
3-carene	0.9	1.1	117.9%	20.8	133.7%
p-cymene	0.9	0.6	62.4%	12.0	76.2%

2. PROPANE RESPONSE

	THEOR		%REC			%REC
BEFORE	94.2	90.4	96.0%	***	33.3	92.5%
AFTER	94.2	87.2	92.6%	***	34.3	95.3%

3. METHANOL LINE RECOVERY

	7/13/92 GC	LINE	%REC	7/14/92 GC	LINE	%REC
BEFORE	9.4	9.3	98.9%	10.4	9.8	94.2%
AFTER	10.4	9.8	94.2%	10.6	8.8	83.0%

4. LINE BLANK

	[--------------FILE REF--------------]	
BEFORE	GDA2005	GDA2015
AFTER	GDA2015	GFA2003

* 917-47-5
** 917-47-3
***THEOR ppm = 36

SOURCE IO-LK/2

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR ppm	DATE ppm	7/21/92 %REC
ethanol	41.9	21.6	51.4%
acetone	33.5	20.3	60.5%
isopropanol	32.2	31.7	98.5%
benzene	27.5	27.9	101.1%
bromodichloromethane	29.7	28.1	94.5%
toluene	23.2	22.2	95.8%
ethyl benzene	20.1	18.9	93.9%
m-xylene	20.1	19.5	96.9%
o-xylene	20.2	19.2	95.2%
cumene	17.7	16.0	90.5%
alpha-pinene	15.4	14.8	95.7%
beta-pinene	15.5	14.4	92.8%
3-carene	15.5	13.3	85.4%
p-cymene	15.8	12.9	81.6%

2. PROPANE RESPONSE

	THEOR		%REC
BEFORE	36.0	35.5	98.6%
AFTER	36.0	33.5	93.1%

3. METHANOL LINE RECOVERY

	GC	7/21/92 LINE	%REC
BEFORE	9.0	8.1	90.0%
AFTER	*	9.0	

4. LINE BLANK

	[--------------FILE REF--------------]
BEFORE	GLA2004
AFTER	*

* Not performed

SOURCE ____________ IO-LK/2

QUALITY CONTROL SUMMARY
METHOD 16

1. CALIBRATION

ANALYTE	LO ppm	MED ppm	HI ppm	CORR COEFF
7/13/92				
hydrogen sulfide	2.0	3.7	6.2	0.9994
methyl mercaptan	1.9	3.5	5.7	0.9994
dimethyl sulfide	2.6	4.8	7.9	0.9995
carbon disulfide	0.8	1.5	2.5	0.9969
dimethyl disulfide	1.1	2.1	3.4	0.9996

* CHK STD	THEOR	EXP	%REC
7/14/92			
hydrogen sulfide	5.8	5.7	98.3%
methyl mercaptan	5.4	5.1	94.8%
dimethyl sulfide	7.5	7.1	95.2%
carbon disulfide	2.4	2.2	90.0%
dimethyl disulfide	3.2	3.1	96.3%

* Calibration from 7/13/92 checked and used on 7/14/92

SOURCE IO-LK/2

QUALITY CONTROL SUMMARY
METHOD 16

1. CALIBRATION

ANALYTE	LO ppm	MED ppm	HI ppm	CORR COEFF
7/21/92				
hydrogen sulfide	2.2	3.2	8.2	0.9996
methyl mercaptan	2.0	2.9	7.6	0.9998
dimethyl sulfide	2.8	4.1	10.6	0.9999
carbon disulfide	0.9	1.3	3.3	0.9999
dimethyl disulfide	1.2	1.8	4.6	0.9999

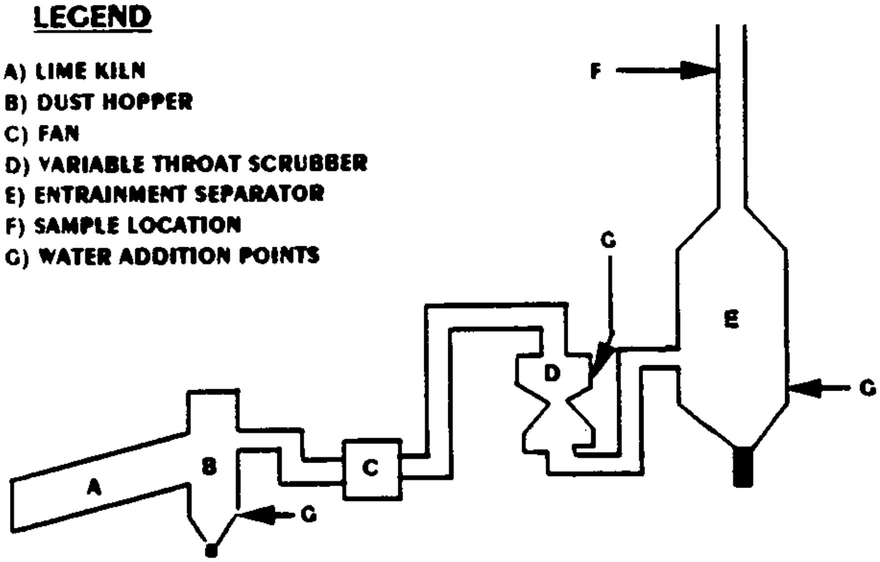
Section 2.3 Process Operating Data

LIME KILN CONFIGURATION

INLAND-ORANGE   ORANGE, TEXAS

LEGEND

A) LIME KILN
B) DUST HOPPER
C) FAN
D) VARIABLE THROAT SCRUBBER
E) ENTRAINMENT SEPARATOR
F) SAMPLE LOCATION
G) WATER ADDITION POINTS



See page 1.4 - 1 for schematic drawing of Causticizing System.

LIME KILN

The lime kiln is a rotary kiln manufactured by Traylor and began operation in 1967. The kiln is 12 ft. in diameter and 260 ft. long. The kiln has a chain section and is fired on natural gas. Non-condensable gases from the pulp mill (UEL and LEL) are burned in the kiln. The kiln produces 283 tons/day CaO (1,400 TPD of unbleached pulp). Fresh mill water is used in the kiln scrubber and dust chamber. Mill hot water is used at the lime mud filter. Hot water is obtained from the liquor coolers (heat exchangers) at the digesters.

Particulate emissions are controlled with a scrubber disk (essentially a variable throat venturi). A precoat drum washer, which is 10 ft. long and also has a diameter of 10 ft., is used for mud washing.

Representative Process Conditions

Production rate (tons lime (CaO)/hr):

7/13/92	15.5
7/14/92	13.0
7/15/92	10.6
7/21/92	12.3

Fuel type and firing rate: Natural Gas firing rates not available

Btu/ton product: Not Available

Hot and cold end temperatures (deg F):

	Cold End	Hot End
7/13/92	768	2,312
7/14/92	721	2,284
7/15/92	735	2,353
7/21/92	753	2,425

Oxygen content in the kiln (%):

7/13/92	6.3
7/14/92	4.9
7/15/92	5.8
7/21/92	5.4

NO_x levels in vent gases at 8% O_2: No data

Solids content of mud (%):

7/13/92	74.4
7/14/92	70.6
7/15/92	69.6
7/21/92	69.4

Sodium content of mud (%):

7/13/92	8.3
7/14/92	12.8
7/15/92	12.2
7/21/92	No Data

Sulfide content of mud (%):

7/13/92	No Data
7/14/92	No Data
7/15/92	No Data
7/21/92	0.25

LIME KILN - PROCESS OPERATING CONDITIONS

Mill:	INLAND-ORANGE	Source:	LIME KILN WITHOUT NCGs
Source:	IO-LK\2	Date:	JULY 13,1992
FIN:	P-LIMK	EPN:	11 CIN: C-28 AND C-29

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		1415			
Fuel Data					
Fuel Type	gas or oil	GAS			0.00
Fuel Firing Rate	GPM or CFM	CFM			0.00
Production Data					
Production Rate	tons CaO/hr	15.5			0.00
Solid Contents of Mud	%	74.4			0.00
NA2S Content	%				0.00
Soda Content	%	8.3			0.00
Hot End Temperature	degree F	2312			0.00
Cold End Temperature	degree F	768			0.00
NCG Burning	yes or no	NO			
Kiln Oxygen Content	%	2.2			0.00
Kiln DAta					
Length	ft	260.0			0.00
Diameter	ft	12.0			0.00
Manufacturer		TRAYLOR			
Particluate Control Device		SCRUBBER DISK			
Scrubber Water Make-up Source		MILL WATER			
Scrubber Make-up Rate	GPM	68 GPM			0.00
Scrubber Pressure Drop	GPM	14 in. W.C. MINIMUN			0.00
Scrubber Recirculation Rate	in. H2O	370 GPM			0.00
Emission Data					
Carbon Dioxide	%				0.00
Oxygen	%	6.25			0.00
Carbon Monoxide	PPM				0.00
TRS (O2 Concentration)	PPM	5.36			0.00
Nitrogen Oxide	PPM				0.00
Sulfer Dioxide	PPM				0.00

LIME KILN - PROCESS OPERATING CONDITIONS

Mill:	INLAND-ORANGE	Source:	LIME KILN WITHOUT NCGs
Source:	IO-LK\2	Date:	JULY 14,1992
FIN:	P-LIMK	EPN:	11 CIN: C-28 AND C-29

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		1130			
Fuel Data					
Fuel Type	gas or oil	GAS			0.00
Fuel Firing Rate	GPM or CFM	CFM			0.00
Production Data					
Production Rate	tons CaO/hr	13.0			0.00
Solid Contents of Mud	%	70.6			0.00
NA2S Content	%				0.00
Soda Content	%	12.8			0.00
Hot End Temperature	degree F	2284.0			0.00
Cold End Temperature	degree F	721.0			0.00
NCG Burning	yes or no	NO			
Kiln Oxygen Content	%	2.7			0.00
Kiln DAta					
Length	ft	260.0			0.00
Diameter	ft	12.0			0.00
Manufacturer					
Particluate Control Device					
Scrubber Water Make-up Source		MILL WATER			
Scrubber Make-up Rate	GPM	68 GPM			0.00
Scrubber Pressure Drop	GPM	14 in. W.C. MINIMUM			0.00
Scrubber Recirculation Rate	in. H2O	370.0			0.00
Emission Data					
Carbon Dioxide	%				0.00
Oxygen	%	4.85			0.00
Carbon Monoxide	PPM				0.00
TRS (O2 Concentration)	PPM	7.04			0.00
Nitrogen Oxide	PPM				0.00
Sulfer Dioxide	PPM				0.00

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SECTION 3
BARK BOILER
(IO-BB)

SECTION 3
BARK BOILER
(IO-BB)

The Bark Boiler was tested on three different days for volatile organic compounds by Methods 25A, 18, VOST and Semi-VOST. Other parameters tested were aldehydes, ketones and hydrogen chloride.

Total Hydrocarbons (M25A)

Figures 3.1, 3.2, and 3.3 present the THC trends for the test periods on 7/8/92, 7/9/92 and 7/10/92. Total hydrocarbon concentrations fluctuated widely over the testing periods. On 7/8/92, the first two hours were generally low (less than 10 ppm) with one spike at 45 ppm. Trends on 7/9/92 were consistent with the third hour of testing on 7/8/92. On 7/10/92, the first hour of testing gave concentrations in the same range (10-15 ppm) as 7/9/92. Problems with dislodged ash gave higher concentrations for the remainder of the test period.

Volatile Organic Compounds (M16 and M18)

Table 3.1 summarizes the results for the Method 18 target compounds, and Section 3.1 is a tabulation of the data. The volumetric flow was measured during sampling with a pitot tube. The source was cyclonic. Methanol was detected in all runs but was generally below the listed detection limit. Percent unknowns as carbon were unusually high. Several recurring compounds at 4.3, 4.5 and 17.2 minutes compose the portion of unknowns. Each of these unidentified compounds is in the range of 0.5 to 1.0 ppm as carbon.

Volatile Organic Sampling Train (VOST)

Table 3.2 summarizes the result of the VOST samples collected on 7/9/92 and 7/10/92. Section 3.2 tabulates the results for target compounds and tentatively identified compounds (TIC). The predominant analyte found in both samples was hexane.

Semivolatile Organic Compounds (MM5)

Table 3.3 summarizes the result of the semivolatile organic compounds sample collected using the Modified Method 5 (MM5) train on 7/9/92 and 7/10/92. Section 3.2 tabulates the results of the target compounds and the tentatively identified compounds (TICs) from the gas chromatography-mass spectrometry (GC-MS) analysis. Naphthalene was identified on both days at 0.1 ppm. Other compounds identified were well below Method 18 detection limits.

Miscellaneous Parameters

Table 3.4 summarizes the results of testing for aldehydes and hydrogen chloride. Section 3.4 tabulates the results for each compound. Formaldehyde, acetaldehyde, and acetone were all detected in samples taken on 7/8/92 and 7/9/92. Acetone was also detected in the Method 18 analysis, but was below the listed limit of detection. The hydrogen chloride emission rate was 0.2 to 0.3 lb/hr on both 7/8/92 and 7/9/92.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 3.5. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 3.6 includes the process operating data as recorded and provided by mill personnel.

FIGURE 3.1
THC TREND ANALYSIS (7/8/92)
BARK BOILER (IO-BB)

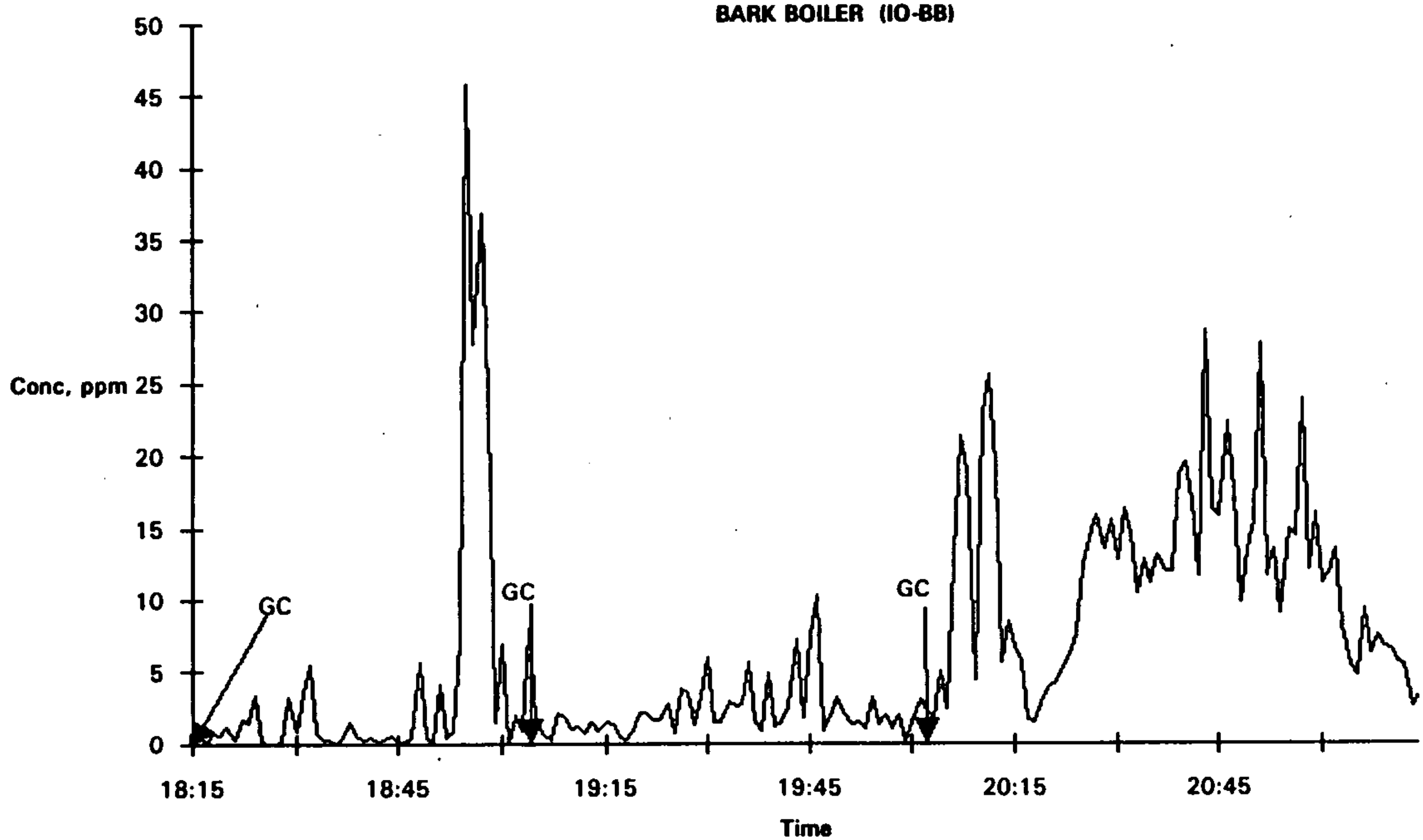

FIGURE 3.2
THC TREND ANALYSIS (7/9/92)
BARK BOILER (IO-BB)

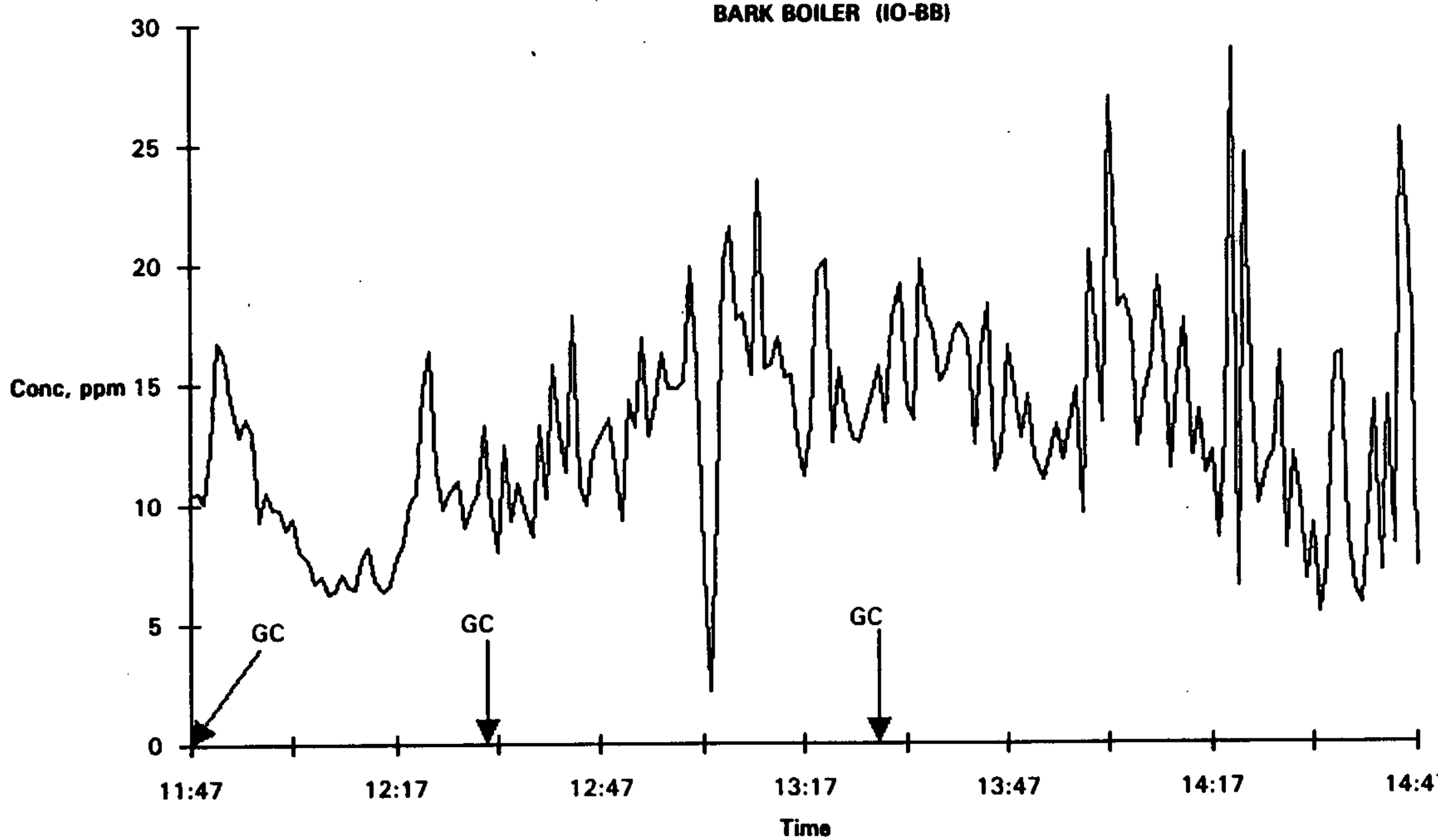

FIGURE 3.3
THC TREND ANALYSIS (7/10/92)
BARK BOILER (IO-BB)

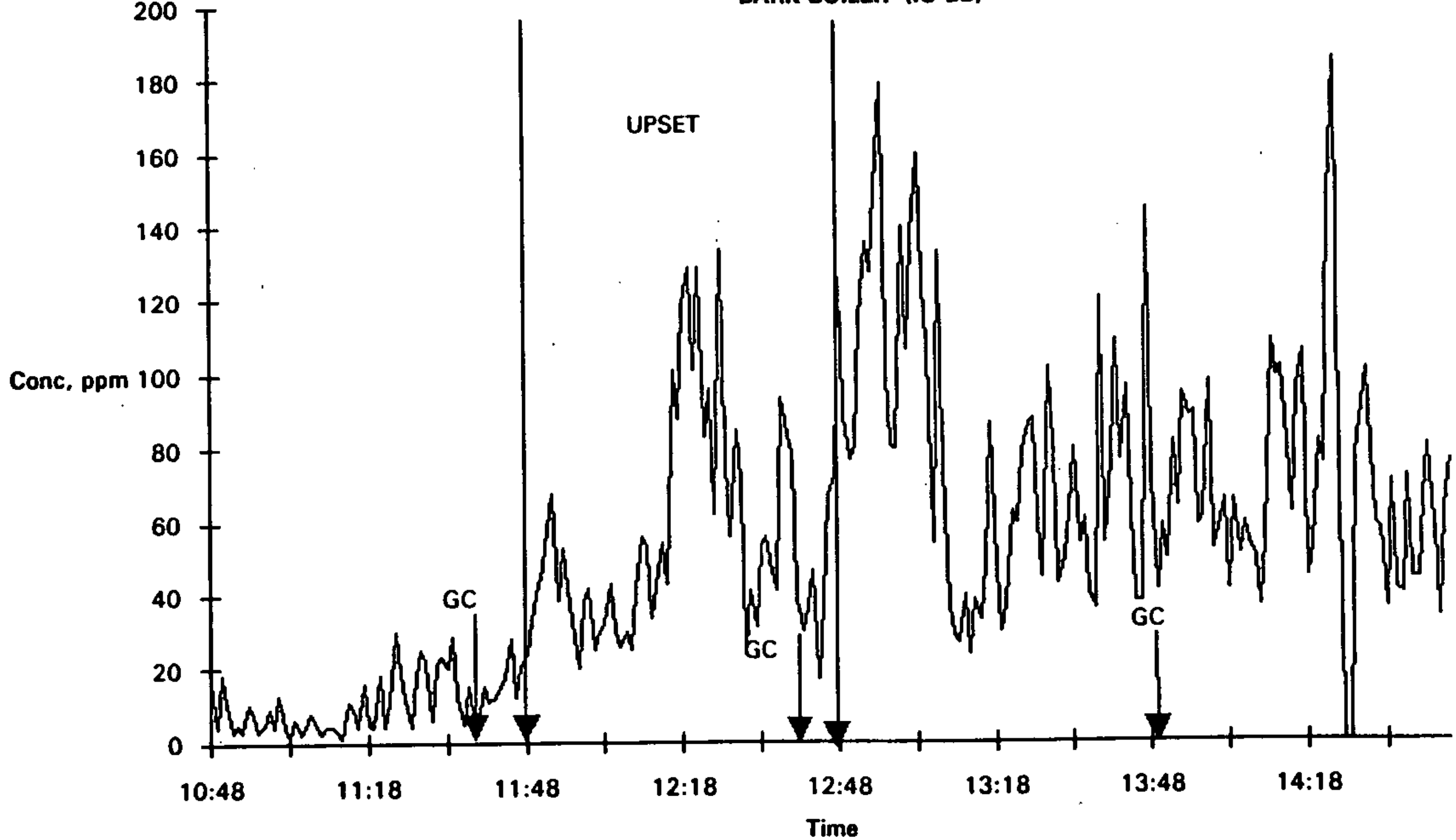

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TABLE 3.1 SUMMARY OF VOC RESULTS

Mill: INLAND - ORANGE | Source: Bark Boiler
Source Code: IO-BB | Test Dates: 7/8/92 7/9/92 7/10/92
FIN: P-BARKB CIN: C-33, C-8 | EPN: 02A

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	155	159	157	
Volumetric Flow Rate, x10^3 DSCFM	67.3	80.5	74.1	
Process Operating Conditions				
Production Rate, x10^6 BTU/hr	429.0	534.0	485.0	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.2
Methyl mercaptan				0.3
Dimethyl sulfide				0.4
Carbon disulfide				0.4
Dimethyl disulfide				0.5
Method 18 Data, lb/hr				
Methanol	ND	1.1	0.6	1
Ethanol	ND	ND	ND	0.4
Acetone	ND	ND	ND	0.5
2-Propanol	ND	ND	ND	0.5
2-Butanone	ND	ND	ND	0.6
Chloroform	ND	ND	ND	1.9
Benzene	ND	ND	ND	0.6
Bromodichloromethane	ND	ND	ND	2.6
Toluene	ND	ND	ND	0.7
Ethyl benzene	ND	ND	ND	0.8
m-, p-Xylene	ND	ND	ND	0.8
o-Xylene	ND	ND	ND	0.8
Cumene	ND	ND	ND	0.9
alpha-Pinene	ND	ND	ND	1.1
beta-Pinene	ND	ND	ND	1.1
3-Carene	ND	ND	ND	1.1
Terpenes (Unspecified)	ND	ND	ND	1.1
p-Cymene	ND	ND	ND	1.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	0.1	0.3	0.2	0.1
Unknowns as C, lb/hr	0.1	0.8	0.4	0.1
Sum of Compounds as C, lb/hr	0.2	1.1	0.6	0.1

ND=Not Detected
DL=Detection Limit

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TABLE 3.2 SUMMARY OF VOST RESULTS

Mill: INLAND-ORANGE
Source Code: IO-BB
FIN: P-BARKB EPN: 02A

Source: Bark Boiler
Test Dates: 7/9/92, 7/10/92
CIN: C-33, C-8

TIME	1240	1129
Volumetric Flow Data		
Stack Temperature, °F	156	155
Volumetric Flow Rate, x 10^3 DSCFM	73.8	67.9
Process Operating Conditions		
Production Rate, x 10^6 BTU/hr	492.0	429.0
Target Compounds, ppm		
Chloromethane	0.109	0.049
Methylene Chloride	0.098	0.237
Acetone	0.051	0.056
Carbon Disulfide		0.067
Chloroform	0.019	0.012
Trichlorofluoromethane	0.004	0.001
Acrolein	0.090	0.005
Acrylonitrile	0.008	
1,3-Butadiene	0.031	0.021
Dimethyl disulfide	0.000	
Isooctane		0.010
t-Butyl methyl ether		0.032
n-Hexane	0.134	0.375
2-Butanone (MEK)	0.007	0.006
1,1,1-Trichloroethane	0.001	
Bromodichloromethane		0.000
Benzene	0.109	0.111
Toluene	0.037	0.048
Ethylbenzene	0.002	0.001
Styrene	0.026	0.004
o-Xylene	0.001	0.001
m-/p-Xylene	0.004	0.002
a-Pinene	0.002	0.003
b-Pinene	0.000	0.001
p-Cymene	0.001	0.001

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TABLE 3.3 SUMMARY OF SEMIVOLATILE RESULTS

Mill: INLAND-ORANGE
Source Code: IO-BB
FIN: P-BARK EPN: 02A

Source: Bark Boiler
Test Dates: 7/8/92
CIN: C-33, C-8

	Run 1	Run 2
TIME	1812	1936
Volumetric Flow Data		
Stack Temperature, °F	159	159
Volumetric Flow Rate, x 10^3 DSCFM	80.5	80.5
Process Operating Conditions		
Production Rate, x 10^6 BTU/hr	534.0	534.0
Target Compounds, ppm		
Cumene	0.006	0.006
a-Pinene	0.081	0.096
B-Pinene	0.041	0.048
1,2,4-Trimethylbenzene	0.004	0.005
p-Cymene	0.011	0.012
Naphthalene	0.111	0.147
Pentamethylbenzene	0.008	0.006
Di-n-butylphthalate	0.008	0.009
Butylbenzylphthalate	0.003	0.004
bis(2-Ethylhexyl)phthalate	0.008	0.060
1,4-Dichlorobenzene	0.008	0.008
4-Methyl phenol		0.008
Benzoic Acid	0.015	0.058
1,2,4-Trichlorobenzene	0.001	
Naphthalene	0.072	0.096
2-Methylnaphthalene	0.001	0.002
Dimethylphthalate	0.002	0.002
Acenapthylene		0.001
Diethylpthalane		0.002
Acenapthylene		0.002
Diethylpthalane		0.008
Di-n-butylphthalate		0.004
Butylbenzylphthalate	0.001	
bis(2-Ethylhexyl)phthalate	0.013	
Di-n-octylphthalate		0.000

TABLE 3.4 SUMMARY OF MISCELLANEOUS RESULTS

Mill: INLAND-ORANGE
Source Code: IO-BB
FIN: P-BARKB   EPN: 02A

Source: Bark Boiler
Test Dates: 7/8/92, 7/9/92
CIN: C-33, C-8

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	156	159	158	
Volumetric Flow Rate, x 10^3 DSCFM	73.8	80.5	77.2	
Process Operating Conditions				
Production Rate, x 10^6 BTU/hr	492.0	534.0	513.0	
Emission Rate, lb/hr				
Formaldehyde	0.6	0.6	0.6	0.1
Acetaldehyde	0.3	0.5	0.4	0.1
Acetone (Impinger)	1.5	2.5	2.0	0.1
2-Butanone (Impinger)	ND	ND	ND	0.4
Benzaldehyde	ND	ND	ND	0.7
Hydrogen chloride	0.2	0.3	0.3	0.1

ND = Not Detected
DL = Detection Limit

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Section 3.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill:	INLAND - ORANGE	Source:	Bark Boiler			FIN:	P-BARKB
Source Code:	IO-BB	Date:	7/8/92	EPN:	02A	CIN:	C-33, C-8

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1814	1914	2014	
Flow Data				
Stack Temperature, °F		159		159
Moisture Content, %		21.3		21.3
Oxygen Concentration, %		9.0		9.0
Carbon Dioxide Concentration, %		10.5		10.5
Volumetric Flow Rate, x10^3 ACFM		119.8		119.8
Volumetric Flow Rate, x10^3 DSCFM		80.5		80.5
Process Operating Conditions				
Production Rate, x 10^6 BTU/hr	534.0	534.0	534.0	534.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	2.5	2.5 *	2.5 *	1.7
Emission Rate, lb/hr	1.0	1.0 *	1.0 *	0.7
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Acetone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE	Source: Bark Boiler		FIN: P-BARKB
Source Code: IO-BB	Date: 7/8/92	EPN: 02A	CIN: C-33, C-8

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.6 *	0.6 *	0.6 *	0.6 *
Chloroform				
Concentration, ppmvd	1.3 *	1.3 *	1.3 *	1.3 *
Emission Rate, lb/hr	1.9 *	1.9 *	1.9 *	1.9 *
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.6 *	0.6 *	0.6 *	0.6 *
Bromodichloromethane				
Concentration, ppmvd	1.3 *	1.3 *	1.3 *	1.3 *
Emission Rate, lb/hr	2.6 *	2.6 *	2.6 *	2.6 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.8 *	0.8 *	0.8 *	0.8 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.8 *	0.8 *	0.8 *	0.8 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.8 *	0.8 *	0.8 *	0.8 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.0 *	1.0 *	1.0 *	1.0 *
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.1 *	1.1 *	1.1 *	1.1 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.1 *	1.1 *	1.1 *	1.1 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.1 *	1.1 *	1.1 *	1.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.1 *	1.1 *	1.1 *	1.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE	Source:	Bark Boiler		FIN:	P-BARKB
Source Code: IO-BB	Date:	7/8/92	EPN: 02A	CIN:	C-33, C-8

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.1 *	1.1 *	1.1 *	1.1 *
Knowns as Carbon				
Concentration, ppmvd	1.8	1.4	1.2	1.5
Unknowns as Carbon				
Concentration, ppmvd	1.9	2.0	2.2	2.0
Sum M18 as Carbon, lb/hr	0.6	0.5	0.5	0.5
Unknown Compounds % of Total	51.7%	59.0%	63.7%	58.1%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	5.1	5.1	15.2	8.5
Emission Rate, lb/hr as C	0.8	0.8	2.3	1.3

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE	Source: Bark Boiler		FIN: P-BARKB
Source Code: IO-BB	Date: 7/9/92	EPN: 02A	CIN: C-33, C-8

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1146	1246	1346	
Flow Data				
Stack Temperature, °F			156	156
Moisture Content, %			29.2	29.2
Oxygen Concentration, %			10.5	10.5
Carbon Dioxide Concentration, %			9.5	9.5
Volumetric Flow Rate, x10^3 ACFM			121.4	121.4
Volumetric Flow Rate, x10^3 DSCFM			73.8	73.8
Process Operating Conditions				
Production Rate, x 10^6 BTU/hr	492.0	492.0	492.0	492.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	2.8 *	2.8 *	3.1	2.0
Emission Rate, lb/hr	1.0 *	1.0 *	1.1	0.7
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Acetone				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
2-Propanol				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE	Source:	Bark Boiler		FIN:	P-BARKB
Source Code: IO-BB	Date:	7/9/92	EPN: 02A	CIN:	C-33, C-8

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.6 *	0.6 *	0.6 *	0.6 *
Chloroform				
Concentration, ppmvd	1.4 *	1.4 *	1.4 *	1.4 *
Emission Rate, lb/hr	1.9 *	1.9 *	1.9 *	1.9 *
Benzene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.6 *	0.6 *	0.6 *	0.6 *
Bromodichloromethane				
Concentration, ppmvd	1.4 *	1.4 *	1.4 *	1.4 *
Emission Rate, lb/hr	2.7 *	2.7 *	2.7 *	2.7 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
Ethyl benzene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.9 *	0.9 *	0.9 *	0.9 *
m-, p-Xylene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.9 *	0.9 *	0.9 *	0.9 *
o-Xylene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.9 *	0.9 *	0.9 *	0.9 *
Cumene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	1.0 *	1.0 *	1.0 *	1.0 *
alpha-Pinene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	1.1 *	1.1 *	1.1 *	1.1 *
beta-Pinene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	1.1 *	1.1 *	1.1 *	1.1 *
3-Carene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	1.1 *	1.1 *	1.1 *	1.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	1.1 *	1.1 *	1.1 *	1.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE	Source:	Bark Boiler			FIN:	P-BARKB
Source Code: IO-BB	Date:	7/9/92	EPN:	02A	CIN:	C-33, C-8

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	1.1 *	1.1 *	1.1 *	1.1 *
Knowns as Carbon				
Concentration, ppmvd	1.8	1.7	2.3	1.9
Unknowns as Carbon				
Concentration, ppmvd	3.4	3.7	5.5	4.2
Sum M18 as Carbon, lb/hr	0.7	0.7	1.1	0.8
Unknown Compounds % of Total	65.6%	68.4%	70.9%	68.3%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	14.1	21.2	19.8	18.4
Emission Rate, lb/hr as C	2.0	2.9	2.7	2.5

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: Bark Boiler | FIN: P-BARKB
Source Code: IO-BB | Date: 7/10/92 | EPN: 02A | CIN: C-33, C-8

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1047	1247	1347	
Flow Data				
Stack Temperature, °F	155			155
Moisture Content, %	28.6			28.6
Oxygen Concentration, %	7.0			7.0
Carbon Dioxide Concentration, %	11.0			11.0
Volumetric Flow Rate, x10^3 ACFM	110.6			110.6
Volumetric Flow Rate, x10^3 DSCFM	67.9			67.9
Process Operating Conditions				
Production Rate, x 10^6 BTU/hr	429.0	429.0	429.0	429.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	2.8 *	2.8 *	2.8 *	2.8 *
Emission Rate, lb/hr	0.9 *	0.9 *	0.9 *	0.9 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Acetone				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
2-Propanol				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE	Source: Bark Boiler			FIN:	P-BARKB
Source Code: IO-BB	Date: 7/10/92	EPN:	02A	CIN:	C-33, C-8

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Chloroform				
Concentration, ppmvd	1.4 *	1.4 *	1.4 *	1.4 *
Emission Rate, lb/hr	1.8 *	1.8 *	1.8 *	1.8 *
Benzene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.6 *	0.6 *	0.6 *	0.6 *
Bromodichloromethane				
Concentration, ppmvd	1.4 *	1.4 *	1.4 *	1.4 *
Emission Rate, lb/hr	2.4 *	2.4 *	2.4 *	2.4 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
Ethyl benzene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.8 *	0.8 *	0.8 *	0.8 *
m-, p-Xylene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.8 *	0.8 *	0.8 *	0.8 *
o-Xylene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.8 *	0.8 *	0.8 *	0.8 *
Cumene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.9 *	0.9 *	0.9 *	0.9 *
alpha-Pinene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	1.0 *	1.0 *	1.0 *	1.0 *
beta-Pinene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	1.0 *	1.0 *	1.0 *	1.0 *
3-Carene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	1.0 *	1.0 *	1.0 *	1.0 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	1.0 *	1.0 *	1.0 *	1.0 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE	Source:	Bark Boiler		FIN:	P-BARKB
Source Code: IO-BB	Date:	7/10/92	EPN: 02A	CIN:	C-33, C-8

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	1.0 *	1.0 *	1.0 *	1.0 *
Knowns as Carbon				
Concentration, ppmvd	1.3	0.7	1.2	1.1
Unknowns as Carbon				
Concentration, ppmvd	2.7	0.6	2.4	1.9
Sum M18 as Carbon, lb/hr	0.5	0.2	0.5	0.4
Unknown Compounds % of Total	67.1%	46.2%	66.7%	60.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	15.4	110.6	95.2	73.8
Emission Rate, lb/hr as C	2.0	14.1	12.1	9.4

* One or more values were less than the detection limit.

WESTON

Section 3.2 Emission Test Results - VOST

EMISSIONS TEST RESULTS - VOST

Mil	INLAND - ORANGE		Source:	Bark Boiler		Condition 1		
	Source Code:	IO-BB	EPN:	02A	IN:	P-BARKB	CIN:	C-33, C-8

Compound	BB-T (µg)	BB-TC (µg)	BB-C (µg/L)	Total µg	IO-BB (µg/m3)	Conc. (ppm)
	Volume = 5 L				Date: 7/9/92	
TARGET COMPOUNDS						
Chloromethane	0.034	1.072		1.106	228.99	0.109
Methylene Chloride	0.074	0.034	36.37	1.672	346.15	0.098
Acetone	0.458	0.027	2.67	0.600	124.18	0.051
Carbon Disulfide						
Chloroform	0.247	0.011	4.82	0.465	96.33	0.019
Trichlorofluoromethane	0.062	0.036		0.098	20.29	0.004
Acrolein	1.009			1.009	208.90	0.090
Acrylonitrile	0.089			0.089	18.43	0.008
1,3-Butadiene	0.272	0.066		0.338	69.98	0.031
Dimethyl disulfide	0.007			0.007	1.45	0.000
Isooctane						
t-Butyl methyl ether						
n-Hexane	0.839	1.446	0.74	2.317	479.67	0.134
2-Butanone (MEK)	0.101			0.101	20.91	0.007
1,1,1-Trichloroethane			0.61	0.026	5.43	0.001
Bromodichloromethane						
Benzene	1.705			1.705	353.00	0.109
Toluene	0.653	0.005	0.52	0.680	140.86	0.037
Ethylbenzene	0.037			0.037	7.66	0.002
Styrene	0.216		7.48	0.538	111.31	0.026
o-Xylene	0.023			0.023	4.76	0.001
m-/p-Xylene	0.091			0.091	18.84	0.004
A-Pinene	0.061			0.061	12.63	0.002
B-Pinene	0.009	0.003		0.012	2.48	0.000
p-Cymene	0.023			0.023	4.76	0.001
TENTATIVELY IDENTIFIED CMPDS.						
Furan	0.584			0.584	120.91	
subst'd HC	0.150			0.150	31.06	
unsat'd HC, C5H8	0.122			0.122	25.26	
unsat'd HC, C5H8	0.104			0.104	21.53	
Branched HC	0.088			0.088	18.22	
Siloxane	0.087			0.087	18.01	
Benzofuran	0.078			0.078	16.15	
unsat'd HC, C7H14	0.077			0.077	15.94	
1-Buten-3-yne	0.074	0.041		0.115	23.81	
Pinene-related compound	0.069			0.069	14.29	
Butene		0.039		0.039	8.07	
Cyclohexane		0.029		0.029	6.00	
subst'd HC						
subst'd HC						
branched HC						
branched HC						
branched HC						
branched HC						

EMISSIONS TEST RESULTS - VOST

Mil	INLAND - ORANGE		Source:	Bark Boiler		Condition 1		
	Source Code:	IO-BB	EPN:	02A	IN:	P-BARKB	CIN:	C-33, C-8

Compound	BB-T (μg)	BB-TC (μg)	BB-C (μg/L)	Total μg	IO-BB (μg/m3)	Conc. (ppm)
	Volume = 5 L				Date: 7/9/92	
SURROGATE STDS						
(% Recovery)						
Toluene-d8	96.8	93.4	101.2			
1,2-Dichloroethane-d4	72.8	79.0	93.8			
Benzene-d6	84.8	75.3	118.0			

NOTES:

-T=Tenax

-TC=Tenax/Charcoal

-C = Condensate

Air Volume = 0.00483 cu.m.

Condensate Vol. 43.0 mL

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HI475
RF FILE: HI469
DATE: 07/31/92
TLI PROJ #: 21415

SAMPLE ID: IO-BB-1VOST-0709
18-T
TLI ID: 58.039.3
ANALYSIS DATE: 07/24/92

METHOD 8240 QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	4739		774	1		IS	
2	Chloromethane	603	.924	166	1	.034	E	.05
3	Bromomethane	0	.924	0	1	.001	ND	.05
4	Vinyl Chloride	0	1.096	0	1	.001	ND	.05
5	Chloroethane	0	.938	0	1	.001	ND	.05
6	Methylene Chloride	2850	2.025	582	1	.074	D	.05
7	Acetone	4794	.552	524	1	.458	D	.05
8	Carbon Disulfide	0	5.799	0	1	.001	ND	.05
9	1,1-Dichloroethene	0	1.618	0	1	.001	ND	.05
10	1,1-Dichloroethane	0	4.648	0	1	.001	ND	.05
11	trans-1,2-Dichloroethene	0	2.075	0	1	.001	ND	.05
12	Chloroform	25528	5.456	793	1	.247	D	.05
13	1,2-Dichloroethane	0	3.052	0	1	.001	ND	.05
43	Trichlorofluoromethane	3070	2.623	396	1	.062	D	.05
45	Acrolein	692	.036	495	1	1.009	E	.05
46	Acrylonitrile	895	.531	622	1	.089	D	.05
47	cis-1,2-Dichloroethene	0	2.411	0	1	.001	ND	.05
52	1,3-butadiene	6600	1.282	225	1	.272	D	.05
57	Allyl chloride	0	1.166	0	1	.001	ND	.05
62	Dimethyl disulfide	588	4.526	1071	1	.007	E	.05
63	Dimethyl sulfide	0	1.861	0	1	.001	ND	.05
65	Iodomethane	0	2.117	0	1	.001	ND	.05
66	Isooctane	0	15.975	0	1	.001	ND	.05
68	Tert-Butyl methyl ether	0	4.526	0	1	.001	ND	.05
69	Vinyl Bromide	0	1.369	0	1	.001	ND	.05
70	n-Hexane	72659	4.571	662	1	.839	D	.05
14	1,4-Difluorobenzene	22441		907	14		IS	
15	2-Butanone	329	.036	760	14	.101	D	.05
16	1,1,1-Trichloroethane	0	.915	0	14	.001	ND	.05
17	Carbon Tetrachloride	0	.671	0	14	.001	ND	.05
18	Vinyl Acetate	0	.806	0	14	.001	ND	.05
19	Bromodichloromethane	0	.876	0	14	.001	ND	.05
20	1,2-Dichloropropane	0	.689	0	14	.001	ND	.05
21	cis-1,3-Dichloropropene	0	1.104	0	14	.001	ND	.05
22	Trichloroethene	0	.557	0	14	.001	ND	.05
23	Dibromochloromethane	0	.493	0	14	.001	ND	.05
24	1,1,2-Trichloroethane	0	.409	0	14	.001	ND	.05
25	Benzene	363427	2.375	847	14	1.705	E	.05
26	trans-1,3-Dichloropropene	0	.745	0	14	.001	ND	.05
27	Bromoform	0	.255	0	14	.001	ND	.05
54	1,4-Dichloro-2-butene	0	.123	0	14	.002	ND	.05
60	Dibromomethane	0	.303	0	14	.001	ND	.05
28	Chlorobenzene-d5	27439		1347	28		IS	
29	4-Methyl-2-Pentanone	0	.194	0	28	.001	ND	.05
30	2-Hexanone	0	.111	0	28	.002	ND	.05
31	Tetrachloroethene	0	.375	0	28	.001	ND	.05
32	1,1,2,2-Tetrachloroethane	0	.339	0	28	.001	ND	.05
33	Toluene	70840	.989	1117	28	.653	D	.05

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FILE NAME: HI475
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TLI PROJ #: 21415

SAMPLE ID: IO-88-1VOST-0709 18-T
TLI ID: 58.039.3
ANALYSIS DATE: 07/24/92

METHOD 8240 QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
34	Chlorobenzene	0	1.073	0	28	.001	ND	.05
35	Ethylbenzene	2377	.582	1382	28	.037	E	.05
36	Styrene	30673	1.295	1484	28	.216	D	.05
37	o-Xylene	1999	.784	1478	28	.023	E	.05
38	m-/p-Xylene	8371	.834	1408	28	.091	D	.05
49	1,2 Dichlorobenzene	0	.586	0	28	.001	ND	.05
50	1,2,3-Trichloropropane	0	.236	0	28	.001	ND	.05
51	1,3 Dichlorobenzene	0	.800	0	28	.001	ND	.05
53	1,4 Dichlorobenzene	0	.674	0	28	.001	ND	.05
56	A-Pinene	8082	1.199	1548	28	.061	D	.05
58	B-Pinene	3011	1.339	1693	28	.020	E	.05
59	Cumene (isopropylbenzene)	1620	1.813	1804	28	.009	E	.05
64	Ethyl methacrylate	0	.402	0	28	.001	ND	.05
67	P-Cymene	4451	1.797	1927	28	.023	E	.05

	SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
41	1,2-Dichloroethane-d4	10480	3.037	844	1	.18	D	72.8
48	Benzene-d6	48486	2.548	842	14	.21	D	84.8
39	Toluene-d8	43415	1.635	1107	28	.24	D	96.8

TRIANGLE LABORATORIES OF RTP, INC.
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18-T
TLI ID: 58.039.3
ANALYSIS DATE: 07/24/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

	NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
1	FURAN	468	103536	774	.25	.584
2	SUBSTITUTED HYDROCARBON	407	26632	774	.25	.150
3	POLYUNSATURATED HYDROCARBON C5H8	513	21558	774	.25	.122
4	POLYUNSATURATED HYDROCARBON C5H6	540	18359	774	.25	.104
5	BRANCHED HYDROCARBON	1305	38548	1347	.25	.088
6	SILOXANE	1233	37987	1347	.25	.087
7	BENZOFURAN	1872	34059	1347	.25	.078
8	MONOUNSATURATED HYDROCARBON C7H14	885	18614	907	.25	.077
9	1-BUTEN-3-YNE	278	13149	774	.25	.074
10	PINENE RELATED COMPOUND	1904	30126	1347	.25	.069

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	774	44340	1
1,4-Difluorobenzene	907	60429	14
Chlorobenzene-d5	1347	109090	28

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FILE NAME: HI471
RF FILE: HI469
DATE: 07/31/92
TLI PROJ #: 21415

SAMPLE ID: IO-BB-1VOST-0709
1B-T/C
TLI ID: 58.039.4
ANALYSIS DATE: 07/24/92

METHOD 8240 QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	4626		772	1		IS	
2	Chloromethane	18330	.924	164	1	1.072	E	.05
3	Bromomethane	0	.924	0	1	.001	ND	.05
4	Vinyl Chloride	0	1.096	0	1	.001	ND	.05
5	Chloroethane	0	.938	0	1	.001	ND	.05
6	Methylene Chloride	1272	2.025	579	1	.034	E	.05
7	Acetone	279	.552	520	1	.027	E	.05
8	Carbon Disulfide	0	5.799	0	1	.001	ND	.05
9	1,1-Dichloroethene	0	1.618	0	1	.001	ND	.05
10	1,1-Dichloroethane	0	4.648	0	1	.001	ND	.05
11	trans-1,2-Dichloroethene	0	2.075	0	1	.001	ND	.05
12	Chloroform	1099	5.456	791	1	.011	E	.05
13	1,2-Dichloroethane	0	3.052	0	1	.001	ND	.05
43	Trichlorofluoromethane	1726	2.623	395	1	.036	E	.05
45	Acrolein	0	.036	0	1	.030	ND	.05
46	Acrylonitrile	0	.531	0	1	.002	ND	.05
47	cis-1,2-Dichloroethene	0	2.411	0	1	.001	ND	.05
52	1,3-butadiene	1577	1.282	223	1	.066	D	.05
57	Allyl chloride	0	1.166	0	1	.001	ND	.05
62	Dimethyl disulfide	0	4.526	0	1	.001	ND	.05
63	Dimethyl sulfide	0	1.861	0	1	.001	ND	.05
65	Iodomethane	0	2.117	0	1	.001	ND	.05
66	Isooctane	0	15.975	0	1	.001	ND	.05
68	Tert-Butyl methyl ether	0	4.526	0	1	.001	ND	.05
69	Vinyl Bromide	0	1.369	0	1	.001	ND	.05
70	n-Hexane	122286	4.571	660	1	1.446	E	.05
14	1,4-Difluorobenzene	24931		905	14		IS	
15	2-Butanone	0	.036	0	14	.006	ND	.05
16	1,1,1-Trichloroethane	0	.915	0	14	.001	ND	.05
17	Carbon Tetrachloride	0	.671	0	14	.001	ND	.05
18	Vinyl Acetate	0	.806	0	14	.001	ND	.05
19	Bromodichloromethane	0	.876	0	14	.001	ND	.05
20	1,2-Dichloropropane	0	.689	0	14	.001	ND	.05
21	cis-1,3-Dichloropropene	0	1.104	0	14	.001	ND	.05
22	Trichloroethene	0	.557	0	14	.001	ND	.05
23	Dibromochloromethane	0	.493	0	14	.001	ND	.05
24	1,1,2-Trichloroethane	0	.409	0	14	.001	ND	.05
25	Benzene	0	2.375	0	14	.001	ND	.05
26	trans-1,3-Dichloropropene	0	.745	0	14	.001	ND	.05
27	Bromoform	0	.255	0	14	.001	ND	.05
54	1,4-Dichloro-2-butene	0	.123	0	14	.002	ND	.05
60	Dibromomethane	0	.303	0	14	.001	ND	.05
28	Chlorobenzene-d5	30252		1343	28		IS	
29	4-Methyl-2-Pentanone	0	.194	0	28	.001	ND	.05
30	2-Hexanone	0	.111	0	28	.001	ND	.05
31	Tetrachloroethene	0	.375	0	28	.001	ND	.05
32	1,1,2,2-Tetrachloroethane	0	.339	0	28	.001	ND	.05
33	Toluene	628	.989	1114	28	.005	E	.05

Triangle Laboratories of RTP, Inc.	FILE NAME: HI471	SAMPLE ID:	IO-BB-1VOST-0709
801 Capitola Drive	RF FILE: HI469		1B-T/C
Durham, NC 27713	DATE: 07/31/92	TLI ID:	58.039.4
Telephone: (919) 544-5729	TLI PROJ #: 21415	ANALYSIS DATE:	07/24/92

M E T H O D   8 2 4 0   Q U A N T I T A T I O N   R E P O R T

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
34 Chlorobenzene	0	1.073	0	28	.001	ND	.05
35 Ethylbenzene	0	.582	0	28	.001	ND	.05
36 Styrene	0	1.295	0	28	.001	ND	.05
37 o-Xylene	0	.784	0	28	.001	ND	.05
38 m-/p-Xylene	0	.834	0	28	.001	ND	.05
49 1,2 Dichlorobenzene	0	.586	0	28	.001	ND	.05
50 1,2,3-Trichloropropane	0	.236	0	28	.001	ND	.05
51 1,3 Dichlorobenzene	0	.800	0	28	.001	ND	.05
53 1,4 Dichlorobenzene	0	.674	0	28	.001	ND	.05
56 A-Pinene	0	1.199	0	28	.001	ND	.05
58 B-Pinene	499	1.339	1544	28	.003	E	.05
59 Cumene (isopropylbenzene)	0	1.613	0	28	.001	ND	.05
64 Ethyl methacrylate	0	.402	0	28	.001	ND	.05
67 P-Cymene	0	1.797	0	28	.001	ND	.05

S U R R O G A T E S U M M A R Y	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	11097	3.037	841	1	.20	D	79.0
48 Benzene-d6	47803	2.548	840	14	.19	D	75.3
39 Toluene-d8	46203	1.635	1104	28	.23	D	93.4

TRIANGLE LABORATORIES OF RTP, INC.	FILE NAME: HI471	SAMPLE ID:	IO-88-1VOST-0709
801 Capitola Drive	DATE: 07/31/92		18-T/C
Durham, NC 27713	TLI PROJ #: 21415	TLI ID:	58.039.4
Telephone: (919) 544-5729		ANALYSIS DATE:	07/24/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

	NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
1	1-BUTEN-3-YNE	276	6650	772	.25	.041
2	BUTENE	203	6351	772	.25	.039
3	CYCLOHEXANE	726	4715	772	.25	.029

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	772	40431	1
1,4-Difluorobenzene	905	69712	14
Chlorobenzene-d5	1343	110939	28

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: AC8953
RF FILE: AC893
DATE: 07/31/92
TLI PROJ #: 21415

SAMPLE ID: IO-BB-1VOST-0709
1B-CONDENSATE
TLI ID: 58.039.14
SAMPLE VOL: .005 L
ANALYSIS DATE: 07/21/92
DILUTION FACTOR: 1

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	CONC, ug/L	CODE	QUAN LIMIT
1 Bromochloromethane	1916		777	1		IS	
2 Chloromethane	0	1.500	0	1	.35	ND	10
3 Bromomethane	0	1.450	0	1	.36	ND	10
4 Vinyl Chloride	0	1.856	0	1	.28	ND	10
5 Chloroethane	0	1.225	0	1	.43	ND	10
6 Methylene Chloride	1655	1.187	580	1	36.37	D	10
7 Acetone	114	1.112	526	1	2.67	E	10
8 Carbon Disulfide	0	2.922	0	1	.18	ND	10
9 1,1-Dichloroethene	0	1.486	0	1	.35	ND	10
10 1,1-Dichloroethane	0	4.168	0	1	.13	ND	10
11 trans-1,2-Dichloroethene	0	1.676	0	1	.31	ND	10
12 Chloroform	534	2.892	796	1	4.82	E	10
13 1,2-Dichloroethane	0	2.959	0	1	.18	ND	10
43 Trichlorofluoromethane	0	1.815	0	1	.29	ND	10
45 Acrolein	0	.471	0	1	1.11	ND	10
46 Acrylonitrile	0	.882	0	1	.59	ND	10
47 cis-1,2-Dichloroethene	0	1.856	0	1	.28	ND	10
52 1,3-butadiene	0	2.246	0	1	.23	ND	10
57 Allyl chloride	0	.649	0	1	.80	ND	10
62 Dimethyl disulfide	0	4.349	0	1	.12	ND	10
63 Dimethyl sulfide	0	2.154	0	1	.24	ND	10
65 Iodomethane	0	1.579	0	1	.33	ND	10
66 Isooctane	0	13.240	0	1	.04	ND	10
68 Tert-Butyl methyl ether	0	3.578	0	1	.15	ND	10
69 Vinyl Bromide	0	1.747	0	1	.30	ND	10
70 n-Hexane	115	4.066	661	1	.74	E	10
14 1,4-Difluorobenzene	8119		913	14		IS	
15 2-Butanone	0	.057	0	14	2.15	ND	10
16 1,1,1-Trichloroethane	66	.667	805	14	.61	E	10
17 Carbon Tetrachloride	0	.536	0	14	.23	ND	10
18 Vinyl Acetate	0	1.187	0	14	.10	ND	10
19 Bromodichloromethane	0	.597	0	14	.21	ND	10
20 1,2-Dichloropropane	0	.730	0	14	.17	ND	10
21 cis-1,3-Dichloropropene	0	.646	0	14	.19	ND	10
22 Trichloroethene	0	.462	0	14	.27	ND	10
23 Dibromochloromethane	0	.618	0	14	.20	ND	10
24 1,1,2-Trichloroethane	0	.529	0	14	.23	ND	10
25 Benzene	0	.962	0	14	.13	ND	10
26 trans-1,3-Dichloropropene	0	.646	0	14	.19	ND	10
27 Bromoform	0	.389	0	14	.32	ND	10
54 1,4-Dichloro-2-butene	0	.263	0	14	.47	ND	10
60 Dibromomethane	0	.362	0	14	.34	ND	10
28 Chlorobenzene-d5	9819		1364	28		IS	
29 4-Methyl-2-Pentanone	0	.608	0	28	.17	ND	10
30 2-Hexanone	0	.636	0	28	.16	ND	10
31 Tetrachloroethene	0	.275	0	28	.37	ND	10
32 1,1,2,2-Tetrachloroethane	0	.759	0	28	.13	ND	10

Triangle Laboratories of RTP, Inc.	FILE NAME: AC8953	SAMPLE ID:	IO-BB-1VOST-0709
801 Capitola Drive	RF FILE: AC893		18-CONDENSATE
Durham, NC 27713	DATE: 07/31/92	TLI ID:	58.039.14
Telephone: (919) 544-5729	TLI PROJ #: 21415	SAMPLE VOL:	.005 L
		ANALYSIS DATE:	07/21/92
		DILUTION FACTOR:	1

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	CONC, ug/L	CODE	QUAN LIMIT
33 Toluene	82	.797	1130	28	.52	E	10
34 Chlorobenzene	0	1.085	0	28	.09	ND	10
35 Ethylbenzene	0	.579	0	28	.16	ND	10
36 Styrene	1784	1.215	1502	28	7.48	E	10
37 o-Xylene	0	.770	0	28	.13	ND	10
38 m-/p-Xylene	0	.728	0	28	.14	ND	10
49 1,2 Dichlorobenzene	0	.849	0	28	.12	ND	10
50 1,2,3-Trichloropropane	0	.453	0	28	.22	ND	10
51 1,3 Dichlorobenzene	0	.947	0	28	.11	ND	10
53 1,4 Dichlorobenzene	0	.848	0	28	.12	ND	10
56 A-Pinene	0	1.243	0	28	.08	ND	10
58 B-Pinene	0	1.385	0	28	.07	ND	10
59 Cumene (isopropylbenzene)	0	1.849	0	28	.06	ND	10
64 Ethyl methacrylate	0	.604	0	28	.17	ND	10
67 P-Cymene	0	2.113	0	28	.05	ND	10

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT,ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	4633	2.577	848	1	.23	D	93.8
48 Benzene-d6	11029	1.151	846	14	.29	D	118.0
39 Toluene-d8	12952	1.304	1121	28	.25	D	101.2

EMISSIONS TEST RESULTS - VOST

Mil	INLAND - ORANGE	Source:	Bark Boiler		Condition 1	
	Source Code:	IO-BB	EPN: 02A	FIN:	P-BARKB	CIN: -33, C-8

Compound	BB-T (µg)	BB-TC (µg)	BB-C (µg/L)	Total µg	IO-BB (µg/m3)	Conc. (ppm)
	Volume = 5 L			Date: 7/10/92		
TARGET COMPOUNDS						
Chloromethane	0.033	0.472		0.51	102.85	0.049
Methylene Chloride	0.076	0.082	92.18	4.12	839.46	0.237
Acetone	0.428		5.61	0.67	136.30	0.056
Carbon Disulfide	0.171	0.865		1.04	211.00	0.067
Chloroform	0.245	0.003	1.18	0.30	60.84	0.012
Trichlorofluoromethane		0.026		0.03	5.30	0.001
Acrolein			1.22	0.05	10.68	0.005
Acrylonitrile						
1,3-Butadiene	0.197	0.036		0.23	47.45	0.021
Dimethyl disulfide						
Isooctane	0.220	0.016		0.24	48.07	0.010
t-Butyl methyl ether	0.520	0.049		0.57	115.89	0.032
n-Hexane	6.312	0.288		6.60	1344.20	0.375
2-Butanone (MEK)	0.084			0.08	17.11	0.006
1,1,1-Trichloroethane						
Bromodichloromethane	0.010			0.01	2.04	0.000
Benzene	1.769			1.77	360.29	0.111
Toluene	0.808	0.038	1.20	0.90	182.81	0.048
Ethylbenzene	0.020			0.02	4.07	0.001
Styrene	0.089			0.09	18.13	0.004
o-Xylene	0.012			0.01	2.44	0.001
m-/p-Xylene	0.034			0.03	6.92	0.002
A-Pinene	0.073			0.07	14.87	0.003
B-Pinene	0.022			0.02	4.48	0.001
p-Cymene	0.029			0.03	5.91	0.001
TENTATIVELY IDENTIFIED CMPDS.						
Furan	0.272			0.27	55.40	
subst'd HC	0.258	0.066	5.13	0.54	110.91	
unsat'd HC, C5H8						
unsat'd HC, C5H8						
Branched HC	1.307			1.31	266.19	
Siloxane						
Benzofuran						
unsat'd HC, C7H14						
1-Buten-3-yne						
Pinene-related compound						
Butene		0.044		0.04	8.96	
Cyclohexane	2.968	0.046		3.01	613.85	
subst'd HC	0.204			0.20	41.55	
subst'd HC	0.178			0.18	36.25	
branched HC	0.097			0.10	19.76	
branched HC	0.092			0.09	18.74	
branched HC	0.090			0.09	18.33	
branched HC	0.081			0.08	16.50	

EMISSIONS TEST RESULTS - VOST

Mil	INLAND - ORANGE		Source:	Bark Boiler		Condition 1	
	Source Code:	IO-BB	EPN:	02A	FIN:	P-BARKB	CIN: -33, C-8

Compound	BB-T (μg)	BB-TC (μg)	BB-C (μg/L)	Total μg	IO-BB (μg/m3)	Conc. (ppm)
	Volume = 5 L			Date: 7/10/92		
SURROGATE STDS						
(% Recovery)						
Toluene-d8	98.500	92.000	99.6			
1,2-Dichloroethane-d4	79.800	72.800	99.9			
Benzene-d6	86.900	85.800	107.0			

NOTES:

-T=Tenax

-TC=Tenax/Charcoal

-C = Condensate

Air Volume = 0.00491 cu.m.

Condensate Vol. 43.0 mL

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HI476
RF FILE: HI469
DATE: 07/31/92
TLI PROJ #: 21415

SAMPLE ID: IO-BB-1VOST-0710
28-T
TLI ID: 58.039.9
ANALYSIS DATE: 07/24/92

METHOD 8240 QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	4313		771	1		IS	
2	Chloromethane	529	.924	165	1	.033	E	.05
3	Bromomethane	0	.924	0	1	.001	ND	.05
4	Vinyl Chloride	0	1.096	0	1	.001	ND	.05
5	Chloroethane	0	.938	0	1	.001	ND	.05
6	Methylene Chloride	2663	2.025	578	1	.076	D	.05
7	Acetone	4077	.552	520	1	.428	D	.05
8	Carbon Disulfide	17103	5.799	495	1	.171	D	.05
9	1,1-Dichloroethene	0	1.618	0	1	.001	ND	.05
10	1,1-Dichloroethane	0	4.648	0	1	.001	ND	.05
11	trans-1,2-Dichloroethene	0	2.075	0	1	.001	ND	.05
12	Chloroform	23080	5.456	790	1	.245	D	.05
13	1,2-Dichloroethane	0	3.052	0	1	.001	ND	.05
43	Trichlorofluoromethane	0	2.623	0	1	.001	ND	.05
45	Acrolein	0	.036	0	1	.032	ND	.05
46	Acrylonitrile	0	.531	0	1	.002	ND	.05
47	cis-1,2-Dichloroethene	0	2.411	0	1	.001	ND	.05
52	1,3-butadiene	4358	1.282	223	1	.197	D	.05
57	Allyl chloride	0	1.166	0	1	.001	ND	.05
62	Dimethyl disulfide	0	4.526	0	1	.001	ND	.05
63	Dimethyl sulfide	0	1.861	0	1	.001	ND	.05
65	Iodomethane	0	2.117	0	1	.001	ND	.05
66	Isooctane	60598	15.975	862	1	.220	D	.05
68	Tert-Butyl methyl ether	40626	4.526	625	1	.520	D	.05
69	Vinyl Bromide	0	1.369	0	1	.001	ND	.05
70	n-Hexane	497776	4.571	662	1	6.312	E	.05
14	1,4-Difluorobenzene	23697		903	14		IS	
15	2-Butanone	288	.036	756	14	.084	D	.05
16	1,1,1-Trichloroethane	0	.915	0	14	.001	ND	.05
17	Carbon Tetrachloride	0	.671	0	14	.001	ND	.05
18	Vinyl Acetate	0	.806	0	14	.001	ND	.05
19	Bromodichloromethane	858	.876	1001	14	.010	E	.05
20	1,2-Dichloropropane	0	.689	0	14	.001	ND	.05
21	cis-1,3-Dichloropropene	0	1.104	0	14	.001	ND	.05
22	Trichloroethene	0	.557	0	14	.001	ND	.05
23	Dibromochloromethane	0	.493	0	14	.001	ND	.05
24	1,1,2-Trichloroethane	0	.409	0	14	.001	ND	.05
25	Benzene	398257	2.375	844	14	1.769	E	.05
26	trans-1,3-Dichloropropene	0	.745	0	14	.001	ND	.05
27	Bromoform	0	.255	0	14	.001	ND	.05
54	1,4-Dichloro-2-butene	0	.123	0	14	.002	ND	.05
60	Dibromomethane	0	.303	0	14	.001	ND	.05
28	Chlorobenzene-d5	28537		1341	28		IS	
29	4-Methyl-2-Pentanone	0	.194	0	28	.001	ND	.05
30	2-Hexanone	0	.111	0	28	.002	ND	.05
31	Tetrachloroethene	0	.375	0	28	.001	ND	.05
32	1,1,2,2-Tetrachloroethane	0	.339	0	28	.001	ND	.05
33	Toluene	91182	.989	1112	28	.808	D	.05

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HI476
RF FILE: HI469
DATE: 07/31/92
TLI PROJ #: 21415

SAMPLE ID: IO-88-1VOST-0710 28-T
TLI ID: 58.039.9
ANALYSIS DATE: 07/24/92

M E T H O D 8 2 4 0 Q U A N T I T A T I O N R E P O R T

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
34 Chlorobenzene	0	1.073	0	28	.001	ND	.05
35 Ethylbenzene	1356	.582	1375	28	.020	E	.05
36 Styrene	13136	1.295	1477	28	.089	D	.05
37 o-Xylene	1052	.784	1472	28	.012	E	.05
38 m-/p-Xylene	3201	.834	1399	28	.034	E	.05
49 1,2 Dichlorobenzene	0	.586	0	28	.001	ND	.05
50 1,2,3-Trichloropropane	0	.236	0	28	.001	ND	.05
51 1,3 Dichlorobenzene	0	.800	0	28	.001	ND	.05
53 1,4 Dichlorobenzene	0	.674	0	28	.001	ND	.05
56 A-Pinene	10059	1.199	1542	28	.073	D	.05
58 B-Pinene	3301	1.339	1686	28	.022	E	.05
59 Cumene (isopropylbenzene)	0	1.613	0	28	.001	ND	.05
64 Ethyl methacrylate	0	.402	0	28	.001	ND	.05
67 P-Cymene	6042	1.797	1917	28	.029	E	.05

S U R R O G A T E S U M M A R Y	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	10451	3.037	841	1	.20	D	79.8
48 Benzene-d6	52465	2.548	839	14	.22	D	86.9
39 Toluene-d8	45951	1.835	1103	28	.25	D	98.5

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HI478
DATE: 07/31/92
TLI PROJ #: 21415

SAMPLE ID: IO-88-1VOST-0710
2B-T
TLI ID: 58.039.9
ANALYSIS DATE: 07/24/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

	NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
1	CYCLOHEXANE	725	466619	771	.25	2.968
2	BRANCHED HYDROCARBON	618	205474	771	.25	1.307
3	FURAN	463	42704	771	.25	.272
4	SUBSTITUTED HYDROCARBON	1694	98113	1341	.25	.258
5	SUBSTITUTED HYDROCARBON	356	31993	771	.25	.204
6	SUBSTITUTED HYDROCARBON	1299	67493	1341	.25	.178
7	BRANCHED HYDROCARBON	1609	36975	1341	.25	.097
8	BRANCHED HYDROCARBON	1137	34753	1341	.25	.092
9	BRANCHED HYDROCARBON	1987	34312	1341	.25	.090
10	BRANCHED HYDROCARBON	1835	30762	1341	.25	.081

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	771	39299	1
1,4-Difluorobenzene	903	66641	14
Chlorobenzene-d5	1341	94945	28

Triangle Laboratories of RTP, Inc.	FILE NAME: HI472	SAMPLE ID:	IO-BB-1VOST-0710
801 Capitola Drive	RF FILE: HI469		28-T/C
Durham, NC 27713	DATE: 07/31/92	TLI ID:	58.039.10
Telephone: (919) 544-5729	TLI PROJ #: 21415	ANALYSIS DATE:	07/24/92

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1 Bromochloromethane	5624		768	1		IS	
2 Chloromethane	9800	.924	163	1	.472	D	.05
3 Bromomethane	0	.924	0	1	.001	ND	.05
4 Vinyl Chloride	0	1.096	0	1	.001	ND	.05
5 Chloroethane	0	.938	0	1	.001	ND	.05
6 Methylene Chloride	3759	2.025	576	1	.082	D	.05
7 Acetone	0	.552	0	1	.002	ND	.05
8 Carbon Disulfide	112787	5.799	494	1	.865	D	.05
9 1,1-Dichloroethene	0	1.618	0	1	.001	ND	.05
10 1,1-Dichloroethane	0	4.648	0	1	.001	ND	.05
11 trans-1,2-Dichloroethene	0	2.075	0	1	.001	ND	.05
12 Chloroform	358	5.456	786	1	.003	E	.05
13 1,2-Dichloroethane	0	3.052	0	1	.001	ND	.05
43 Trichlorofluoromethane	1544	2.623	393	1	.026	E	.05
45 Acrolein	0	.036	0	1	.025	ND	.05
46 Acrylonitrile	0	.531	0	1	.002	ND	.05
47 cis-1,2-Dichloroethene	0	2.411	0	1	.001	ND	.05
52 1,3-butadiene	1028	1.282	222	1	.036	E	.05
57 Allyl chloride	0	1.166	0	1	.001	ND	.05
62 Dimethyl disulfide	0	4.526	0	1	.001	ND	.05
63 Dimethyl sulfide	0	1.861	0	1	.001	ND	.05
65 Iodomethane	0	2.117	0	1	.001	ND	.05
66 Isooctane	5909	15.975	658	1	.016	E	.05
68 Tert-Butyl methyl ether	5000	4.526	622	1	.049	E	.05
69 Vinyl Bromide	0	1.369	0	1	.001	ND	.05
70 n-Hexane	29606	4.571	657	1	.288	D	.05
14 1,4-Difluorobenzene	25187		900	14		IS	
15 2-Butanone	0	.036	0	14	.005	ND	.05
16 1,1,1-Trichloroethane	0	.915	0	14	.001	ND	.05
17 Carbon Tetrachloride	0	.671	0	14	.001	ND	.05
18 Vinyl Acetate	0	.806	0	14	.001	ND	.05
19 Bromodichloromethane	0	.876	0	14	.001	ND	.05
20 1,2-Dichloropropane	0	.689	0	14	.001	ND	.05
21 cis-1,3-Dichloropropene	0	1.104	0	14	.001	ND	.05
22 Trichloroethene	0	.557	0	14	.001	ND	.05
23 Dibromochloromethane	0	.493	0	14	.001	ND	.05
24 1,1,2-Trichloroethane	0	.409	0	14	.001	ND	.05
25 Benzene	0	2.375	0	14	.001	ND	.05
26 trans-1,3-Dichloropropene	0	.745	0	14	.001	ND	.05
27 Bromoform	0	.255	0	14	.001	ND	.05
54 1,4-Dichloro-2-butene	0	.123	0	14	.002	ND	.05
60 Dibromomethane	0	.303	0	14	.001	ND	.05
28 Chlorobenzene-d5	30723		1337	28		IS	
29 4-Methyl-2-Pentanone	0	.194	0	28	.001	ND	.05
30 2-Hexanone	0	.111	0	28	.001	ND	.05
31 Tetrachloroethene	0	.375	0	28	.001	ND	.05
32 1,1,2,2-Tetrachloroethane	0	.339	0	28	.001	ND	.05
33 Toluene	4625	.989	1108	28	.038	E	.05

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FILE NAME:	HI472	SAMPLE ID:	IO-8B-1VOST-0710
RF FILE:	HI469		2B-T/C
DATE:	07/31/92	TLI ID:	58.039.10
TLI PROJ #:	21415	ANALYSIS DATE:	07/24/92

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
34 Chlorobenzene	0	1.073	0	28	.001	ND	.05
35 Ethylbenzene	0	.582	0	28	.001	ND	.05
36 Styrene	0	1.295	0	28	.001	ND	.05
37 o-Xylene	0	.784	0	28	.001	ND	.05
38 m-/p-Xylene	0	.834	0	28	.001	ND	.05
49 1,2 Dichlorobenzene	0	.586	0	28	.001	ND	.05
50 1,2,3-Trichloropropane	0	.236	0	28	.001	ND	.05
51 1,3 Dichlorobenzene	0	.800	0	28	.001	ND	.05
53 1,4 Dichlorobenzene	0	.674	0	28	.001	ND	.05
56 A-Pinene	0	1.199	0	28	.001	ND	.05
58 B-Pinene	0	1.339	0	28	.001	ND	.05
59 Cumene (isopropylbenzene)	0	1.613	0	28	.001	ND	.05
64 Ethyl methacrylate	0	.402	0	28	.001	ND	.05
67 P-Cymene	0	1.797	0	28	.001	ND	.05

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	12428	3.037	836	1	.18	D	72.8
48 Benzene-d6	55048	2.548	835	14	.21	D	85.8
39 Toluene-d8	46214	1.635	1098	28	.23	D	92.0

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FILE NAME: HI472
DATE: 07/31/92
TLI PROJ #: 21415

SAMPLE ID: IO-BB-1VOST-0710
2B-T/C
TLI ID: 58.039.10
ANALYSIS DATE: 07/24/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

	NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
1	SUBSTITUTED HYDROCARBON	354	12616	768	.25	.066
2	CYCLOHEXANE	723	8860	768	.25	.046
3	BUTENE	202	8474	768	.25	.044

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	768	47932	1
Chlorobenzene-d5	1337	107203	28

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
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FILE NAME: AC8954
RF FILE: AC893
DATE: 07/31/92
TLI PROJ #: 21415

SAMPLE ID: IO-BB-1VOST-0710
28-CONDENSATE
TLI ID: 58.039.17
SAMPLE VOL: .005 L
ANALYSIS DATE: 07/21/92
DILUTION FACTOR: 1

M E T H O D 8 2 4 0 Q U A N T I T A T I O N R E P O R T

	NAME	AREA	RF	SCAN	ISID	CONC, ug/L	CODE	QUAN LIMIT
1	Bromochloromethane	1741		780	1		IS	
2	Chloromethane	0	1.500	0	1	.38	ND	10
3	Bromomethane	0	1.450	0	1	.40	ND	10
4	Vinyl Chloride	0	1.856	0	1	.31	ND	10
5	Chloroethane	0	1.225	0	1	.47	ND	10
6	Methylene Chloride	3811	1.187	583	1	92.18	D	10
7	Acetone	217	1.112	527	1	5.61	E	10
8	Carbon Disulfide	0	2.922	0	1	.20	ND	10
9	1,1-Dichloroethene	0	1.486	0	1	.39	ND	10
10	1,1-Dichloroethane	0	4.168	0	1	.14	ND	10
11	trans-1,2-Dichloroethene	0	1.676	0	1	.34	ND	10
12	Chloroform	119	2.892	800	1	1.18	E	10
13	1,2-Dichloroethane	0	2.959	0	1	.19	ND	10
43	Trichlorofluoromethane	0	1.815	0	1	.32	ND	10
45	Acrolein	0	.471	0	1	1.22	ND	10
46	Acrylonitrile	0	.882	0	1	.65	ND	10
47	cis-1,2-Dichloroethene	0	1.856	0	1	.31	ND	10
52	1,3-butadiene	0	2.246	0	1	.26	ND	10
57	Allyl chloride	0	.649	0	1	.89	ND	10
62	Dimethyl disulfide	0	4.349	0	1	.13	ND	10
63	Dimethyl sulfide	0	2.154	0	1	.27	ND	10
65	Iodomethane	0	1.579	0	1	.36	ND	10
66	Isooctane	0	13.240	0	1	.04	ND	10
68	Tert-Butyl methyl ether	0	3.578	0	1	.16	ND	10
69	Vinyl Bromide	0	1.747	0	1	.33	ND	10
70	n-Hexane	0	4.066	0	1	.14	ND	10
14	1,4-Difluorobenzene	8259		917	14		IS	
15	2-Butanone	0	.057	0	14	2.12	ND	10
16	1,1,1-Trichloroethane	0	.667	0	14	.18	ND	10
17	Carbon Tetrachloride	0	.536	0	14	.23	ND	10
18	Vinyl Acetate	0	1.187	0	14	.10	ND	10
19	Bromodichloromethane	0	.597	0	14	.20	ND	10
20	1,2-Dichloropropane	0	.730	0	14	.17	ND	10
21	cis-1,3-Dichloropropene	0	.646	0	14	.19	ND	10
22	Trichloroethene	0	.462	0	14	.26	ND	10
23	Dibromochloromethane	0	.618	0	14	.20	ND	10
24	1,1,2-Trichloroethane	0	.529	0	14	.23	ND	10
25	Benzene	0	.962	0	14	.13	ND	10
26	trans-1,3-Dichloropropene	0	.646	0	14	.19	ND	10
27	Bromoform	0	.389	0	14	.31	ND	10
54	1,4-Dichloro-2-butene	0	.263	0	14	.46	ND	10
60	Dibromomethane	0	.362	0	14	.33	ND	10
28	Chlorobenzene-d5	9861		1366	28		IS	
29	4-Methyl-2-Pentanone	0	.608	0	28	.17	ND	10
30	2-Hexanone	0	.636	0	28	.16	ND	10
31	Tetrachloroethene	0	.275	0	28	.37	ND	10
32	1,1,2,2-Tetrachloroethane	0	.759	0	28	.13	ND	10

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FILE NAME: AC8954
RF FILE: AC893
DATE: 07/31/92
TLI PROJ #: 21415

SAMPLE ID: IO-BB-1VOST-0710
28-CONDENSATE
TLI ID: 58.039.17
SAMPLE VOL: .005 L
ANALYSIS DATE: 07/21/92
DILUTION FACTOR: 1

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	CONC, ug/L	CODE	QUAN LIMIT
33 Toluene	189	.797	1133	28	1.20	E	10
34 Chlorobenzene	0	1.085	0	28	.09	ND	10
35 Ethylbenzene	0	.579	0	28	.18	ND	10
36 Styrene	0	1.215	0	28	.08	ND	10
37 o-Xylene	0	.770	0	28	.13	ND	10
38 m-/p-Xylene	0	.728	0	28	.14	ND	10
49 1,2 Dichlorobenzene	0	.849	0	28	.12	ND	10
50 1,2,3-Trichloropropane	0	.453	0	28	.22	ND	10
51 1,3 Dichlorobenzene	0	.947	0	28	.11	ND	10
53 1,4 Dichlorobenzene	0	.848	0	28	.12	ND	10
56 A-Pinene	0	1.243	0	28	.08	ND	10
58 B-Pinene	0	1.385	0	28	.07	ND	10
59 Cumene (isopropylbenzene)	0	1.849	0	28	.05	ND	10
64 Ethyl methacrylate	0	.604	0	28	.17	ND	10
67 P-Cymene	0	2.113	0	28	.05	ND	10

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT,ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	4483	2.577	851	1	.25	D	99.9
48 Benzene-d6	10178	1.151	850	14	.27	D	107.0
39 Toluene-d8	12799	1.304	1123	28	.25	D	99.6

TRIANGLE LABORATORIES OF RTP, INC.	FILE NAME: AC8954	SAMPLE ID:	IO-BB-1VOST-0710
801 Capitola Drive	DATE: 07/31/92		2B-CONDENSATE
Durham, NC 27713	TLI PROJ #: 21415	TLI ID:	58.039.17
Telephone: (919) 544-5729		SAMPLE VOL:	.005 L
		ANALYSIS DATE:	07/21/92
		DILUTION FACTOR:	1

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	SCAN	AREA	IS SCAN #	IS AMT	CONC, ug/L
1 SUBSTITUTED HYDROCARBON	537	1640	781	.25	5.13

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	781	15984	1
Chlorobenzene-d5	1367	34606	28

Section 3.3 Emission Test Results - SEMI-VOST

EMISSION TEST RESULTS - SEMI-VOST

Mill INLAND - ORANGE Source: Bark Boiler Condition 1
Source Code: IO-BB FIN: P-BARK CIN: C-33, C-8
EPN: 02A

Compound	IO-BB (µg)	Sampling Date: 7/8/92 IO-BB (µg/m3)	Conc. (ppm)
TARGET COMPOUNDS			
Clean Air Act Cmpds			
Cumene	1.03	27.88	0.006
a-Pinene	16.92	458.04	0.081
B-Pinene	8.58	232.27	0.041
1,2,4-Trimethylbenzene	0.79	21.39	0.004
p-Cymene	2.21	59.83	0.011
Naphthalene	21.90	592.85	0.111
Pentamethylbenzene	1.76	47.64	0.008
Di-n-butylphthalate	3.26	88.25	0.008
Butylbenzylphthalate	1.60	43.31	0.003
bis(2-Ethylhexyl)phthalate	18.78	508.39	0.031
Method 8270 Cmpds			
1,4-Dichlorobenzene	1.70	46.02	0.008
Benzoic Acid	2.82	76.34	0.015
1,2,4-Trichlorobenzene	0.39	10.56	0.001
Naphthalene	14.24	385.49	0.072
2-Methylnaphthalene	0.30	8.12	0.001
Dimethylphthalate	0.46	12.45	0.002
Butylbenzylphthalate	0.66	17.87	0.001
bis(2--Ethylhexyl)phthalate	7.88	213.32	0.013
TENTATIVELY IDENTIFIED CMPDS.			
Toluene	101.56	2749.32	
Butoxyethanol	48.51	1313.21	
Dimethylbenzene	32.76	886.84	
Branched Propionic Acid	15.85	429.07	
Pinene-related compound	15.16	410.40	
Subst'd HC	12.42	336.22	
Styrene	11.79	319.17	
Aromatic HC	11.10	300.49	
SURROGATE STDS	**CAA**	**Method 8270**	
Nitrobenzene-d5	68.3	28.3	
Phenol-d5	74.4	67.1	
1,3,5-Trichlorobenzene-d3	75.2	56.9	
1,4-Dibromobenzene-d4	63.9	62.9	
2-Fluorobiphenyl	95.0	67.2	
2,4,6-Tribromophenol	106.7	75.0	
Anthracene-d10	127.0	71.5	
Pyrene-d10	119.0	69.4	

NOTES: Air Vol. = 0.03694 cu.m.

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
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DATA FILE: GJ770 SAMPLE ID: IO-68/1MM5/0708/1A-1E
RF FILE: GJ766 TLI SAMPLE ID: 58.37.1A-1E
DATE: 09/14/92 DILUTION FACTOR: 1
TLI PROJ: 21413 ANALYSIS DATE: 09/10/92

METHOD 8270 QUANTITATION REPORT

	NAME	AREA	RF	SCAN		AMT, ug	CODE	QUAN LIMIT
1	1,4-Dichlorobenzene-d4	3828		457	1		IS	
2	Naphthalene-d8	14039		629	2		IS	
3	Acenaphthene-d10	7927		880	3		IS	
4	Phenanthrene-d10	10880		1095	4		IS	
5	Chrysene-d12	10009		1486	5		IS	
6	Perylene-d12	10233		1783	6		IS	
20	n-Nitrosodimethylamine	0	.601	0	1	.35	ND	10
21	Cumene	266	2.693	354	1	1.03	E	10
22	a-Pinene	2089	1.291	367	1	16.92	D	10
23	b-Pinene	1238	1.508	418	1	8.58	E	10
24	Aniline	0	1.810	0	1	.12	ND	10
25	1,2,4-Trimethylbenzene	153	2.021	435	1	.79	E	10
26	Phenol	0	1.622	0	1	.13	ND	10
27	Benzyl Chloride	0	2.284	0	1	.09	ND	10
28	bis-(2-Chloroethyl)ether	0	1.236	0	1	.17	ND	10
29	n-Nitrosomorpholine	0	.507	0	1	.41	ND	10
30	1,4-Dichlorobenzene	0	1.046	0	1	.20	ND	10
31	p-Cymene	470	2.222	468	1	2.21	E	10
32	Acetophenone	0	.244	0	1	.86	ND	10
33	1,2-Dibromo-3-chloropropane	0	.486	0	1	.43	ND	10
34	Hexachloroethane	0	.448	0	1	.47	ND	10
35	o-Toluidine	0	1.863	0	1	.11	ND	10
36	2-Methylphenol	0	.915	0	1	.23	ND	10
37	Nitrobenzene	0	.369	0	2	.15	ND	10
38	N,N-Dimethylaniline	0	.444	0	2	.13	ND	10
39	Isophorone	0	.435	0	2	.13	ND	10
40	Catechol	0	.138	0	2	.41	ND	10
41	3/4-Methylphenol	0	.280	0	2	.20	ND	10
42	1,2,4-Trichlorobenzene	0	.198	0	2	.29	ND	10
43	a-Terpineol	0	.151	0	2	.38	ND	10
44	Naphthalene	6089	.792	632	2	21.90	D	10
45	o-Anisidine	0	.205	0	2	.28	ND	10
46	Hexachlorobutadiene	0	.097	0	2	.59	ND	10
47	2-Chloroacetophenone	0	.535	0	2	.11	ND	10
48	a,a,a-Trichlorotoluene	0	.236	0	2	.24	ND	10
49	N,N-Diethylaniline	0	.429	0	2	.13	ND	10
50	1,4-Phenylenediamine	0	.156	0	2	.37	ND	10
51	Hydroquinone	0	.257	0	2	.22	ND	10
52	Pentamethylbenzene	298	.482	715	2	1.76	E	10
53	Hexachlorocyclopentadiene	0	.132	0	3	.76	ND	10
54	Phthalic Anhydride	0	.055	0	3	1.85	ND	10
55	2,4,6-Trichlorophenol	0	.233	0	3	.43	ND	10
56	2,4,5-Trichlorophenol	0	.254	0	3	.40	ND	10
57	2,4-Toluenediamine	0	.365	0	3	.28	ND	10
58	2,4-Dichlorophenol	0	.372	0	3	.27	ND	10

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

68115VP2

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

DATA FILE: GJ770   SAMPLE ID: IO-8B/1MM5/0708/1A-1E
RF FILE: GJ766   TLI SAMPLE ID: 58.37.1A-1E
DATE: 09/14/92   DILUTION FACTOR: 1
TLI PROJ: 21413   ANALYSIS DATE: 09/10/92

METHOD 8270 QUANTITATION REPORT

	NAME	AREA	RF	SCAN		AMT, ug	CODE	QUAN LIMIT
59	2,3-Dichlorophenol	0	.355	0	3	.28	ND	10
60	2,6-Dichlorophenol	0	.423	0	3	.24	ND	10
61	3,5-Dichlorophenol	0	1.195	0	3	.08	ND	10
62	3,4-Dichlorophenol	0	.465	0	3	.22	ND	10
63	Biphenyl	0	1.004	0	3	.10	ND	10
64	Dimethylphthalate	0	.843	0	3	.12	ND	10
65	2,4-Dinitrotoluene	0	.187	0	3	.54	ND	10
66	2,4-Dinitrophenol	0	.050	0	3	2.01	ND	10
67	4,6-Dinitro-2-methylphenol	0	.105	0	3	.96	ND	10
68	Dibenzofuran	0	1.291	0	3	.08	ND	10
69	4-Nitrophenol	0	.672	0	3	.15	ND	10
70	Trifluralin	0	.191	0	3	.53	ND	10
71	Hexachlorobenzene	0	.170	0	4	.43	ND	10
72	4-Aminobiphenyl	0	.644	0	4	.11	ND	10
73	Pentachlorophenol	0	.105	0	4	.70	ND	10
74	Pentachloronitrobenzene	0	.066	0	4	1.12	ND	10
75	4-Nitrobiphenyl	0	.283	0	4	.26	ND	10
76	Di-n-butylphthalate	1029	1.159	1189	4	3.28	E	10
77	Pyrene	0	1.065	0	5	.08	ND	10
78	Benzidine	0	.461	0	5	.17	ND	10
79	4,4'-Methylenedianiline	0	.297	0	5	.27	ND	10
80	Dimethylaminoazobenzene	0	.370	0	5	.22	ND	10
81	Butylbenzylphthalate	252	.629	1408	5	1.60	E	10
82	3,3'-Dimethylbenzidine	0	.694	0	5	.12	ND	10
83	Methylene bis-chloroaniline	0	.197	0	5	.41	ND	10
84	Chrysene	0	.830	0	5	.10	ND	10
85	3,3'-Dichlorobenzidine	0	.320	0	5	.25	ND	10
86	bis(2-Ethylhexyl)phthalate	3634	.773	1505	5	18.78	D	10
87	3,3'-Dimethoxybenzidine	0	.255	0	5	.31	ND	10

	SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
10	Phenol-d5	9131	1.283	416	1	74.40	D	74.4
12	Nitrobenzene-d5	6681	.279	531	2	68.32	D	68.3
13	1,3,5-Trichlorobenzene-d3	6009	.228	577	2	75.24	D	75.2
14	1,4-Dibromobenzene-d4	3456	.566	636	1	63.87	D	63.9
15	2-Fluorobiphenyl	15684	.833	785	3	95.00	D	95.0
16	2,4,6-Tribromophenol	2672	.126	995	3	106.67	D	106.7
17	Anthracene-d10	22538	.653	1103	4	126.96	D	127.0
18	Pyrene-d10	24323	.817	1301	5	118.95	D	119.0

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

TRIANGLE LABORATORIES OF RTP, INC.	FILE NAME: GJ770	SAMPLE ID:	IO\88\MM5F8\1A-1E
801 Capitola Drive	DATE: 09/14/92	TLI ID:	58.37.1A-1E
Durham, NC 27713	TLI PROJ #: 21413	DILN FACTOR:	1
Telephone: (919) 544-5729		ANAL DATE:	09/10/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
TOLUENE	153	56464	457	40.00	101.56
BUTOXYETHANOL	330	26970	457	40.00	48.51
DIMETHYLBENZENE	289	18215	457	40.00	32.76
BRANCHED PROPIONIC ACID	949	18003	880	40.00	15.85
PINENE RELATED COMPOUND	473	8426	457	40.00	15.16
UNKNOWN	979	16455	880	40.00	14.49
SUBSTITUTED HYDROCARBON	240	6907	457	40.00	12.42
UNKNOWN	1412	19407	1486	40.00	12.05
STYRENE	316	6557	457	40.00	11.79
AROMATIC HYDROCARBON	1213	8237	1095	40.00	11.10

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
1,4-Dichlorobenzene-d4	457	22239	1
Naphthalene-d8	629	43840	14
Acenaphthene-d10	880	45429	28
Phenanthrene-d10	1095	29682	47
Chrysene-d12	1486	64445	57
Perylene-d12	1783	42305	64

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

DATA FILE: GJ289
RF FILE: GJ280
DATE: 08/24/92
TLI PROJ #: 21413

SAMPLE ID: IO-BB/1MM5/0708/2A-2E
TLI ID: 58.37.2A-2E
DILUTION FACTOR: 1
ANALYSIS DATE: 08/18/92

METHOD 8270 QUANTITATION REPORT

39.101 L.

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	1,4-Dichlorobenzene-d4	6786		422	1		IS	
2	Phenol	0	2.1396	0	1	.06	ND	10
3	bis(2-Chloroethyl)ether	0	1.5459	0	1	.08	ND	10
4	2-Chlorophenol	0	1.6481	0	1	.07	ND	10
5	1,3-Dichlorobenzene	0	1.9212	0	1	.06	ND	10
6	1,4-Dichlorobenzene	621	1.9419	424	1	1.88	E	10
7	Benzyl alcohol	0	1.0162	0	1	.12	ND	10
8	1,2-Dichlorobenzene	0	1.8477	0	1	.06	ND	10
9	2-Methylphenol	0	1.3775	0	1	.09	ND	10
10	bis(2-Chloroisopropyl)ether	0	1.1315	0	1	.10	ND	10
11	4-Methylphenol	333	1.4284	481	1	1.37	E	10
12	N-Nitroso-di-n-propylamine	0	.9554	0	1	.12	ND	10
13	Hexachloroethane	0	.7319	0	1	.16	ND	10
14	Naphthalene-d8	26248		591	14		IS	
15	Nitrobenzene	0	.3999	0	14	.08	ND	10
16	Isophorone	0	.7067	0	14	.04	ND	10
17	2-Nitrophenol	0	.2410	0	14	.13	ND	10
18	2,4-Dimethylphenol	0	.3857	0	14	.08	ND	10
19	Benzoic acid	1858	.2454	565	14	11.54	D	10
20	bis(2-Chloroethoxy)methane	0	.4582	0	14	.07	ND	10
21	2,4-Dichlorophenol	0	.3505	0	14	.09	ND	10
22	1,2,4-Trichlorobenzene	0	.3678	0	14	.08	ND	10
23	Naphthalene	15127	1.1519	594	14	20.01	D	10
24	4-Chloroaniline	0	.5635	0	14	.05	ND	10
25	Hexachlorobutadiene	0	.1726	0	14	.18	ND	10
26	4-Chloro-3-methylphenol	0	.3570	0	14	.09	ND	10
27	2-Methylnaphthalene	243	.8782	692	14	.42	E	10
28	Acenaphthene-d10	15360		838	28		IS	
29	Hexachlorocyclopentadiene	0	.1997	0	28	.26	ND	10
30	2,4,6-Trichlorophenol	0	.4019	0	28	.13	ND	10
31	2,4,5-Trichlorophenol	0	.4531	0	28	.11	ND	10
32	2-Chloronaphthalene	0	1.2735	0	28	.04	ND	10
33	2-Nitroaniline	0	.3944	0	28	.13	ND	10
34	Dimethylphthalate	259	1.3423	809	28	.50	E	10
35	Acenaphthylene	364	1.9696	817	28	.48	E	10
36	3-Nitroaniline	0	.4415	0	28	.12	ND	10
37	Acenaphthene	0	1.1701	0	28	.04	ND	10
38	2,4-Dinitrophenol	0	.0958	0	28	.54	ND	10
39	4-Nitrophenol	0	.2092	0	28	.25	ND	10
40	Dibenzofuran	0	1.7752	0	28	.03	ND	10
41	2,4-Dinitrotoluene	0	.5161	0	28	.10	ND	10
42	2,6-Dinitrotoluene	0	.3647	0	28	.14	ND	10
43	Diethylphthalate	1664	1.4308	912	28	3.03	E	10

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

fn: BB12SVP2

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

DATA FILE: GJ289
RF FILE: GJ280
DATE: 08/24/92
TLI PROJ #: 21413

SAMPLE ID: IO-88/1MM5/0708/2A-2E
TLI ID: 58.37.2A-2E
DILUTION FACTOR: 1
ANALYSIS DATE: 08/18/92

METHOD 8270 QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
44	4-Chlorophenyl-phenylether	0	.6667	0	28	.08	ND	10
45	Fluorene	0	1.4729	0	28	.04	ND	10
46	4-Nitroaniline	0	.5311	0	28	.10	ND	10
47	Phenanthrene-d10	27517		1049	47		IS	
48	4,6-Dinitro-2-methylphenol	0	.1141	0	47	.25	ND	10
49	N-Nitrosodiphenylamine(1)	0	.6015	0	47	.05	ND	10
50	4-Bromophenyl-phenylether	0	.2003	0	47	.15	ND	10
51	Hexachlorobenzene	0	.2359	0	47	.12	ND	10
52	Pentachlorophenol	0	.1578	0	47	.18	ND	10
53	Phenanthrene	0	1.2762	0	47	.02	ND	10
54	Anthracene	0	1.3383	0	47	.02	ND	10
55	Di-n-butylphthalate	2238	1.6006	1149	47	2.03	E	10
56	Fluoranthene	0	1.5325	0	47	.02	ND	10
57	Chrysene-d12	18403		1428	57		IS	
58	Pyrene	0	2.1810	0	57	.02	ND	10
59	Butylbenzylphthalate	279	1.1029	1363	57	.55	E	10
60	3,3'-Dichlorobenzidine	0	.4695	0	57	.09	ND	10
61	Benzo(a)anthracene	0	1.7240	0	57	.03	ND	10
62	Chrysene	0	1.7459	0	57	.02	ND	10
63	bis(2-Ethylhexyl)phthalate	8970	1.4029	1453	57	13.90	D	10
64	Perylene-d12	16965		1668	64		IS	
65	Di-n-octylphthalate	297	3.0730	1561	64	.23	E	10
66	Benzo(b)fluoranthene	0	1.4935	0	64	.03	ND	10
67	Benzo(k)fluoranthene	0	2.1137	0	64	.02	ND	10
68	Benzo(a)pyrene	0	1.4617	0	64	.03	ND	10
69	Indeno(1,2,3-cd)pyrene	0	.7450	0	64	.06	ND	10
70	Dibenz(a,h)anthracene	0	.8415	0	64	.06	ND	10
71	Benzo(g,h,i)perylene	0	.9614	0	64	.05	ND	10

	SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
72	Nitrobenzene-d5	13345	.7067	495	14	28.78	D	28.8
73	2-Fluorobiphenyl	30430	1.1551	747	28	68.61	D	68.6
75	Phenol-d5	18675	1.5697	381	1	70.12	D	70.1
77	2,4,6-Tribromophenol	5652	.1946	951	28	75.63	D	75.6
81	1,4-Dibromobenzene-d4	7559	.6883	599	1	64.73	D	64.7
82	1,3,5-Trichlorobenzene-d3	10839	.3125	540	14	52.86	D	52.9
83	Anthracene-d10	55362	1.0847	1057	47	74.19	D	74.2
84	Pyrene-d10	52824	1.6065	1251	57	71.47	D	71.5

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

EMISSION TEST RESULTS - SEMI-VOST

Mill	INLAND - ORANGE	Source: Bark Boiler		Condition 1
	Source Code: IO-BB/1	FIN: P-BARK	CIN:	C-33, C-8
		EPN: 02A		

Compound	IO-BB/1 (μg)	IO-BB/1 (μg/m3)	Conc. (ppm)
	Sampling Date:	7/8/92	
TARGET COMPOUNDS			
Clean Air Act Cmpds			
Cumene	1.09	27.88	0.006
a-Pinene	21.16	541.18	0.096
B-Pinene	10.60	271.10	0.048
1,2,4-Trimethylbenzene	0.97	24.81	0.005
p-Cymene	2.58	65.98	0.012
Naphthalene	30.62	783.12	0.147
Pentamethylbenzene	1.48	37.85	0.006
Di-n-butylphthalate	4.06	103.84	0.009
Butylbenzylphthalate	2.18	55.75	0.004
bis(2-Ethylhexyl)phthalate	38.09	974.17	0.060
Method 8270 Cmpds			
1,4-Dichlorobenzene	1.88	48.08	0.008
4-Methylphenol	1.37	35.04	0.008
Benzoic Acid	11.54	295.14	0.058
Naphthalene	20.01	511.76	0.096
2-Methylnaphthalene	0.42	10.74	0.002
Dimethylphthalate	0.50	12.79	0.002
Acenaphthylene	0.48	12.28	0.002
Diethylphthalate	3.03	77.49	0.008
Di-n-butylphthalate	2.03	51.92	0.004
Butylbenzylphthalate	0.55	14.07	0.001
bis(2--Ethylhexyl)phthalate	13.90	355.50	0.022
Di-n-octylphthalate	0.23	5.88	0.000
TENTATIVELY IDENTIFIED CMPDS.			
Toluene	96.79	2475.45	
Butoxyethanol	42.36	1083.38	
Dimethylbenzene	40.27	1029.92	
Subst'd HC	29.57	756.27	
Cyclic HC	14.14	361.64	
Branched Naphthalenediol	13.93	356.27	
Benzaldehyde	12.30	314.58	

EMISSION TEST RESULTS - SEMI-VOST

Mill	INLAND - ORANGE	Source:	Bark Boiler		Condition 1
	Source Code:	IO-BB/1	FIN: P-BARK	CIN:	C-33, C-8
			EPN: 02A		

Sampling Date: 7/8/92

Compound	IO-BB/1 (µg)	IO-BB/1 (µg/m3)	Conc. (ppm)
SURROGATE STDS			
(% Recovery)	**CAA**	**Method 8270**	
Nitrobenzene-d5	71.0	28.8	
Phenol-d5	77.4	70.1	
1,3,5-Trichlorobenzene-d3	74.4	52.9	
1,4-Dibromobenzene-d4	68.7	64.7	
2-Fluorobiphenyl	107.3	68.6	
2,4,6-Tribromophenol	105.2	75.6	
Anthracene-d10	135.4	74.2	
Pyrene-d10	162.2	71.5	

NOTES:

Air Volume = 0.03910 cu.m.

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
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Telephone: (919) 544-5729

DATA FILE: GJ771
RF FILE: GJ766
DATE: 09/14/92
TLI PROJ: 21413

SAMPLE ID: IO-BB/1MM5/0708/2A-2E
TLI SAMPLE ID: 58.37.2A-2E
DILUTION FACTOR: 1
ANALYSIS DATE: 09/10/92

METHOD 8270 QUANTITATION REPORT

	NAME	AREA	RF	SCAN		AMT, ug	CODE	QUAN LIMIT
1	1,4-Dichlorobenzene-d4	3322		457	1		IS	
2	Naphthalene-d8	11677		629	2		IS	
3	Acenaphthene-d10	6174		880	3		IS	
4	Phenanthrene-d10	8116		1095	4		IS	
5	Chrysene-d12	5318		1486	5		IS	
6	Perylene-d12	4263		1783	6		IS	
20	n-Nitrosodimethylamine	0	.601	0	1	.40	ND	10
21	Cumene	245	2.693	355	1	1.09	E	10
22	a-Pinene	2269	1.291	367	1	21.16	D	10
23	b-Pinene	1328	1.508	418	1	10.60	D	10
24	Aniline	0	1.810	0	1	.13	ND	10
25	1,2,4-Trimethylbenzene	163	2.021	435	1	.97	E	10
26	Phenol	0	1.622	0	1	.15	ND	10
27	Benzyl Chloride	0	2.284	0	1	.11	ND	10
28	bis-(2-Chloroethyl)ether	0	1.236	0	1	.19	ND	10
29	n-Nitrosomorpholine	0	.507	0	1	.47	ND	10
30	1,4-Dichlorobenzene	0	1.046	0	1	.23	ND	10
31	p-Cymene	476	2.222	468	1	2.58	E	10
32	Acetophenone	0	.244	0	1	.99	ND	10
33	1,2-Dibromo-3-chloropropane	0	.486	0	1	.50	ND	10
34	Hexachloroethane	0	.448	0	1	.54	ND	10
35	o-Toluidine	0	1.863	0	1	.13	ND	10
36	2-Methylphenol	0	.915	0	1	.26	ND	10
37	Nitrobenzene	0	.369	0	2	.18	ND	10
38	N,N-Dimethylaniline	0	.444	0	2	.15	ND	10
39	Isophorone	0	.435	0	2	.15	ND	10
40	Catechol	0	.138	0	2	.49	ND	10
41	3/4-Methylphenol	0	.260	0	2	.24	ND	10
42	1,2,4-Trichlorobenzene	0	.198	0	2	.34	ND	10
43	a-Terpineol	0	.151	0	2	.45	ND	10
44	Naphthalene	7202	.792	632	2	30.62	D	10
45	o-Anisidine	0	.205	0	2	.33	ND	10
46	Hexachlorobutadiene	0	.097	0	2	.70	ND	10
47	2-Chloroacetophenone	0	.535	0	2	.13	ND	10
48	a,a,a-Trichlorotoluene	0	.236	0	2	.28	ND	10
49	N,N-Diethylaniline	0	.429	0	2	.16	ND	10
50	1,4-Phenylenediamine	0	.156	0	2	.43	ND	10
51	Hydroquinone	0	.257	0	2	.26	ND	10
52	Pentamethylbenzene	213	.482	715	2	1.48	E	10
53	Hexachlorocyclopentadiene	0	.132	0	3	.98	ND	10
54	Phthalic Anhydride	0	.055	0	3	2.37	ND	10
55	2,4,6-Trichlorophenol	0	.233	0	3	.56	ND	10
56	2,4,5-Trichlorophenol	0	.254	0	3	.51	ND	10
57	2,4-Toluenediamine	0	.365	0	3	.35	ND	10
58	2,4-Dichlorophenol	0	.372	0	3	.35	ND	10

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

BB12SVP2

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

DATA FILE: GJ771 SAMPLE ID: IO-88/1MM5/0708/2A-2E
RF FILE: GJ788 TLI SAMPLE ID: 58.37.2A-2E
DATE: 09/14/92 DILUTION FACTOR: 1
TLI PROJ: 21413 ANALYSIS DATE: 09/10/92

METHOD 8270 QUANTITATION REPORT

	NAME	AREA	RF	SCAN		AMT, ug	CODE	QUAN LIMIT
59	2,3-Dichlorophenol	0	.355	0	3	.38	ND	10
60	2,6-Dichlorophenol	0	.423	0	3	.31	ND	10
61	3,5-Dichlorophenol	0	1.195	0	3	.11	ND	10
62	3,4-Dichlorophenol	0	.465	0	3	.28	ND	10
63	Biphenyl	0	1.004	0	3	.13	ND	10
64	Dimethylphthalate	0	.843	0	3	.15	ND	10
65	2,4-Dinitrotoluene	0	.187	0	3	.69	ND	10
66	2,4-Dinitrophenol	0	.050	0	3	2.58	ND	10
67	4,6-Dinitro-2-methylphenol	0	.105	0	3	1.23	ND	10
68	Dibenzofuran	0	1.291	0	3	.10	ND	10
69	4-Nitrophenol	0	.672	0	3	.19	ND	10
70	Trifluralin	0	.191	0	3	.68	ND	10
71	Hexachlorobenzene	0	.170	0	4	.58	ND	10
72	4-Aminobiphenyl	0	.644	0	4	.15	ND	10
73	Pentachlorophenol	0	.105	0	4	.94	ND	10
74	Pentachloronitrobenzene	0	.066	0	4	1.50	ND	10
75	4-Nitrobiphenyl	0	.283	0	4	.35	ND	10
76	Di-n-butylphthalate	956	1.159	1189	4	4.06	E	10
77	Pyrene	0	1.065	0	5	.14	ND	10
78	Benzidine	0	.461	0	5	.33	ND	10
79	4,4'-Methylenedianiline	0	.297	0	5	.51	ND	10
80	Dimethylaminoazobenzene	0	.370	0	5	.41	ND	10
81	Butylbenzylphthalate	182	.629	1408	5	2.18	E	10
82	3,3'-Dimethylbenzidine	0	.694	0	5	.22	ND	10
83	Methylene bis-chloroaniline	0	.197	0	5	.77	ND	10
84	Chrysene	0	.830	0	5	.18	ND	10
85	3,3'-Dichlorobenzidine	0	.320	0	5	.47	ND	10
86	bis(2-Ethylhexyl)phthalate	3916	.773	1505	5	38.09	D	10
87	3,3'-Dimethoxybenzidine	0	.255	0	5	.59	ND	10

SURROGATE SUMMARY

		AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
10	Phenol-d5	6246	1.283	416	1	77.39	D	77.4
12	Nitrobenzene-d5	5874	.279	531	2	71.00	D	71.0
13	1,3,5-Trichlorobenzene-d3	5024	.228	577	2	74.35	D	74.4
14	1,4-Dibromobenzene-d4	3228	.566	636	1	68.66	D	68.7
15	2-Fluorobiphenyl	13795	.833	785	3	107.29	D	107.3
16	2,4,6-Tribromophenol	2053	.126	995	3	105.22	D	105.2
17	Anthracene-d10	17934	.653	1103	4	135.44	D	135.4
18	Pyrene-d10	17625	.817	1301	5	162.23	D	162.2

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

TRIANGLE LABORATORIES OF RTP, INC.	FILE NAME: GJ771	SAMPLE ID: IO\B8\MM5F8\2A-2E
801 Capitola Drive	DATE: 09/13/92	TLI ID: 58.37.2A-2E
Durham, NC 27713	TLI PROJ #: 21413	DILN FACTOR: 1
Telephone: (919) 544-5729		ANAL DATE: 09/10/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
TOLUENE	154	49882	457	40.00	96.79
BUTOXYETHANOL	330	21831	457	40.00	42.36
DIMETHYLBENZENE	290	20754	457	40.00	40.27
UNKNOWN	1412	16105	1486	40.00	17.25
SUBSTITUTED HYDROCARBON	316	7692	457	40.00	14.93
SUBSTITUTED HYDROCARBON	240	7543	457	40.00	14.64
UNKNOWN	979	14816	880	40.00	14.49
CYCLIC HYDROCARBON	473	7287	457	40.00	14.14
BRANCHED NAPHTHALENEDIOL	1739	5432	1783	40.00	13.93
BENZALDEHYDE	400	6337	457	40.00	12.30

29.57

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
1,4-Dichlorobenzene-d4	457	20614	1
Naphthalene-d8	629	40650	14
Acenaphthene-d10	880	40907	28
Phenanthrene-d10	1095	22175	47
Chrysene-d12	1486	37345	57
Perylene-d12	1783	15602	64

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

DATA FILE: GJ288
RF FILE: GJ280
DATE: 09/03/92
TLI PROJ #: 21413

SAMPLE ID: IO-88/1MM5/0708/1A-1E
TLI ID: 58.37.1A-1E
DILUTION FACTOR: 1
ANALYSIS DATE: 08/18/92

METHOD 8270 QUANTITATION REPORT

36.937 L

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	1,4-Dichlorobenzene-d4	6564		422	1		IS	
2	Phenol	0	2.1398	0	1	.08	ND	10
3	bis(2-Chloroethyl)ether	0	1.5459	0	1	.08	ND	10
4	2-Chlorophenol	0	1.6481	0	1	.07	ND	10
5	1,3-Dichlorobenzene	0	1.9212	0	1	.06	ND	10
6	1,4-Dichlorobenzene	542	1.9419	424	1	1.70	E	10
7	Benzyl alcohol	0	1.0162	0	1	.12	ND	10
8	1,2-Dichlorobenzene	0	1.6477	0	1	.07	ND	10
9	2-Methylphenol	0	1.3775	0	1	.09	ND	10
10	bis(2-Chloroisopropyl)ether	0	1.1315	0	1	.11	ND	10
11	4-Methylphenol	0	1.4284	0	1	.09	ND	10
12	N-Nitroso-di-n-propylamine	0	.9554	0	1	.13	ND	10
13	Hexachloroethane	0	.7319	0	1	.17	ND	10
14	Naphthalene-d8	25174		591	14		IS	
15	Nitrobenzene	0	.3998	0	14	.08	ND	10
16	Isophorone	0	.7067	0	14	.04	ND	10
17	2-Nitrophenol	0	.2410	0	14	.13	ND	10
18	2,4-Dimethylphenol	0	.3857	0	14	.08	ND	10
19	Benzoic acid	435	.2454	570	14	2.82	E	10
20	bis(2-Chloroethoxy)methane	0	.4582	0	14	.07	ND	10
21	2,4-Dichlorophenol	0	.3505	0	14	.09	ND	10
22	1,2,4-Trichlorobenzene	90	.3678	585	14	.39	E	10
23	Naphthalene	10324	1.1519	594	14	14.24	D	10
24	4-Chloroaniline	0	.5635	0	14	.06	ND	10
25	Hexachlorobutadiene	0	.1726	0	14	.18	ND	10
26	4-Chloro-3-methylphenol	0	.3570	0	14	.09	ND	10
27	2-Methylnaphthalene	165	.6782	692	14	.30	E	10
28	Acenaphthene-d10	14795		838	28		IS	
29	Hexachlorocyclopentadiene	0	.1997	0	28	.27	ND	10
30	2,4,6-Trichlorophenol	0	.4019	0	28	.13	ND	10
31	2,4,5-Trichlorophenol	0	.4531	0	28	.12	ND	10
32	2-Chloronaphthalene	0	1.2735	0	28	.04	ND	10
33	2-Nitroaniline	0	.3944	0	28	.14	ND	10
34	Dimethylphthalate	228	1.3423	809	28	.46	E	10
35	Acenaphthylene	0	1.9696	0	28	.03	ND	10
36	3-Nitroaniline	0	.4415	0	28	.12	ND	10
37	Acenaphthene	0	1.1701	0	28	.05	ND	10
38	2,4-Dinitrophenol	0	.0958	0	28	.56	ND	10
39	4-Nitrophenol	0	.2092	0	28	.26	ND	10
40	Dibenzofuran	0	1.7752	0	28	.03	ND	10
41	2,4-Dinitrotoluene	0	.5161	0	28	.10	ND	10
42	2,6-Dinitrotoluene	0	.3647	0	28	.15	ND	10
43	Diethylphthalate	0	1.4306	0	28	.04	ND	10

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

for BB11SVP2

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

DATA FILE: GJ288
RF FILE: GJ280
DATE: 09/03/92
TLI PROJ #: 21413

SAMPLE ID: IO-88/1MM5/0708/1A-1E
TLI ID: 58.37.1A-1E
DILUTION FACTOR: 1
ANALYSIS DATE: 08/18/92

METHOD 8270 QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
44	4-Chlorophenyl-phenylether	0	.6667	0	28	.08	ND	10
45	Fluorene	0	1.4729	0	28	.04	ND	10
46	4-Nitroaniline	0	.5311	0	28	.10	ND	10
47	Phenanthrene-d10	26511		1049	47		IS	
48	4,6-Dinitro-2-methylphenol	0	.1141	0	47	.26	ND	10
49	N-Nitrosodiphenylamine(1)	0	.6015	0	47	.05	ND	10
50	4-Bromophenyl-phenylether	0	.2003	0	47	.15	ND	10
51	Hexachlorobenzene	0	.2359	0	47	.13	ND	10
52	Pentachlorophenol	0	.1578	0	47	.19	ND	10
53	Phenanthrene	0	1.2762	0	47	.02	ND	10
54	Anthracene	0	1.3383	0	47	.02	ND	10
55	Di-n-butylphthalate	0	1.6006	0	47	.02	ND	10
56	Fluoranthene	0	1.5325	0	47	.02	ND	10
57	Chrysene-d12	17766		1426	57		IS	
58	Pyrene	0	2.1810	0	57	.02	ND	10
59	Butylbenzylphthalate	322	1.1029	1363	57	.66	E	10
60	3,3'-Dichlorobenzidine	0	.4695	0	57	.10	ND	10
61	Benzo(a)anthracene	0	1.7240	0	57	.03	ND	10
62	Chrysene	0	1.7459	0	57	.03	ND	10
63	bis(2-Ethylhexyl)phthalate	4907	1.4029	1453	57	7.88	E	10
64	Perylene-d12	16819		1668	64		IS	
65	Di-n-octylphthalate	0	3.0730	0	64	.02	ND	10
66	Benzo(b)fluoranthene	0	1.4935	0	64	.03	ND	10
67	Benzo(k)fluoranthene	0	2.1137	0	64	.02	ND	10
68	Benzo(a)pyrene	0	1.4617	0	64	.03	ND	10
69	Indeno(1,2,3-cd)pyrene	0	.7450	0	64	.06	ND	10
70	Dibenz(a,h)anthracene	0	.8415	0	64	.06	ND	10
71	Benzo(g,h,i)perylene	0	.9614	0	64	.05	ND	10

	SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
72	Nitrobenzene-d5	12576	.7067	495	14	28.27	D	28.3
73	2-Fluorobiphenyl	28723	1.1551	747	28	67.23	D	67.2
75	Phenol-d5	17284	1.5697	381	1	67.10	D	67.1
77	2,4,6-Tribromophenol	5399	.1946	951	28	75.00	D	75.0
81	1,4-Dibromobenzene-d4	7105	.6683	599	1	62.90	D	62.9
82	1,3,5-Trichlorobenzene-d3	11197	.3125	540	14	58.94	D	58.9
83	Anthracene-d10	51432	1.0847	1057	47	71.54	D	71.5
84	Pyrene-d10	49529	1.6065	1251	57	69.42	D	69.4

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

Section 3.4 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: INLAND - ORANGE　　Source: Bark Boiler　　FIN: P-BARKB

Source Code: IO-BB　　Date: 7/8/92　　EPN: 02A　　CIN: C-33, C-8

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1912			
Flow Data				
Stack Temperature, °F	159			159
Moisture Content, %	21.3			21.3
Oxygen Concentration, %	9.0			9.0
Carbon Dioxide Concentration, %	10.5			10.5
Volumetric Flow Rate, x10^3 ACFM	119.8			119.8
Volumetric Flow Rate, x10^3 DSCFM	80.5			80.5
Process Operating Conditions				
Production Rate, 10^6 BTU/hr	534.0			534.0
Miscellaneous Parameters				
Formaldehyde				
Concentration, ppmvd	1.5			1.5
Emission Rate, lb/hr	0.6			0.6
Acetaldehyde				
Concentration, ppmvd	0.5			0.5
Emission Rate, lb/hr	0.3			0.3
Acetone (Impinger)				
Concentration, ppmvd	3.4			3.4
Emission Rate, lb/hr	2.5			2.5
Acetophenone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.8 *			0.8 *
2-Butanone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.5 *			0.5 *
Methyl isobutyl ketone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.6 *			0.6 *
Acrolein				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.4 *			0.4 *
Benzaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.7 *			0.7 *
Hydrogen chloride				
Concentration, ppmvd	0.7			0.7
Emission Rate, lb/hr	0.3			0.3

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: INLAND - ORANGE	Source: Bark Boiler			FIN:	P-BARKB
Source Code: IO-BB	Date: 7/9/92	EPN:	02A	CIN:	C-33, C-8

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1300			
Flow Data				
Stack Temperature, °F	156			156
Moisture Content, %	29.2			29.2
Oxygen Concentration, %	10.5			10.5
Carbon Dioxide Concentration, %	9.5			9.5
Volumetric Flow Rate, x10^3 ACFM	121.4			121.4
Volumetric Flow Rate, x10^3 DSCFM	73.8			73.8
Process Operating Conditions				
Production Rate, 10^6 BTU/hr	492.0			492.0
Miscellaneous Parameters				
Formaldehyde				
Concentration, ppmvd	1.8			1.8
Emission Rate, lb/hr	0.6			0.6
Acetaldehyde				
Concentration, ppmvd	1.0			1.0
Emission Rate, lb/hr	0.5			0.5
Acetone (Impinger)				
Concentration, ppmvd	2.2			2.2
Emission Rate, lb/hr	1.5			1.5
Acetophenone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.7 *			0.7 *
2-Butanone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.4 *			0.4 *
Methyl isobutyl ketone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.6 *			0.6 *
Acrolein				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.3 *			0.3 *
Benzaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.6 *			0.6 *
Hydrogen chloride				
Concentration, ppmvd	0.5			0.5
Emission Rate, lb/hr	0.2			0.2

* One or more values were less than the detection limit.

Section 3.5 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

SOURCE IO-BB

QUALITY CONTROL SUMMARY
METHOD 25A

1. CALIBRATION

THEOR	7/8/92		7/9/92	
ppm	ppm	%ERR	ppm	%ERR
0	-2.0	-1.2	1.0	0.6
32	31.0	-0.3	29.0	-1.5
94	98.0	2.2	93.0	-0.7
169	166.0	-1.8	169.0	0.0
CORR COEFF		0.9990		0.9998

2. PROPANE LINE RECOVERY

	DATE 7/8/92			DATE 7/9/92		
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	166.0	162.0	97.6%	171.0	168.0	98.2%
AFTER	171.0	168.0	98.2%	171.0	157.0	91.8%

3. LINE BLANK

	7/8/92 ppm	7/9/92 ppm
BEFORE	0	1
AFTER	1	3

gw

SOURCE IO-88

QUALITY CONTROL SUMMARY
METHOD 25A

1. CALIBRATION

THEOR ppm	7/10/92 ppm	%ERR
0	1.0	0.6
32	29.0	-1.5
94	93.0	-0.7
169	169.0	0.0
CORR COEFF		0.9998

2. PROPANE LINE RECOVERY

DATE	7/10/92		
	INST	LINE	%REC
BEFORE	171.0	157.0	91.8%
AFTER	*	*	*

3. LINE BLANK

	7/10/92 ppm
BEFORE	3
AFTER	*

* Not performed - lines moved

SOURCE IO-BB

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR ppm	DATE ppm	7/8/92 %REC	DATE ppm	7/9/92 %REC
ethanol	41.9	36.0	85.9%	34.9	83.2%
acetone	33.5	31.7	94.7%	32.2	96.2%
isopropanol	32.2	30.5	95.0%	31.1	96.8%
benzene	27.5	24.1	87.4%	51.7	187.8%
bromodichloromethane	29.7	15.2	51.1%	30.8	103.5%
toluene	23.2	22.2	95.7%	23.2	100.3%
ethyl benzene	20.1	18.8	93.5%	21.2	105.6%
m-xylene	20.1	18.4	91.6%	21.3	106.1%
o-xylene	20.2	19.3	95.8%	21.3	105.8%
cumene	17.7	17.6	99.4%	18.8	106.4%
alpha-pinene	15.4	15.5	100.5%	16.0	103.4%
beta-pinene	15.5	15.3	98.6%	16.5	106.5%
3-carene	15.5	15.2	97.9%	16.4	105.7%
p-cymene	15.8	19.2	121.8%	17.1	108.7%

2. PROPANE RESPONSE

	THEOR		%REC		%REC
BEFORE	31.5	35.7	113.2%	33.3	105.7%
AFTER	31.5	33.3	105.7%	32.1	101.7%

3. METHANOL LINE RECOVERY

	7/8/92			7/9/92		
	GC	LINE	%REC	GC	LINE	%REC
BEFORE	14.7	14.0	95.2%	9.1	8.8	96.7%
AFTER	9.1	8.8	96.7%	9.7	9.7	99.9%

4. LINE BLANK

	[--------------FILE REF--------------]	
BEFORE	G8A2011	G9A2007
AFTER	G9A2007	G9A2019

gw

SOURCE IO-BB

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR ppm	DATE ppm	7/10/92 %REC
ethanol	41.9	34.3	81.7%
acetone	33.5	31.0	92.4%
isopropanol	32.2	30.9	96.1%
benzene	27.5	32.8	119.3%
bromodichloromethane	29.7	29.3	98.4%
toluene	23.2	22.8	98.4%
ethyl benzene	20.1	20.2	100.3%
m-xylene	20.1	19.3	96.3%
o-xylene	20.2	20.2	100.3%
cumene	17.7	18.5	104.8%
alpha-pinene	15.4	15.9	102.6%
beta-pinene	15.5	16.1	104.0%
3-carene	15.5	16.1	103.5%
p-cymene	15.8	16.9	107.3%

2. PROPANE RESPONSE

	THEOR		%REC
BEFORE	31.5	33.9	107.6%
AFTER	264.0	271.7	102.9%

3. METHANOL LINE RECOVERY

	GC	7/10/92 LINE	%REC
BEFORE	9.7	9.7	99.9%
AFTER	8.6 *		

4. LINE BLANK

	[--------------FILE REF--------------]
BEFORE	GAA2008
AFTER	*

*Not performed - lines moved.

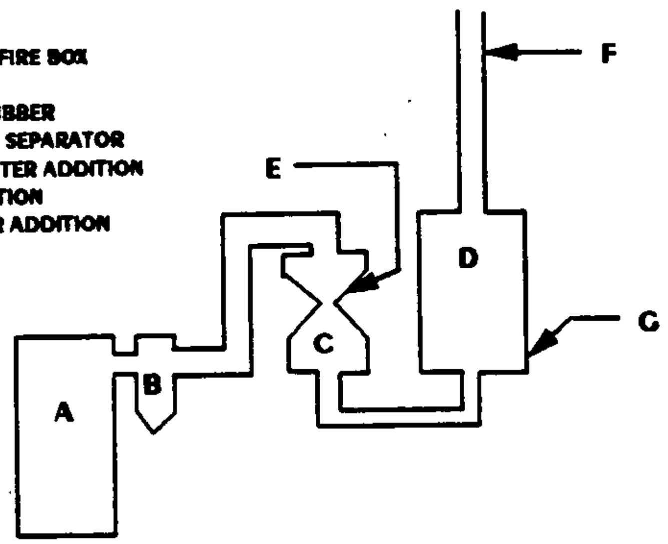
Section 3.6 Process Operating Data

BARK BOILER SCRUBBER CONFIGURATION

INLAND-ORANGE ORANGE, TEXAS

LEGEND

A) BARK BOILER FIRE BOX
B) MULTICLONES
C) VENTURI SCRUBBER
D) ENTRAINMENT SEPARATOR
E) SCRUBBER WATER ADDITION
F) SAMPLE LOCATION
G) SLUICE WATER ADDITION



BARK BOILER

The 270,000 pounds of steam per hour Babcock and Wilcox bark boiler can also be fired on natural gas, either as an auxiliary fuel or up to 240,000 pounds of steam per hour. Steaming capacity when operating on one hundred percent bark is 200,000 pounds per hour. The boiler was equipped with five bark feeders and a traveling grate. No sludge was burned in this unit.

The venturi scrubber was operated on mill water supply.

Representative Process Conditions

Bark feed rate (Tons/hr):	7/ 8/92	33.3
	7/ 9/92	30.58
	7/10/92	29.92
Gas feed rate (ACFM/hr):	7/ 8/92	33,300
	7/ 9/92	30,580
	7/10/92	29,920
Excess air (%):	7/ 8/92	4.6
	7/ 9/92	4.7
	7/10/92	6.0
Fuel Btu content (Btu/lb. or Ft.^{3}):	7/ 8/92	8,007
	7/ 9/92	8,050
	7/10/92	7,363

Natural gas computed at 1035 Btu/ACFM

Fuel moisture content (%):	7/ 8/92	61.7 (?)
	7/ 9/92	54.3
	7/10/92	54.4
Oxygen content (%):	7/ 8/92	61.7 (?)
	7/ 9/92	54.3
	7/10/92	54.4

POWER BOILERS - PROCESS OPERATING CONDITIONS

Mill:	INLAND-ORANGE	Source:	BARK BOILER
Source:	IO-BB	Date:	JULY 8, 1992
FIN:	P-BARKB	EPN:	2 CIN: C-33

INPUT DATA	Units	Run 1
Beginning Time		1805
Boiler Type	BARK BOILER	
Fuel Type	BARK AND NATURAL GAS	
Fuel Firing	MMBTU/HR	534
Excess Air	%	4.6
Fuel BTU Content	BTU/lb	8007.0
Fuel Moisture Content	%	54.8
Emission Data		
O_2 Concentration		
CO_2 Concentration		
CO Concentration		
SO_2 Concentration		
NO_x Concentration		
Sludge Burning	yes or no	NO
Sludge Burning Rate	lb/hr	
Sludge Moisture Content	%	

POWER BOILERS - PROCESS OPERATING CONDITIONS

Mill:	INLAND-ORANGE	Source:	BARK BOILER
Source:	IO-BB	Date:	JULY 9, 1992
FIN:	P-BARKB	EPN:	2 CIN: C-33

INPUT DATA	Units	Run 1
Beginning Time		1140
Boiler Type	BARK BOILER	
Fuel Type	BARK AND NATURAL GAS	
Fuel Firing	MMBTU/HR	492
Excess Air	%	4.7
Fuel BTU Content	BTU/lb	8050.0
Fuel Moisture Content	%	54.3
Emission Data		
O_2 Concentration		
CO_2 Concentration		
CO Concentration		
SO_2 Concentration		
NO_x Concentration		
Sludge Burning	yes or no	
Sludge Burning Rate	lb/hr	
Sludge Moisture Content	%	

POWER BOILERS - PROCESS OPERATING CONDITIONS

Mill:	INLAND-ORANGE	Source:	BARK BOILER
Source:	IO-BB	Date:	JULY 10, 1992
FIN:	P-BARKB	EPN:	2 CIN: C-33

INPUT DATA	Units	Run 1
Beginning Time		1045
Boiler Type	BARK BOILER	
Fuel Type	BARK AND NATURAL GAS	
Fuel Firing	MMBTU/HR	429
Excess Air	%	6.0
Fuel BTU Content	BTU/lb	7363.0
Fuel Moisture Content	%	54.4
Emission Data		
O_2 Concentration		
CO_2 Concentration		
CO Concentration		
SO_2 Concentration		
NO_x Concentration		
Sludge Burning	yes or no	
Sludge Burning Rate	lb/hr	
Sludge Moisture Content	%	

POWER BOILERS

BOILER TYPE Bark Boiler
FUEL TYPE Bark and Natural Gas

FUEL FIRING RATE

	7/8	7/9	7/10	
Bark	33.33 TPH	30.58 TPH	29.92 TPH	
Gas	25.67 CFPH	19.3 CFPH	39.67 CFPH	CFPH=ft3/hour

EXCESS O2 (%)

	7/8		7/9	7/10
18:00	4.9	11:00	4.0	5.9
19:00	5.0	12:00	-	5.7
20:00	4.3	13:00	5.2	-
21:00	4.1	14:00	4.9	5.9
		15:00	4.5	6.6

FUEL BTU CONTENT (On other sheet)
FUEL MOISTURE CONTENT (On other sheet)

research analyses consultation

EFEH & ASSOCIATES

10919 SAGEWIND DRIVE • HOUSTON, TEXAS 77089 • TELEPHONE (713) 484-2362

August 4, 1992

Mr. Tom Noble
Inland Orange, Inc.
P.O. Box 2500
Orange, Texas 77630

Dear Mr. Noble:

Following are the results of the bark samples submitted to our laboratory for analyses on July 20, 1992:

P.O. #: 92-45197

SAMPLE I.D.		Bark Sample 7/08/92 First Hour	Bark Sample 7/08/92 2nd Hour	Bark Sample 7/08/92 3rd Hour
LAB NO.		F-5091	F-5092	F-5093
BTU/lb		8105	8259	7657
Particle Size:				
Sieve	Mesh (Microns)			
8	2360	57.56	65.05	61.67
35	500	35.12	26.82	30.75
50	300	4.01	4.74	4.92
70	212	2.23	2.00	1.52
100	150	0.76	0.97	0.58
140	106	0.10	0.39	0.46
200	75	0.13	0.03	0.08
pan		0.09	0.00	0.02

SAMPLE I.D.	Bark Sample 7/09/92 First Hour	Bark Sample 7/09/92 2nd Hour	Bark Sample 7/09/92 3rd Hour
LAB NO.	F-5094	F-5095	F-5096
BTU/lb	8342	8080	7728

EFEH & ASSOCIATES

SAMPLE I.D.		Bark Sample 7/09/92 First Hour	Bark Sample 7/09/92 2nd Hour	Bark Sample 7/09/92 3rd Hour
LAB NO.		F-5094	F-5095	F-5096
Particle Size:				
Sieve	Mesh (Microns)			
8	2360	53.04	42.69	37.29
35	500	40.05	48.78	54.46
50	300	5.36	6.26	5.01
70	212	1.01	1.52	2.06
100	150	0.37	0.61	0.48
140	106	0.25	0.14	0.42
200	75	0.02	0.00	0.28
pan		0.00	0.00	0.01

SAMPLE I.D.		Bark Sample 7/10/92 First Hour	Bark Sample 7/10/92 2nd Hour	Bark Sample 7/10/92 3rd Hour
LAB NO.		F-5097	F-5098	F-5099
BTU/lb		6835	7721	6938
Particle Size				
Sieve	Mesh (Microns)			
8	2360	75.12	60.70	62.57
35	500	18.50	33.13	30.76
50	300	4.00	4.09	4.83
70	212	1.26	1.10	1.59
100	150	0.63	0.42	0.14
140	106	0.24	0.30	0.10
200	75	0.15	0.23	0.01
pan		0.10	0.03	0.00

SAMPLE I.D.	Bark Sample 7/10/92 4th Hour
LAB NO.	F-5100
BTU/lb	7959

EFEH & ASSOCIATES

SAMPLE I.D. Bark Sample
7/10/92
4th Hour

LAB NO. F-5100

Particle Size

Sieve	Mesh (Microns)	
8	2360	64.47
35	500	27.70
50	300	5.07
70	212	2.04
100	150	0.07
140	106	0.21
200	75	0.16
pan		0.28

METHODS: BTU - ANSI 2015-66

Please contact me if you have any questions concerning these results.

Sincerely,

Edwin B. Smith, Jr. PhD

INLAND-ORANGE, INC. LABORATORY
REPORT OF ANALYSIS

DATE: 7/8/92

ANALYSIS OF: BARK

FROM: BARK Boiler Feed

FOR:

DEPARTMENT:

SPECIAL INSTSRUCTIONS:

REPORT IN TERMS OF: % moist (UNLESS OTHERWISE NOTED)

					DRY WT
1:8	1	6:30 PM	55.5	x	502.7
49	2	7:00	66.5	x	605
105	3	7:30	62.0	x Not good FS	625.5
107	4	8:00	64.2		334.0
122	5	8:30	61.6	x	510.4
100	6	9:00	60.2	x	445.2

x

WORK BY:

3.6 - 9

INLAND-ORANGE, INC. LABORATORY
REPORT OF ANALYSIS

DATE: 7/9/92 7/10/92

ANALYSIS OF: BARK

FROM: BARK BOILER FEED

FOR:

DEPARTMENT:

SPECIAL INSTSRUCTIONS:

REPORT IN TERMS OF: % Moist (UNLESS OTHERWISE NOTED).

7/9	1	41 12:10 pm	58.8	
	2	17	55.5	
	3	67	55.4	
	4	1	53.1	
	5	59	51.5	
	6	36 2:40 pm	51.2	
7/10	1	113 11:15	55.4	
	2	6	54.4	
	3	121	53.0	
	4	42	54.2	
	5	25	56.1	
	6	2	54.7	
	7	31	54.1	
	8	13 2:45	53.6	

3.6 - 10

WORK BY:

DATE ______________

BARK BOILER LOG

TIME	STEAM: STEAM FLOW THOUS LB/HR X	STEAM: FEED WATER °F THOUS LB/HR	STEAM: STEAM TEMP	GAS: BURNERS X	GAS: GAS FLOW SCFH X	GAS: AIR FLOW TO GAS MPPH	BARK: BARK FLOW X	BARK: AIR TO BARK MPPH	TOTAL AIR FLOW MPPH X	OVER FIRE AIR FLOW MPPH	O_2 % X	AIR HEATER AIR DIFF PRESS	F D FAN DUCT PRESS	BURNER WD BX PRESS	FURN PRESS	SUPER HEATER DIFF PRESS	BOILER DIFF. PRESS	AIR HEATER GAS	DUST COLL DIFF PRESS	ID FAN DIFF PRESS	GRATE AIR PRESS	FUEL GAS TO BURNER PRESS	DRUM PRESS	GRATE TEMP. X	GRATE TEMP X	GRATE TEMP X	GRATE TEMP X	SUPER HEATER HOT LEG TEMP °F
6 AM	200	200	880	4	4	133	68	37	160		3.8	2.0	4.0	0	-.1	0	3	.6	1.6	5	.9	0	880	457	375	460	423	
7	205	200	880	4	4	133	68	37	160		4.3	2.0	4.2	0	0	0	3	.5	1.5	5	.9	0	880	457	384	422	425	
8	215	215	880	4	3	133	70	37	161		4.2	1.8	4.0	0	0	0	3	.6	1.5	5	.9	0	880	467	389	476	441	
9	215	215	880	4	4	133	72	37	159		4.0	2.0	4.0	0	0	0	3	.6	1.5	5	.9	0	880	472	386	479	447	
10	220	220	880	4	4	134	74	37	157		3.8	2.2	4.2	0	0	0	3	.6	1.5	5	1.0	0	880	477	388	484	451	
11																												
12	175	190	880	4	4	134	66	37	159		5.1	2.0	4.0	0	-.1	0	3	.6	1.4	5	.9	0	880	468	380	475	432	
1 PM	180	180	860	4	4	134	60	37	163		6.6	2.0	4.0	0	-.1	0	3	.6	1.4	5	.7	0	880	465	374	411	415	
2																												
3	190	190	850	4	4	134	62	37	243		6.2	2.2	4.5	0	-.1	0	3	.6	1.5	5	.9	0	880	450	363	457	461	
4	180	180	850	4	4	136	62	37	240		6.5	2.2	4.5	0	0	0	3	.9	1.5	5	.9	0	[illegible]	445	359	444	395	
5	175	180	850	4	4	136	56	37	237		7.3	2.4	5.0	0	0	0	3	.5	1.6	5	1.2	0	880	426	344	427	378	
6	150	160	840	4	11	137	42	36	243		7.2	2.4	4.0	0	-.1	0	3	.9	1.9	7	1.4	0	860	412	374	449	379	
7	150	160	840	4	3	135	48	36	240		8.7	2.3	4.0	0	0	0	3	.9	2.0	7	.8	6	860	420	341	433	374	
8	170	170	140	4	6	14[illegible]	51	36	277		7.6	2.2	4.0	0	0	0	3	.9	[illegible]	7	1.0	0	820	42[illegible]	[illegible]3	430	[illegible]	
9																												
10														BARK		OUT												
11	175	175	850	4	11	14[illegible]	60	36	246		7.2	2.6	4.3	0	-.1	0	3	.9	2.4	9	.9	0	890	411	320	4[illegible]	376	
12	170	175	840	4	8	14[illegible]	60	36	251		6.9	2.4	4.3	0	-.2	0	3	.1	2.6	9	.8	0	890	427	384	432	376	
1 AM	180	180	850	4	7	143	56	36	249		6.9	2.6	4.3	0	-.2	0	3	.9	2.4	9	1.0	0	[illegible]	428	372	427	369	
2	175	175	850	4	8	143	52	36	248		6.7	2.5	4.3	0	-.1	0	3	.9	2.3	7	1.2	0	860	425	379	429	372	
3	175	180	850	4	8	145	[illegible]	[illegible]	248		7.2	2.5	4.3	0	-.1	0	3	.9	2.4	8	.7	0	825	427	345	42[illegible]	372	
4																												
5 AM	190	190	710	4	17	146	58	36	251		7.6	2.6	4.3	0	-.2	0	3	.9	2.4	7	1.0	2	880	421	343	429	374	

BRK. BLR. ID TURB.: MAIN OIL PRESS	OIL TEMP	BRG OIL PRESS	GEAR SPRAY	BARK BOILER SCRUBBER: PRESS DROP INCHES X	RECIRC BLEED RATE GPM X	SPRAY WATER FLOW X	NOZZLE PRESS EAST	NOZZLE PRESS WEST	DISCHG OUTLET TEMP X	TIME
60	152	16	19	8.2	197	1500			150°	6 AM
60	152	16	19	8.1	183	1500			150°	7
60	154	16	19	8.0	156	1500			150°	8
60	154	16	19	8.0	142	1500			150°	9
60	154	16	19	8.2	151	1500			150°	10
60	155	16	19							11
60	155	16	19	7.9	187	1500			150°	12
60	155	16	[illegible]	7.[illegible]	[illegible]	[illegible]			150°	1 PM
										2
60	[illegible]	16	19	8.1	[illegible]	[illegible]			150°	3
60	155	16	19	7.9	181	1500			150°	4
60	155	16	19	7.9	185	1500			150°	5
60	158	16	19	8.2	18[illegible]	1540			150°	6
60	158	16	[illegible]	7.7	181	1540			150°	7
60	158	16	19	8.1	180	1520			150°	8
										9
										10
60	158	16	17	7.8	181	1520			150°	11
60	157	16	19	8.[illegible]	18[illegible]	1520			150°	12
60	[illegible]	16	17	8.1	[illegible]	1520			150°	1 AM
60	158	16	17	7.1	18[illegible]	1520			150°	2
60	156	16	[illegible]	8.2	18[illegible]	1540			150°	3
										4
60	158	16	19	7.7	16[illegible]	14[illegible]			150°	5 AM

	SCRUBBER SOLIDS	SCRUBBER BOOSTER FAN VIBRATION INBOARD	VIBRATION OUTBOARD	TEMPERATURE INBOARD	TEMPERATURE OUTBOARD	BLEW SOOT BLOWERS
6 AM-6 PM		1.6	3.4	110°	100°	✓
6 PM-6 AM		1.8	3.4	125	110°	

REMARKS:

	OPERATOR
6 AM-6 PM	[illegible]
6 PM-6 AM	[illegible]

B[redacted]K [redacted]LE[redacted]LO[redacted]

DATE [redacted]

TIME	STEAM: STEAM FLOW THOUS LB/HR	STEAM: FEED WATER °F THOUS LB/HR	STEAM: STEAM TEMP	GAS: BURNERS	GAS: GAS FLOW SCFH	GAS: AIR FLOW TO GAS MPPH	BARK: BARK FLOW	BARK: AIR TO BARK MPPH	TOTAL AIR FLOW MPPH	OVER FIRE AIR FLOW MPPH	O_2 %
6 A.M.	190	190	850	4	12	137	60	37	247		6.9
7	190	190	850	4	15	140	60	37	244		5.5
8											
9	200	200	900	4	191	183	44	37	251		8.9
10											
11											
12	220	220	900	4	26	148	68	37	241		5.7
1 P.M.	240	240	900	4	31	152	72	37	236		5.0
2											
3	240	240	880	4	15	147	80	24	245		4.9
4	240	245	880	4	12	150	78	24	247		4.4
5	245	245	880	4	12	151	80	24	249		3.8
6	240	240	880	4	20	151	74	24	250		4.9
7	240	240	880	4	37	153	74	24	248		5.0
8	240	240	880	4	22	150	74	24	243		4.3
9	240	245	880	4	18	150	76	24	240		4.1
10	245	245	860	4	16	150	78	22	241		4.7
11	245	245	860	4	11	149	76	22	241		4.0
12											
1 A.M.	245	245	880	4	22	149	78	22	245		3.7
2	245	245	880	4	20	150	74	22	243		3.6
3	245	245	880	4	16	160	78	22	242		3.0
4	245	245	880	4	14	147	71	22	244		3.4
5 A.M.	240	240	880	4	31	150	74	22	243		4.1

TIME	AIR HEATER AIR DIFF PRESS	F.D. FAN DUCT PRESS	BURNER WD BX PRESS	FURN PRESS	SUPER HEATER DIFF PRESS	BOILER DIFF PRESS	AIR HEATER GAS	DUST COLL DIFF PRESS	ID FAN DIFF PRESS	GRATE AIR PRESS	FUEL GAS TO BURNER PRESS	DRUM PRESS	GRATE TEMP	GRATE TEMP	GRATE TEMP	GRATE TEMP	SUPER HEATER HOT LEG TEMP °F
6 A.M.	2.6	4.2	0	-.1	0	3	.9	2.4	9	1.0	2	880	433	345	427	377	
7	[illegible]	4.2	0	-.1	0	3	.9	2.4	9	1.2	2	880	428	337	420	368	
8																	
9	2.4	4.2	1.5	-.1	0	3	1.2	2.4	9.5	.6	18	880	418	320	401	363	
10																	
11																	
12	2.4	4.2	1.0	-.1	0	3	.9	2.4	9	.9	2	860	415	347	433	376	
1 P.M.	2.2	4.4	1.0	0	0	3	.9	2.4	9	.9	2	850	454	354	447	352	
2																	
3	2.4	4.4	0	0	0	3	.9	2.4	9	1.0	0	880	454	360	450	395	
4	2.8	4.4	0	0	0	3	.9	2.4	9	1.2	0	880	456	364	456	404	
5	2.4	4.5	.5	-.1	0	3	.9	2.4	9	1.0	0	900	457	360	450	402	
6	2.8	4.3	.5	0	0	3	.9	2.3	9	1.2	0	900	453	362	452	400	
7	2.5	4.3	.5	0	0	3	.9	2.3	9	1.2	4	900	454	363	455	404	
8	2.2	6.8	.5	0	0	3	.9	2.3	9	1.2	2	900	454	357	449	406	
9	2.4	7.0	.5	0	0	3	.9	2.3	9	1.4	1	900	458	352	449	[illegible]	
10	2.4	6.1	.5	-.1	0	3	.9	2.4	9	1.4	2	900	454	353	442	390	
11	2.4	6.1	.5	0	[illegible]	[illegible]	.9	2.4	9	1.3	2	900	457	358	451	390	
12																	
1 A.M.	2.4	7.0	.5	0	0	3	.9	2.4	9	1.4	3	900	458	356	[illegible]	[illegible]	
2	2.5	7.0	.5	0	0	3	.9	2.4	9	1.5	2	900	457	357	448	394	
3	2.4	7.0	.5	0	0	3	.9	2.3	9	1.4	0	900	468	357	447	393	
4	2.4	7.0	.5	0	0	3	.9	2.4	9	1.3	0	900	454	355	452	389	
5 A.M.	2.4	6.8	.5	0	0	3	.9	2.3	9	1.4	2	870	454	358	447	389	

TIME	BRK. BLR. ID TURB.: MAIN OIL PRESS	OIL TEMP	BRG OIL PRESS	GEAR SPRAY	BARK BOILER SCRUBBER: PRESS DROP INCHES	RECIRC BLEED RATE GPM	SPRAY WATER FLOW	NOZZLE PRESS EAST	NOZZLE PRESS WEST	DISCHG OUTLET TEMP	TIME
6 A.M.	60	158	16	18	8.0	186	1500			150°	6 A.M.
7	60	160	16	18	7.9	19.5	1500			150°	7
8											8
9	60	162	16	18	8.1	194	1500			150°	9
10											10
11	60	165	16	18							11
12	60	165	[illegible]	[illegible]	8.0	191	1500			150°	12
1 P.M.	60	162	16	18	8.3	185	1500			155°	1 P.M.
2	60	162	16	18							2
3	60	162	16	[illegible]	8.2	152	1500			150°	3
4	60	162	16	18	8.0	189	1500			150°	4
5	60	162	16	18	7.8	184	1500			150°	5
6	60	162	16	18	8.1	187	1520			150°	6
7	60	162	16	18	7.7	184	1510			150°	7
8	60	161	16	18	8.4	189	1520			150°	8
9	60	162	16	12	7.9	191	1520			150°	9
10	60	161	16	12	8.0	181	1520			150°	10
11	[illegible]	[illegible]	[illegible]	[illegible]	8.1	187	1520			150°	11
12											12
1 A.M.	60	160	16	17	8.3	189	1520			150°	1 A.M.
2	60	160	16	18	8.4	187	1520			150°	2
3	[illegible]	[illegible]	[illegible]	11	8.4	193	1520			150°	3
4	60	160	16	18	8.0	190	1520			150°	4
5 A.M.	60	160	[illegible]	11	8.0	188	1520			150°	5 A.M.

	SCRUBBER SOLIDS	SCRUBBER BOOSTER FAN: VIBRATION INBOARD	VIBRATION OUTBOARD	TEMPERATURE INBOARD	TEMPERATURE OUTBOARD	BLEW SOOT BLOWERS
6 AM-6 PM		1.6	3.4	115°	105°	✓
6 PM-6 AM		1.4	3.6	115°	115°	

REMARKS:

OPERATOR	
6 AM-6 PM	[illegible signature]
6 PM-6 AM	[illegible signature]

units?
wet or dry?

SCFH
ft³/hr

400

BARK BOILER LOG

DATE 7-9-72

TIME	STEAM: STEAM FLOW THOUS LB/HR	STEAM: FEED WATER °F THOUS LB/HR	STEAM: STEAM TEMP	GAS: BURNERS	GAS: GAS FLOW SCFH	GAS: AIR FLOW TO GAS MPPH	BARK: BARK FLOW	BARK: AIR TO BARK MPPH	TOTAL AIR FLOW MPPH	OVER FIRE AIR FLOW MPPH	O_2 %	AIR HEATER AIR DIFF PRESS	FD FAN DUCT PRESS	BURNER WD BX PRESS	FURN PRESS	SUPER HEATER DIFF PRESS	BOILER DIFF PRESS	AIR HEATER GAS	DUST COLL DIFF PRESS	ID FAN DIFF PRESS	GRATE AIR PRESS	FUEL GAS TO BURNER PRESS
6 A.M.	240	240	880	4	15	151	74	22	243		3.7	2.4	6.6	.5	0	0	3	.9	2.4	9	1.2	2
7	245	245	860	4	23	151	76	22	246		4.9	2.5	6.6	.5	-.1	0	3	.9	2.4	9	1.2	2
8	250	250	880	4	17	149	76	22	244		4.1	2.5	6.8	.5	0	0	3	.9	2.4	9	1.3	2
9	250	240	880	4	13	148	80	22	244		3.6	2.6	7	.5	0	0	3	.9	2.4	9	1.4	2
10	250	250	880	4	12	149	80	24	249		4.0	2.6	6.8	.5	0	0	3	1.0	2.4	9	1.3	0
11	250	245	880	4	9	148	80	24	249		4.0	2.2	6.8	.5	0	0	3	.9	2.4	9	1.5	2
12																						
1 P.M.	245	240	880	4	26	150	74	24	255		5.2	2.6	6.6	.5	0	0	3	.9	2.4	9	1.2	2
2	245	240	880	4	21	150	78	24	252		4.9	2.4	6.8	.5	0	0	3	.9	2.4	9	1.3	0
3	250	250	880	4	11	149	80	24	250		4.5	2.4	6.5	.5	0	0	3	.9	2.4	9	1.3	2
4	245	245	880	4	23	150	78	24	247		5.3	2.5	6.8	.5	-.1	0	3	.9	2.4	9.5	1.2	2
5	245	240	880	4	29	150	76	22	241		6.1	2.6	6.8	.5	-.1	0	3	.9	2.4	9.5	1.2	2
6	240	240	880	4	13	147	77	22	240		5.0	2.6	6.8	.5	-.1	0	3	.9	2.4	9.5	1.1	2
7	240	240	880	4	42	148	70	22	244		6.4	2.6	6.8	.5	0	0	3	.9	2.4	9.8	1.1	5
8	240	240	880	4	39	[illegible]	72	22	242		6.2	2.5	6.8	.5	0	0	3	.9	2.4	9.8	1.2	4
9																						
10	225	230	860	4	32	148	66	22	241		6.9	2.5	6.8	.5	-.1	0	3	.9	2.5	9.8	1.3	3
11	225	220	860	4	32	148	66	22	242		6.2	2.4	7.0	0	-.1	0	3	.9	2.6	9.8	1.2	2
12	225	220	860	4	22	148	72	22	246		6.5	2.4	7.0	0	-.1	0	3	.9	2.6	9.8	1.3	2
1 A.M.	230	230	860	4	20	147	72	22	243		6.2	2.4	6.8	0	-.2	0	3	.9	2.5	9.8	1.3	2
2	225	230	860	4	21	148	70	22	241		6.4	2.6	6.8	0	-.1	0	3	.9	2.5	9.8	1.3	2
3	230	230	860	4	21	150	72	22	244		6.6	2.6	7.0	0	-.1	0	3	.9	2.5	9.8	1.3	2
4	225	230	860	4	21	147	70	22	243		6.6	2.6	7.0	0	-.1	0	3	.9	2.5	9.8	1.2	2
5 A.M.	225	220	860	4	24	150	70	22	241		6.8	2.6	7.0	0	-.1	0	3	.9	2.6	9.8	1.2	2

TIME	DRUM PRESS	GRATE TEMP	GRATE TEMP	GRATE TEMP	GRATE TEMP	SUPER HEATER HOT LEG TEMP °F	BRK. BLR. ID TURB.: MAIN OIL PRESS	OIL TEMP	BRG OIL PRESS	GEAR SPRAY	BARK BOILER SCRUBBER: PRESS DROP INCHES	RECIRC BLEED RATE GPM	SPRAY WATER FLOW	NOZZLE PRESS EAST	NOZZLE PRESS WEST	DISCHG OUTLET TEMP	TIME
6 A.M.	900	453	354	445	386		60	160	16	18	7.7	191	1500			150°	6 A.M.
7	900	451	359	451	397		60	160	16	18	8.1	183	1500			150°	7
8	900	455	362	451	401		60	160	16	18	8.3	183	1500			150°	8
9	900	458	361	453	411		60	160	16	18	8.5	185	1500			150°	9
10	900	460	362	455	413		60	160	16	18	7.6	181	1500			150°	10
11	900	461	362	457	407		60	160	16	18	8.2	177	1500			150°	11
12																	12
1 P.M.	900	464	369	455	417		60	162	16	18	8.3	154	1500			150°	1 P.M.
2	900	460	361	466	417		60	162	16	18	8.2	181	1500			150°	2
3	900	456	363	460	407		60	162	16	18	8.1	182	1500			150°	3
4	900	464	367	451	412		60	162	16	18	8.2	181	1500			150°	4
5	900	463	364	459	402		60	162	16	18	7.1	175	1500			150°	5
6	900	463	364	463	405		60	162	16	18	8.3	186	1640			150°	6
7	900	466	362	460	405		60	162	16	18	8.2	185	1500			150°	7
8	900	460	361	455	405		60	162	16	18	8.2	182	1500			150°	8
9																	9
10	870	450	353	445	387		60	160	16	18	8.4	182	1500			150°	10
11	870	451	351	442	388		60	160	16	16	8.2	177	1500			150°	11
12	870	455	353	442	384		60	160	16	18	8.3	181	1520			150°	12
1 A.M.	890	450	348	441	385		60	160	16	18	8.3	184	1500			150°	1 A.M.
2	890	452	354	450	370		60	160	16	18	8.3	183	1520			150°	2
3	870	452	356	446	387		60	160	16	18	8.0	180	1500			150°	3
4	870	452	354	445	385		60	160	16	18	8.1	176	1500			150°	4
5 A.M.	890	452	356	447	388		60	160	16	18	8.2	176	1520			150°	5 A.M.

	SCRUBBER SOLIDS	SCRUBBER BOOSTER FAN VIBRATION INBOARD	VIBRATION OUTBOARD	TEMPERATURE INBOARD	TEMPERATURE OUTBOARD	BLEW SOOT BLOWERS
6 AM-6 PM		1.6	3.6	120°	110°	✓
6 PM-6 AM		2.0	3.4	130°	125°	

REMARKS:

	OPERATOR
6 AM-6 PM	Moe
6 PM-6 AM	Mo ya

BARK BOILER LOG

DATE 7-10-7[illegible]

TIME	STEAM: STEAM FLOW THOUS LB/HR	STEAM: FEED WATER °F	STEAM: STEAM TEMP.	GAS: BURNERS	GAS: GAS FLOW SCFH	GAS: AIR FLOW TO GAS MPPH	BARK: BARK FLOW	BARK: AIR TO BARK MPPH	TOTAL AIR FLOW MPPH	OVER FIRE AIR FLOW MPPH	O_2 %	AIR HEATER AIR DIFF PRESS	F.D. FAN DUCT PRESS	BURNER WB BX PRESS	FURN PRESS	SUPER HEATER DIFF PRESS	BOILER DIFF PRESS	AIR HEATER GAS	DUST COLL DIFF PRESS	I.D. FAN DIFF PRESS	GRATE AIR PRESS
6 AM	23?	230	8?0	4	2?	149	72	22	24?		7.0	2.6	2.2	0	-.1	0	3	.9	[illegible]	10	1.?
7	235	230	8??	4	20	149	72	22	245		6.5	2.6	7	0	-.2	[illegible]	3	.9	[illegible]	12	1.1
8	230	230	[illegible]	4	18	149	72	22	245		6.?	2.6	7	0	.2	[illegible]	3	.9	[illegible]	[illegible]	1.1
9	240	230	871	4	15	149	72	22	240		6.?	2.6	7	[illegible]	.2	[illegible]	3	.1	[illegible]	1.8	1.2
10	230	230	875	4	18	149	72	22	243		6.1	2.6	7	0	.2	[illegible]	3	.9	[illegible]	10	1.2
11	250	260	875		30	15?	71	22	246		5.9	2.7	7	0	.2	[illegible]	3	.9	[illegible]	[illegible]	1.1
12	250	260	[illegible]	4	31	150	71	22	246		5.?	2.6	7	0	.2	[illegible]	3	.1	[illegible]	[illegible]	1.1
1 PM																					
2	250	250	875	4	41	149	72	22	238		5.?	2.?	7	0	.2	[illegible]	3	.1	2.?	[illegible]	1.1
3	2??	2??	88?	4	41	149	70	22	233		6.6	2.?	7	0	.2	[illegible]	3	.85	2.?	10	1.2
4																					
5	25?	25?	[illegible]	4	36	149	71	22	240		4.8	2.?	6.8	0	-.2	0	3	.9	2.1	15	1.5
6	255	250	870	4	31	[illegible]	70	22	237		4.?	2.6	7.0	0	.2	0	3	.9	[illegible]	10	1.6
7	250	250	870	4	29	1??	70	22	239		4.9	2.5	7.0	[illegible]	-.1	0	3	.9	2.?	4.5	1.5
8	255	245	87?	4	35	147	72	22	243		6.1	2.6	7.0	0	-.1	[illegible]	3	[illegible]	2.?	9.9	1.?
9	210	2??	[illegible]	4	[illegible]	[illegible]	[illegible]	22	240		6.?	2.6	7.0	0	.2	0	3	.9	2.?	9	
10	1?0	190	890	[illegible]	[illegible]	[illegible]	[illegible]	22	24?		6.3	2.6	7.0	.3	-.1	0	3	.9	2.?	[illegible]	1.?
11	190	190	8??	4	4	161	51	22	2??		6.1	2.6	7.?	.3	-.1	0	3	.9	2.?	[illegible]	[illegible]
12	190	180	8??	4	4	151	62	22	261		6.?	2.6	6.9	.4	0	0	3	.9	2.?	10	1.?
1 AM	200	190	[illegible]	4	4	[illegible]	[illegible]	[illegible]	[illegible]		5.?	2.6	6.9	.4	0	3	3	.9	2.?	[illegible]	[illegible]
2																					
3	175	190	160	4	[illegible]	[illegible]	59	22	241		6.?	2.6	6.9	0	.?	0	3	.9	2.8	10	1.?
4	175	185	160	4	4	[illegible]	[illegible]	22	22?		6.3	2.0	5.3	0	.?	0	3	.9	2.2	10	1.?
5 AM	170	170	860	4	4	[illegible]	71	21	21?		6.6	2.6	4.1	0	[illegible]	0	3	.9	[illegible]	[illegible]	[illegible]

TIME	FUEL GAS TO BURNER PRESS	DRUM PRESS	GRATE TEMP	GRATE TEMP	GRATE TEMP	GRATE TEMP	SUPER HEATER HOT LEG TEMP °F	BRK. BLR. ID TURB.: MAIN OIL PRESS	OIL TEMP	BRG OIL PRESS	GEAR SPRAY	BARK BOILER SCRUBBER: PRESS DROP INCHES	RECIRC BLEED RATE GPM	SPRAY WATER FLOW	NOZZLE PRESS EAST	NOZZLE PRESS WEST	DISCHG OUTLET TEMP	TIME
6 AM	2	89?	424	363	421	378		60	160	16	18	[illegible]	[illegible]	[illegible]			[illegible]	6 AM
7	2	870	420	3??	413	383		57	157	[illegible]	18	[illegible]	111	156			[illegible]	7
8	2	[illegible]	451	35?	44?	35?		60	[illegible]	[illegible]	18	[illegible]	[illegible]	156			[illegible]	8
9	2	[illegible]	45?	35?	417	35?		60	160	11	18	[illegible]	[illegible]	158			[illegible]	9
10	2	[illegible]	451	36?	45?	37?		60	[illegible]	[illegible]	[illegible]	8.0	77	158			[illegible]	10
11	2	[illegible]	463	367	463	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]	175	155			[illegible]	11
12	2	[illegible]	[illegible]	371	46?	41?		57	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	155			[illegible]	12
1 PM																		1 PM
2	3	[illegible]	41?	3??	46?	[illegible]		57	15?	[illegible]	[illegible]	8.?	210	152			15?	2
3	5	[illegible]	41?	36?	[illegible]	[illegible]		57	15?	[illegible]	[illegible]	[illegible]	[illegible]	150			15?	3
4																		4
5	3	[illegible]	[illegible]	367	[illegible]	[illegible]		58	[illegible]			[illegible]	9?	150			150	5
6	[illegible]	[illegible]	461	36?	469	493		58	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	15?			150	6
7	4	[illegible]	447	370	46?	454		56	16?	16	[illegible]	8.4	213	15?			15?	7
8	4		45?	359	[illegible]			57	16?	16	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	8
9	0	390	41?	350	[illegible]	390		57	[illegible]		19	[illegible]	2??	1.0?			150	9
10	0	870	45?	[illegible]	[illegible]	39?		57	160	[illegible]	[illegible]	[illegible]	[illegible]	1.0?			15?	10
11	0	890	439	347	441	39?		[illegible]	160	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	11
12	0	[illegible]	[illegible]	347	434	393		58	[illegible]	[illegible]	19	[illegible]	[illegible]	[illegible]			[illegible]	12
1 AM	[illegible]	[illegible]	436	346	43?	[illegible]		[illegible]	[illegible]			8.?	1??	[illegible]			[illegible]	1 AM
2																		2
3	0	[illegible]	[illegible]	[illegible]	43?	379		[illegible]	[illegible]	[illegible]		7.8	200	5?			[illegible]	3
4		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		58	16?	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	4
5 AM	[illegible]	[illegible]	44?	[illegible]	44?	41?		[illegible]	[illegible]	16	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	5 AM

	SCRUBBER SOLIDS	SCRUBBER BOOSTER FAN VIBRATION INBOARD	VIBRATION OUTBOARD	TEMPERATURE INBOARD	TEMPERATURE OUTBOARD	BLEW SOOT BLOWERS
6 AM-6 PM						
6 PM-6 AM		1 4	[illegible]	126°	126°	

REMARKS:

	OPERATOR
6 AM-6 PM	[illegible signature]
6 PM-6 AM	[illegible signature]

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SECTION 4
"B" BROWN STOCK WASHER HOOD VENT
(IO-BSWBHV)

4. IO-BSWBHV

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SECTION 4
"B" BROWN STOCK WASHER HOOD VENT
(IO-BSWBHV)

The "B" Brown Stock Washer Hood Vent was tested on two different days for volatile organic compounds by Methods 25A, 16, 18, and VOST.

Total Hydrocarbons (M25A)

Figures 4.1, 4.2, and 4.3 present the THC trends for the test periods on 7/23/92 and 7/24/92. Total hydrocarbon concentrations on 7/23/92 showed an upward trend (400-424 ppm) while on 7/24/92, a downward trend was seen (435-390 ppm).

Volatile Organic Compounds (M16 and M18)

Table 4.1 summarizes the results for the Method 16 and Method 18 target compounds, and Section 4.1 is a tabulation of the data. Fan curve data was used to calculate the mass emission rate. Methyl mercaptan, dimethyl sulfide, and dimethyl disulfide were all identified in one or more runs on both days. Methanol, alpha- and beta-pinene were the major target compounds present in all runs. The three compounds gave an average emission rate of 10-20 lb/hr each. Run 1 on 7/24/92 contained several compounds not present in the other runs of that test period.

Volatile Organic Sampling Train (VOST)

Table 4.2 summarizes the result of the VOST sample collected on 7/23/92. Section 4.2 tabulates the results for target compounds and tentatively identified compounds (TIC). A high level VOST analysis was performed. Chloromethane, methylene chloride, dimethyl sulfide, and the pinenes were all detected at levels above the Method 18 detection limits. These results were generally in the same range as Method 18 results, although chloromethane and methylene chloride were not Method 18 target compounds.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 4.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 4.4 includes the process operating data as recorded and provided by mill personnel. Process data were not given for all run times. The data with the closest run time was used.

FIGURE 4.1
THC TREND ANALYSIS (7/23/92) (a)
"B" BROWN STOCK WASHER HOOD VENT
(IO-BSWBHV)

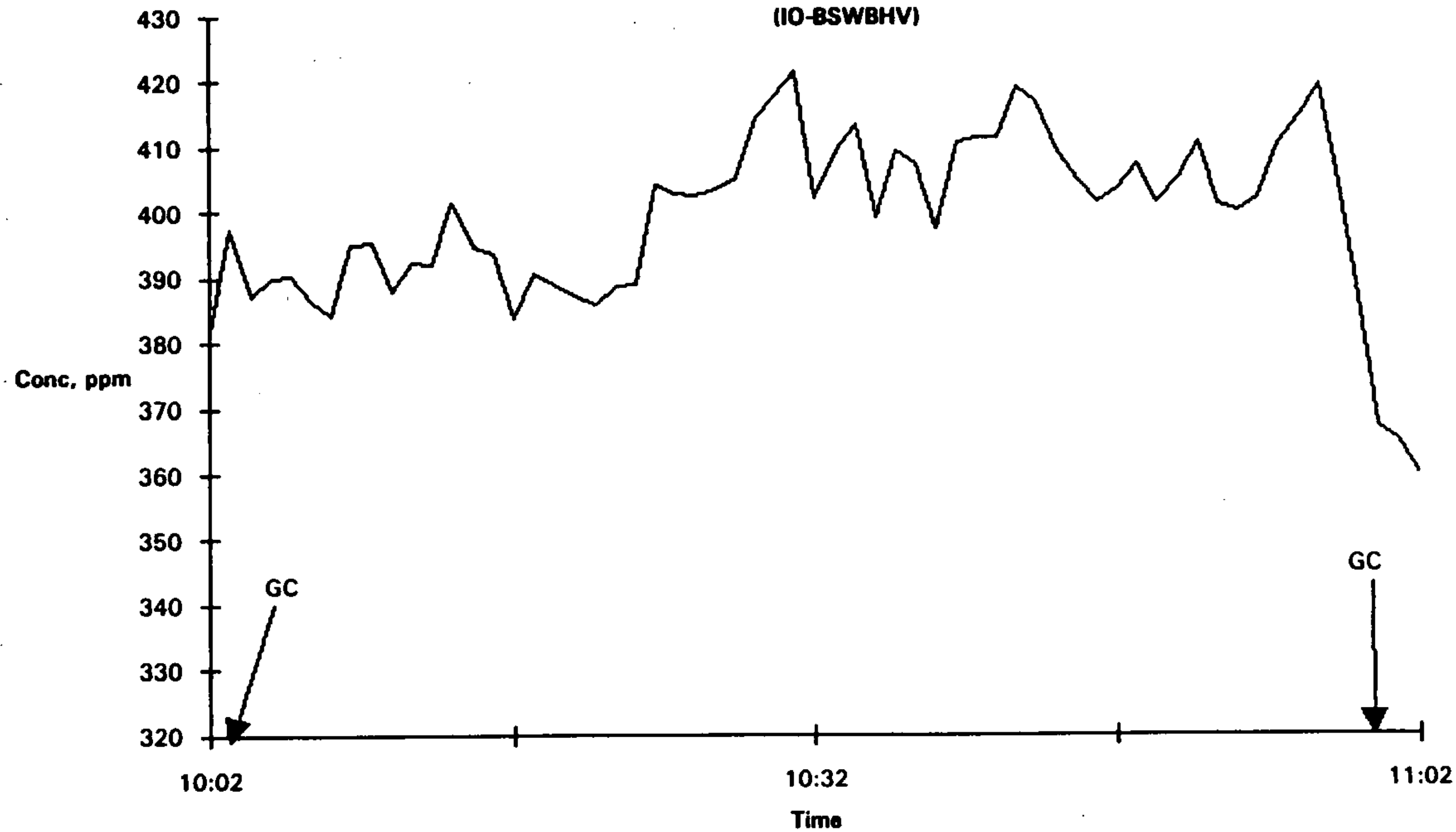

FIGURE 4.2
THC TREND ANALYSIS (7/23/92) (b)
"B" BROWN STOCK WASHER HOOD VENT
(IO-BSWBHV)

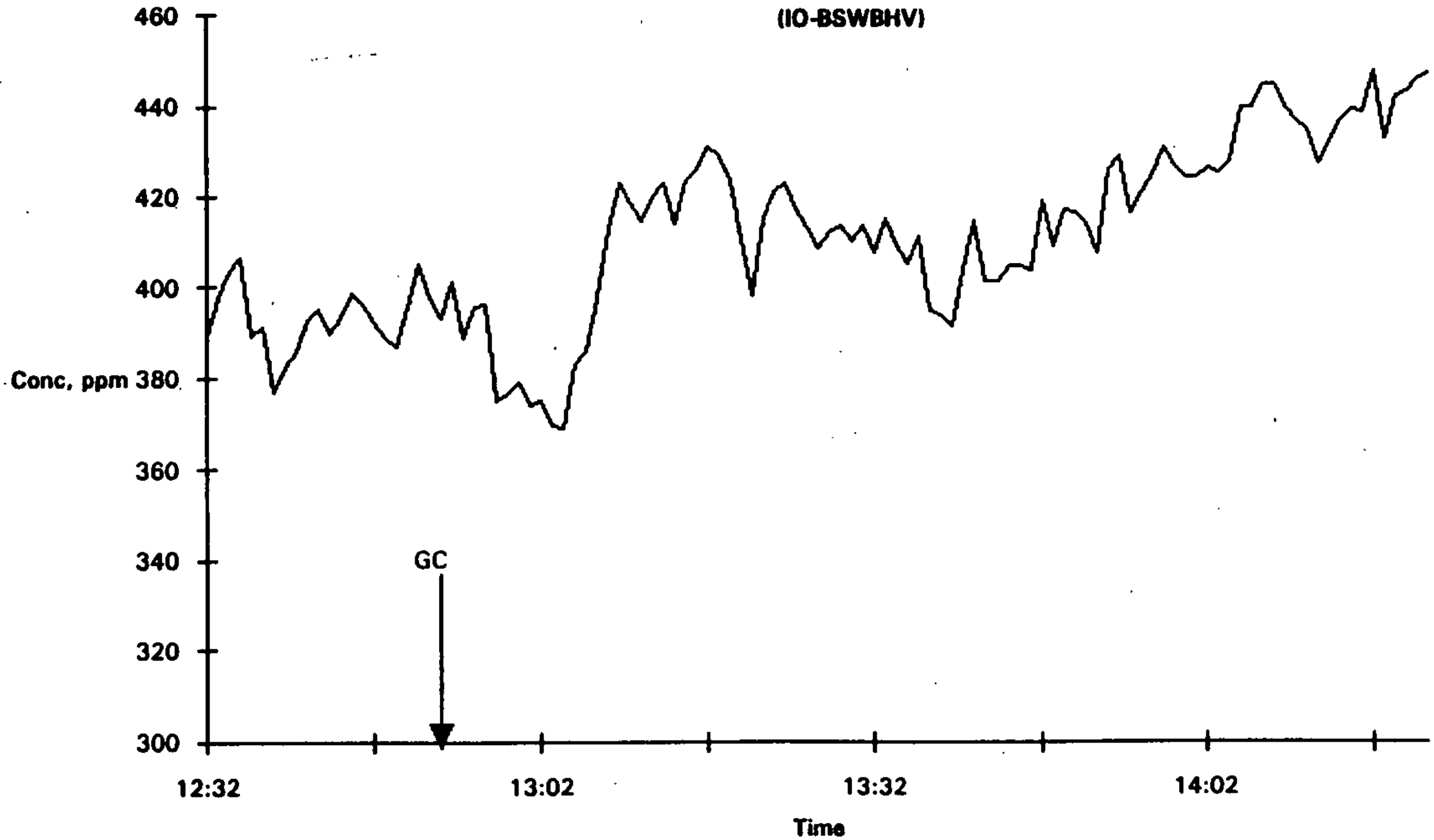

FIGURE 4.3
THC TREND ANALYSIS (7/24/92)
"B" BROWN STOCK WASHER HOOD VENT
(IO-BSWBHV)

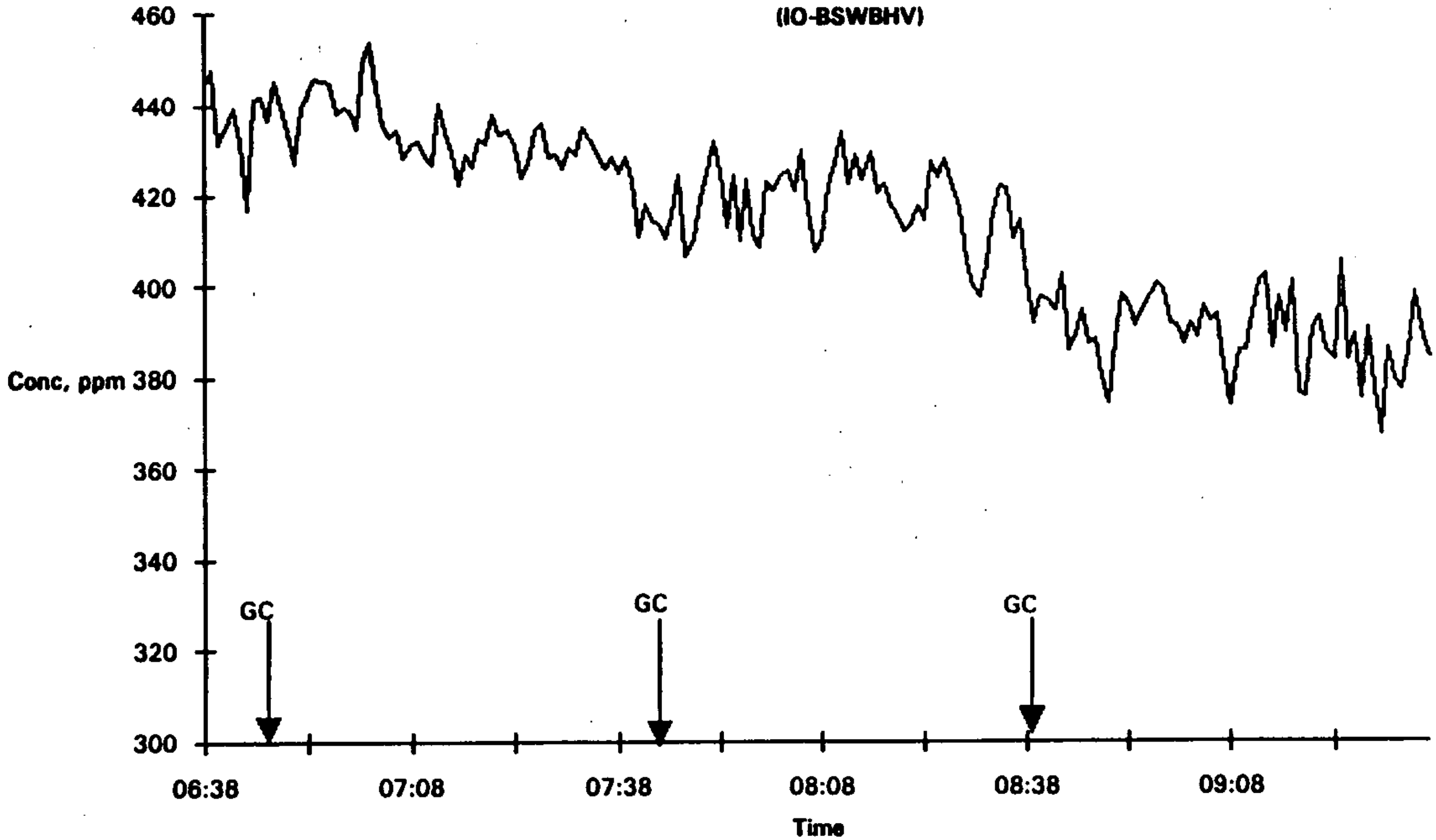

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TABLE 4.1 SUMMARY OF VOC RESULTS

Mill: INLAND - ORANGE

Source Code: IO-BSWBHV

FIN: P-BSWB CIN:

Source: "B" Brown Stock Washer Hood Vent

Test Dates: 7/23/92 7/24/92

EPN: 17

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	108	115	112	
Volumetric Flow Rate, x10^3 DSCFM	25.0	25.8	25.4	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	33.3	33.3	33.3	
Method 16 Data, lb/hr				
Hydrogen sulfide	ND	ND	ND	0.1
Methyl mercaptan	0.1	0.4	0.3	0.1
Dimethyl sulfide	ND	0.5	0.3	0.1
Carbon disulfide	ND	ND	ND	0.2
Dimethyl disulfide	ND	0.4	0.3	0.2
Method 18 Data, lb/hr				
Methanol	12.7	16.3	14.4	0.3
Ethanol	0.1	0.2	0.2	0.1
Acetone	0.3	0.4	0.4	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.2
Chloroform	ND	ND	ND	0.5
Benzene	ND	ND	ND	0.2
Bromodichloromethane	ND	ND	ND	0.7
Toluene	ND	ND	ND	0.2
Ethyl benzene	ND	ND	ND	0.2
m-, p-Xylene	ND	ND	ND	0.2
o-Xylene	ND	2.4	0.6	0.2
Cumene	ND	ND	ND	0.3
alpha-Pinene	18.6	21.5	19.6	0.3
beta-Pinene	10.5	11.8	11.1	0.3
3-Carene	ND	ND	ND	0.3
Terpenes (Unspecified)	6.5	10.2	8.0	0.3
p-Cymene	ND	ND	ND	0.3
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	33.6	39.0	35.9	0.1
Unknowns as C, lb/hr	ND	2.1	0.4	0.1
Sum of Compounds as C, lb/hr	33.6	41.1	36.3	0.1

ND=Not Detected

DL=Detection Limit

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TABLE 4.2 SUMMARY OF VOST RESULTS

Mill: INLAND-ORANGE
Source Code: IO-BSWBHV
FIN: P-BSWB EPN: 17

Source: "B" Brown Stock Washer Hood Vent
Test Dates: 7/23/92
CIN:

TIME	1119
Volumetric Flow Data	
Stack Temperature, °F	108
Volumetric Flow Rate, x 10^3 DSCFM	30.0
Process Operating Conditions	
Production Rate, ADT pulp/hr	33.3
Target Compounds, ppm	
Chloromethane	0.485
Vinyl Chloride	0.058
Methylene Chloride	0.258
Acetone	0.649
Chloroform	0.112
Dibromomethane	0.000
Dimethyl disulfide	0.367
Dimethyl sulfide	0.580
n-Hexane	0.001
2-Butanone (MEK)	0.006
Toluene	0.045
Styrene	0.001
a-Pinene	18.018
B-Pinene	11.890

Section 4.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE	Source: "B" Brown Stock Washer Hood Vent		FIN: P-BSWB
Source Code: IO-BSWBHV	Date: 7/23/92	EPN: 17	CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1000	1231	1332	
Flow Data				
Stack Temperature, °F			108	108
Moisture Content, %			8.1	8.1
Oxygen Concentration, %			20.8	20.8
Carbon Dioxide Concentration, %			0.0	0.0
Volumetric Flow Rate, x10^3 ACFM			30.0	30.0
Volumetric Flow Rate, x10^3 DSCFM			25.8	25.8
Process Operating Conditions				
Production Rate, ADT pulp/hr	33.3	33.3	33.3	33.3
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd	1.2	0.6	0.7	0.8
Emission Rate, lb/hr	0.2	0.1	0.1	0.2
Dimethyl sulfide				
Concentration, ppmvd	1.2	0.5 *	0.5 *	0.6
Emission Rate, lb/hr	0.3	0.1 *	0.1 *	0.1
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Method 18 Data				
Methanol				
Concentration, ppmvd	111.9	124.5	126.7	121.0
Emission Rate, lb/hr	14.4	16.1	16.3	15.6
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.8	0.9	0.9	0.9
Emission Rate, lb/hr	0.2	0.2	0.2	0.2
Acetone				
Concentration, ppmvd	1.5	1.6	1.8	1.7
Emission Rate, lb/hr	0.4	0.4	0.4	0.4
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE
Source Code: IO-BSWBHV

Source: "B" Brown Stock Washer Hood Vent
Date: 7/23/92 EPN: 17

FIN: P-BSWB
CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Chloroform				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
alpha-Pinene				
Concentration, ppmvd	33.9	35.1	34.2	34.4
Emission Rate, lb/hr	18.6	19.3	18.7	18.9
beta-Pinene				
Concentration, ppmvd	19.5	19.8	19.2	19.5
Emission Rate, lb/hr	10.7	10.9	10.5	10.7
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Terpenes (Unspecified)				
Concentration, ppmvd	12.6	13.8	11.9	12.8
Emission Rate, lb/hr	6.9	7.6	6.5	7.0

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: "B" Brown Stock Washer Hood Vent | FIN: P-BSWB
Source Code: IO-BSWBHV | Date: 7/23/92 | EPN: 17 | CIN: -

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Knowns as Carbon				
Concentration, ppmvd	694.9	727.4	694.5	705.6
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.5	0.2
Sum M18 as Carbon, lb/hr	33.6	35.2	33.6	34.1
Unknown Compounds % of Total	0.0%	0.0%	0.1%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	435.3	435.3	461.4	444.0
Emission Rate, lb/hr as C	21.1	21.1	22.3	21.5

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: "B" Brown Stock Washer Hood Vent | FIN: P-BSWB
Source Code: IO-BSWBHV | Date: 7/24/92 | EPN: 17 | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	637	737	837	
Flow Data				
Stack Temperature, °F			115	115
Moisture Content, %			10.0	10.0
Oxygen Concentration, %			20.7	20.7
Carbon Dioxide Concentration, %			0.0	0.0
Volumetric Flow Rate, x10^3 ACFM			30.0	30.0
Volumetric Flow Rate, x10^3 DSCFM			25.0	25.0
Process Operating Conditions				
Production Rate, ADT pulp/hr	33.3	33.3	33.3	33.3
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd	2.0	2.0	2.0	2.0
Emission Rate, lb/hr	0.4	0.4	0.4	0.4
Dimethyl sulfide				
Concentration, ppmvd	1.9	1.9	2.0	1.9
Emission Rate, lb/hr	0.5	0.5	0.5	0.5
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	1.0	1.0	1.0	1.0
Emission Rate, lb/hr	0.4	0.4	0.4	0.4
Method 18 Data				
Methanol				
Concentration, ppmvd	105.9	102.0	109.0	105.6
Emission Rate, lb/hr	13.2	12.7	13.6	13.2
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.8	0.7	0.8	0.7
Emission Rate, lb/hr	0.1	0.1	0.1	0.1
Acetone				
Concentration, ppmvd	1.7	1.4	1.6	1.6
Emission Rate, lb/hr	0.4	0.3	0.4	0.4
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: "B" Brown Stock Washer Hood Vent | FIN: P-BSWB

Source Code: IO-BSWBHV | Date: 7/24/92 | EPN: 17 | CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Chloroform				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
o-Xylene				
Concentration, ppmvd	5.9	0.6 *	0.6 *	2.1
Emission Rate, lb/hr	2.4	0.2 *	0.2 *	0.9
Cumene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
alpha-Pinene				
Concentration, ppmvd	36.1	38.2	40.7	38.3
Emission Rate, lb/hr	19.1	20.3	21.5	20.3
beta-Pinene				
Concentration, ppmvd	20.9	21.9	22.3	21.7
Emission Rate, lb/hr	11.1	11.6	11.8	11.5
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Terpenes (Unspecified)				
Concentration, ppmvd	19.2	15.0	16.9	17.0
Emission Rate, lb/hr	10.2	7.9	8.9	9.0

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE
Source Code: IO-BSWBHV
Source: "B" Brown Stock Washer Hood Vent
Date: 7/24/92
EPN: 17
FIN: P-BSWB
CIN:

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Knowns as Carbon				
Concentration, ppmvd	833.4	766.8	815.7	805.3
Unknowns as Carbon				
Concentration, ppmvd	45.7	2.6	3.2	17.1
Sum M18 as Carbon, lb/hr	41.1	36.0	38.3	38.5
Unknown Compounds % of Total	5.2%	0.3%	0.4%	2.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	483.3	464.4	433.3	460.4
Emission Rate, lb/hr as C	22.6	21.7	20.3	21.5

* One or more values were less than the detection limit.

Section 4.2 Emission Test Results - VOST

EMISSION TEST RESULTS - VOST

Mill	INLAND - ORANGE		Source:	"B" Brown Stock Washer Hood Vent		
	Source Code:	IO-BSWBHV	EPN: 17	FIN: P-BSWB	CIN:	-
				HIGH-LEVEL VOST		

Compound	BSWBHV-T (µg)	BSWBHV-TC (µg)	BSWBHV-C (µg/L)	Date: 7/23/92 Total µg	IO-BSWBHV (µg/m3)	Conc. (ppm)
TARGET COMPOUNDS						
Chloromethane		7.301		7.30	1019.69	0.485
Bromomethane						
Vinyl Chloride		1.071		1.07	149.58	0.058
Methylene Chloride	3.296	1.472	40.97	6.53	911.97	0.258
Acetone	10.791		10.19	11.23	1568.32	0.649
Carbon Disulfide						
Chloroform	3.987			3.99	556.84	0.112
Acrolein						
Dibromomethane			0.50	0.02	3.00	0.000
Dimethyl disulfide	9.950	0.358		10.31	1439.66	0.367
Dimethyl sulfide	10.692		0.90	10.73	1498.70	0.580
n-Hexane			0.34	0.01	2.04	0.001
2-Butanone (MEK)			2.94	0.13	17.66	0.006
Benzene						
Toluene	1.086		3.28	1.23	171.37	0.045
Styrene			0.49	0.02	2.94	0.001
A-Pinene	573.102	157.815		730.92	102083.38	18.018
B-Pinene	436.253	46.066		482.32	67362.99	11.890
TENTATIVELY IDENTIFIED CMPDS.						
Siloxane/Silane	5.136	14.108	3.84	19.41	2710.77	
Sulfur Dioxide			18.81	0.81	112.97	
Pinene-related compounds	39.111	4.387		43.50	6075.14	
Subst'd HC			14.37	0.62	86.30	
Cyclic HC			0.77	0.03	4.62	
Acidic Ester			0.76	0.03	4.56	
SURROGATE STDS (% Recovery)						
Toluene-d8	148.3	155.1	106.9			
1,2-Dichloroethane-d4	94.8	97.2	79.6			
Benzene-d6	125.4	124.1	121.6			

NOTES:
- -T=Tenax
- -TC=Tenax/Charcoal
- -C = Condensate

Air Volume = 0.00716 cu.m.

Condensate Vol. = 43.0 mL

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: BC209
RF FILE: BC206
DATE: 08/12/92
TLI PROJ #: 21509

SAMPLE ID: IO-BSWBHV-1VOST-0723-3A T
TLI ID: 58.116.17
ANALYSIS DATE: 08/03/92

METHOD 8240--HIGH LEVEL VOST QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1 Bromochloromethane	522		882	1		IS	
2 Chloromethane	0	.495	0	1	.988	ND	5
3 Bromomethane	0	.927	0	1	.517	ND	5
4 Vinyl Chloride	0	.508	0	1	.943	ND	5
5 Chloroethane	0	.737	0	1	.650	ND	5
6 Methylene Chloride	367	2.670	661	1	3.296	E	5
7 Acetone	207	.460	610	1	10.791	D	5
8 Carbon Disulfide	0	4.939	0	1	.097	ND	5
9 1,1-Dichloroethene	0	1.727	0	1	.277	ND	5
10 1,1-Dichloroethane	0	5.348	0	1	.090	ND	5
11 trans-1,2-Dichloroethene	0	2.590	0	1	.185	ND	5
12 Chloroform	1014	6.093	880	1	3.987	E	5
13 1,2-Dichloroethane	0	2.676	0	1	.179	ND	5
43 Trichlorofluoromethane	0	1.099	0	1	.436	ND	5
47 cis-1,2-Dichloroethene	0	3.264	0	1	.147	ND	5
57 Allyl chloride	0	1.362	0	1	.352	ND	5
62 Dimethyl disulfide	2179	5.245	1188	1	9.950	D	5
63 Dimethyl sulfide	810	1.814	587	1	10.692	D	5
65 Iodomethane	0	3.230	0	1	.148	ND	5
66 Isooctane	0	10.516	0	1	.046	ND	5
68 Tert-Butyl methyl ether	0	4.492	0	1	.107	ND	5
69 Vinyl Bromide	0	1.157	0	1	.414	ND	5
70 n-Hexane	0	2.594	0	1	.185	ND	5
14 1,4-Difluorobenzene	2998		1006	14		IS	
15 2-Butanone	0	.022	0	14	3.817	ND	5
16 1,1,1-Trichloroethane	0	.551	0	14	.151	ND	5
17 Carbon Tetrachloride	0	.493	0	14	.169	ND	5
18 Vinyl Acetate	0	.543	0	14	.154	ND	5
19 Bromodichloromethane	0	.631	0	14	.132	ND	5
20 1,2-Dichloropropane	0	.569	0	14	.147	ND	5
21 cis-1,3-Dichloropropene	0	.616	0	14	.135	ND	5
22 Trichloroethene	0	.488	0	14	.171	ND	5
23 Dibromochloromethane	0	.456	0	14	.183	ND	5
24 1,1,2-Trichloroethane	0	.300	0	14	.278	ND	5
25 Benzene	0	1.045	0	14	.080	ND	5
26 trans-1,3-Dichloropropene	0	.559	0	14	.149	ND	5
27 Bromoform	0	.225	0	14	.370	ND	5
54 1,4-Dichloro-2-butene	0	.087	0	14	.961	ND	5
60 Dibromomethane	0	.221	0	14	.377	ND	5
28 Chlorobenzene-d5	3844		1480	28		IS	
29 4-Methyl-2-Pentanone	0	.200	0	28	.325	ND	5
30 2-Hexanone	0	.162	0	28	.401	ND	5
31 Tetrachloroethene	0	.292	0	28	.223	ND	5
33 Toluene	191	.573	1238	28	1.088	E	
34 Chlorobenzene	0	.698	0	28	.094	ND	5
35 Ethylbenzene	0	.425	0	28	.153	ND	5
36 Styrene	0	.660	0	28	.099	ND	5
37 o-Xylene	0	.454	0	28	.143	ND	5

Triangle Laboratories of RTP, Inc.	FILE NAME: 8C209	SAMPLE ID:	IO-8SW8HV-1VOST-0723-3A T
801 Capitola Drive	RF FILE: 8C206	TLI ID:	58.116.17
Durham, NC 27713	DATE: 08/12/92	ANALYSIS DATE:	08/03/92
Telephone: (919) 544-5729	TLI PROJ #: 21509		

METHOD 8240--HIGH LEVEL VOST QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
38 m-/p-Xylene	0	.402	0	28	.182	ND	5
49 1,2 Dichlorobenzene	0	.334	0	28	.195	ND	5
50 1,2,3-Trichloropropane	0	.154	0	28	.421	ND	5
51 1,3 Dichlorobenzene	0	.520	0	28	.125	ND	5
53 1,4 Dichlorobenzene	0	.403	0	28	.161	ND	5
56 A-Pinene	122465	.695	1707	28	573.102	E	5
58 B-Pinene	100035	.746	1900	28	436.253	E	5
59 Cumene (isopropylbenzene)	0	.894	0	28	.073	ND	5
64 Ethyl methacrylate	0	.296	0	28	.220	ND	5
67 P-Cymene	0	.935	0	28	.070	ND	5

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	1100	2.223	938	1	11.85	D	94.8
48 Benzene-d6	4257	1.133	936	14	15.67	D	125.4
39 Toluene-d8	4966	.871	1225	28	18.54	D	148.3

TRIANGLE LABORATORIES OF RTP, INC. FILE NAME: 8C209 SAMPLE ID: IO-BSWSHV-1VOST-0723-3A T
801 Capitola Drive DATE: 08/13/92 TLI ID: 58.116.17
Durham, NC 27713 TLI PROJ #: 21509 ANALYSIS DATE: 08/03/92
Telephone: (919) 544-5729

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
PINENE RELATED COMPOUND	1769	32545	1480	12.5	34.081
PINENE RELATED COMPOUND	1660	4803	1480	12.5	5.030
SILOXANE\SILANE	912	982	862	12.5	3.470
SILOXANE\SILANE	1344	1591	1480	12.5	1.666

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	862	3538	1
1,4-Difluorobenzene	1005	7342	14
Chlorobenzene-d5	1480	11937	28

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: BC212
RF FILE: BC206
DATE: 08/12/92
TLI PROJ #: 21509

SAMPLE ID: IO-BSWBHV-1VOST-0723-38 TC
TLI ID: 58.118.18
ANALYSIS DATE: 08/03/92

METHOD 8240--HIGH LEVEL VOST QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1 Bromochloromethane	460		861	1		IS	
2 Chloromethane	133	..495	209	1	7.301	D	5
3 Bromomethane	0	.927	0	1	.586	ND	5
4 Vinyl Chloride	0	.508	0	1	1.071	ND	5
5 Chloroethane	0	.737	0	1	.738	ND	5
6 Methylene Chloride	145	2.670	661	1	1.472	E	5
7 Acetone	0	.460	0	1	1.182	ND	5
8 Carbon Disulfide	0	4.939	0	1	.110	ND	5
9 1,1-Dichloroethene	0	1.727	0	1	.315	ND	5
10 1,1-Dichloroethane	0	5.348	0	1	.102	ND	5
11 trans-1,2-Dichloroethene	0	2.590	0	1	.210	ND	5
12 Chloroform	0	6.093	0	1	.089	ND	5
13 1,2-Dichloroethane	0	2.676	0	1	.203	ND	5
43 Trichlorofluoromethane	0	1.099	0	1	.495	ND	5
47 cis-1,2-Dichloroethene	0	3.264	0	1	.167	ND	5
57 Allyl chloride	0	1.362	0	1	.399	ND	5
62 Dimethyl disulfide	69	5.245	1189	1	.358	E	5
63 Dimethyl sulfide	0	1.814	0	1	.300	ND	5
65 Iodomethane	0	3.230	0	1	.168	ND	5
66 Isooctane	0	10.516	0	1	.052	ND	5
68 Tert-Butyl methyl ether	0	4.492	0	1	.121	ND	5
69 Vinyl Bromide	0	1.157	0	1	.470	ND	5
70 n-Hexane	0	2.594	0	1	.210	ND	5
14 1,4-Difluorobenzene	2784		1006	14		IS	
15 2-Butanone	0	.022	0	14	4.109	ND	5
16 1,1,1-Trichloroethane	0	.551	0	14	.163	ND	5
17 Carbon Tetrachloride	0	.493	0	14	.182	ND	5
18 Vinyl Acetate	0	.543	0	14	.165	ND	5
19 Bromodichloromethane	0	.631	0	14	.142	ND	5
20 1,2-Dichloropropane	0	.569	0	14	.158	ND	5
21 cis-1,3-Dichloropropene	0	.616	0	14	.146	ND	5
22 Trichloroethene	0	.488	0	14	.184	ND	5
23 Dibromochloromethane	0	.456	0	14	.197	ND	5
24 1,1,2-Trichloroethane	0	.300	0	14	.300	ND	5
25 Benzene	0	1.045	0	14	.086	ND	5
26 trans-1,3-Dichloropropene	0	.559	0	14	.161	ND	5
27 Bromoform	0	.225	0	14	.398	ND	5
54 1,4-Dichloro-2-butene	0	.087	0	14	1.035	ND	5
60 Dibromomethane	0	.221	0	14	.406	ND	5
28 Chlorobenzene-d5	3420		1479	28		IS	
29 4-Methyl-2-Pentanone	0	.200	0	28	.365	ND	5
30 2-Hexanone	0	.162	0	28	.451	ND	5
31 Tetrachloroethene	0	.292	0	28	.250	ND	5
33 Toluene	0	.573	0	28	.128	ND	5
34 Chlorobenzene	0	.696	0	28	.105	ND	5
35 Ethylbenzene	0	.425	0	28	.172	ND	5
36 Styrene	0	.660	0	28	.111	ND	5
37 o-Xylene	0	.454	0	28	.161	ND	5

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: BC212
RF FILE: BC208
DATE: 08/12/92
TLI PROJ #: 21509

SAMPLE ID: IO-BSWBHV-1VOST-0723-38 TC
TLI ID: 58.116.18
ANALYSIS DATE: 08/03/92

METHOD 8240--HIGH LEVEL VOST QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
38 m-/p-Xylene	0	.402	0	28	.182	ND	5
49 1,2 Dichlorobenzene	0	.334	0	28	.219	ND	5
50 1,2,3-Trichloropropane	0	.154	0	28	.473	ND	5
51 1,3 Dichlorobenzene	0	.520	0	28	.141	ND	5
53 1,4 Dichlorobenzene	0	.403	0	28	.181	ND	5
56 A-Pinene	30009	.695	1700	28	157.815	E	5
58 B-Pinene	9400	.746	1896	28	46.066	D	5
59 Cumene (isopropylbenzene)	0	.894	0	28	.082	ND	5
64 Ethyl methacrylate	0	.296	0	28	.247	ND	5
67 P-Cymene	0	.935	0	28	.078	ND	5

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	993	2.223	938	1	12.15	D	97.2
46 Benzene-d6	3915	1.133	936	14	15.51	D	124.1
39 Toluene-d8	4622	.871	1225	28	19.39	D	155.1

TRIANGLE LABORATORIES OF RTP, INC.	FILE NAME: BC212	SAMPLE ID: IO-BSWBHV-1VOST-0723-38 TC
801 Capitola Drive	DATE: 08/13/92	TLI ID: 38.116.18
Durham, NC 27713	TLI PROJ #: 21509	ANALYSIS DATE: 08/03/92
Telephone: (919) 544-5729		

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
PINENE RELATED COMPOUND	1770	3687	1480	12.5	4.387
SILOXANE\SILANE	486	1092	862	12.5	4.004
SILOXANE\SILANE	910	722	862	12.5	2.647
SILOXANE\SILANE	1343	2120	1480	12.5	2.522
SILOXANE\SILANE	471	489	862	12.5	1.792
SILOXANE\SILANE	501	464	862	12.5	1.701
SILOXANE\SILANE	1444	1212	1480	12.5	1.442

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	862	3410	1
1,4-Difluorobenzene	1006	8675	14
Chlorobenzene-d5	1480	10507	28

Triangle Laboratories of RTP, Inc.	FILE NAME: AC9455	SAMPLE ID:	IO-BSW8HV-1VOST-0723-3C
801 Capitola Drive	RF FILE: AC940	TLI ID:	58.116.27
Durham, NC 27713	DATE: 08/12/92	SAMPLE VOL:	.005 L
Telephone: (919) 544-5729	TLI PROJ #: 21509	ANALYSIS DATE:	07/28/92
		DILUTION FACTOR:	1

METHOD 8240 QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	CONC, ug/L	CODE	QUAN LIMIT
1	Bromochloromethane	2868		782	1		IS	
2	Chloromethane	0	2.136	0	1	.18	ND	10
3	Bromomethane	0	1.702	0	1	.22	ND	10
4	Vinyl Chloride	0	2.393	0	1	.16	ND	10
5	Chloroethane	0	1.579	0	1	.24	ND	10
6	Methylene Chloride	4979	2.278	586	1	40.97	D	10
7	Acetone	908	1.665	529	1	10.19	D	10
8	Carbon Disulfide	0	6.283	0	1	.06	ND	10
9	1,1-Dichloroethene	0	2.001	0	1	.19	ND	10
10	1,1-Dichloroethane	0	4.708	0	1	.08	ND	10
11	trans-1,2-Dichloroethene	0	2.432	0	1	.15	ND	10
12	Chloroform	0	4.473	0	1	.08	ND	10
13	1,2-Dichloroethane	0	3.604	0	1	.10	ND	10
43	Trichlorofluoromethane	0	1.673	0	1	.22	ND	10
45	Acrolein	0	.541	0	1	.69	ND	10
46	Acrylonitrile	0	.942	0	1	.40	ND	10
47	cis-1,2-Dichloroethene	0	2.619	0	1	.14	ND	10
52	1,3-butadiene	0	2.898	0	1	.13	ND	10
55	2-Chloro-1,3-Butadiene	0	1.511	0	1	.25	ND	10
57	Allyl chloride	0	1.144	0	1	.33	ND	10
60	Dibromomethane	66	2.508	987	1	.50	E	10
61	Dichlorodifluoromethane	0	3.033	0	1	.12	ND	10
62	Dimethyl disulfide	0	5.464	0	1	.07	ND	10
63	Dimethyl sulfide	131	2.716	515	1	.90	E	10
65	Iodomethane	0	2.346	0	1	.16	ND	10
66	Isooctane	0	15.486	0	1	.02	ND	10
68	Tert-Butyl methyl ether	0	6.646	0	1	.06	ND	10
69	Vinyl Bromide	0	1.902	0	1	.20	ND	10
70	n-Hexane	93	5.071	667	1	.34	E	10
14	1,4-Difluorobenzene	11193		917	14		IS	
15	2-Butanone	60	.091	766	14	2.94	E	10
16	1,1,1-Trichloroethane	0	.695	0	14	.13	ND	10
17	Carbon Tetrachloride	0	.656	0	14	.14	ND	10
18	Vinyl Acetate	0	1.232	0	14	.07	ND	10
19	Bromodichloromethane	0	.805	0	14	.11	ND	10
20	1,2-Dichloropropane	0	.772	0	14	.12	ND	10
21	cis-1,3-Dichloropropene	0	1.387	0	14	.06	ND	10
22	Trichloroethene	0	.475	0	14	.19	ND	10
23	Dibromochloromethane	0	.642	0	14	.14	ND	10
24	1,1,2-Trichloroethane	0	.592	0	14	.15	ND	10
25	Benzene	0	1.589	0	14	.06	ND	10
26	trans-1,3-Dichloropropene	0	.409	0	14	.22	ND	10
27	Bromoform	0	.566	0	14	.16	ND	10
42	2-Chloroethylvinylether	0	.320	0	14	.28	ND	10
54	1,4-Dichloro-2-butene	0	.382	0	14	.23	ND	10
28	Chlorobenzene-d5	14431	1.000	1365	28		IS	
29	4-Methyl-2-Pentanone	0	.690	0	28	.10	ND	10

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: AC9455
RF FILE: AC940
DATE: 08/12/92
TLI PROJ #: 21509

SAMPLE ID: IO-BSWBHV-1VOST-0723-3C
TLI ID: 58.116.27
SAMPLE VOL: .005 L
ANALYSIS DATE: 07/28/92
DILUTION FACTOR: 1

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	CONC, ug/L	CODE	QUAN LIMIT
30 2-Hexanone	0	.892	0	28	.10	ND	10
31 Tetrachloroethene	0	.437	0	28	.16	ND	10
32 1,1,2,2-Tetrachloroethane	0	.949	0	28	.07	ND	10
33 Toluene	900	.949	1132	28	3.28	E	10
34 Chlorobenzene	0	1.073	0	28	.06	ND	10
35 Ethylbenzene	0	.716	0	28	.10	ND	10
36 Styrene	171	1.220	1503	28	.49	E	10
37 o-Xylene	0	.806	0	28	.09	ND	10
38 m-/p-Xylene	0	1.457	0	28	.05	ND	10
49 1,2 Dichlorobenzene	0	1.062	0	28	.07	ND	10
50 1,2,3-Trichloropropane	0	.686	0	28	.10	ND	10
51 1,3 Dichlorobenzene	0	1.116	0	28	.06	ND	10
53 1,4 Dichlorobenzene	0	1.098	0	28	.06	ND	10
56 A-Pinene	0	1.487	0	28	.05	ND	10
58 B-Pinene	0	1.550	0	28	.04	ND	10
59 Cumene (isopropylbenzene)	0	2.029	0	28	.03	ND	10
64 Ethyl methacrylate	0	.804	0	28	.09	ND	10
67 P-Cymene	0	2.052	0	28	.03	ND	10

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
39 Toluene-d8	20210	1.310	1122	28	.267	D	106.9
41 1,2-Dichloroethane-d4	5975	2.812	852	1	.199	D	79.6
46 Benzene-d6	20636	1.516	850	14	.304	D	121.6

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: AC9455
DATE: 08/13/92
TLI PROJ #: 21509

SAMPLE ID: IO-BSWBHV-1VOST-0723-3C
TLI ID: 58.116.27
SAMPLE VOL: .005 L
ANALYSIS DATE: 07/28/92
DILUTION FACTOR: 1

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	SCAN	AREA	IS SCAN #	IS AMT	CONC, ug/L
SULFUR DIOXIDE	399	8925	782	.25	18.81
SUBSTITUTED HYDROCARBON	539	4502	782	.25	9.49
SUBSTITUTED HYDROCARBON	624	1488	782	.25	3.14
SILOXANE\SILANE	882	1465	782	.25	3.09
SUBSTITUTED HYDROCARBON	566	475	782	.25	1.00
CYCLIC HYDROCARBON	1720	850	1365	.25	.77
ACIDIC ESTER	1039	363	782	.25	.76
SILOXANE\SILANE	1248	834	1365	.25	.75
SUBSTITUTED HYDROCARBON	1408	821	1365	.25	.74

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	782	23720	1
Chlorobenzene-d5	1365	55266	28

Section 4.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

SOURCE IO-BSWBHV

QUALITY CONTROL SUMMARY
METHOD 25A

1. CALIBRATION

THEOR	7/23/92		7/24/92	
ppm	ppm	%ERR	ppm	%ERR
0.0	12.0	0.8	12.0	0.8
94.0	76.0	-1.2	76.0	-1.2
264.0	269.0	0.3	269.0	0.3
1506.0	1506.0	0.0	1506.0	0.0
CORR COEFF	0.9998		0.9998	

2. PROPANE LINE RECOVERY

	DATE	7/23/92		DATE	7/24/92	
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	94.9	96.4	101.6%	1505.0	1432.0	95.1%
AFTER	1505.0	1432.0	95.1%	1399.0	1415.0	101.1%

3. LINE BLANK

	7/23/92	7/24/92
	ppm	ppm
BEFORE	1.4	*
AFTER	*	4.0

* Not performed

SOURCE IO-BSWBHV

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR ppm	DATE 7/23/92 ppm	%REC	DATE 7/24/92 ppm	%REC
ethanol	41.9	33.9	80.8%	29.5	70.3%
acetone	33.5	33.0	98.4%	30.7	91.4%
isopropanol	32.2	27.5	85.4%	26.6	82.8%
DMS	33.5	32.0	95.5%	30.3	90.5%
benzene	27.5	28.3	102.8%	30.3	110.0%
bromodichloromethane	29.7	29.4	99.0%	26.2	88.0%
DMDS	27.3	26.6	97.3%	25.3	92.5%
toluene	23.2	22.2	95.7%	21.2	91.5%
ethyl benzene	20.1	19.7	98.2%	19.0	94.4%
m-xylene	20.1	19.7	98.4%	19.1	95.1%
o-xylene	20.2	19.7	97.8%	18.6	92.2%
cumene	17.7	17.3	98.0%	16.3	91.9%
alpha-pinene	15.4	15.4	99.4%	14.4	93.5%
beta-pinene	15.5	13.8	89.2%	13.1	84.7%
3-carene	15.5	14.7	94.3%	13.8	88.9%
p-cymene	15.8	15.2	96.5%	14.4	91.3%

2. PROPANE RESPONSE

	THEOR		%REC		%REC
BEFORE	36.0	32.7	90.8%	32.8	91.1%
AFTER	36.0	32.8	91.1%	*	

3. METHANOL LINE RECOVERY

	7/23/92 GC	LINE	%REC	7/24/92 GC	LINE	%REC
BEFORE	10.1	9.5	94.1%	7.5	6.6	88.0%
AFTER	7.5	6.6	88.0%	*		

4. LINE BLANK

	[--------------FILE REF	--------------]
BEFORE	GNB2003	*
AFTER	*	*

SOURCE IO-BSWBHV

QUALITY CONTROL SUMMARY
METHOD 16

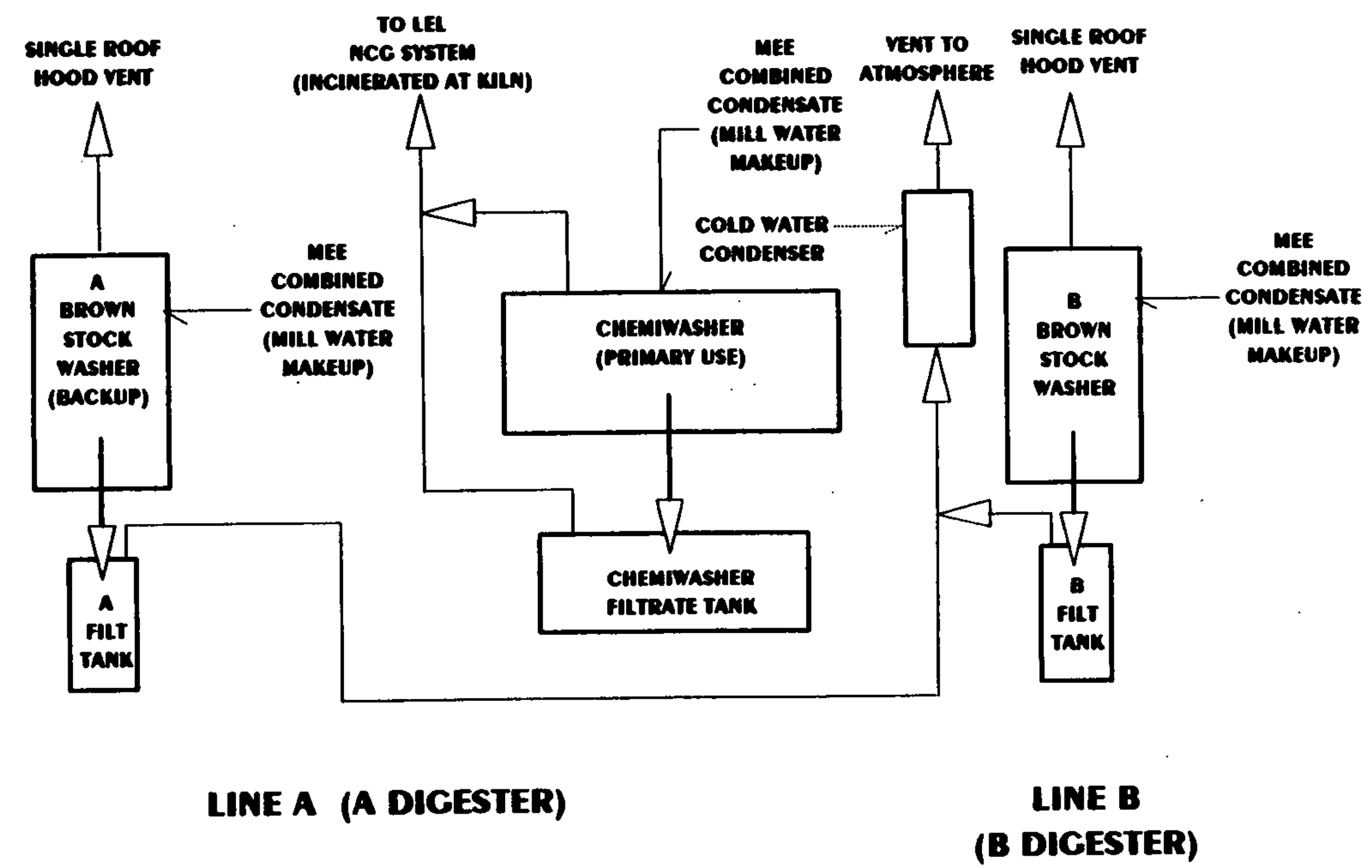
1. CALIBRATION

ANALYTE	LO ppm	MED ppm	HI ppm	CORR COEFF
7/23/92 *				
hydrogen sulfide	2.2	3.2	8.2	0.9996
methyl mercaptan	2.0	2.9	7.6	0.9998
dimethyl sulfide	2.8	4.1	10.6	0.9999
carbon disulfide	0.9	1.3	3.3	0.9999
dimethyl disulfide	1.2	1.8	4.6	0.9999
7/24/92				
hydrogen sulfide	2.9	4.5	8.3	0.9987
methyl mercaptan	2.7	4.2	7.7	0.9992
dimethyl sulfide	3.7	5.8	10.7	0.9997
carbon disulfide	1.2	1.8	3.4	0.9998
dimethyl disulfide	1.6	2.5	4.6	0.9993

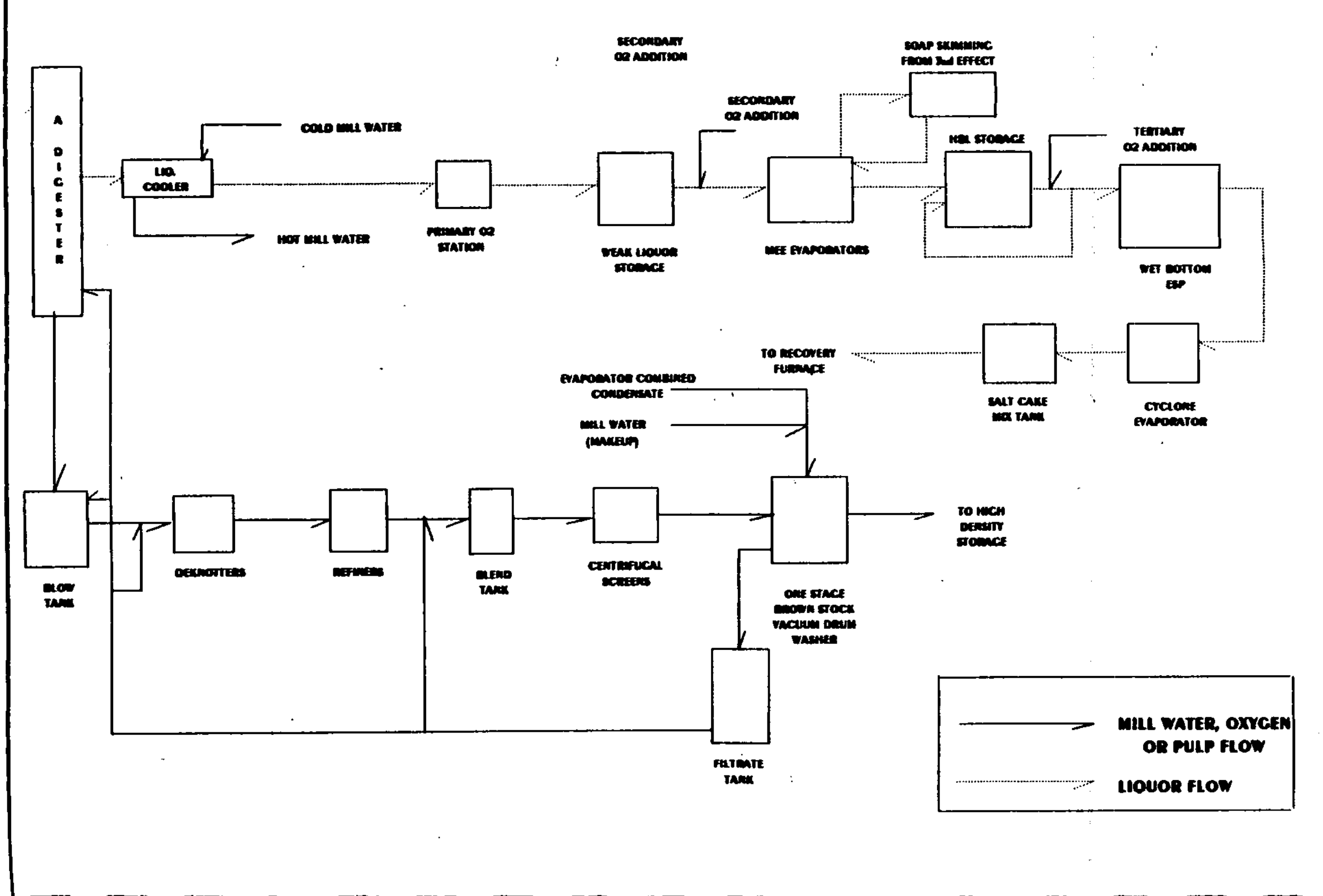
* Calibration from 7/21/92 was checked and used.

Section 4.4 Process Operating Data

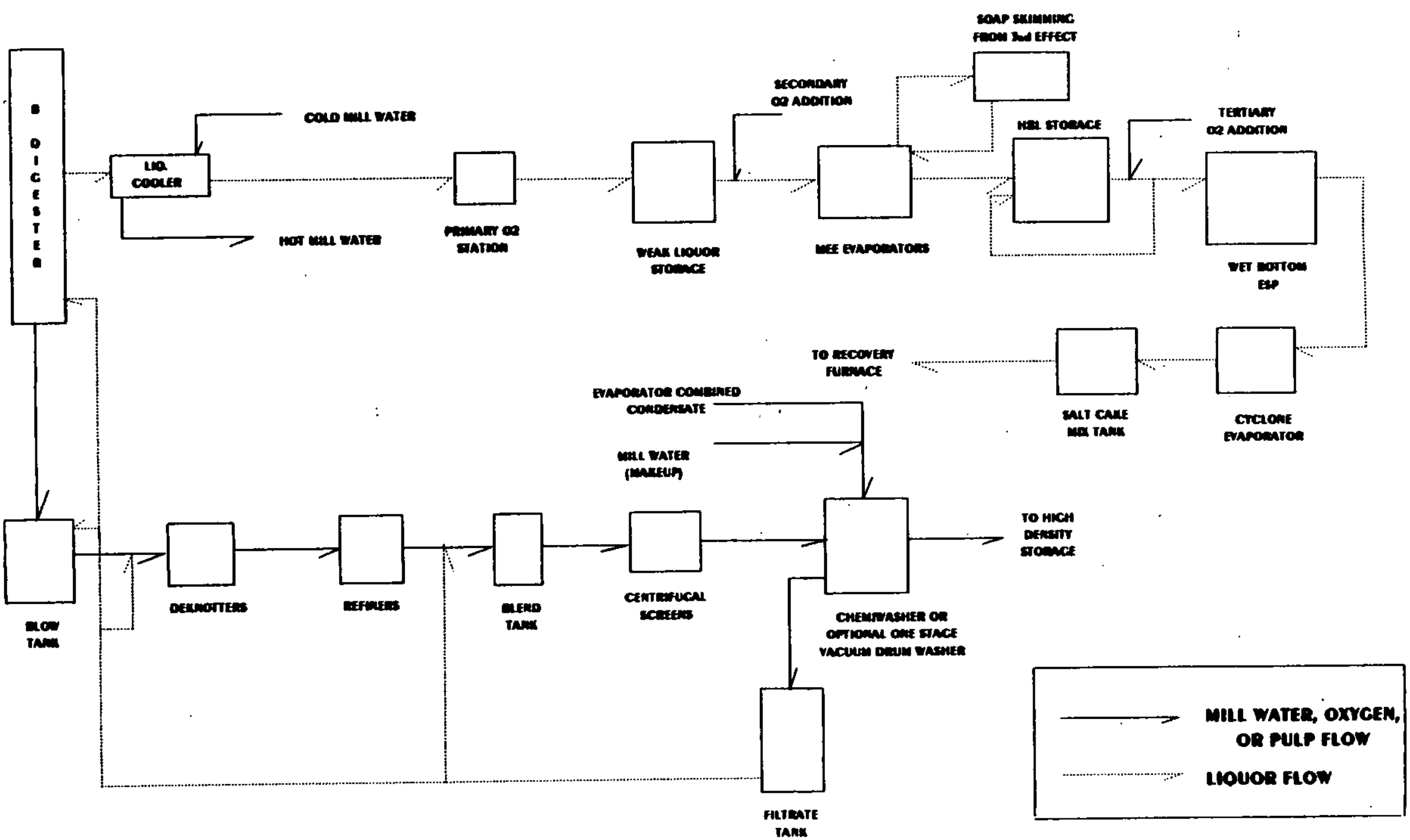
BROWN STOCK WASHER SCHEMATIC



"A" LINE FLOW SCHEMATIC



"B" LINE FLOW SCHEMATIC



BROWN STOCK WASHERS

The brown stock washers,"A" and "B" line, serve "A" and "B" digesters or the base sheet and the top sheet lines, respectively. "A" line typically consists of the Chemiwasher which is a flat belt pulp washer designed to wash 1,400 ADT of pulp per day. The design wash water rate was 1,600 gpm of evaporator combined condensate that has fresh water make-up to maintain an appropriate level in the storage tank. During operation of the Chemiwasher, air was pulled from the bottom of the belt and reinjected on the top side. A slip stream was wasted to the LEL (lower explosive limit) NCG system and combined with gases from the filtrate tank prior to condensation and incineration in the lime kiln.

As an alternative to the Chemiwasher, the pulp from "A" digester can also be washed on the "A" brown stock washing system that is essentially identical to the "B" brown stock washer system to be described below. During the testing period, "A" washer line was not in operation.

The "B" brown stock washer line was a one-stage vacuum drum washer with a single fan equipped hood vent that exited through the roof. The washer set was designed to wash 1,000 ADT of pulp per day. The washers were preceded by washing in the bottom of the digester. The knots were recycled and there were no atmospheric emissions from this process. The source of wash water, like the Chemiwasher, was the evaporator combined condensate storage tank.

The filtrate tank vent combined with the vent from the "A" line brown stock washers, passed through a non-contact cold water condenser and was vented to the atmosphere.

Representative Process Conditions

Wood species (HW or SW): All production was softwood

		Chemiwasher	"B" Washer
Pulp flow (ADT/day):	7/23/92	950	800
	7/24/92	950	800

Shower water source: All shower water was evaporator combined condensate as described above, in the evaporator NCG gas section and also in the evaporator flow diagram in the same section. Makeup for level control in the storage tank was mill water.

		Chemiwasher	"B" Washer
Shower water flow rate (GPM):	7/23/92	988	575
	7/24/92	1,100	600
Shower water temperature (Deg F):	7/23/92	159	176
	7/24/92	163	164
Vat temperature (Deg F):	7/23/92	163	163
	7/24/92	163	163

BROWN STOCK WASHER - PROCESS OPERATING CONDITIONS

Mill:	INLAND-ORANGE	Source:	B" BROWN STOCK WASHER HOOD VENT
Source:	IO-BSWBHV	Date:	JULY 23, 1992
FIN:	P-BSWB	EPN:	17 CIN:

INPUT DATA		Unit	Run 1	Run 2	Run 3	Average
Beginning Time			1230			
Measured Parameter						
Wood Species		HW or SW	SW			
Pulp Flow	TPD	ADT/day	800			
Shower Water Source			•			
Shower Water Flow Rate		GPM	575			
Shower Water Temperature		degree F	176			
Vat Temperature		degree F	163			

• HEATED MILL WATER FROM BLACK LIQUOR EXCHANGE

BROWN STOCK WASHER - PROCESS OPERATING CONDITIONS

Mill:	INLAND-ORANGE	Source:	B" BROWN STOCK WASHER HOOD VENT
Source:	IO-BSWBHV	Date:	JULY 24,1992
FIN:	P-BSWB	EPN:	17 CIN:

INPUT DATA		Unit	Run 1	Run 2	Run 3	Average
Beginning Time			638			
Measured Parameter						
Wood Species		HW or SW	SW			
Pulp Flow	TPD	ADT/day	800			
Shower Water Source			*			
Shower Water Flow Rate		GPM	600			
Shower Water Temperature		degree F	164			
Vat Temperature		degree F	163			

* HEATED MILL WATER FROM BLACK LIQUOR EXCHANGE

BROWN STOCK WASHERS

WOOD SPECIES Softwood

	7/23 A	7/23 B	7/24 A	7/24 B
PULP FLOW RATE	950 TPD	800 TPD	950 TPD	800 TPD

SHOWER WATER SOURCE Heated mill water from black liquor exchangers, and clean condensate from #1 evaporator

VAT TEMPERATURE 163 deg.F

SHOWER WATER FLOW RATE (GPM)

		A	B
7/23/92	13:00	950	550
	14:00	950	550
	15:00	1000	600
	16:00	1050	600

		A	B
7/24 92	7:00	1100	600
	8:00	1100	600
	9:00	1100	600
	10:00	1100	600

SHOWER WATER TEMPERATURE (deg. F)

		A	B
7/23/92	13:00	160	182
	14:00	160	179
	15:00	160	173
	16:00	156	170

		A	B
7/24/92	7:00	165	166
	8:00	162	163
	9:00	164	163
	10:00	162	163

SODA CONTENT

7/23/92

CHEMI-WASHER

SAMPLE	TIME	SODA	AVERAGE	UNITS
STOCK IN	13:45	501.1		
	15:00	518.9	552.7	LBS/TON
	15:45	638.1		
STOCK OUT	13:45	28.7		
	15:00	41.6	33.5	LBS/TON
	15:45	30.1		
FILTRATE	13:45	0.036		
	15:00	0.037	0.037	LBS/GAL
	15:45	0.037		

B-WASHER

SAMPLE	TIME	SODA	AVERAGE	UNITS
STOCK IN	13:45	549.8		
	15:00	499.1	508.9	LBS/TON
	15:45	477.9		
STOCK OUT	13:45	25.3		
	15:00	22.5	27.8	LBS/TON
	15:45	35.7		
FILTRATE	13:45	0.028		
	15:00	0.029	0.028	LBS/GAL
	15:45	0.027		
MILL WATER	13:45	0.003		
	15:00	0.004	0.004	LBS/GAL
	15:45	0.005		
CONDENSATE	13:45	0.002		
	15:00	0.002	0.002	LBS/GAL
	15:45	0.001		

SODA CONTENT

7/24/92

CHEMI-WASHER

SAMPLE	TIME	SODA	AVERAGE	UNITS
STOCK IN	7:30	377.9		
	8:30	586.7	524.3	LBS/TON
	9:30	608.4		
STOCK OUT	7:30	32.4		
	8:30	32	32.1	LBS/TON
	9:30	31.9		
FILTRATE	7:30	0.038		
	8:30	0.036	0.037	LBS/GAL
	9:30	0.036		

B-WASHER

SAMPLE	TIME	SODA	AVERAGE	UNITS
STOCK IN	7:30	448.1		
	8:30	532.7	478.2	LBS/TON
	9:30	453.7		
STOCK OUT	7:30	26.7		
	8:30	22.4	24.0	LBS/TON
	9:30	22.8		
FILTRATE	7:30	0.029		
	8:30	0.028	0.028	LBS/GAL
	9:30	0.028		
MILL WATER	7:30	0.003		
	8:30	0.003	0.003	LBS/GAL
	9:30	0.003		
CONDENSATE	7:30	0.002		
	8:30	0.002	0.002	LBS/GAL
	9:30	0.001		

7-23-92

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7 DIGESTER

PRODUCTION RATE			WHITE LIQUOR				TOP CIRCULATION				UPPER COOKING CIRCULATION ZONE			LOWER COOKING CIRCULATION ZONE					EXTRACTION ZONE					
Chip Screw Used	Prod. Rate T/D	Chip Meter RPM	Wt. Sc. 1 Wood	W.L. Flow GPM	W.L. S Test	Ext. Res. E.A.	S.V. Press. PSI	Top Circ. Flow GPM	Top Circ. Temp. °F	H.P.F. Amps & Setting	Upper Cooking Cir. Fl. GPM	Heater Temp. Hot	Heater Temp. Cold	Lower Cooking Cir. Fl. GPM	Heater Temp. Hot Comp.	Heater Temp. Hot Actual	Heater Temp. Cold	H. P. F.	Dilut. Factor Actual	Ext. Flow GPM	Ext. Temp. °F	Wash Flow GPM	White Liquor Solids	Filtrate Tank Level
E1/	950	12.7	13.0	368	72/72	27.4	15	3999	226	26	2251	280	270	2622	310	306	294	2.1	1.6	1037	296	318	.0	49
E1/	950	12.6	13.0	361	73	.060	15	4062	227	27	2309	279	264	2666	309	312	303		1.6	949	294	320		50
E1/	950	13.1	13.0	370	72/72	27.4	15	3981	227	26	2285	280	271	2665	310	306	300	2.1	1.6	967	295	323	.0	50
E1/	950	13.1	13.0	372	73		15	4014	224	26	2328	280	266	2666	310	311	305	✓	1.6	1006	293	318		49
E1/	950	13.1	12.9	370	72/74	27.4	15	4010	223	26	2347	280	256	2677	310	306	295		1.6	1025	294	321	.0	50
						.056																		
					72/	29.4																	.0	5
E1/	950	12.7	12.9	361	73		15	4090	219	29	2396	280	266	2661	310	311	294		1.6	988	296	319		56
E1/	950	12.7	12.9	366	73/73	29.4	15	4100	218	28	2366	279	265	2660	309	313	300		1.6	999	298	326	.0	52
E1/	950	12.7	12.9	359	73	.060	15	4128	219	26	2320	279	262	2621	309	312	304		1.6	1008	299	321		49
E1/	950	12.7	12.9	360	72/73	27.7	15	4031	219	31	2516	280	261	2620	310	306	305		1.6	946	296	317	.0	54
E1/	950	12.8	13.0	360	73		15	3985	220	28	2325	281	266	2667	311	306	303		1.6	945	295	319		50
E/	950	12.8	13.0	365	.73/.73	272	15	4019	221	26	2405	282	256	2657	312	309	304	2.1	1.6	971	295	317	.0	50
E/	950	12.7	13.0	360	.74	.072	15	4036	223	26	2421	282	265	2652	312	308	306	2.1	1.6	948	297	320		51
E/	950	12.7	13.0	363	.73/.73	27.2	15	3961	223	27	2452	281	270	2664	311	313	295	2.1	1.6	962	299	322	.0	
E/	950	12.8	13.0	364	.73		15	3999	224	26	2537	282	261	2673	312	312	307	2.1	1.6	939	300	320		50
E/	950	12.7	13.0	365	.73/.73	29.7	15	4062	223	15	2623	281.8	271	2655	311.8	313	297	2.1	1.6	971	298	317	.0	50
E/	950	13.1	13.0	375	.73	.096	15	3965	223	28	2704	281	268	2650	311	307	302	2.1	1.6	1002	300	321		52
E/	950	13.1	13.1	381	.73/.72	27.7	15	4071	223	28	2101	282	269	2657	312	315	296	2.1	1.6	977	297	322	.0	50
E/	950	13.2	13.0	381	.72		15	4036	224	29	2117	281.9	266	2660	311.9	316	296	2.1	1.6	953	298	318		51
E/	950	13.2	13.0	381	.74/.72	25.5	15	4068	225	15	2153	281	263	2667	311	314	295	2.1	1.6	974	299	319	.0	53
E/	950	13.1	12.9	379	.72	.068	15	4087	224	26	2198	280	260	2667	310	306	305	2.1	1.6	981	296	322		52
E/	950	13.1	12.9	377	.73/.72	30.0	15	4053	225	29	2230	280	257	2670	310	310	305	2.1	1.6	963	296	320	.0	49
E/	950	13.1	12.9	379	.72		15	4097	225	15	2280	280	258	2663	310	312	300	2.1	1.6	945	297	318		50

28.0

INTEGRATOR READINGS

	HIGH PRESS. STEAM	LOW PRESS. STEAM	WHITE LIQUOR	CHIP METER	WEIGHTOMETER
6 AM FINISH	435328	588327	516300	18110	
6 AM START					
DIFFERENCE					

6-AM Cut Rate [illegible]

Keep [illegible]

6-PM Defoamer - Level 12% - 680 [illegible]

INC. A DIG. 7-23-92

(105)

~~110~~

CC .OW	OW PRESS.		OUTLET DEVICE		TOP SEPARATOR		DIGESTER BLOW RATE			KAPPA & SOLIDS		HOT STOCK SCREENS									B. S. WASHER			HIGH DENSITY STORAGE		TI
													Pre-Refiner						Reject Refiner							
	Dig. Press PSI	Cold Blow to O.D. Flow	O.D. RPM	O.D. Amps	Computer Dig Level %	Top Sep. Amps	Dig. Blow Rate GPM	Dig. Blow Valve %	Dig. Blow Temp.	Blow Line No.	Solids	B.T. Level	Amp Load	Disc. Press	No. 1 Screen Diff. Press	No. 2 Screen Diff. Press	Spare Screen Diff. Press	[illegible]	Amp Load	Disc Press	Washer Shower Flow	Washer Shower Temp.	To H.D. & Time	Base H.D. Level	Top H.D. Level	
3	150	32	7.0	25	38	26	1130	46	162	105.9	16.7	24	660		2.4	1.6	.6	5.0	693		1000	156		61	48	6 A
3	150	22	7.0	77	35	29	1178	44	163			29	695		2.5	2.2	.7	5.1	681		1000	157		62	48	7
4	150	158	6.6	64	28	28	1134	41	163	118	16.6	28	673		2.1	1.7	0.6	5.0	629		1100	165		64	50	8
5	150	278	6.5	23	28	26	1122	43	162			25	663		2.0	1.6	.7	4.6	726		1000	158		64	52	9
8	150	263	6.8	67	28	27	1070	45	162	10.7	16.8	21	670		2.1	1.5	.6	4.7	723		1000	159		65	53	10
																										11
										116.1	16.2															12
8	150	27	6.7	25	40	27	1139	41	159			23	638		1.5	.1	.1	3.3	717		850	160		60	55	1 P
4	150	26	6.9	60	45	29	1120	44	160	109.0	16.5	23	666		1.4	.5	.3	3.4	706		850	160		60	55	2
6	150	25	7.0	55	50	34	1086	45	160			24	648		1.2	.4	.6	3.7	675		1000	160		59	56	3
0	150	165	6.7	62	41	25	1184	44	160	90.5	17.4	27	665		2.2	1.1	.5	4.0	712		1050	[illegible]		61	58	4
8	150	406	5.3	63	32	25	1179	44	160			29	678		2.0	.5	.4	4.1	657		1050	166		61	59	5
5	150	351	5.6	79	42	25	1169	43.5	160	120.9	16.0	24	671		2.5	1.4	0.4	4.3	710		1050	168		63	63	6
01	152	316	5.9	89	41	26	1167	45.9	161			25	658		2.7	2.1	1.1	4.7	730		1050	168		62	63	7
5		155	6.5	86	43	26	1197	45.0	161	123.5	18.4	26	679		2.8	2.7	0.9	4.6	751		1050	167		62	63	8
29	149	166	6.3	90	38	27	1181	40.2	162			24	669		2.7	2.4	1.0	4.8	739		1050	161		62	64	9
9	151	26	6.7	69	40	27	1177	43.3	161	123.2		25	699		2.8	2.1	0.8	4.9	739		1050	167		63	65	10
24	150	310	6.0	72	29	26	1099	42.3	162			26	657		2.6	1.6	0.9	4.6	699		1100	160		64	66	11
40	149	220	6.3	83	28	26	1156	44.3	161	115.0	22.3	22	652		2.9	2.0	0.8	4.3	723		1100	166		64	69	12
26	149	267	6.1	77	25	27	1175	39.0	162			23	657		3.0	2.0	0.7	4.1	715		1100	162		62	75	1 A
00	150	155	6.3	78	27	27	1097	43.5	161	120.7	21.8	20	645		2.9	2.2	0.6	4.3	716		1100	165		61	79	2
5	150	74	6.9	81	26	27	1098	42.5	162			21	639		2.9	2.2	1.0	4.5	713		1100	166		60	80	3
52	151	95	6.9	67	27	26	1100	45.2	162	119.9	21.7	22	625		2.6	1.7	0.7	4.4	701		1100	165		60	82	4
9	149	149	6.5	59	26	27	1163	41.4	163			22	623		2.5	1.6	0.8	4.1	672		1100	165		60	83	5 A

E — INSTRUCTIONS — REMARKS

2) (Pat [illegible] 12'5) ([illegible] Cut out [illegible])

[illegible] Level 14 C.C. 660)

DATE	7-23-92	
	A	OPERATOR B
6 AM — 6 PM	[illegible signature]	[illegible signature]
6 PM — 6 AM	Brinson	Broussard

B 7-23-92

DIGESTER

INLAND

Production Rate			White Liquor				Top Circulation				Upper Cooking Circulation Zone			Lower Cooking Circulation Zone					Extraction Zone					
Chip Screw Used	Prod. Rate T/D	Chip Meter RPM	W.L. Ea. 1 Wood	W.L. Flow GPM	W.L. B Test	Ext. Res. E.A.	S.V. Press. PSI	Top Circ. Flow GPM	Top Circ. Temp. °F	H.P.F. Amps & Setting	Upper Cooking Cir. Fl. GPM	Heater Temp. Hot	Heater Temp. Cold	Lower Cooking Cir. Fl. GPM	Heater Temp Hot Comp	Heater Temp. Hot Actual	Heater Temp Cold	HPF	Dilut. Factor Actual	Ext. Flow GPM	Ext. Temp °F	Wash Flow GPM	White Liquor Solids	Filtrate Tank Level
E/W	800	11.6	12.2	314	72 / 72	27.4	15	4054	233	24	2207	2901	269	2336	316	313	301	4.3	1.6	827	292	302	.0	47
E/W	800	11.6	12.2	314	72		15	4042	233	24	2199	288	269	2336	316	313	301		1.6	824	292	300		47
E/W	800	11.6	12.2	314	72 / 72		15	4268	233	24	2206	288	268	2340	316	314	302	4.3	1.6	830	292	301	.0	47
E/W	800	11.5	12.2	308	72		15	4040	234	24	2195	290	274	2341	315	318	307		1.6	818	291	302		47
E/W	800	11.5	12.2	308	72 / 72	27.4	15	4040	234	24	2222	290	274	2346	315	318	307	4.5	1.6	818	291	302	.0	47
E/W	800	11.5	12.1	304	72	056	15	4121	232	26	2191	293	271	2314	315	318	308		1.6	825	289	302		47
E/W	800	11.5	12.1	304	73 / 72	29.4	15	4040	232	26	2201	290	271	2311	315	318	308	4.8	1.6	859	289	302	.0	47
E/W	800	12.0	12.2	320	72		15	4046	223	28	2194	291	270	2212	316	313	301		1.6	823	290	300		54
E/W	800	12.0	12.2	320	72 / 72	29.4	15	4117	223	29	2209	291	270	2183	316	313	301	4.2	1.6	820	290	300	.0	54
E/W	800	12.0	12.2	320	72	052	15	4089	223	30	2211	291	270	2194	316	313	301		1.6	820	290	297		54
E/W	800	11.6	12.1	306	72 / 72	27.7	15	4114	222	24	2702	287	276	2330	312	311	301	4.2	1.6	838	292	299	.0	46
E/W	800	11.6	12.1	306	72		15	4114	222	24	2702	287	277	2337	312	311	301		1.6	844	291	300		46
E/E	800	11.4	12.2	306	.73 / 73	27.2	15	4051	222	27	2681	291	273	2332	316	312	308	4.2	1.6	831	291	305	.0	47
E/E	800	11.4	12.2	304	74	.076	15	4106	224	30	2680	291	274	2338	316	316	305		1.6	791	290	303		48
E/E	800	11.6	12.2	308	.73 / 73	27.2	15	4133	224	28	2686	290	284	2348	315	317	311	4.2	1.6	907	290	301	.0	
E/W	800	11.6	12.2	310	.73		15	4090	226	34	2673	290	276	2337	315	310	304		1.6	834	287	303		47
E/E	800	11.6	12.2	312	.73 / 73	29.7	15	4068	225	17	2685	290	280	2332	315	318	308	4.2	1.6	832	290	306	.0	48
E/E	800	11.3	12.2	307	73	.080	15	4126	226	28	2709	290	284	2342	315	318	311		1.6	799	289	305		48
E/E	800	11.3	12.2	311	.73 / 72	27.[illegible]	15	4120	225	31	2622	290	281	2333	315	318	308	4.2	1.6	809	291	303	.0	47
E/E	800	11.8	12.2	318	72		15	4154	226	32	2669	290	274	2348	315	310	302		1.6	840	290	304		49
E/E	800	11.7	12.2	322	.74 / 72	25.5	15	4009	225	35	2672	290	278	2302	315	316	306	4.2	1.6	833	289	306	.0	50
E/E	800	11.6	12.2	315	72	.076	15	4125	227	34	2622	290	279	2359	315	316	307		1.6	846	289	306		47
E/E	800	11.7	12.1	317	.73 / 72	30.0	15	4123	228	30	2676	289	275	2357	314	310	301	4.2	1.6	818	290	305	.0	46
E/E	800	11.5	12.1	314	72		15	4052	226	34	2682	289	276	2357	314	313	302		1.6	841	289	300		47

INTEGRATOR READINGS

	HIGH PRESS. STEAM	LOW PRESS. STEAM	WHITE LIQUOR	CHIP METER	WEIGHTOMETER
6 AM FINISH	398110	592077	436532	16592	
6 AM START					
DIFFERENCE					

INC. B DIG 7-23-92

90

CO… FLOW	…OW …ESS.		OUTLET DEVICE		TOP SEPARATOR		DIGESTER BLOW RATE			KAPPA & SOLIDS		HOT STOCK SCREENS									B. S. WASHER			HIGH DENSITY STORAGE		TIME
													Pre-Refiner						Reject Refiner							
PM	Dig. Press PSI	Cold Blow to O D Flow	O.D. RPM	O D. Amps	Computer Dig. Level %	Top Sep. Amps	Dig. Blow Rate GPM	Dig. Blow Valve %	Dig. Blow Temp	Blow Line No	Solids	B T Level	Amp Load	Disc Press	No. 1 Screen Diff Press	No 2 Screen Diff Press	Spare Screen Diff. Press.		Amp Load	Disc Press	Washer Shower Flow	Washer Shower Temp.	To H.D. & Time	Base H D Level	Top H.D Level	TIME
	160	237	3.9	57	29	35	713	41	161	79.5	17.0	19	616		5.5	5.1			682		550 550	187 171	T	61	48	6 A
	160	257	3.9	57	26	35	710	41	161			17	643		5.4	4.8			673		550 550	173 172	T	62	49	7
	160	257	3.9	61	24	35	712	41	161	[illegible]	[illegible]	17	549		5.2	4.6			629		550 551	187 170	T	64	50	8
	160	257	3.7	59	28	32	723	39	161			19	594		5.3	4.9			721		553 553	185 172	T	64	52	9
	160	257	3.7	59	30	32	732	39	161	[illegible]	16.0	15	610		5.2	4.9			719		550 550	194 171	T	65	53	10
	160	252	3.8	62	31	36	729	42	161			23	[illegible]		[illegible]	5.0			[illegible]		[illegible]	[illegible]	T	61	[illegible]	11
	160	252	3.8	62	31	36	729	42	161	[illegible]	14.9	23	[illegible]		[illegible]	5.0			[illegible]		[illegible]	[illegible]	T	[illegible]	[illegible]	12
	160	50	2.1	73	15	37	674	37	158			16	502		5.4	4.4			688		550 550	185 182	T	61	55	1 P
	160	50	2.1	73	15	37	679	37	158	78.7	17.1	26	531		5.1	4.2			716		550 550	185 170	T	61	55	2
	160	50	2.1	73	15	36	674	37	158			27	591		5.1	4.8			628		600 600	190 173	T	61	57	3
	157	99	3.1	70	28	37	675	40	160	89.5	17.0	23	566		5.3	4.6			712		600 600	196 170	T	61	58	4
	157	99	3.1	70	28	37	690	40	160			23	598		5.4	4.7			668		600 600	194 171	T	61	59	5
	159	142	3.5	64	31	35	724	37.9	159	[illegible]	15.9	18	573		5.4	5.0					600 600	195 169	T	63	63	6
23	159	286	3.6	59	25	32	732	38.5	160			14	566		4.8	4.4					600 600	194 168	T	62	63	7
		351	3.4	66	27	35	704	41.4	161	79.2	15.7	18	549		5.2	4.8					600 600	192 168	T	62	63	8
	157	313	3.5	56	26	36	713	41.3	161			25	535		4.9	4.3					600 600	186 166	T	62	64	9
	162	204	3.2	69	30	32	693	38.0	160	89.4		23	560		4.8	4.6					600 600	195 168	T	63	65	10
	161	195	3.5	57	30	34	756	42.7	160			27	542		4.9	4.5					600 600	184 163	T	64	66	11
	159	214	2.9	60	39	31	712	40.0	160	85.7	17.7	24	542		5.1	4.7					600 600	193 164	T	64	63	12
	159	198	3.4	66	15	34	685	38.8	160			22	573		4.9	4.8					600 600	185 162	T	62	75	1 A
	160	251	3.0	67	22	32	680	37.7	160	84.0	17.5	11	502		4.7	4.0					600 600	193 164	T	61	79	2
	158	148	3.3	64	22	31	728	41.5	161			22	552		4.8	4.7					600 600	193 165	T	60	80	3
23	160	103	3.2	66	14	31	682	39.2	161	[illegible]	16.7	24	534		4.8	4.3					600 600	192 165	T	60	82	4
	162	38	3.4	66	29	33	712	41.9	161			22	549		5.0	4.4					600 600	191 164	T	60	83	5 A

…E — INSTRUCTIONS — REMARKS

DATE	7-23-92	
	A	OPERATOR B
6 AM — 6 PM	Pannell	[illegible]
6 PM — 6 AM	[illegible]	[illegible]

7-24-92

INLAND

Or

4 DIGESTER

PRODUCTION RATE			WHITE LIQUOR				TOP CIRCULATION				UPPER COOKING CIRCULATION ZONE			LOWER COOKING CIRCULATION ZONE					EXTRACTION ZONE					
Chip Screw Used	Prod. Rate T/D	Chip Meter RPM	WL Ea. 1 Wood	WL Flow GPM	WL B Test	Ext. Res. E.A.	S.V. Press. PSI	Top Circ. Flow GPM	Top Circ. Temp. °F	H.P.F. Amps & Setting	Upper Cooking Cir. Fl. GPM	Heater Temp. Hot	Heater Temp. Cold	Lower Cooking Cir. Fl. GPM	Heater Temp Hot Comp.	Heater Temp. Hot Actual	Heater Temp. Cold	H. P. F.	Dilut. Factor Actual	Ext. Flow GPM	Ext. Temp. °F	Wash Flow GPM	White Liquor Solids	Filtrate Tank Level
E W	950	12.9	12.8	368	71/.72	34.1	15	4103	224	26	2338	281	265	2661	311	313	293	2.1	1.6	935	295	316	.0	50
E W	950	12.9	12.8	368	.72	.060	15	4029	226	26	2373	280	259	2658	310	309	304	2.1	1.6	1009	295	317		50
E W	950	12.8	12.8	362	71/.72	32.6	15	4172	226	28	2382	280	270	2654	310	311	293	2.1	1.6	947	301		.0	50
E W	950	12.7	12.8	361	.72		15	4039	229	26	2626	280	269	2655	310	309	292	2.1	1.6	919	298	264		49
E W	950	12.7	12.4	360	71/.72	32.4	15	4022	230	27	2688	[illegible]	[illegible]	2668	310	[illegible]	305	2.1	1.6	[illegible]	[illegible]	[illegible]	.0	[illegible]
E W	950	12.8	12.8	359	.72	[illegible]	15	4050	230	27	2408	280	271	2659	310	307	299	2.1	1.6	906	298	272		50
E W	950	12.8	12.9	364	71/.73	32.3	15	4053	230	15	2446	282	267	2661	312	314	307	2.1	1.6	911	300	265	.0	47
E W	950	12.8	13.0	362	.73		15	4046	231	27	2485	282	268	2659	312	315	304	2.1	1.6	959	299	247		51
E W	950	12.9	13.0	364	71/.73	31.3	15	3999	232	28	2187	282	272	2652	312	310	297	2.1	1.6	969	298	284	.0	51
E W	950	12.7	12.9	356	.73	.068	15	4010	232	26	2356	282	276	2657	312	312	296	2.1	1.6	929	297	286		49
E W	950	12.8	13.0	359	.74	30.6	15	4032	232	28	2469	282	270	2662	312	315	301	2.1	1.6	920	297	294	.0	52
E W	950	12.7	13.1	360	.74		15	4013	233	26	2571	282	270	2657	312	307	301	2.1	1.6	956	298	285		51
E W	950	12.7	13.1	361	73/.74	28.3	15	4019	232	14	2630	282	269	2642	312	310	304	2.1	1.6	921	297	292	0	53
E W	950	12.9	13.2	368	.74	.064	15	4000	232	27	2639	280	264	2657	313	318	298	2.1	1.6	913	300	286		50
E W	950	13.1	13.1	370	74/.74	39.0	15	3978	231	26	2701	286	272	2664	314	311	299	2.1	1.6	994	299	286	0	[illegible]
E W	950	12.9	13.1	364	.74	.064	15	4069	231	15	2581	279	262	2666	312	317	299	2.1	1.6	989	300	292		50
E W	950	13.0	13.2	369	73/.74	31.7	15	4101	231	26	2641	281	269	2653	312	308	297	2.1	1.6	947	302	291	0	51
E W	950	13.0	13.1	366	.74	.056	15	4046	232	27	2597	285	269	2651	311	310	305	2.1	1.6	961	299	292		50
E W	950	13.2	13.1	372	76/.74	35.3	15	4054	232	13	2551	280	260	2637	311	307	302	2.1	1.6	968	299	288	0	51
E W	950	13.1	13.1	367	.75	.056	15	4018	232	27	2553	279	271	2650	311	309	298	2.1	1.6	913	296	289		50
E W	950	13.1	13.0	364	74/.75	26.0	15	4139	233	26	2532	280	263	2647	310	314	300	2.1	1.6	925	297	292	0	51
E W	950	13.0	13.0	361	.75	.064	15	4024	233	15	2541	279	269	2650	311	307	293	2.1	1.6	959	295	292		52
E W	950	12.9	13.0	357	76/.75	33.3	15	4015	233	15	2491	280	264	2662	311	314	304	2.1	1.6	947	297	291	0	52
E W	950	13.0	12.9	355	.75		15	4043	237	15	2324	283	264	2655	310	312	306	2.1	1.6	904	299	[illegible]		[illegible]

31.6

INTEGRATOR READINGS

	HIGH PRESS. STEAM	LOW PRESS. STEAM	WHITE LIQUOR	CHIP METER	WEIGHTOMETER
6 AM FINISH	4041.70	581.995	51683.1	18341	
6 AM START					
DIFFERENCE					

6A - 6P - Adjusted Top Sept. P

E INC. A Dig. 7-24-92

105

C… Blow Flow GPM	Dig. Press. PSI	Cold Blow to O.D. Flow	O.D. RPM	O.D. Amps	Computer Dig. Level %	Top Sep. Amps	Dig. Blow Rate GPM	Dig. Blow Valve %	Dig. Blow Temp.	Blow Line No.	Solids	B.T. Level	Pre-Refiner Amp Load	Pre-Refiner Disc. Press.	No. 1 Screen Diff. Press.	No 2 Screen Diff. Press.	Spare Screen Diff. Press.		Reject Refiner Amp Load	Reject Refiner Disc. Press.	Washer Shower Flow	Washer Shower Temp.	To H.D. & Time	Base H.D Level	Top H.D Level	TI…
5	150	252	6.0	64	34	27	1169	43	163	112.4	—	20	602		1.7	1.1	0.9	3.7	640		1100	163		60	85	8 A
69	150	255	6.2	65	33	25	1108	42	162			22	607		2.5	1.4	0.4	3.8	650		1100	165		59	86	7
7	150	325	5.5	64	34	26	1144	45	162	116.2	—	25	600		2.1	1.3	0.5	3.7	640		1100	162		61	89	[illegible]
317	151	253	5.6	71	40	24	1120	46	161			21	630		2.6	1.8	0.9	4.0	650		1100	164		65	88	9
6	149	260	5.6	65	45	25	1130	42	161	119.5	—	22	599		2.3	1.2	0.0	4.0	600		1100	162		65	[illegible]	1
23	152	179	5.6	75	41	27	1170	39	161			27	600		2.3	1.5	0.7	3.7	630		1100	163		68	87	1
0	150	165	5.1	93	41	26	1201	40	162	116.3	—	27	650		2.4	1.9	0.9	4.1	650		1100	164		71	85	1
6	149	222	5.1	81	41	27	1142	45	162			26	660		2.3	1.9	0.8	4.2	650		1100	165		72	85	1 P
4	149	260	5.1	89	41	28	1140	40	162	111.1	—	24	670		2.4	1.7	0.4	4.4	660		1100	165		73	84	2
3	150	86	5.3	82	41	26	1190	45	163			23	670		3.0	2.1	1.0	4.8	680		1100	164		75	84	3
45	151	77	5.6	89	44	27	1198	45	162	111.5	—	54	780		0.4	1.7	0.6	4.6	660		1100	162		74	82	4
5	148	25	5.9	90	40	26	1226	45	162			62	780		2.1	2.1	0.5	4.2	650		1100	164		74	82	5
13	150	82	5.3	80	37	29	1275	40	161	119.5	21.1	64	754		0.9	1.4	0.2	4.3	573		1100	166		75	83	6
5	[illegible]	63	5.4	84	29	27	1216	44	162			68	804		1.8	2.3	0.4	4.0	609		1100	164		75	84	7
71	[illegible]	48	5.3	96	33	27	1160	44	162	108.3	20.0	56	816		1.5	2.7	0.6	4.2	666		1100	167		76	84	8
5	151	25	6.2	88	35	26	1172	47	163			52	788		2.1	2.8	0.4	4.6	650		1100	166		75	84	9
3	150	27	6.7	85	30	27	1157	41	163	119.7	20.1	47	809		2.7	2.9	0.7	5.0	696		1100	165		76	83	1
35	150	23	7.0	65	28	25	1145	43	163			49	766		1.8	2.0	0.4	4.4	620		1100	165		76	86	1
8	151	332	6.1	80	26	25	1114	47	163	102.3	16.5	60	795		1.9	1.7	0.3	4.3	603		1100	160		77	86	1
7	151	316	6.4	71	27	25	1171	43	163			42	811		1.9	1.8	0.3	4.4	655		1100	163		79	87	1 A
7	151	332	6.0	79	27	25	1172	42	163	109.7	16.5	41	787		1.3	1.4	0.5	4.4	629		1100	157		80	89	2
78	151	241	6.2	77	30	25	1166	40	162			37	796		1.9	1.7	0.6	4.4	634		1100	160		81	[illegible]	3
1	150	96	6.4	76	32	26	1143	46	162	117.5	16.9	34	792		2.0	1.8	0.6	4.4	642		1100	162		82	90	4
1	149	160	6.0	78	30	24	1218	40	162			31	781		1.9	1.5	0.2	4.4	613		1100	161		[illegible]	[illegible]	5 A

E — INSTRUCTIONS — REMARKS

Phase II on Upper Heater. Rec. load of Defoamer.

DATE	7-24-92	
	A	OPERATOR B
6 AM — 6 PM	Sanchez	Peveto
6 PM — 6 AM	STARKEY	LISTER

3 7-24-92

INLAND

Or[illegible]

DIGESTER

PRODUCTION RATE			WHITE LIQUOR				TOP CIRCULATION				UPPER COOKING CIRCULATION ZONE			LOWER COOKING CIRCULATION ZONE					EXTRACTION ZONE					
Chip Screw Used	Prod. Rate T/D	Chip Meter RPM	WL Ea. 1 Wood	WL Flow GPM	WL B Test	Ext. Res. EA	S.V. Press. PSI	Top Circ. Flow GPM	Top Circ. Temp. °F	H.P.F. Amps & Setting	Upper Cooking Cir. Fl. GPM	Heater Temp. Hot	Heater Temp. Cold	Lower Cooking Cir. Fl. GPM	Heater Temp. Hot Comp.	Heater Temp. Hot Actual	Heater Temp. Cold	H/F	Dilut. Factor Actual	Ext. Flow GPM	Ext. Temp. °F	Wash Flow GPM	White Liquor Solids	Filtrate Tank Level
EW	900	11.4	[illegible]	310	.72	30.7	15	4000	227	31	2650	[illegible]	280	2340	[illegible]	[illegible]	305	4.2	1.6	870	[illegible]	300	.10	47
EW	800	11.4	12.[illegible]	309	[illegible]		15	4082	228	29	2695	289	[illegible]	2340	[illegible]	316	306		1.7	820	280	303		47
EW	800	[illegible]	[illegible]	305	[illegible]	30.6	15	[illegible]	229	30	2660	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	304	4.2	1.6	[illegible]	282	301	.10	46
EW	800	11.5	12.1	308	[illegible]		[illegible]	4006	230	30	2660	288	286	[illegible]	316	312	301		1.6	821	288	30		46
EW	800	11.6	12.[illegible]	305	.72	30.6	15	4207	230	35	2660	280	[illegible]	[illegible]	[illegible]	316	307	4.2	1.6	770	280	305	.10	47
EW	800	11.5	12.2	308	.72	[illegible]	15	4112	232	30	2669	292	282	2350	315	317	308		1.7	840	288	305		47
EW	800	11.5	12.7	301	.72	31.3	15	4112	232	[illegible]	2662	[illegible]	283	2350	315	[illegible]	310	4.2	[illegible]	[illegible]	[illegible]	305	.10	47
EW	800	11.6	12.2	302	.74		15	4024	231	31	2660	290	286	[illegible]	315	317	311		1.6	[illegible]	[illegible]	304		46
EW	800	11.4	12.3	305	.74	30.1	15	4020	231	28	2661	292	282	2337	315	317	310	4.2	1.6	820	285	302	.10	[illegible]
EW	800	11.4	12.7	305	.70	.068	15	4045	233	30	2669	29[illegible]	282	2323	315	317	308		1.6	817	28[illegible]	300		[illegible]
EW	800	11.4	12.3	305	.74	30.6	15	4041	232	28	266[illegible]	290	280	[illegible]	315	318	302	4.2	1.6	830	289	300	.10	45
EW	800	11.0	12.3	305	.74		15	4092	230	26	26[illegible]	290	225	[illegible]	[illegible]	[illegible]	309		1.6	832	289	301		4[illegible]
EW	800	11.6	12.2	310	.74	28.3	15	4[illegible]	231	28	2[illegible]	29[illegible]	255	2[illegible]	315	317	310	4.2	1.6	812	291	299	.0	50
EW	800	11.6	123	30[illegible]	.74	.068	15	4[illegible]	233	2[illegible]	2[illegible]	2[illegible]	25[illegible]	2387	315	317	3[illegible]	4.2	1.8	785	255	303		47
EW	800	11.5	12.5	312	.74	30.0	15	4112	23[illegible]	26	2646	29[illegible]	275	2417	315	31[illegible]	3[illegible]	4.2	1.8	86[illegible]	291	30[illegible]	0	
EW	800	11.4	123	3[illegible]	74	.069	15	40[illegible]	234	26	2[illegible]	29[illegible]	28[illegible]	2413	315	317	30[illegible]	4.2	1.5	775	28[illegible]	30[illegible]		45
EW	800	11.[illegible]	12[illegible]	3[illegible]	.75	31.7	15	4[illegible]	23[illegible]	2[illegible]	2[illegible]	29[illegible]	282	24[illegible]	31[illegible]	31[illegible]	31[illegible]	4.2	1.6	80[illegible]	25[illegible]	3[illegible]	0	48
EW	700	10.3	12[illegible]	29[illegible]	.7[illegible]	.060	15	4015	235	26	26[illegible]	25[illegible]	25[illegible]	233[illegible]	311	312	3[illegible]	4.2	1.5	760	289	302		45
EW	700	10.2	12[illegible]	282	.71	35.3	15	3525	23[illegible]	28	229[illegible]	25[illegible]	250	24[illegible]	31[illegible]	31[illegible]	30[illegible]	4.2	1.5	740	25[illegible]	30[illegible]	0	4[illegible]
EW	700	10.1	123	27[illegible]	.75	.060	15	4[illegible]	235	25	260[illegible]	25[illegible]	25[illegible]	23[illegible]	3[illegible]	3[illegible]	3[illegible]	4.2	1.[illegible]	711	28[illegible]	[illegible]		45
EW	700	10.2	12[illegible]	2[illegible]	.75	26.0	15	416[illegible]	23[illegible]	26	272	25[illegible]	[illegible]	24[illegible]	3[illegible]	3[illegible]	[illegible]	4.2	1.[illegible]	72[illegible]	25[illegible]	2[illegible]	0	4[illegible]
EW	[illegible]	1[illegible]	12[illegible]	[illegible]	.75	.052	15	4[illegible]	236	25	2660	25[illegible]	22[illegible]	24[illegible]	312	31[illegible]	[illegible]	4.2	1.5	725	257	3[illegible]		5[illegible]
EW	[illegible]		[illegible]	[illegible]	.75	33.3	15	41[illegible]	235	25	275[illegible]	258	27[illegible]	24[illegible]	31[illegible]	[illegible]	[illegible]	4.2	1.5	[illegible]	25[illegible]	3[illegible]	0	[illegible]
EW	6[illegible]	1[illegible]	123	26[illegible]	75		15	40[illegible]	23[illegible]	2[illegible]	26[illegible]	25[illegible]	275	244[illegible]	31[illegible]	3[illegible]	3[illegible]	4.2	1.5	[illegible]	25[illegible]	[illegible]		5[illegible]

INTEGRATOR READINGS

	HIGH PRESS. STEAM	LOW PRESS. STEAM	WHITE LIQUOR	CHIP METER	WEIGHTOMETER
6 AM FINISH	315 55[illegible]	1198 356	1122 965	[illegible]	
6 AM START					
DIFFERENCE					

[illegible]

E INC.

7-24-92

B Dig.

90

CO... OW (Cold Blow Flow GPM)	Dig. Press. PSI	Cold Blow to O.D. Flow	O.D. RPM	O.D. Amps	Computer Dig. Level %	Top Sep. Amps	Dig. Blow Rate GPM	Dig. Blow Valve %	Dig. Blow Temp.	Blow Line No.	Solids	B.T. Level	Pre-Refiner Amp Load	Pre-Refiner Disc. Press	No 1 Screen Diff. Press	No 2 Screen Diff Press	Spare Screen Diff Press		Reject Refiner Amp Load	Reject Refiner Disc. Press	Washer Shower Flow	Washer Shower Temp.	To H.D. & Time	Base H.D. Level	Top H.D. Level	TI(ME)
18	159	78	3.5	60	36	33	718	42	161	83.9	16.4	30	551		4.[illegible]	[illegible]			64		600 600	19 165	T	60	86	6
16	159	[illegible]	3.5	60	36	33	719	42	151			29	551		4.7	4.[illegible]			[illegible]		600 600	192 166	T	60	86	7
[illegible]	[illegible]	[illegible]	3.[illegible]	61	[illegible]	[illegible]	718	[illegible]	160	84.7	16.1	30	552		4.[illegible]	[illegible]			66		600 602	[illegible] 163	T	62	[illegible]	8
18	160	207	3.6	[illegible]	37	35	[illegible]	35	160			32	550		4.7	[illegible]			[illegible]		600 602	187 163	T	63	85	9
[illegible]	[illegible]	12[illegible]	3.[illegible]	62	--	--	[illegible]	42	[illegible]	83.0	15.7	28	55[illegible]		5.[illegible]	[illegible]			[illegible]		[illegible]	187 16[illegible]	T	65	85	10
14	151	170	3.3	62	23	30	699	39	160			33	514		5.1	4.9			636		600 600	184 166	T	65	86	11
[illegible]	160	190	3.2	60	22	34	710	39	160	87.1	15.5	39	5[illegible]		5.0	4.7			6[illegible]1		600 600	190 165	T	71	85	12
14	161	209	2.8	74	20	36	700	39	161			42	511		4.8	4.7			661		600 600	173 165	T	73	84	1 P
20	161	210	2.9	74	25	30	710	38	160	87.9	15.8	41	58[illegible]		4.9	[illegible]			661		600 600	[illegible]	T	73	84	2
12	161	134	3.0	74	29	29	725	38	161			38	591		5.9	4.7			628		600 600	187 163	T	74	84	3
[illegible]	160	121	3.2	74	[illegible]	31	[illegible]	37	160	87.4	16.2	39	551		6.0	4.8			[illegible]		600 600	170 167	T	74	87	4
[illegible]	162	76	3.1	74	40	34	734	41	160			37	552		6.3	4.7			[illegible]		600 600	[illegible] 164	T	74	83	5
32	161	147	3.1	72	24	31	722	39	160	83.6	16.7	36	54		[illegible]	5.5			545		600 600	195 165	T	75	83	6
30	161	35	3.1	71	29	35	753	41	161			36	515		6.2	4.7			[illegible]		600 600	192 161	T	75	84	7
12	[illegible]	13[illegible]	3.[illegible]	73	[illegible]	31	712	40	161	82.4	20.9	41	501		6.3	4.6			[illegible]		[illegible]	155	T	76	83	8
16	160	70	3.1	71	25	[illegible]	718	40	161			46	[illegible]		6.[illegible]	[illegible]			672		[illegible]	159	T	76	83	9
[illegible]	160	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	706	41	161	89.5	20.1	50	[illegible]		[illegible]	[illegible]			703		[illegible]	[illegible]	T	76	83	10
27	16[illegible]	82	3.1	75	24	40	[illegible]	40	160			50	541		5.7	4.[illegible]			595		[illegible]	157 162	T	77	85	11
[illegible]	161	9[illegible]	3.[illegible]	71	[illegible]	[illegible]	700	40	161	82.2	21.5	[illegible]	53[illegible]		[illegible]	4.[illegible]			59[illegible]		[illegible]	165	T	77	85	12
25	16[illegible]	[illegible]	2.9	73	[illegible]	32	[illegible]	38	161			40	[illegible]		55	52			[illegible]		[illegible]	157	T	78	85	1 A
[illegible]	16[illegible]	[illegible]	28	74	[illegible]	33	630	39	160	86.8	20.8	[illegible]	47[illegible]		[illegible]	55			633		[illegible]	[illegible]	T	80	85	2
[illegible]	15[illegible]	[illegible]	27	72	30	31	661	37	161			36	[illegible]		[illegible]	4.7			652		[illegible]	[illegible]	T	81	87	3
[illegible]	15[illegible]	[illegible]	[illegible]	75	[illegible]	31	[illegible]	37	160	81.5	20.9	35	[illegible]		[illegible]	[illegible]			645		[illegible]	154 161	T	81	85	4
[illegible]	15[illegible]	[illegible]	27	[illegible]	22	[illegible]	[illegible]	[illegible]	16[illegible]			22	[illegible]		5[illegible]	[illegible]			[illegible]		[illegible]	[illegible]	—	[illegible]	[illegible]	5 A

E — INSTRUCTIONS — REMARKS

DATE	7-24-92
OPERATOR	A / B
6 AM — 6 PM	[illegible] / [illegible]
6 PM — 6 AM	[illegible] / [illegible]

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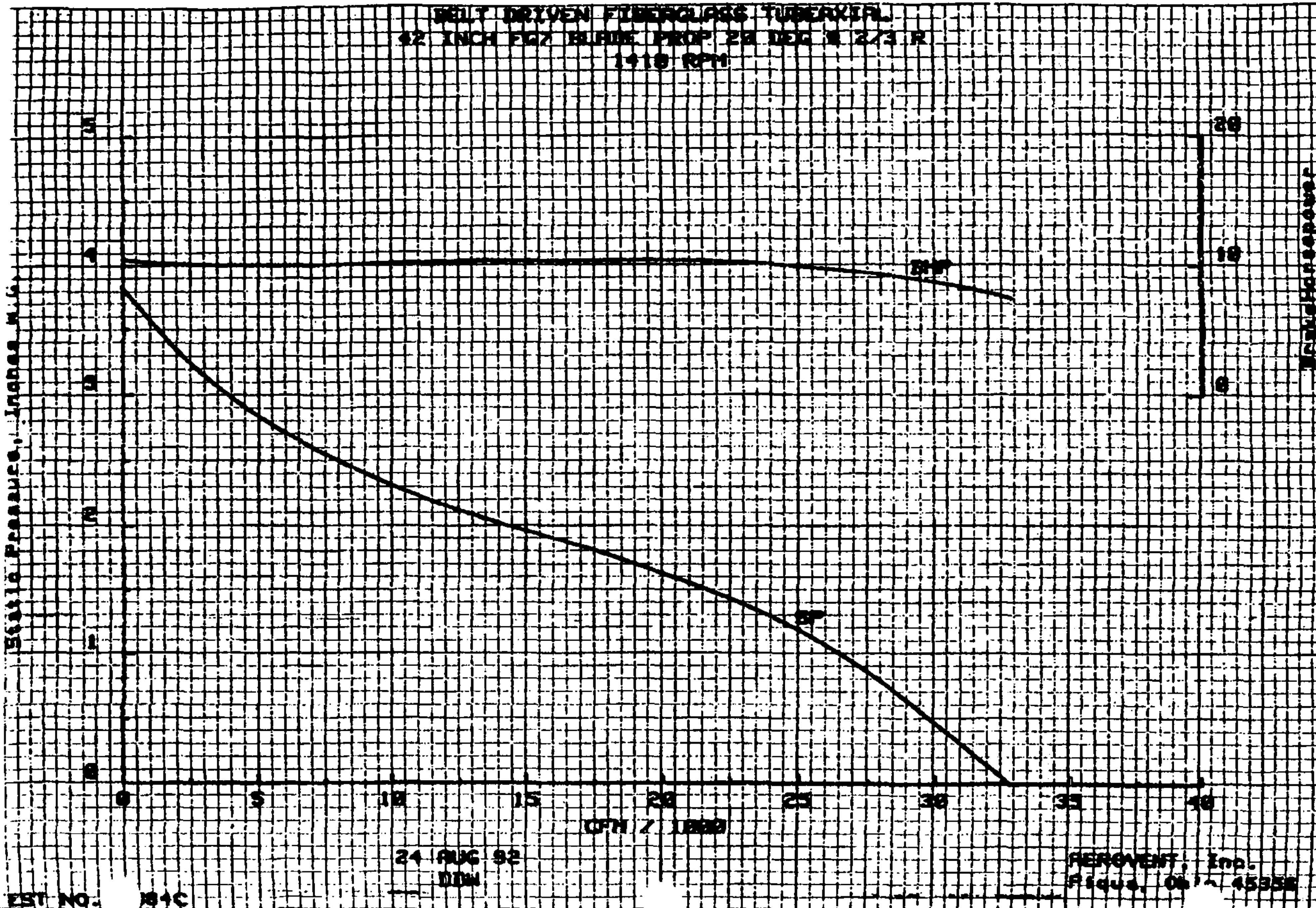
"B" Stock Washer Roof Vent Fan



SECTION 5

"B" BROWN STOCK WASHER FILTRATE VENT

(IO-BSWBFV)

5. IO-BSWBFV

SECTION 5
"B" BROWN STOCK WASHER FILTRATE VENT
(IO-BSWBFV)

The "B" Brown Stock Washer Filtrate Vent was tested on two different days for volatile organic compounds by Methods 16 and 18. Because of the high concentrations of VOC's in this source, bag samples were collected and diluted before analysis.

Volatile Organic Compounds (M16 and M18)

Table 5.1 summarizes the results for the Method 16 and Method 18 target compounds, and Section 5.1 is a tabulation of the data. The volumetric flow was measured during sampling using a hot wire anemometer. Of the reduced sulfur compounds, methyl mercaptan and dimethyl sulfide were present. Methanol, alpha- and beta-pinene, and various unspecified terpenes were detected by Method 18. The largest components were alpha- and beta-pinene at 26 and 10 lb/hr, respectively.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 5.2. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Process operating data were taken from the "B" Brown Stock Washer Hood Vent as instructed by mill personnel. The data with the closest run time was used and is included in Section 5.3.

WESTON

TABLE 5.1 SUMMARY OF VOC RESULTS

Mill: INLAND - ORANGE
Source Code: IO-BSWBFV
FIN: T-BFILT CIN: 40

Source: "B" Brown Stock Washer Filtrate Vent
Test Dates: 7/23/92 7/24/92
EPN: 86

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	92	92	92	
Volumetric Flow Rate, x10^3 DSCFM	0.3	0.3	0.3	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	33.3	33.3	33.3	
Method 16 Data, lb/hr				
Hydrogen sulfide	ND	ND	ND	0.1
Methyl mercaptan	ND	0.4	0.2	0.1
Dimethyl sulfide	0.2	0.5	0.3	0.1
Carbon disulfide	ND	ND	ND	0.1
Dimethyl disulfide	<0.1	<0.1	0.1	0.1
Method 18 Data, lb/hr				
Methanol	0.4	0.9	0.8	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	ND	ND	ND	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	20.8	34.8	26.3	0.1
beta-Pinene	8.0	13.1	9.6	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	2.2	4.3	3.0	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	25.9	42.9	32.2	0.1
Unknowns as C, lb/hr	ND	0.2	0.1	0.1
Sum of Compounds as C, lb/hr	26.1	42.9	32.3	0.1

ND=Not Detected
DL=Detection Limit

Section 5.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE	Source: "B" Brown Stock Washer Filtrate Vent		FIN: T-BFILT
Source Code: IO-BSWBFV	Date: 7/23/92	EPN: 86	CIN: 40

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1442	1538	1643	
Flow Data				
Stack Temperature, °F		92		92
Moisture Content, %		5.0		5.0
Oxygen Concentration, %		20.0		20.0
Carbon Dioxide Concentration, %		0.0		0.0
Volumetric Flow Rate, x10^3 ACFM		0.3		0.3
Volumetric Flow Rate, x10^3 DSCFM		0.3		0.3
Process Operating Conditions				
Production Rate, ADT pulp/hr	33.3	33.3	33.3	33.3
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	5.0 *	5.0 *	5.0 *	5.0 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd	165.5	116.2	5.0 *	94.7
Emission Rate, lb/hr	0.4	0.3	0.1 *	0.2
Dimethyl sulfide				
Concentration, ppmvd	103.3	161.4	77.6	114.1
Emission Rate, lb/hr	0.3	0.5	0.2	0.3
Carbon disulfide				
Concentration, ppmvd	5.0 *	5.0 *	5.0 *	5.0 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	11.1	11.7	11.7	11.5
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Method 18 Data				
Methanol				
Concentration, ppmvd	586.3	550.0	499.6	545.3
Emission Rate, lb/hr	0.9	0.8	0.8	0.8
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	84.2 *	84.2 *	84.2 *	84.2 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Acetone				
Concentration, ppmvd	84.2 *	84.2 *	84.2 *	84.2 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
2-Propanol				
Concentration, ppmvd	84.2 *	84.2 *	84.2 *	84.2 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE	Source: "B" Brown Stock Washer Filtrate Vent	FIN: T-BFILT
Source Code: IO-BSWBFV	Date: 7/23/92 EPN: 86	CIN: 40

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	84.2 *	84.2 *	84.2 *	84.2 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Chloroform				
Concentration, ppmvd	168.4 *	168.4 *	168.4 *	168.4 *
Emission Rate, lb/hr	1.0 *	1.0 *	1.0 *	1.0 *
Benzene				
Concentration, ppmvd	84.2 *	84.2 *	84.2 *	84.2 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Bromodichloromethane				
Concentration, ppmvd	168.4 *	168.4 *	168.4 *	168.4 *
Emission Rate, lb/hr	1.3 *	1.3 *	1.3 *	1.3 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	84.2 *	84.2 *	84.2 *	84.2 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Ethyl benzene				
Concentration, ppmvd	84.2 *	84.2 *	84.2 *	84.2 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
m-, p-Xylene				
Concentration, ppmvd	84.2 *	84.2 *	84.2 *	84.2 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
o-Xylene				
Concentration, ppmvd	84.2 *	84.2 *	84.2 *	84.2 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Cumene				
Concentration, ppmvd	84.2 *	84.2 *	84.2 *	84.2 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
alpha-Pinene				
Concentration, ppmvd	3209.4	4570.9	3884.2	3888.2
Emission Rate, lb/hr	20.8	29.7	25.2	25.2
beta-Pinene				
Concentration, ppmvd	1235.9	1370.8	1422.6	1343.1
Emission Rate, lb/hr	8.0	8.9	9.2	8.7
3-Carene				
Concentration, ppmvd	84.2 *	84.2 *	84.2 *	84.2 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Terpenes (Unspecified)				
Concentration, ppmvd	341.6	369.8	660.7	457.4
Emission Rate, lb/hr	2.2	2.4	4.3	3.0

*One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE	Source: "B" Brown Stock Washer Filtrate Vent		FIN: T-BFILT
Source Code: IO-BSWBFV	Date: 7/23/92	EPN: 86	CIN: 40

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	84.2 *	84.2 *	84.2 *	84.2 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Knowns as Carbon				
Concentration, ppmvd	45178.5	59155.5	55814.7	53382.9
Unknowns as Carbon				
Concentration, ppmvd	408.0	306.5	0.0	238.2
Sum M18 as Carbon, lb/hr	26.1	34.1	32.0	30.7
Unknown Compounds % of Total	0.9%	0.5%	0.0%	0.5%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C				
Emission Rate, lb/hr as C				

COMMENTS :

M16 detection limit for <0.5 is <5 ppm due to dilution factor.
M18 detection limit for <0.5 is <80 ppm and for <1.0 is <160 ppm due to dilution factor and range change.

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: "B" Brown Stock Washer Filtrate Vent | FIN: T-BFILT
Source Code: IO-BSWBFV | Date: 7/24/92 | EPN: 86 | CIN: 40

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	840	936	1034	
Flow Data				
Stack Temperature, °F		92		92
Moisture Content, %		5.0		5.0
Oxygen Concentration, %		20.0		20.0
Carbon Dioxide Concentration, %		0.0		0.0
Volumetric Flow Rate, x10^3 ACFM		0.3		0.3
Volumetric Flow Rate, x10^3 DSCFM		0.3		0.3
Process Operating Conditions				
Production Rate, ADT pulp/hr	33.3	33.3	33.3	33.3
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	5.0 *	5.0 *	5.0 *	5.0 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd	79.2	82.3	5.0 *	54.7
Emission Rate, lb/hr	0.2	0.2	0.1 *	0.1
Dimethyl sulfide				
Concentration, ppmvd	90.5	100.8	73.0	88.1
Emission Rate, lb/hr	0.3	0.3	0.2	0.2
Carbon disulfide				
Concentration, ppmvd	5.0 *	5.0 *	5.0 *	5.0 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	7.6	13.5	9.7	10.3
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Method 18 Data				
Methanol				
Concentration, ppmvd	256.0	556.7	609.1	473.9
Emission Rate, lb/hr	0.4	0.8	0.9	0.7
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	84.2 *	84.2 *	84.2 *	84.2 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Acetone				
Concentration, ppmvd	84.2 *	84.2 *	84.2 *	84.2 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
2-Propanol				
Concentration, ppmvd	84.2 *	84.2 *	84.2 *	84.2 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: "B" Brown Stock Washer Filtrate Vent | FIN: T-BFILT
Source Code: IO-BSWBFV | Date: 7/24/92 | EPN: 86 | CIN: 40

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	84.2 *	84.2 *	84.2 *	84.2 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Chloroform				
Concentration, ppmvd	168.4 *	168.4 *	168.4 *	168.4 *
Emission Rate, lb/hr	0.9 *	0.9 *	0.9 *	0.9 *
Benzene				
Concentration, ppmvd	84.2 *	84.2 *	84.2 *	84.2 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Bromodichloromethane				
Concentration, ppmvd	168.4 *	168.4 *	168.4 *	168.4 *
Emission Rate, lb/hr	1.2 *	1.2 *	1.2 *	1.2 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	84.2 *	84.2 *	84.2 *	84.2 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Ethyl benzene				
Concentration, ppmvd	84.2 *	84.2 *	84.2 *	84.2 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
m-, p-Xylene				
Concentration, ppmvd	84.2 *	84.2 *	84.2 *	84.2 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
o-Xylene				
Concentration, ppmvd	84.2 *	84.2 *	84.2 *	84.2 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Cumene				
Concentration, ppmvd	84.2 *	84.2 *	84.2 *	84.2 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
alpha-Pinene				
Concentration, ppmvd	4076.9	3743.1	5727.4	4515.8
Emission Rate, lb/hr	24.8	22.7	34.8	27.4
beta-Pinene				
Concentration, ppmvd	1430.9	1540.6	2160.5	1710.7
Emission Rate, lb/hr	8.7	9.4	13.1	10.4
3-Carene				
Concentration, ppmvd	84.2 *	84.2 *	84.2 *	84.2 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Terpenes (Unspecified)				
Concentration, ppmvd	371.2	409.1	676.0	485.4
Emission Rate, lb/hr	2.3	2.5	4.1	2.9

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: "B" Brown Stock Washer Filtrate Vent | FIN: T-BFILT
Source Code: IO-BSWBFV | Date: 7/24/92 | EPN: 86 | CIN: 40

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	84.2 *	84.2 *	84.2 *	84.2 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Knowns as Carbon				
Concentration, ppmvd	55735.4	53308.3	79980.2	63008.0
Unknowns as Carbon				
Concentration, ppmvd	137.9	0.0	0.0	46.0
Sum M18 as Carbon, lb/hr	30.0	28.6	42.9	33.8
Unknown Compounds % of Total	0.2%	0.0%	0.0%	0.1%

Method 25A Data

	Run 1	Run 2	Run 3	Average
Total Hydrocarbons				
Concentration, ppmvd as C				
Emission Rate, lb/hr as C				

COMMENTS :

M16 detection limit for <0.5 is <5 ppm due to dilution factor.
M18 detection limit for <0.5 is <80 ppm and for <1.0 is <160 ppm due to dilution factor and range change.

* One or more values were less than the detection limit.

Section 5.2 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

SOURCE IO-BSWBFV

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR ppm	DATE ppm	7/23/92 %REC	DATE ppm *	7/24/92 %REC
ethanol	41.9	33.9	80.8%	29.5	70.3%
acetone	33.5	33.0	98.4%	30.7	91.4%
isopropanol	32.2	27.5	85.4%	26.6	82.8%
DMS	33.5	32.0	95.5%	30.3	90.5%
benzene	27.5	28.3	102.8%	30.3	110.0%
bromodichloromethane	29.7	29.4	99.0%	26.2	88.0%
DMDS	27.3	26.6	97.3%	25.3	92.5%
toluene	23.2	22.2	95.7%	21.2	91.5%
ethyl benzene	20.1	19.7	98.2%	19.0	94.4%
m-xylene	20.1	19.7	98.4%	19.1	95.1%
o-xylene	20.2	19.7	97.8%	18.6	92.2%
cumene	17.7	17.3	98.0%	16.3	91.9%
alpha-pinene	15.4	15.4	99.4%	14.4	93.5%
beta-pinene	15.5	13.8	89.2%	13.1	84.7%
3-carene	15.5	14.7	94.3%	13.8	88.9%
p-cymene	15.8	15.2	96.5%	14.4	91.3%

2. PROPANE RESPONSE

	THEOR		%REC		%REC
BEFORE	36.0	33.7	93.6%	32.8	91.1%
AFTER	36.0	32.8	91.1%	32.3	89.7%

3. METHANOL LINE RECOVERY

	7/23/92			7/24/92		
	QC	LINE	%REC	QC	LINE	%REC
BEFORE	NA			NA		
AFTER	NA			NA		

4. LINE BLANK

	[-------------FILE REF	-------------]
BEFORE	NA	NA
AFTER	NA	NA

NA = Not applicable for bag samples.

* One sample (IBS1) run on Channel A - for QC see NCGCFT

SOURCE IO-BSWBFV

QUALITY CONTROL SUMMARY
METHOD 16

1. CALIBRATION

ANALYTE	LO ppm	MED ppm	HI ppm	CORR COEFF
7/23/92 *				
hydrogen sulfide	2.2	3.2	8.2	0.9996
methyl mercaptan	2.0	2.9	7.6	0.9998
dimethyl sulfide	2.8	4.1	10.6	0.9999
carbon disulfide	0.9	1.3	3.3	0.9999
dimethyl disulfide	1.2	1.8	4.6	0.9999
7/24/92				
hydrogen sulfide	2.9	4.5	8.3	0.9987
methyl mercaptan	2.7	4.2	7.7	0.9992
dimethyl sulfide	3.7	5.8	10.7	0.9997
carbon disulfide	1.2	1.8	3.4	0.9998
dimethyl disulfide	1.6	2.5	4.6	0.9993

* Calibration from 7/21/92 was checked and used .

Section 5.3 Process Operating Data

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(L) WWC 19 January 1993

BROWN STOCK WASHER - PROCESS OPERATING CONDITIONS

Mill:	INLAND-ORANGE	Source:	B" BROWN STOCK WASHER HOOD VENT
Source:	IO-BSWBHV	Date:	JULY 23, 1992
FIN:	P-BSWB	EPN:	17 CIN:

INPUT DATA		Unit	Run 1	Run 2	Run 3	Average
Beginning Time			1230			
Measured Parameter						
Wood Species		HW or SW	SW			
Pulp Flow	TPD	ADT/day	800			
Shower Water Source			*			
Shower Water Flow Rate		GPM	575			
Shower Water Temperature		degree F	176			
Vat Temperature		degree F	163			

* HEATED MILL WATER FROM BLACK LIQUOR EXCHANGE

BROWN STOCK WASHER - PROCESS OPERATING CONDITIONS

Mill:	INLAND-ORANGE	Source:	B" BROWN STOCK WASHER HOOD VENT
Source:	IO-BSWBHV	Date:	JULY 24,1992
FIN:	P-BSWB	EPN:	17 CIN:

INPUT DATA		Unit	Run 1	Run 2	Run 3	Average
Beginning Time			638			
Measured Parameter						
Wood Species		HW or SW	SW			
Pulp Flow	TPD	ADT/day	800			
Shower Water Source			*			
Shower Water Flow Rate		GPM	600			
Shower Water Temperature		degree F	164			
Vat Temperature		degree F	163			

* HEATED MILL WATER FROM BLACK LIQUOR EXCHANGE

See Section 4.4 for process schematic drawing.

SECTION 6
NCG SYSTEM AT LIME KILN
(IO-NCGLK)

WESTON
MANAGERS DESIGNERS CONSULTANTS

SECTION 6
NCG SYSTEM AT LIME KILN
(IO-NCGLK)

The NCG System at the Lime Kiln was tested on two different days for volatile organic compounds by Methods 16 and 18. Bag samples were collected over a short period of time (approximately ten minutes) and analyzed without dilution.

Volatile Organic Compounds (M16 and M18)

Table 6.1 summarizes the results for the Method 16 and Method 18 target compounds, and Section 6.1 is a tabulation of the data. The volumetric flow was measured during sampling using a pitot tube. Hydrogen sulfide and carbon disulfide concentrations were below the listed detection limits. Methyl mercaptan, dimethyl sulfide and dimethyl disulfide were analyzed by Method 18 due to the high concentrations of these compounds. Of the remaining target compounds, methanol and alpha- and beta-pinene were detected as well as various unspecified terpenes. Cumene was detected in all runs at levels near the detection limit.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 6.2. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 6.3 includes the process operating data as recorded and provided by mill personnel.

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TABLE 6.1 SUMMARY OF VOC RESULTS

Mill: INLAND - ORANGE	Source: NCG System at Lime Kiln
Source Code: IO-NCGLK	Test Dates: 7/15/92 7/21/92
FIN: Note a CIN: C-36, C-28, C-29	EPN: 11

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	76	97	87	
Volumetric Flow Rate, x10^3 *DSCFM*	0.4	0.4	0.4	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	64.2	66.7	65.5	
Method 16 Data, lb/hr				
Hydrogen sulfide	<0.1	<0.1	0.1	0.1
Carbon disulfide	ND	ND	ND	0.1
Method 18 Data, lb/hr				
Methanol	0.4	0.6	0.5	0.1
Methyl mercaptan	38.8	50.3	41.6	0.1
Ethanol	ND	<0.1	0.1	0.1
Acetone	ND	<0.1	0.1	0.1
2-Propanol	ND	<0.1	0.1	0.1
Dimethyl sulfide	2.9	4.1	3.7	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	ND	ND	ND	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Dimethyl disulfide	0.2	1.0	0.4	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	0.1	0.1	0.1
alpha-Pinene	8.1	9.1	8.6	0.1
beta-Pinene	3.3	3.6	3.4	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	1.0	1.5	1.2	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	16.1	17.7	16.9	0.1
Unknowns as C, lb/hr	ND	0.2	0.1	0.1
Sum of Compounds as C, lb/hr	16.2	17.9	17.0	0.1

ND=Not Detected
DL=Detection Limit

Section 6.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: NCG System at Lime Kiln | FIN: Note a
Source Code: IO-NCGLK | Date: 7/15/92 | EPN: 11 | CIN: C-36,28,29

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1900	2000	2045	
Flow Data				
Stack Temperature, °F	76			76
Moisture Content, %	3.2			3.2
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.5			0.5
Volumetric Flow Rate, x10^3 DSCFM	0.4			0.4
Process Operating Conditions				
Production Rate, ADT Pulp/hr	64.2	64.2	64.2	64.2
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	0.9	1.8	1.4	1.4
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	187.1	229.3	180.4	198.9
Emission Rate, lb/hr	0.4	0.5	0.4	0.4
Methyl mercaptan				
Concentration, ppmvd	11679.3	11752.1	11654.5	11695.3
Emission Rate, lb/hr	38.9	39.1	38.8	38.9
Ethanol				
Concentration, ppmvd	13.6	8.3 *	8.3 *	7.3
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	12.9	13.3	13.0	13.1
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	8.3 *	8.3 *	8.3 *	8.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: NCG System at Lime Kiln | FIN: Note a

Source Code: IO-NCGLK | Date: 7/15/92 | EPN: 11 | CIN: C-36,28,29

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd	893.7	871.3	891.0	885.3
Emission Rate, lb/hr	3.8	3.7	3.8	3.8
2-Butanone				
Concentration, ppmvd	8.3 *	8.3 •	8.3 *	8.3 *
Emission Rate, lb/hr	0.1 *	0.1 •	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	16.5 *	16.5 *	16.5 •	16.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 •
Benzene				
Concentration, ppmvd	8.3 *	8.3 *	8.3 *	8.3 •
Emission Rate, lb/hr	0.1 •	0.1 •	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	16.5 *	16.5 *	16.5 *	16.5 *
Emission Rate, lb/hr	0.2 •	0.2 •	0.2 *	0.2 •
Dimethyl disulfide				
Concentration, ppmvd	25.3	154.1	68.7	82.7
Emission Rate, lb/hr	0.2	1.0	0.4	0.5
Toluene				
Concentration, ppmvd	8.3 *	8.3 *	8.3 *	8.3 *
Emission Rate, lb/hr	0.1 *	0.1 •	0.1 •	0.1 •
Ethyl benzene				
Concentration, ppmvd	8.3 *	8.3 *	8.3 *	8.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	8.3 *	8.3 *	8.3 •	8.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	8.3 *	8.3 *	8.3 *	8.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	10.5	8.3 *	13.2	9.3
Emission Rate, lb/hr	0.1 *	0.1 *	0.1	0.1
alpha-Pinene				
Concentration, ppmvd	890.5	934.8	960.6	928.7
Emission Rate, lb/hr	8.4	8.8	9.1	8.8
beta-Pinene				
Concentration, ppmvd	375.3	348.7	353.8	359.3
Emission Rate, lb/hr	3.5	3.3	3.3	3.4
3-Carene				
Concentration, ppmvd	8.3 *	8.3 •	8.3 •	8.3 *
Emission Rate, lb/hr	0.1 *	0.1 •	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	109.4	131.5	124.5	121.8
Emission Rate, lb/hr	1.0	1.2	1.2	1.1

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE	Source:	NCG System at Lime Kiln			FIN:	Note a
Source Code: IO-NCGLK	Date:	7/15/92	EPN:	11	CIN:	C-36,28,29

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	8.3 *	8.3 *	8.3 *	8.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	20302.8	20814.8	20949.5	20689.0
Unknowns as Carbon				
Concentration, ppmvd	35.8	60.7	46.4	47.7
Sum M18 as Carbon, lb/hr	16.9	17.4	17.5	17.3
Unknown Compounds % of Total	0.2%	0.3%	0.2%	0.2%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C				
Emission Rate, lb/hr as C				

COMMENTS :

M18 detection limit for <0.5 is <8 ppm and for <1.0 is <16 ppm due to range change.

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE	Source: NCG System at Lime Kiln		FIN: Note a
Source Code: IO-NCGLK	Date: 7/21/92	EPN: 11	CIN: C-36,28,29

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1030	1150	1400	
Flow Data				
Stack Temperature, °F		97		97
Moisture Content, %		6.4		6.4
Oxygen Concentration, %		21.0		21.0
Carbon Dioxide Concentration, %		0.0		0.0
Volumetric Flow Rate, x10^3 ACFM		0.5		0.5
Volumetric Flow Rate, x10^3 DSCFM		0.4		0.4
Process Operating Conditions				
Production Rate, ADT Pulp/hr	66.7	66.7	66.7	66.7
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	6.0	4.5	5.5	5.3
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	200.3	269.1	163.7	211.0
Emission Rate, lb/hr	0.4	0.6	0.4	0.5
Methyl mercaptan				
Concentration, ppmvd	13310.8	15478.4	12048.0	13612.4
Emission Rate, lb/hr	43.2	50.3	39.1	44.2
Ethanol				
Concentration, ppmvd	8.5 *	8.5 *	8.5 *	8.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	9.1	12.0	8.5 *	8.4
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	11.8	15.6	10.7	12.7
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE	Source: NCG System at Lime Kiln		FIN: Note a
Source Code: IO-NCGLK	Date: 7/21/92	EPN: 11	CIN: C-36,28,29

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd	861.4	969.0	682.7	837.7
Emission Rate, lb/hr	3.6	4.1	2.9	3.5
2-Butanone				
Concentration, ppmvd	8.5 *	8.5 *	8.5 *	8.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	17.1 *	17.1 *	17.1 *	17.1 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Benzene				
Concentration, ppmvd	8.5 *	8.5 *	8.5 *	8.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	17.1 *	17.1 *	17.1 *	17.1 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Dimethyl disulfide				
Concentration, ppmvd	45.6	52.7	56.5	51.6
Emission Rate, lb/hr	0.3	0.3	0.4	0.3
Toluene				
Concentration, ppmvd	8.5 *	8.5 *	8.5 *	8.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	8.5 *	8.5 *	8.5 *	8.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	8.5 *	8.5 *	8.5 *	8.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	8.5 *	8.5 *	8.5 *	8.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	8.5 *	8.5 *	8.5 *	8.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	878.6	945.8	942.7	922.4
Emission Rate, lb/hr	8.1	8.7	8.7	8.5
beta-Pinene				
Concentration, ppmvd	371.3	389.6	360.3	373.7
Emission Rate, lb/hr	3.4	3.6	3.3	3.4
3-Carene				
Concentration, ppmvd	8.5 *	8.5 *	8.5 *	8.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	108.1	110.6	161.3	126.7
Emission Rate, lb/hr	1.0	1.0	1.5	1.2

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: NCG System at Lime Kiln | FIN: Note a
Source Code: IO-NCGLK | Date: 7/21/92 EPN: 11 | CIN: C-36,28,29

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	8.5 *	8.5 *	8.5 *	8.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	19830.7	21765.2	19801.7	20465.8
Unknowns as Carbon				
Concentration, ppmvd	94.4	294.3	91.0	159.9
Sum M18 as Carbon, lb/hr	16.2	17.9	16.2	16.8
Unknown Compounds % of Total	0.5%	1.3%	0.5%	0.8%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C				
Emission Rate, lb/hr as C				

COMMENTS :

M18 detection limit for <0.5 is <8 ppm and for <1.0 is <16 ppm due to range change.

* One or more values were less than the detection limit.

Section 6.2 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

SOURCE IO-NCGLK

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR ppm	DATE ppm	7/15/92 %REC	DATE ppm	7/21/92 %REC
ethanol	41.9	18.8	44.9%	35.3	84.2%
acetone	33.5	23.3	69.5%	33.1	98.6%
isopropanol	32.2	29.8	92.7%	28.9	89.8%
DMS	33.5	--		32.1	95.9%
benzene	27.5	29.5	107.3%	31.1	113.0%
bromodichloromethane	29.7	26.6	89.3%	27.4	92.0%
DMDS	27.3	--		26.0	95.0%
toluene	23.2	21.8	94.1%	22.6	97.6%
ethyl benzene	20.1	19.0	94.7%	19.9	99.1%
m-xylene	20.1	19.9	99.4%	20.0	99.7%
o-xylene	20.2	19.0	94.1%	20.0	98.9%
cumene	17.7	16.7	94.4%	17.3	97.8%
alpha-pinene	15.4	15.5	100.3%	15.2	98.4%
beta-pinene	15.5	15.3	98.3%	14.7	94.6%
3-carene	15.5	22.7	145.8%	14.8	95.4%
p-cymene	15.8	13.2	83.7%	15.2	96.6%

2. PROPANE RESPONSE

	THEOR		%REC		%REC
BEFORE	36.0	32.3	89.7%	34.6	96.1%
AFTER	36.0	*		31.1	86.4%

3. METHANOL LINE RECOVERY

	7/15/92 GC	LINE	%REC	7/21/92 GC	LINE	%REC
BEFORE	NA			NA		
AFTER	NA			NA		

4. LINE BLANK

	[--------------FILE REF	--------------]
BEFORE	NA	NA
AFTER	NA	NA

NA = Not Applicable for bag samples

* Not performed

SOURCE IO-NCGLK

QUALITY CONTROL SUMMARY
METHOD 16

1. CALIBRATION

ANALYTE	LO ppm	MED ppm	HI ppm	CORR COEFF
7/16/92 *				
hydrogen sulfide	1.7	4.3	10.6	0.9987
methyl mercaptan	1.6	3.9	9.8	0.9996
dimethyl sulfide	2.2	5.5	13.7	0.9999
carbon disulfide	0.7	1.7	4.3	0.9989
dimethyl disulfide	0.9	2.4	5.9	0.9996
7/24/92				
hydrogen sulfide	2.9	4.5	8.3	0.9987
methyl mercaptan	2.7	4.2	7.7	0.9992
dimethyl sulfide	3.7	5.8	10.7	0.9997
carbon disulfide	1.2	1.8	3.4	0.9998
dimethyl disulfide	1.6	2.5	4.6	0.9993

* Calibration from 7/15/92 checked and used

Section 6.3 Process Operating Data

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(L) WWC 02 October 1992

NCG INCINERATION SYSTEM

The non-condensable gas incineration system had two components that operated independent of each other, the upper explosive limit system (UEL) and the lower explosive limit system (LEL). The UEL system was of a traditional nature, picking up the uncondensed gases from the multiple-effect evaporators, the combined condensate storage tank and the turpentine recovery system on the blow gases from the two continuous Kamyr digesters operated on softwood. The evaporators were a six (6) body set, rated at 10,740 gpm liquor discharge at fifty (50) percent solids. The design steam feed rate was 148,500 pounds per hour at sixty-five (65) psig.

The LEL system consists of the vent off the pressurization of the Chemiwasher and the vent off the Chemiwasher filtrate tank. These combined gases pass through a cold water condenser prior to incineration in the lime kiln.

Representative Process Conditions

		"A" dig.	"B" dig.
Digester production (ADT/day):	7/15/92	950	590
	7/21/92	950	650
Sulfidity (% by weight):	7/15/92	28.4	28.4
	7/21/92	31.3	31.3
Cook Temperature (Deg F):	7/15/92	306	308
	7/21/92	313	313
Cook Pressure (psig):	7/15/92	160	150
	7/21/92	160	160
Kappa Number:	7/15/92	104	82
	7/21/92	97	97

Kappa Number Measured at: "A" refiner and "B" refiner

Evaporator Rate (Lb. BLS/hr):	7/13/92	213,236
	7/14/92	196,898
	7/21/92	178,537

TOTAL UPPER EXPLOSIVE LIMIT

NON-CONDENSABLE GAS COLLECTION SYSTEM AT LIME KILN

DATE	PRODUCTION RATE
July 15, 1992	64.2 ADT of Kraft Pulp/Hr
July 21, 1992	66.7 ADT of Kraft Pulp/Hr

WESTON
MANAGERS DESIGNERS/CONSULTANTS

SECTION 7
NCG BLOW HEAT RECOVERY VENT
(IO-NCGBHR)

7. IO-NCGBHR

WESTON

SECTION 7
NCG BLOW HEAT RECOVERY VENT
(IO-NCGBHR)

The NCG Blow Heat Recovery Vent was tested on two different days for volatile organic compounds by Methods 16 and 18. Bag samples were collected and analyzed without dilution.

Volatile Organic Compounds (M16 and M18)

Table 7.1 summarizes the results for the Method 16 and Method 18 target compounds, and Section 7.1 is a tabulation of the data. The volumetric flow was measured during sampling with a pitot tube. Hydrogen sulfide and carbon disulfide were detected at levels below the listed detection limits by Method 16. Methyl mercaptan at approximately 35 lb/hr, dimethyl sulfide at 3 lb/hr and dimethyl disulfide at 0.4 lb/hr were analyzed by Method 18. Methanol, acetone and alpha- and beta-pinene were identified in one or more runs at emission rates greater than 0.1 lb/hr.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 7.2. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Process data were not submitted. A description of the NCG collection system was provided.

TABLE 7.1 SUMMARY OF VOC RESULTS

Mill: INLAND - ORANGE
Source Code: IO-NCGBHR
FIN: Note b CIN: C-21, C-36, C-28, C-29

Source: NCG Blow Heat Recovery Vent
Test Dates: 7/15/92 7/21/92
EPN: 11

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	78	104	91	
Volumetric Flow Rate, x10^3 DSCFM	0.3	0.3	0.3	
Process Operating Conditions				
Production Rate				
Method 16 Data, lb/hr				
Hydrogen sulfide	ND	<0.1	0.1	0.1
Carbon disulfide	ND	<0.1	0.1	0.1
Method 18 Data, lb/hr				
Methanol	0.3	0.5	0.4	0.1
Methyl mercaptan	26.3	38.6	34.4	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	<0.1	0.1	0.1
2-Propanol	ND	<0.1	0.1	0.1
Dimethyl sulfide	2.6	3.5	3.0	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	ND	ND	ND	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Dimethyl disulfide	0.2	0.7	0.4	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	5.4	7.4	6.8	0.1
beta-Pinene	2.4	3.1	2.7	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	0.6	1.6	1.1	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	11.7	14.7	13.3	0.1
Unknowns as C, lb/hr	0.1	0.1	0.1	0.1
Sum of Compounds as C, lb/hr	11.8	14.8	13.6	0.1

ND=Not Detected
DL=Detection Limit

Section 7.1 Emission Test Results - VOC

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(L) WWC 31 December 1992

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: NCG Blow Heat Recovery Vent | FIN: Note b
Source Code: IO-NCGBHR | Date: 7/15/92 | EPN: 11 | CIN:C21,36,28,29

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1900	2000	2045	
Flow Data				
Stack Temperature, °F	78			78
Moisture Content, %	3.2			3.2
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.3			0.3
Volumetric Flow Rate, x10^3 DSCFM	0.3			0.3
Process Operating Conditions				
Production Rate, tons/hr				
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	2.6	2.7	0.9	2.1
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd	3.3	2.9	1.5	2.6
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	223.5	268.6	223.1	238.4
Emission Rate, lb/hr	0.3	0.4	0.3	0.4
Methyl mercaptan				
Concentration, ppmvd	15223.3	11410.1	15289.3	13974.2
Emission Rate, lb/hr	35.1	26.3	35.2	32.2
Ethanol				
Concentration, ppmvd	8.3 *	8.3 *	8.3 *	8.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	9.8	8.3 *	9.6	7.9
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	12.9	8.3 *	12.6	9.9
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: NCG Blow Heat Recovery Vent | FIN: Note b
Source Code: IO-NCGBHR | Date: 7/15/92 EPN: 11 | CIN:C21,36,28,29

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd	1174.0	882.4	1178.8	1078.4
Emission Rate, lb/hr	3.5	2.6	3.5	3.2
2-Butanone				
Concentration, ppmvd	8.3 *	8.3 *	8.3 •	8.3 •
Emission Rate, lb/hr	0.1 •	0.1 •	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	16.5 *	16.5 *	16.5 *	16.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Benzene				
Concentration, ppmvd	8.3 *	8.3 *	8.3 *	8.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	16.5 *	16.5 *	16.5 *	16.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	37.7	139.2	62.1	79.6
Emission Rate, lb/hr	0.2	0.6	0.3	0.4
Toluene				
Concentration, ppmvd	8.3 *	8.3 *	8.3 *	8.3 *
Emission Rate, lb/hr	0.1 *	0.1 •	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	8.3 *	8.3 *	8.3 *	8.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	8.3 *	8.3 *	8.3 *	8.3 •
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	8.3 *	8.3 *	8.3 •	8.3 *
Emission Rate, lb/hr	0.1 •	0.1 *	0.1 •	0.1 •
Cumene				
Concentration, ppmvd	8.3 *	8.3 *	8.3 •	8.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 •
alpha-Pinene				
Concentration, ppmvd	917.9	1099.5	1129.2	1048.9
Emission Rate, lb/hr	6.0	7.2	7.4	6.8
beta-Pinene				
Concentration, ppmvd	365.5	453.4	448.5	422.5
Emission Rate, lb/hr	2.4	3.0	2.9	2.8
3-Carene				
Concentration, ppmvd	8.3 *	8.3 *	8.3 *	8.3 •
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 •	0.1 •
Terpenes (Unspecified)				
Concentration, ppmvd	96.5	196.3	151.1	148.0
Emission Rate, lb/hr	0.6	1.3	1.0	1.0

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: NCG Blow Heat Recovery Vent | FIN: Note b
Source Code: IO-NCGBHR | Date: 7/15/92 EPN: 11 | CIN:C21,36,28,29

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	8.3 *	8.3 *	8.3 *	8.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	21591.4	23048.1	24883.6	23174.4
Unknowns as Carbon				
Concentration, ppmvd	228.2	89.5	122.2	146.6
Sum M18 as Carbon, lb/hr	12.6	13.3	14.4	13.4
Unknown Compounds % of Total	1.0%	0.4%	0.5%	0.6%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C				
Emission Rate, lb/hr as C				

COMMENTS :

M18 detection limit for <0.5 is <8 ppm and for <1.0 is <16 ppm for 7/15 data due to range change.

M18 detection limit (run 1) for <0.5 is <16 ppm and for <1.0 is <32 ppm for 7/21 due to range change.
Detection limits (run 2 and 3) for <0.5 are <8 ppm and for <1.0 are <16 ppm for 7/21 due to range change.

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: NCG Blow Heat Recovery Vent | FIN: Note b
Source Code: IO-NCGBHR | Date: 7/21/92 EPN: 11 | CIN:C21,36,28,29

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1040	1200	1400	
Flow Data				
Stack Temperature, °F		104		104
Moisture Content, %		7.4		7.4
Oxygen Concentration, %		21.0		21.0
Carbon Dioxide Concentration, %		0.0		0.0
Volumetric Flow Rate, x10^3 ACFM		0.4		0.4
Volumetric Flow Rate, x10^3 DSCFM		0.3		0.3
Process Operating Conditions				
Production Rate, tons/hr				
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	5.0	3.5	0.5 *	2.9
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	302.1	200.9	224.4	242.4
Emission Rate, lb/hr	0.5	0.3	0.4	0.4
Methyl mercaptan				
Concentration, ppmvd	16027.0	14603.2	14894.7	15175.0
Emission Rate, lb/hr	38.6	35.2	35.9	36.5
Ethanol				
Concentration, ppmvd	17.3 *	8.6 *	8.6 *	11.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	17.3 *	8.6 *	8.6 *	11.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	17.3 *	15.0	15.7	13.1
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: NCG Blow Heat Recovery Vent | FIN: Note b
Source Code: IO-NCGBHR | Date: 7/21/92 EPN: 11 | CIN:C21,36,28,29

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd	1018.4	822.5	888.2	909.7
Emission Rate, lb/hr	3.2	2.6	2.8	2.8
2-Butanone				
Concentration, ppmvd	17.3 *	8.6 *	8.6 *	11.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	34.6 *	17.3 *	17.3 *	23.0 *
Emission Rate, lb/hr	0.2 *	0.1 *	0.1 *	0.1 *
Benzene				
Concentration, ppmvd	17.3 *	8.6 *	8.6 *	11.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	34.6 *	17.3 *	17.3 *	23.0 *
Emission Rate, lb/hr	0.3 *	0.1 *	0.1 *	0.2 *
Dimethyl disulfide				
Concentration, ppmvd	143.4	52.3	46.9	80.8
Emission Rate, lb/hr	0.7	0.2	0.2	0.4
Toluene				
Concentration, ppmvd	17.3 *	8.6 *	8.6 *	11.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	17.3 *	8.6 *	8.6 *	11.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	17.3 *	8.6 *	8.6 *	11.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	17.3 *	8.6 *	8.6 *	11.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	17.3 *	8.6 *	8.6 *	11.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	1059.2	787.5	1076.0	974.2
Emission Rate, lb/hr	7.2	5.4	7.3	6.6
beta-Pinene				
Concentration, ppmvd	409.4	346.7	447.6	401.2
Emission Rate, lb/hr	2.8	2.4	3.1	2.7
3-Carene				
Concentration, ppmvd	17.3 *	8.6 *	8.6 *	11.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	230.3	104.0	192.9	175.7
Emission Rate, lb/hr	1.6	0.7	1.3	1.2

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: NCG Blow Heat Recovery Vent | FIN: Note b
Source Code: IO-NCGBHR | Date: 7/21/92 EPN: 11 | CIN:C21,36,28,29

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	17.3 *	8.6 *	8.6 *	11.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	24475.7	19419.2	23689.2	22528.0
Unknowns as Carbon				
Concentration, ppmvd	180.2	239.5	217.4	212.4
Sum M18 as Carbon, lb/hr	14.8	11.8	14.4	13.7
Unknown Compounds % of Total	0.7%	1.2%	0.9%	1.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C				
Emission Rate, lb/hr as C				

COMMENTS :

M18 detection limit for <0.5 is <8 ppm and for <1.0 is <16 ppm for 7/15 data due to range change.

M18 detection limit (run 1) for <0.5 is <16 ppm and for <1.0 is <32 ppm for 7/21 due to range change.
Detection limits (run 2 and 3) for <0.5 are <8 ppm and for <1.0 are <16 ppm for 7/21 due to range change.

* One or more values were less than the detection limit.

Section 7.2 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

SOURCE IO-NCGBHR

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR ppm	DATE 7/15/92 ppm	%REC	DATE 7/21/92 ppm	%REC
ethanol	41.9	29.8	70.9%	35.3	84.2%
acetone	33.5	33.6	100.2%	33.1	98.6%
isopropanol	32.2	28.6	89.1%	28.9	89.8%
DMS	33.5	--		32.1	95.9%
benzene	27.5	27.8	101.0%	31.1	113.0%
bromodichloromethane	29.7	29.9	100.7%	27.4	92.0%
DMDS	27.3	--		26.0	95.0%
toluene	23.2	21.3	91.8%	22.6	97.6%
ethyl benzene	20.1	18.7	92.8%	19.9	99.1%
m-xylene	20.1	18.7	93.1%	20.0	99.7%
o-xylene	20.2	18.4	91.4%	20.0	98.9%
cumene	17.7	16.6	93.7%	17.3	97.8%
alpha-pinene	15.4	14.9	96.6%	15.2	98.4%
beta-pinene	15.5	14.6	94.3%	14.7	94.6%
3-carene	15.5	23.1	148.5%	14.8	95.4%
p-cymene	15.8	14.2	90.2%	15.2	96.6%

2. PROPANE RESPONSE

	THEOR		%REC		%REC
BEFORE	36.0	31.6	87.8%	34.6	96.1%
AFTER	36.0	*		33.6	93.3%

3. METHANOL LINE RECOVERY

	7/15/92 GC	LINE	%REC	7/21/92 GC	LINE	%REC
BEFORE	NA			NA		
AFTER	NA			NA		

4. LINE BLANK

	[------------FILE REF------------]	
BEFORE	NA	NA
AFTER	NA	NA

NA = Not applicable for bag samples

SOURCE IO-NCGBHR

QUALITY CONTROL SUMMARY
METHOD 16

1. CALIBRATION

ANALYTE	LO ppm	MED ppm	HI ppm	CORR COEFF
7/16/92 *				
hydrogen sulfide	1.7	4.3	10.6	0.9987
methyl mercaptan	1.6	3.9	9.8	0.9996
dimethyl sulfide	2.2	5.5	13.7	0.9999
carbon disulfide	0.7	1.7	4.3	0.9989
dimethyl disulfide	0.9	2.4	5.9	0.9996
7/24/92				
hydrogen sulfide	2.9	4.5	8.3	0.9987
methyl mercaptan	2.7	4.2	7.7	0.9992
dimethyl sulfide	3.7	5.8	10.7	0.9997
carbon disulfide	1.2	1.8	3.4	0.9998
dimethyl disulfide	1.6	2.5	4.6	0.9993

* Calibration from 7/15/92 checked and used

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Section 7.3 Process Operating Data

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NON-CONDENSABLE GAS COLLECTION SYSTEM

The non-condensable gas system had two components that operated independent of each other, the upper explosive limit system (UEL) and the lower explosive limit system (LEL). The UEL system was of a traditional nature, picking up the uncondensed gases from the multiple-effect evaporators, the combined condensate storage tank and the turpentine recovery system on the blow gasses from the two continuous Kamyr digesters operated on softwood. The evaporators were a six (6) body set, rated at 10,740 gpm liquor discharge at fifty (50) percent solids. The design steam feed rate was 148,500 pounds per hour at sixty-five (65) psig.

The LEL system consists of the vent off the pressurization of the Chemiwasher and the vent off the Chemiwasher filtrate tank. These combined gases pass through a cold water condenser prior to incineration in the lime kiln.

UNIT PROCESS DESCRIPTION

CONTINUOUS DIGESTERS

The mill uses two continuous Kamyr digesters, each rated to produce 1,000 tons/day of softwood pulp. The digesters include built-in diffusion washers. "A" digester typically feeds the Chemiwasher and supplies the base sheet of the finished linerboard product. "B" digester typically feeds "B" washer line and then becomes the top sheet of the finished product. Both digesters feature bottom washing with black liquor from the brown stock washers fed counterflow in the bottom of the digesters. Information on process parameters is provided below.

Wood species pulped: Southern Pine (softwood)

Parameter	Date	"A" digester	"B" digester
Production rate (ADT/D):	7/15/92	950	590
	7/21/92	950	650
Active alkali (% $^w/w$):		0.056	
Sulfidity (% $^w/w$):	7/15/92	28.4	
	7/21/92	31.3	
Cooking temperature ($^\circ$F):	7/15/92	306	308
	7/21/92	313	313
Digester pressure (psig):	7/15/92	150	160
	7/21/92	160	160
Kappa no. of pulp:	7/15/92	103.6	82.0
	7/21/92	96.7	96.7
Chip feed rate (bdt chips/day):	7/15/92	1,337	1,004
	7/21/92	1,383	1,091
Liquor feed rate (GPM):	7/15/92	347	247
	7/21/92	363	263

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SECTION 8

NCG MULTI-EFFECT EVAPORATOR HOTWELL VENT

(IO-NCGEHV)

8. IO-NCGEHV

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SECTION 8
NCG MULTI-EFFECT EVAPORATOR HOTWELL VENT
(IO-NCGEHV)

The NCG Multi-Effect Evaporator Hotwell Vent was tested on three different days for volatile organic compounds by Methods 16 and 18. Bag samples were collected and analyzed with an approximate dilution factor of 40 on 7/13/92. No dilution was needed on 7/14/92 and 7/21/92.

Volatile Organic Compounds (M16 and M18)

Table 8.1 summarizes the results for the Method 16 and Method 18 target compounds, and Section 8.1 is a tabulation of the data. The volumetric flow was measured during sampling with a pitot tube. No reduced sulfur compounds were found at levels above the listed detection limit. Methanol, alpha- and beta-pinene were detected in all runs. No explanation can be found for inconsistent pinene emission rates.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 8.2. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Process data were not submitted. A description of the NCG collection system was provided.

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TABLE 8.1 SUMMARY OF VOC RESULTS

Mill: INLAND - ORANGE
Source Code: IO-NCGEHV
FIN: Note c CIN: C-36, C-28, C-29

Source: NCG Multi-Effect Evap. Hotwell Vent
Test Dates: 7/13/92 7/14/92 7/21/92
EPN: 11

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	97	112	104	
Volumetric Flow Rate, $x10^3$ DSCFM	0.3	0.3	0.3	
Process Operating Conditions				
Production Rate				
Method 16 Data, lb/hr				
Hydrogen sulfide	ND	<0.1	0.1	0.1
Methyl mercaptan	ND	<0.1	0.1	0.1
Dimethyl sulfide	ND	<0.1	0.1	0.1
Carbon disulfide	ND	ND	ND	0.1
Dimethyl disulfide	ND	0.1	0.1	0.1
Method 18 Data, lb/hr				
Methanol	0.4	1.3	0.7	0.1
Ethanol	ND	<0.1	0.1	0.1
Acetone	ND	<0.1	0.1	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	ND	<0.3	0.1	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	<0.1	0.1	0.1
alpha-Pinene	ND	1.5	0.6	0.1
beta-Pinene	ND	0.6	0.3	0.1
3-Carene	ND	<0.1	0.1	0.1
Terpenes (Unspecified)	ND	0.6	0.2	0.1
p-Cymene	ND	<0.1	0.1	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	0.2	2.5	1.1	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	0.2	2.5	1.1	0.1

ND=Not Detected
DL=Detection Limit

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Section 8.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE	Source: NCG Multi-Effect Evap. Hotwell Vent	FIN: Note c
Source Code: IO-NCGEHV	Date: 7/13/92 EPN: 11	CIN: C-36,28,29

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1420	1535	1600	
Flow Data				
Stack Temperature, °F	112			112
Moisture Content, %	9.3			9.3
Oxygen Concentration, %	21.0			21.0
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.4			0.4
Volumetric Flow Rate, x10^3 DSCFM	0.3			0.3
Process Operating Conditions				
Production Rate, tons/hr				
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	20.1 *	20.1 *	20.1 *	20.1 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd	20.1 *	20.1 *	20.1 *	20.1 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl sulfide				
Concentration, ppmvd	20.1 *	20.1 *	20.1 *	20.1 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Carbon disulfide				
Concentration, ppmvd	20.1 *	20.1 *	20.1 *	20.1 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	20.1 *	20.1 *	20.1 *	20.1 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Method 18 Data				
Methanol				
Concentration, ppmvd	353.1	824.0	963.3	713.5
Emission Rate, lb/hr	0.5	1.3	1.5	1.1
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	22.2 *	22.2 *	22.2 *	22.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	22.2 *	22.2 *	22.2 *	22.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	22.2 *	22.2 *	22.2 *	22.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE
Source Code: IO-NCGEHV

Source: NCG Multi-Effect Evap. Hotwell Vent
Date: 7/13/92 EPN: 11

FIN: Note c
CIN: C-36,28,29

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	22.2 *	22.2 *	22.2 *	22.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	44.3 *	44.3 *	44.3 *	44.3 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Benzene				
Concentration, ppmvd	22.2 *	22.2 *	22.2 *	22.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	44.3 *	44.3 *	44.3 *	44.3 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	22.2 *	22.2 *	22.2 *	22.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	22.2 *	22.2 *	22.2 *	22.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	22.2 *	22.2 *	22.2 *	22.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	22.2 *	22.2 *	22.2 *	22.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	22.2 *	22.2 *	22.2 *	22.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	115.5	72.0	94.6	94.0
Emission Rate, lb/hr	0.8	0.5	0.6	0.6
beta-Pinene				
Concentration, ppmvd	74.5	34.0	45.8	51.4
Emission Rate, lb/hr	0.5	0.2	0.3	0.3
3-Carene				
Concentration, ppmvd	22.2 *	22.2 *	22.2 *	22.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	38.6	22.2 *	34.5	28.1
Emission Rate, lb/hr	0.3	0.1 *	0.2	0.2

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE	Source: NCG Multi-Effect Evap. Hotwell Vent		FIN: Note c
Source Code: IO-NCGEHV	Date: 7/13/92	EPN: 11	CIN: C-36,28,29

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	22.2 *	22.2 *	22.2 *	22.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	2345.4	1780.8	2184.3	2103.5
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	1.4	1.0	1.3	1.2
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	2703.4	2260.2	2481.8	2481.8
Emission Rate, lb/hr as C	1.6	1.3	1.4	1.4

COMMENTS :

M18 data for day 1 had detection limits of <20.1 for <0.5 ppm and <40.2 for 1.0 ppm, due to dilution factor.

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE	Source:	NCG Multi-Effect Evap. Hotwell Vent		FIN:	Note c
Source Code: IO-NCGEHV	Date:	7/14/92	EPN: 11	CIN:	C-36,28,29

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1318	1814	1814	
Flow Data				
Stack Temperature, °F	97			97
Moisture Content, %	6.0			6.0
Oxygen Concentration, %	21.0			21.0
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.4			0.4
Volumetric Flow Rate, x10^3 DSCFM	0.3			0.3
Process Operating Conditions				
Production Rate, tons/hr				
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	0.9	0.9	0.9	0.9
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd	15.7	1.2	16.7	11.2
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl sulfide				
Concentration, ppmvd	5.1	0.9	6.2	4.1
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	22.6	2.3	27.9	17.6
Emission Rate, lb/hr	0.1	0.1 *	0.1	0.1
Method 18 Data				
Methanol				
Concentration, ppmvd	301.5	382.3	348.6	344.1
Emission Rate, lb/hr	0.5	0.6	0.6	0.6
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	2.2	0.5 *	2.8	1.8
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	8.9	0.5 *	12.2	7.1
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: NCG Multi-Effect Evap. Hotwell Vent | FIN: Note c

Source Code: IO-NCGEHV | Date: 7/14/92 | EPN: 11 | CIN: C-36,28,29

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 •	0.5 •	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	3.9	1.1 *	4.5	3.0
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 •	1.1 *	1.1 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 •	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 •	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.7	0.5 *	1.1	0.7
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 •
alpha-Pinene				
Concentration, ppmvd	101.1	11.1	105.4	72.5
Emission Rate, lb/hr	0.7	0.1 *	0.7	0.5
beta-Pinene				
Concentration, ppmvd	41.5	5.4	49.4	32.1
Emission Rate, lb/hr	0.3	0.1 *	0.3	0.2
3-Carene				
Concentration, ppmvd	3.2	0.5 *	1.1	1.5
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 •
Terpenes (Unspecified)				
Concentration, ppmvd	21.8	4.6	16.3	14.2
Emission Rate, lb/hr	0.2	0.1 •	0.1	0.1

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: NCG Multi-Effect Evap. Hotwell Vent | FIN: Note c
Source Code: IO-NCGEHV | Date: 7/14/92 | EPN: 11 | CIN: C-36,28,29

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.9	0.5 *	0.5 *	0.5
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	1840.6	477.0	1966.6	1428.1
Unknowns as Carbon				
Concentration, ppmvd	5.6	19.4	20.9	15.3
Sum M18 as Carbon, lb/hr	1.1	0.3	1.2	0.9
Unknown Compounds % of Total	0.3%	3.9%	1.0%	1.8%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C				
Emission Rate, lb/hr as C				

COMMENTS :

M18 data for day 1 had detection limits of <20.1 for <0.5 ppm
and <40.2 for 1.0 ppm, due to dilution factor.

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: NCG Multi-Effect Evap. Hotwell Vent | FIN: Note c
Source Code: IO-NCGEHV | Date: 7/21/92 | EPN: 11 | CIN: C-36,28,29

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1222	1320	1848	
Flow Data				
Stack Temperature, °F	102			102
Moisture Content, %	6.9			6.9
Oxygen Concentration, %	21.0			21.0
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.4			0.4
Volumetric Flow Rate, x10^3 DSCFM	0.3			0.3
Process Operating Conditions				
Production Rate, tons/hr				
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd	7.8	2.8	19.6	10.1
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl sulfide				
Concentration, ppmvd	4.7	2.2	7.9	4.9
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	1.1	1.0	1.3	1.1
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Method 18 Data				
Methanol				
Concentration, ppmvd	303.3	276.6	326.7	302.2
Emission Rate, lb/hr	0.5	0.4	0.5	0.5
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	2.3	1.9	0.5 *	1.5
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	2.4	1.4	0.5 *	1.3
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: NCG Multi-Effect Evap. Hotwell Vent | FIN: Note c
Source Code: IO-NCGEHV | Date: 7/21/92 | EPN: 11 | CIN: C-36,28,29

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.6	1.1 *	1.1 *	0.9
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	5.2	0.5 *	0.5 *	1.9
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	227.0	79.8	4.5	103.8
Emission Rate, lb/hr	1.5	0.5	0.1 *	0.7
beta-Pinene				
Concentration, ppmvd	83.7	17.8	3.0	34.8
Emission Rate, lb/hr	0.6	0.1	0.1 *	0.2
3-Carene				
Concentration, ppmvd	2.1	0.5 *	0.5 *	0.9
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	89.2	34.9	2.5	42.2
Emission Rate, lb/hr	0.6	0.2	0.1 *	0.3

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE
Source Code: IO-NCGEHV

Source: NCG Multi-Effect Evap. Hotwell Vent
Date: 7/21/92 EPN: 11

FIN: Note c
CIN: C-36,28,29

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	2.0	1.3	0.5 *	1.2
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	4129.4	1440.3	328.9	1966.2
Unknowns as Carbon				
Concentration, ppmvd	3.3	0.5	2.0	2.0
Sum M18 as Carbon, lb/hr	2.5	0.9	0.2	1.2
Unknown Compounds % of Total	0.1%	0.0%	0.6%	0.2%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C				
Emission Rate, lb/hr as C				

COMMENTS :

M18 data for day 1 had detection limits of <20.1 for <0.5 ppm
and <40.2 for 1.0 ppm, due to dilution factor.

* One or more values were less than the detection limit.

Section 8.2 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

SOURCE IO-NCGEHV

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR ppm *	DATE ppm *	7/13/92 %REC	DATE ppm **	7/14/92 %REC
ethanol	2.5	0.2	8.0%	29.8	70.9%
acetone	2.0	0.7	34.2%	33.6	100.2%
isopropanol	1.9	0.9	47.1%	28.6	89.1%
benzene	1.7	0.0	0.0%	27.8	83.0%
bromodichloromethane	1.8	1.0	57.2%	29.9	108.7%
toluene	1.4	1.1	78.9%	21.3	71.5%
ethyl benzene	1.2	1.8	148.4%	18.7	68.2%
m-xylene	1.2	1.1	89.3%	18.7	80.7%
o-xylene	1.2	1.0	85.1%	18.4	91.7%
cumene	1.1	1.3	124.4%	16.6	82.6%
alpha-pinene	0.9	1.1	122.2%	14.9	74.0%
beta-pinene	0.9	1.0	108.1%	14.6	82.7%
3-carene	0.9	1.5	162.8%	23.1	149.4%
p-cymene	0.9	0.8	81.3%	14.2	91.7%

2. PROPANE RESPONSE

	THEOR		%REC	***	%REC
BEFORE	94.2	84.6	89.8%	27.0	75.0%
AFTER	94.2	81.5	86.5%	34.3	95.3%

3. METHANOL LINE RECOVERY

	7/13/92 GC	7/13/92 LINE	7/13/92 %REC	7/14/92 GC	7/14/92 LINE	7/14/92 %REC
BEFORE	NA			NA		
AFTER	NA			NA		

4. LINE BLANK

	[--------------FILE REF--------------]	
BEFORE	NA	NA
AFTER	NA	NA

NA = Not applicable for bag standards
* 917-47-5
** 917-47-3
***THEOR = 36ppm

SOURCE IO-NCGEHV

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR ppm	DATE ppm *	7/21/92 %REC	
ethanol	41.9	35.3	84.2%	
acetone	33.5	33.1	98.6%	
isopropanol	32.2	28.9	89.8%	
DMS	33.5	32.1	95.8%	
benzene	27.5	31.1	113.0%	
bromodichloromethane	29.7	27.4	92.0%	
DMDS	27.3	26.0	95.0%	
toluene	23.2	22.6	97.6%	
ethyl benzene	20.1	19.9	99.1%	
m-xylene	20.1	20.0	99.7%	
o-xylene	20.2	20.0	98.9%	
cumene	17.7	17.3	97.8%	
alpha-pinene	15.4	15.2	98.4%	
beta-pinene	15.5	14.7	94.6%	
3-carene	15.5	14.8	95.4%	
p-cymene	15.8	15.2	96.6%	

2. PROPANE RESPONSE

	THEOR		%REC	
BEFORE	36.0	34.6	96.1%	
AFTER	36.0	33.7	93.6%	

3. METHANOL LINE RECOVERY

	QC	7/21/92 LINE	%REC	
BEFORE	NA			
AFTER	NA			

4. LINE BLANK

	[------------FILE REF------------]	
BEFORE	NA	
AFTER	NA	

NA = Not applicable for bag samples
* One sample (IBS3) run on Channel A - see LK/1 for QC

QUALITY CONTROL SUMMARY
METHOD 16

1. CALIBRATION

ANALYTE	LO ppm	MED ppm	HI ppm	CORR COEFF
7/14/92 *				
hydrogen sulfide	2.0	3.7	6.2	0.9994
methyl mercaptan	1.9	3.5	5.7	0.9994
dimethyl sulfide	2.6	4.8	7.9	0.9995
carbon disulfide	0.8	1.5	2.5	0.9969
dimethyl disulfide	1.1	2.1	3.4	0.9996
7/24/92				
hydrogen sulfide	2.9	4.5	8.3	0.9987
methyl mercaptan	2.7	4.2	7.7	0.9992
dimethyl sulfide	3.7	5.8	10.7	0.9997
carbon disulfide	1.2	1.8	3.4	0.9998
dimethyl disulfide	1.6	2.5	4.6	0.9993

* Calibration from 7/13/92 checked and used on 7/14/92

Section 8.3 Process Operating Data

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(L) WWC 31 December 1992

MULTIPLE-EFFECT EVAPORATORS

The multiple-effect evaporators are a six body set numbered sequentially in the direction of steam/vapor flow. They were rated at 10,740 gpm liquor discharge at fifty percent solids. The design steam feed rate was 148,500 pounds per hour at 165 psig. The current configuration features split liquor feed to the fourth and fifth bodies with the fifth effect liquor progressing to the sixth effect prior to injection to the fourth effect. Fourth effect liquor then progresses sequentially to the third effect, soap skimming, first effect, then the second effect prior to discharge to heavy liquor storage.

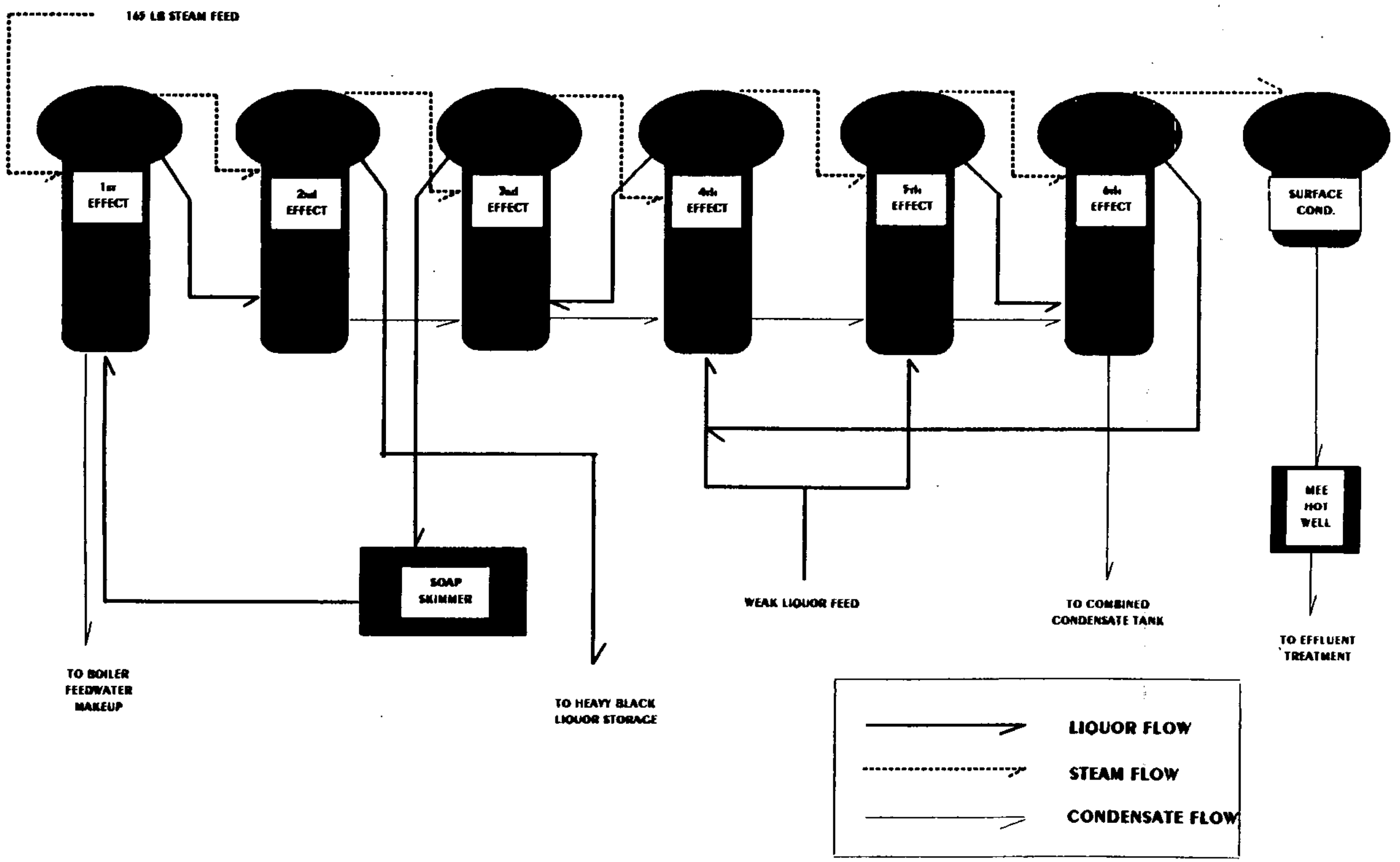
The steam condensate from the first effect is collected and returned to boiler feedwater make-up while the surface condenser condensate (from the sixth effect evaporation) is piped directly to effluent treatment. The condensate from the second through sixth effect bodies is collected as combined condensate and is the primary constituent of water used in pulp washing.

Non-condensable gases are collected from the evaporator hot well and from the combined condensate storage tank.

Representative Process Conditions

Evaporator Rate (Lb. BLS/hr):	7/13/92	213,236
	7/14/92	196,898
	7/21/92	178,537

MULTIPLE EFFECT EVAPORATOR FLOW SCHEMATIC



WESTON
MANAGERS DESIGNERS/CONSULTANTS

SECTION 9

NCG CHEMIWASHER FILTRATE TANK VENT

(IO-NCGCFT, IO-NCGCHV)

SECTION 9
NCG CHEMIWASHER FILTRATE TANK VENT
(IO-NCGCFT, IO-NCGCHV)

The Combined NCG Chemiwasher Vent was tested on two different days for volatile organic compounds. Bag samples were collected and analyzed with a tenfold dilution.

Volatile Organic Compounds (M16 and M18)

Table 9.1 summarizes the results for the Method 16 and Method 18 target compounds, and Section 9.1 is a tabulation of the data. The volumetric flow was measured during sampling with a pitot tube. Hydrogen sulfide and carbon disulfide were not identified by Method 16. Concentrations of methyl mercaptan and dimethyl sulfide were detected by Method 18 on 7/23/92. Of the remaining target compounds, methanol and alpha- and beta-pinene concentrations were at significant levels.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 9.2. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 9.3 includes the process operating data as recorded and provided by mill personnel. Process data were not given for all run times. The data with the closest run time was used.

WESTON

TABLE 9.1 SUMMARY OF VOC RESULTS

Mill: INLAND - ORANGE
Source Code: IO-NCGCFT
FIN: T-CWFLT CIN: C-36, C-29

Source: NCG Chemiwasher Filtrate Tank Vent
Test Dates: 7/23/92 7/24/92
EPN: 11

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	111	120	116	
Volumetric Flow Rate, x10^3 DSCFM	0.3	0.3	0.3	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	39.6	39.6	39.6	
Method 16 Data, lb/hr				
Hydrogen sulfide	ND	ND	ND	0.1
Carbon disulfide	ND	ND	ND	0.1
Method 18 Data, lb/hr				
Methanol	0.3	0.4	0.4	0.1
Methyl mercaptan	ND	2.3	0.6	0.2
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
Dimethyl sulfide	ND	0.3	0.2	0.2
2-Butanone	ND	ND	ND	0.1
Chloroform	ND	ND	ND	0.1
Benzene	ND	ND	ND	0.1
Dimethyl disulfide	ND	ND	ND	0.4
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	21.7	39.9	30.4	0.1
beta-Pinene	6.9	13.0	9.3	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	1.5	3.2	2.3	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	25.5	46.9	35.2	0.1
Unknowns as C, lb/hr	0.1	0.1	0.1	0.1
Sum of Compounds as C, lb/hr	25.6	47.0	35.3	0.1

ND=Not Detected
DL=Detection Limit

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(L) WWC (R) SRG 19 January 1993

Section 9.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: NCG Chemiwasher Filtrate Tank Vent | FIN: T-CWFLT
Source Code: IO-NCGCFT | Date: 7/23/92 | EPN: 11 | CIN: C-36, C-29

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1415	1515	1615	
Flow Data				
Stack Temperature, °F			111	111
Moisture Content, %			8.9	8.9
Oxygen Concentration, %			12.0	12.0
Carbon Dioxide Concentration, %			0.0	0.0
Volumetric Flow Rate, x10^3 ACFM			0.4	0.4
Volumetric Flow Rate, x10^3 DSCFM			0.3	0.3
Process Operating Conditions				
Production Rate, ADT pulp/hr	39.6	39.6	39.6	39.6
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	5.0 *	5.0 •	5.0 *	5.0 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd	5.0 *	5.0 *	5.0 *	5.0 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	272.3	242.4	197.4	237.4
Emission Rate, lb/hr	0.4	0.4	0.3	0.4
Methyl mercaptan				
Concentration, ppmvd	87.8 *	1001.1	339.2	461.4
Emission Rate, lb/hr	0.2 *	2.3	0.8	1.1
Ethanol				
Concentration, ppmvd	87.8 *	87.8 *	87.8 *	87.8 *
Emission Rate, lb/hr	0.2 •	0.2 *	0.2 *	0.2 *
Acetone				
Concentration, ppmvd	87.8 •	87.8 *	87.8 *	87.8 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
2-Propanol				
Concentration, ppmvd	87.8 •	87.8 *	87.8 *	87.8 *
Emission Rate, lb/hr	0.3 •	0.3 *	0.3 •	0.3 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE
Source Code: IO-NCGCFT

Source: NCG Chemiwasher Filtrate Tank Vent
Date: 7/23/92 EPN: 11

FIN: T-CWFLT
CIN: C-36, C-29

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd	87.8 *	99.9	87.8 *	62.6
Emission Rate, lb/hr	0.3 *	0.3	0.3 *	0.2
2-Butanone				
Concentration, ppmvd	87.8 *	87.8 *	87.8 *	87.8 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Chloroform				
Concentration, ppmvd	175.6 *	175.6 *	175.6 *	175.6 *
Emission Rate, lb/hr	1.0 *	1.0 *	1.0 *	1.0 *
Benzene				
Concentration, ppmvd	87.8 *	87.8 *	87.8 *	87.8 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Bromodichloromethane				
Concentration, ppmvd	175.6 *	175.6 *	175.6 *	175.6 *
Emission Rate, lb/hr	1.4 *	1.4 *	1.4 *	1.4 *
Dimethyl disulfide				
Concentration, ppmvd	87.8 *	87.8 *	87.8 *	87.8 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Toluene				
Concentration, ppmvd	87.8 *	87.8 *	87.8 *	87.8 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Ethyl benzene				
Concentration, ppmvd	87.8 *	87.8 *	87.8 *	87.8 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
m-, p-Xylene				
Concentration, ppmvd	87.8 *	87.8 *	87.8 *	87.8 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
o-Xylene				
Concentration, ppmvd	87.8 *	87.8 *	87.8 *	87.8 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Cumene				
Concentration, ppmvd	87.8 *	87.8 *	87.8 *	87.8 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
alpha-Pinene				
Concentration, ppmvd	4675.2	4770.0	3282.4	4242.6
Emission Rate, lb/hr	30.9	31.6	21.7	28.1
beta-Pinene				
Concentration, ppmvd	1505.8	1267.2	1050.5	1274.5
Emission Rate, lb/hr	10.0	8.4	7.0	8.4
3-Carene				
Concentration, ppmvd	87.8 *	87.8 *	87.8 *	87.8 *
Emission Rate, lb/hr	0.6 *	0.6 *	0.6 *	0.6 *
Terpenes (Unspecified)				
Concentration, ppmvd	325.8	323.6	252.9	300.8
Emission Rate, lb/hr	2.2	2.1	1.7	2.0

*One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE	Source:	NCG Chemiwasher Filtrate Tank Vent		FIN:	T-CWFLT
Source Code: IO-NCGCFT	Date:	7/23/92	EPN: 11	CIN:	C-36, C-29

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	87.8 *	87.8 *	87.8 *	87.8 *
Emission Rate, lb/hr	0.6 *	0.6 *	0.6 *	0.6 *
Knowns as Carbon				
Concentration, ppmvd	61936.9	60793.4	43702.2	55477.5
Unknowns as Carbon				
Concentration, ppmvd	116.5	133.7	140.5	130.2
Sum M18 as Carbon, lb/hr	36.2	35.6	25.6	32.5
Unknown Compounds % of Total	0.2%	0.2%	0.3%	0.2%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C				
Emission Rate, lb/hr as C				

COMMENTS :

M16 detection limit for <0.5 is <5 ppm due to dilution factor.
M18 detection limit for <0.5 is <80 ppm and for <1.0 is <160 ppm due to dilution factor and range change.

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE
Source Code: IO-NCGCFT

Source: NCG Chemiwasher Filtrate Tank Vent
Date: 7/24/92 EPN: 11

FIN: T-CWFLT
CIN: C-36, C-29

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	700	815	900	
Flow Data				
Stack Temperature, °F			120	120
Moisture Content, %			11.5	11.5
Oxygen Concentration, %			12.0	12.0
Carbon Dioxide Concentration, %			0.0	0.0
Volumetric Flow Rate, x10^3 ACFM			0.3	0.3
Volumetric Flow Rate, x10^3 DSCFM			0.3	0.3
Process Operating Conditions				
Production Rate, ADT pulp/hr	39.6	39.6	39.6	39.6
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	5.0 *	5.0 *	5.0 *	5.0 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd	5.0 *	5.0 *	5.0 *	5.0 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	186.1	315.9	275.9	259.3
Emission Rate, lb/hr	0.3	0.4	0.4	0.4
Methyl mercaptan				
Concentration, ppmvd	90.4 *	90.4 *	90.4 *	90.4 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Ethanol				
Concentration, ppmvd	90.4 *	90.4 *	90.4 *	90.4 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Acetone				
Concentration, ppmvd	90.4 *	90.4 *	90.4 *	90.4 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
2-Propanol				
Concentration, ppmvd	90.4 *	90.4 *	90.4 *	90.4 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: NCG Chemiwasher Filtrate Tank Vent | FIN: T-CWFLT
Source Code: IO-NCGCFT | Date: 7/24/92 | EPN: 11 | CIN: C-36, C-29

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd	90.4 *	90.4 *	90.4 *	90.4 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
2-Butanone				
Concentration, ppmvd	90.4 *	90.4 *	90.4 *	90.4 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Chloroform				
Concentration, ppmvd	180.8 *	180.8 *	180.8 *	180.8 *
Emission Rate, lb/hr	0.9 *	0.9 *	0.9 *	0.9 *
Benzene				
Concentration, ppmvd	90.4 *	90.4 *	90.4 *	90.4 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Bromodichloromethane				
Concentration, ppmvd	180.8 *	180.8 *	180.8 *	180.8 *
Emission Rate, lb/hr	1.3 *	1.3 *	1.3 *	1.3 *
Dimethyl disulfide				
Concentration, ppmvd	90.4 *	90.4 *	90.4 *	90.4 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Toluene				
Concentration, ppmvd	90.4 *	90.4 *	90.4 *	90.4 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Ethyl benzene				
Concentration, ppmvd	90.4 *	90.4 *	90.4 *	90.4 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
m-, p-Xylene				
Concentration, ppmvd	90.4 *	90.4 *	90.4 *	90.4 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
o-Xylene				
Concentration, ppmvd	90.4 *	90.4 *	90.4 *	90.4 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Cumene				
Concentration, ppmvd	90.4 *	90.4 *	90.4 *	90.4 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
alpha-Pinene				
Concentration, ppmvd	4154.2	5711.9	6781.2	5549.1
Emission Rate, lb/hr	24.4	33.6	39.9	32.6
beta-Pinene				
Concentration, ppmvd	1170.6	1838.2	2211.0	1739.9
Emission Rate, lb/hr	6.9	10.8	13.0	10.2
3-Carene				
Concentration, ppmvd	90.4 *	90.4 *	90.4 *	90.4 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Terpenes (Unspecified)				
Concentration, ppmvd	247.1	471.8	540.6	419.8
Emission Rate, lb/hr	1.5	2.8	3.2	2.5

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill:	INLAND - ORANGE	Source:	NCG Chemiwasher Filtrate Tank Vent	FIN:	T-CWFLT
Source Code:	IO-NCGCFT	Date:	7/24/92 EPN: 11	CIN:	C-36, C-29

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	90.4 *	90.4 *	90.4 *	90.4 *
Emission Rate, lb/hr	0.5 *	0.5 •	0.5 *	0.5 *
Knowns as Carbon				
Concentration, ppmvd	52932.4	76237.1	90385.0	73184.8
Unknowns as Carbon				
Concentration, ppmvd	138.3	111.6	171.6	140.5
Sum M18 as Carbon, lb/hr	27.5	39.6	47.0	38.1
Unknown Compounds % of Total	0.3%	0.1%	0.2%	0.2%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C				
Emission Rate, lb/hr as C				

COMMENTS :

M16 detection limit for <0.5 is <5 ppm due to dilution factor.
M18 detection limit for <0.5 is <80 ppm and for <1.0 is <160 ppm due to dilution factor and range change.

* One or more values were less than the detection limit.

Section 9.2 Quality Control Results

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QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

SOURCE IO-NCGCFT / IO-NCGCHV

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR ppm	DATE ppm	7/23/92 %REC	DATE ppm	7/24/92 %REC
ethanol	41.9	18.8	44.8%	19.7	46.9%
acetone	33.5	14.5	43.2%	18.0	53.8%
isopropanol	32.2	29.1	90.6%	27.8	86.5%
DMS	33.5	29.0	86.6%	27.9	83.1%
benzene	27.5	25.0	90.9%	25.7	93.5%
bromodichloromethane	29.7	24.9	83.8%	25.1	84.5%
DMDS	27.3	23.3	85.3%	22.4	82.0%
toluene	23.2	17.9	77.3%	20.2	87.1%
ethyl benzene	20.1	17.1	85.2%	16.2	80.5%
m-xylene	20.1	19.0	94.7%	15.9	79.1%
o-xylene	20.2	17.5	86.9%	16.4	81.5%
cumene	17.7	14.3	80.7%	14.6	82.3%
alpha-pinene	15.4	14.6	94.5%	13.9	89.9%
beta-pinene	15.5	14.2	91.7%	13.5	86.7%
3-carene	15.5	13.4	86.3%	11.8	76.0%
p-cymene	15.8	11.2	71.2%	11.3	71.6%

2. PROPANE RESPONSE

	THEOR		%REC		%REC
BEFORE	36.0	34.3	95.3%	35.5	98.6%
AFTER	36.0	35.5	98.6%	34.8	96.7%

3. METHANOL LINE RECOVERY

	7/23/92			7/24/92		
	GC	LINE	%REC	GC	LINE	%REC
BEFORE	NA			NA		
AFTER	NA			NA		

4. LINE BLANK

	[------------FILE REF	------------]
BEFORE	NA	NA
AFTER	NA	NA

NA = Not applicable for bag samples

SOURCE IO-NCGCFT

QUALITY CONTROL SUMMARY
METHOD 16

1. CALIBRATION

ANALYTE	LO ppm	MED ppm	HI ppm	CORR COEFF
7/23/92 *				
hydrogen sulfide	2.2	3.2	8.2	0.9996
methyl mercaptan	2.0	2.9	7.6	0.9998
dimethyl sulfide	2.8	4.1	10.6	0.9999
carbon disulfide	0.9	1.3	3.3	0.9999
dimethyl disulfide	1.2	1.8	4.6	0.9999
7/24/92				
hydrogen sulfide	2.9	4.5	8.3	0.9987
methyl mercaptan	2.7	4.2	7.7	0.9992
dimethyl sulfide	3.7	5.8	10.7	0.9997
carbon disulfide	1.2	1.8	3.4	0.9998
dimethyl disulfide	1.6	2.5	4.6	0.9993

* Calibration from 7/21/92 was checked and used .

Section 9.3 Process Operating Conditions

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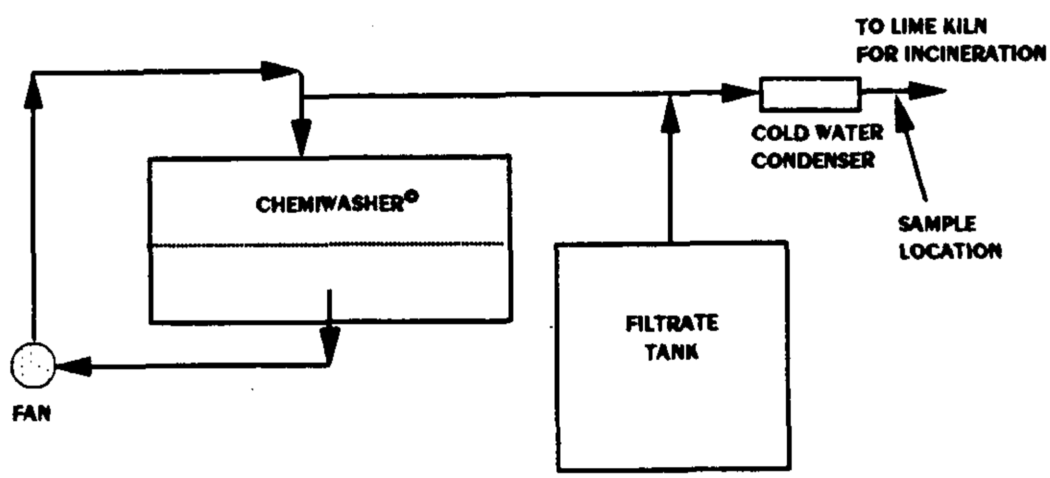
CHEMIWASHER

The Chemiwasher was a flat belt pulp washer designed to wash 1,400 ADT per day. The design wash water feed rate was 1,600 gpm of evaporator combined condensate that has fresh water make-up to maintain the appropriate level in the storage tank.

The air was pulled from the bottom of the belt and reinjectd on the top side. A slip stream was wasted to the LEL (lower explosive limit) NCG system and combined with gases from the filtrate tank prior to condensation and incineration in the lime kiln.

LEL (CHEMIWASHER) NCG SYSTEM CONFIGURATION

INLAND-ORANGE ORANGE, TEXAS



BROWN STOCK WASHER - PROCESS OPERATING CONDITIONS

Mill:	INLAND-ORANGE	Source:	NCG CHEMIWASHER SYST
Source:	IO-NCGCFT	Date:	JULY 23,1992
FIN:	T-CWFLT	EPN:	100 CIN:

INPUT DATA	Unit	Run 1	Run 2	Run 3	Average
Beginning Time		1230			
Measured Parameter					
Wood Species	HW or SW	SW			0.00
Pulp Flow TPD	ADT/day	950			0
Shower Water Source		*			0.00
Shower Water Flow Rate	GPM	988			0.0
Shower Water Temperature	degree F	159.0			0.0
Vat Temperature	degree F	163			0.000

* HEATED MILL WATER FROM BLACK LIQUOR EXCHANGE

Mill:	INLAND-ORANGE	Source:	NCG CHEMIWASHER SYSTEM
Source:	IO-NCGCFT	Date:	JULY 24,1992
FIN:	T-CWFLT	EPN:	100 CIN:

INPUT DATA		Unit	Run 1	Run 2	Run 3
Beginning Time			638		
Measured Parameter					
Wood Species		HW or SW	SW		
Pulp Flow	TPD	ADT/day	950		
Shower Water Source			*		
Shower Water Flow Rate		GPM	1100		
Shower Water Temperature		degree F	163		
Vat Temperature		degree F	163		

* HEATED MILL WATER FROM BLACK LIQUOR EXCHANGE

SECTION 10

TALL OIL REACTOR SCRUBBER STACK

(IO-TORV)

Section 10.1 Emission Test Results - VOC

Section 10.2 Quality Control Results

Section 10.3 Process Operating Conditions

10. IO-TORV

SECTION 10
TALL OIL REACTOR SCRUBBER STACK
(IO-TORV)

The Tall Oil Reactor Scrubber Stack was tested on three different days for volatile organic compounds by Methods 25A, 16, and 18.

Total Hydrocarbons (M25A)

Figures 10.1, 10.2, and 10.3 present the THC trends for the test periods on 7/13/92, 7/14/92, and 7/22/92. A third test period was performed to better profile the cook using a different dilution. Differences in the trend plots could be attributed to a variation in operating parameters. The valley on the trend plot for 7/14/92 at 1442 was attributed to a problem with the process. Total hydrocarbon levels on 7/22/92 were approximately 30 percent of those on the other two days. No explanation can be given.

Volatile Organic Compounds (M16 and M18)

Table 10.1 summarizes the results for the Method 16 and Method 18 target compounds, and Section 10.1 is a tabulation of the data. The volumetric flow was measured during sampling with a pitot tube. Hydrogen sulfide and dimethyl sulfide were detected by Method 16. Method 18 compounds identified include methanol, alpha- and beta-pinene, p-cymene, and various unspecified terpenes.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 10.2. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 10.3 includes the process operating data as recorded and provided by mill personnel. Process operating data were not given for all run times. The data with the closest run time was used.

FIGURE 10.1
THC TREND ANALYSIS (7/13/92)
TALL OIL REACTOR SCRUBBER STACK
(IO-TORV)

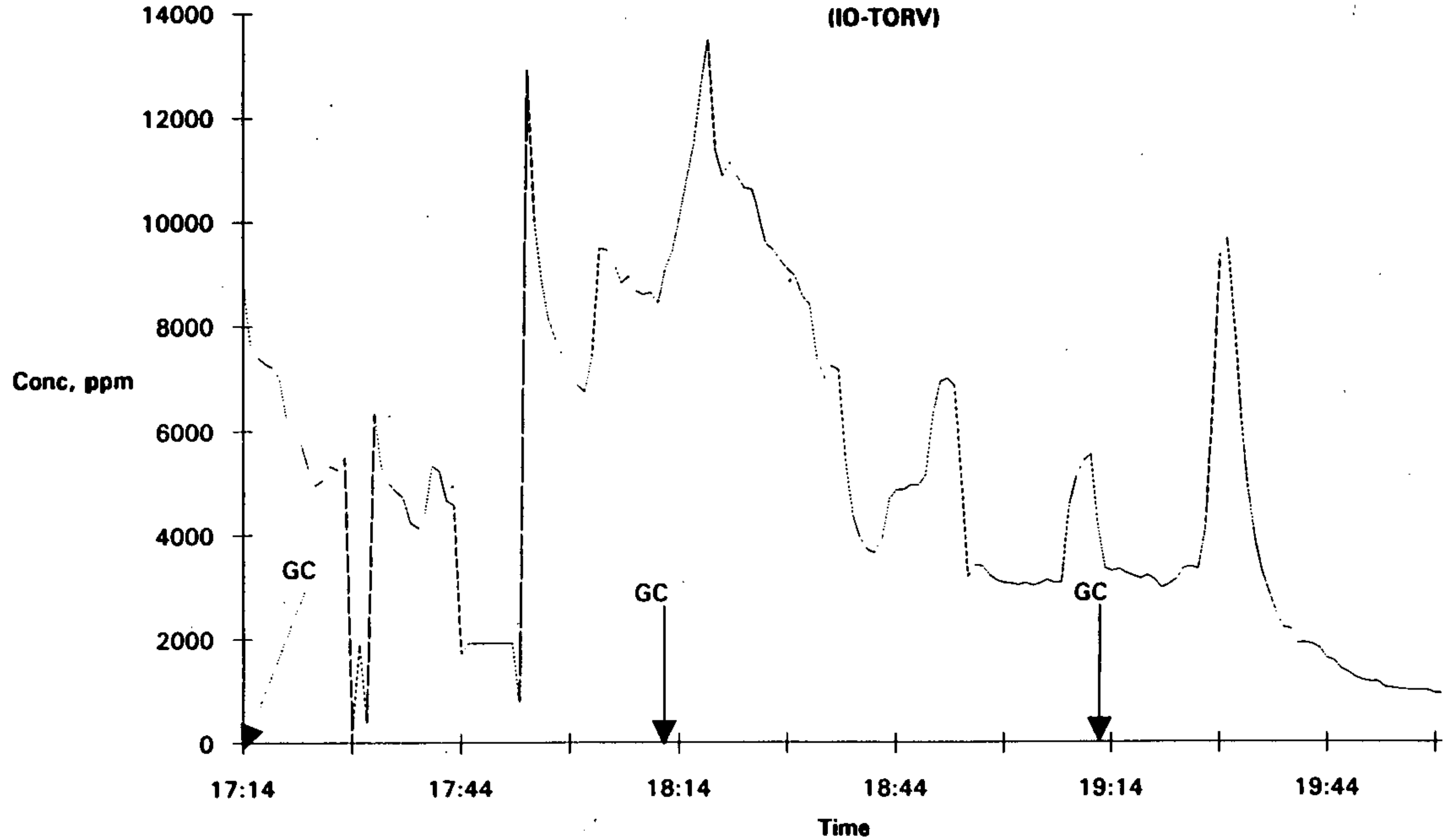


FIGURE 10.2
THC TREND ANALYSIS (7/14/92)
TALL OIL REACTOR SCRUBBER STACK
(IO-TORV)

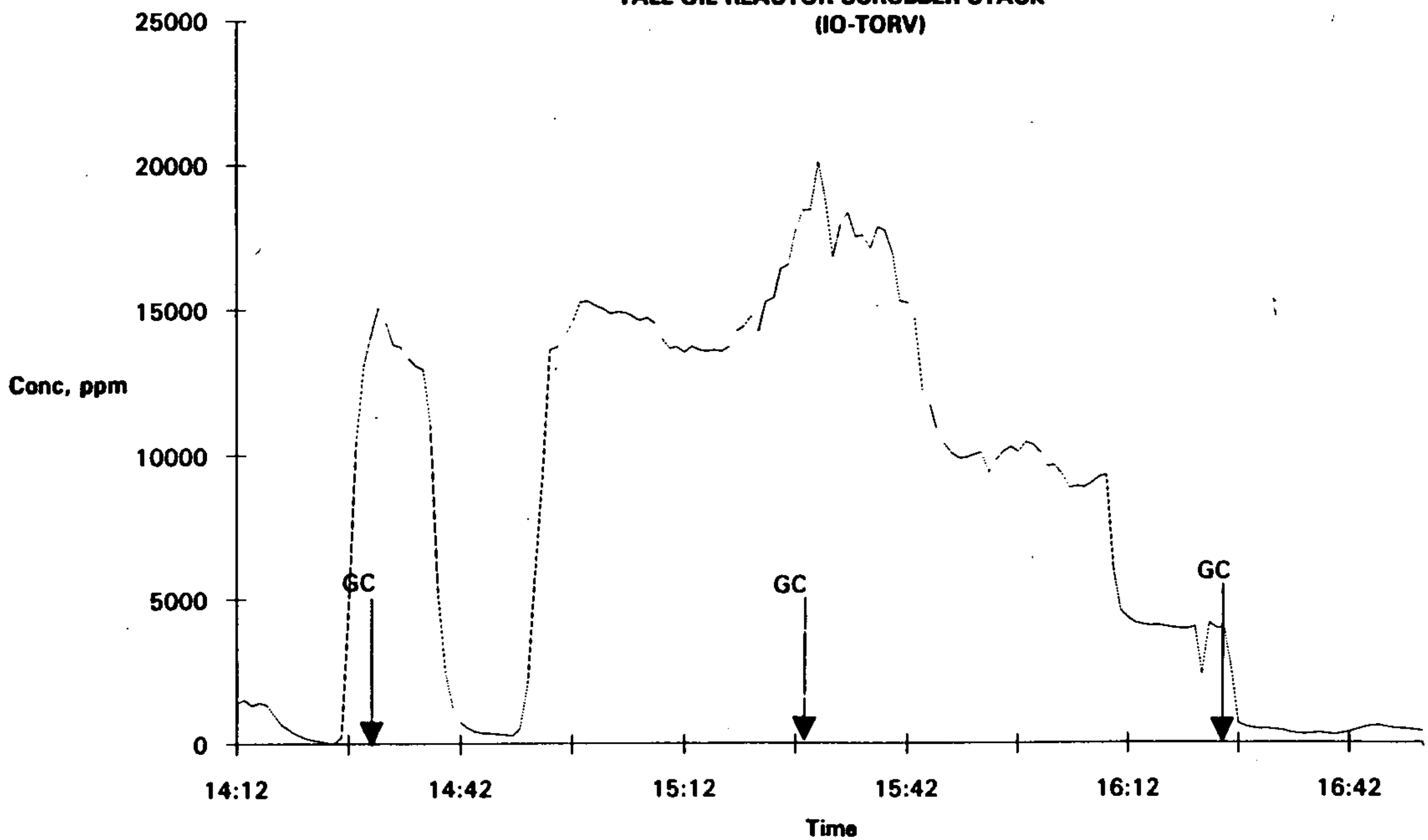


FIGURE 10.3
THC TREND ANALYSIS (7/22/92)
TALL OIL REACTOR SCRUBBER STACK
(IO-TORV)

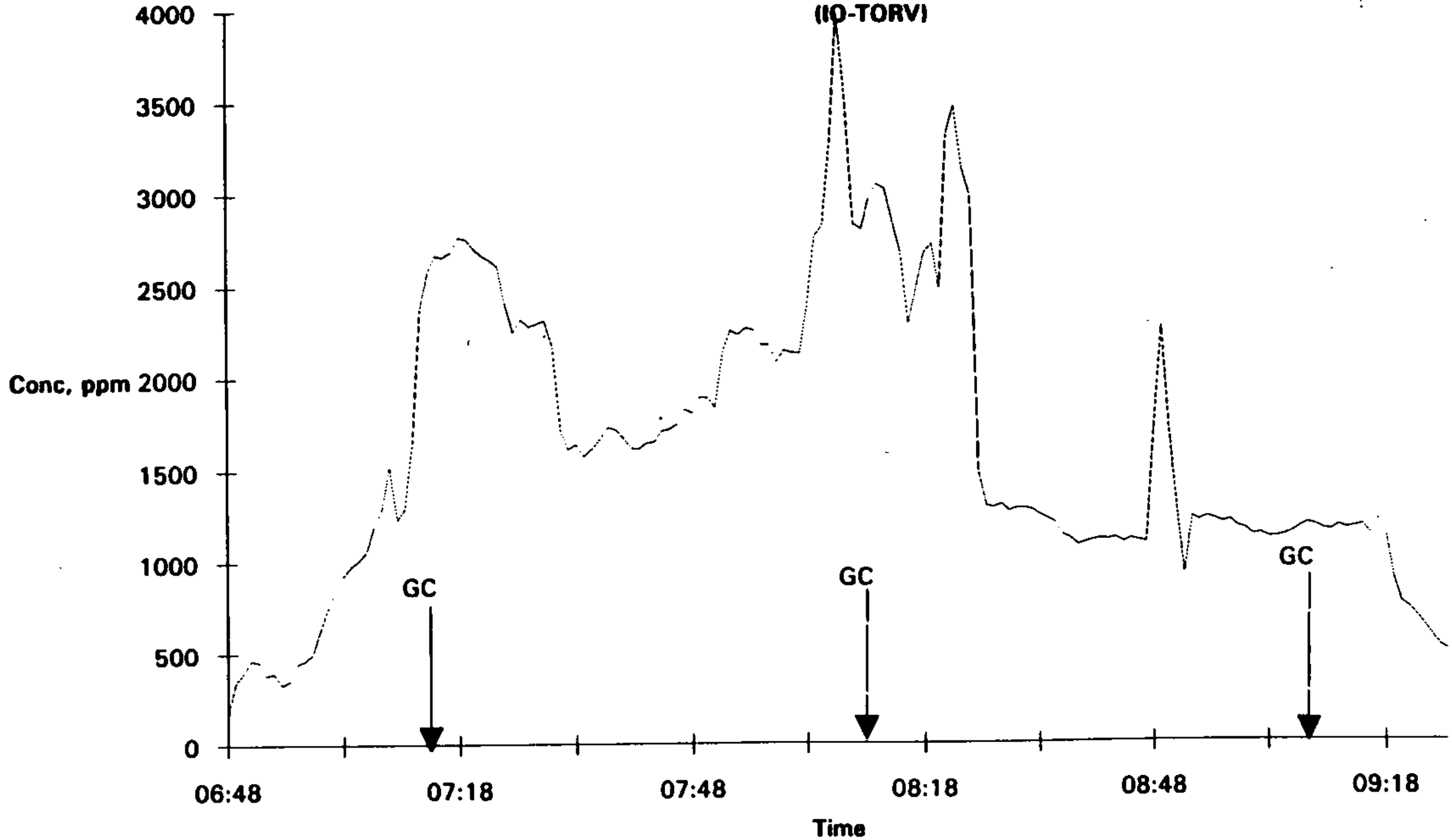


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TABLE 10.1 SUMMARY OF VOC RESULTS

Mill: INLAND - ORANGE
Source Code: IO-TORV
FIN: P-TOR CIN: C-31

Source: Tall Oil Reactor Scrubber Stack
Test Dates: 7/13/92 7/14/92 7/22/92
EPN: 12

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	106	127	113	
Volumetric Flow Rate, x10³ DSCFM	2.6	3.3	3.1	
Process Operating Conditions				
Production Rate, GPM	204.0	221.0	215.0	
Method 16 Data, lb/hr				
Hydrogen sulfide	ND	0.3	0.4	0.1
Methyl mercaptan	ND	ND	ND	0.1
Dimethyl sulfide	ND	1.5	0.9	0.1
Carbon disulfide	ND	ND	ND	0.1
Dimethyl disulfide	ND	ND	ND	0.1
Method 18 Data, lb/hr				
Methanol	ND	5.0	2.4	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	4.5	1.3	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	ND	ND	ND	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	6.7	231.9	78.4	0.1
beta-Pinene	1.6	64.8	22.0	0.1
3-Carene	ND	9.4	2.3	0.1
Terpenes (Unspecified)	1.8	123.2	33.1	0.1
p-Cymene	ND	15.5	3.8	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	8.7	364.5	124.6	0.1
Unknowns as C, lb/hr	ND	5.6	1.1	0.1
Sum of Compounds as C, lb/hr	8.7	370.1	125.8	0.1

ND=Not Detected
DL=Detection Limit

Section 10.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: Tall Oil Reactor Scrubber Stack | FIN: P-TOR
Source Code: IO-TORV | Date: 7/13/92 | EPN: 12 | CIN: C-31

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1714	1755	1855	
Flow Data				
Stack Temperature, °F	106			106
Moisture Content, %	4.9			4.9
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	3.7			3.7
Volumetric Flow Rate, x10^3 DSCFM	3.3			3.3
Process Operating Conditions				
Production Rate, GPM	221.0	221.0	221.0	221.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd		97.5 *	97.5 *	97.5 *
Emission Rate, lb/hr		1.7 *	1.7 *	1.7 *
Methyl mercaptan				
Concentration, ppmvd		97.5 *	97.5 *	97.5 *
Emission Rate, lb/hr		2.4 *	2.4 *	2.4 *
Dimethyl sulfide				
Concentration, ppmvd		97.5 *	97.5 *	97.5 *
Emission Rate, lb/hr		3.1 *	3.1 *	3.1 *
Carbon disulfide				
Concentration, ppmvd		97.5 *	97.5 *	97.5 *
Emission Rate, lb/hr		3.8 *	3.8 *	3.8 *
Dimethyl disulfide				
Concentration, ppmvd		97.5 •	97.5 *	97.5 *
Emission Rate, lb/hr		4.7 *	4.7 *	4.7 •
Method 18 Data				
Methanol				
Concentration, ppmvd	184.9	256.2	179.9	207.0
Emission Rate, lb/hr	3.0	4.2	2.9	3.4
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	102.5 *	102.5 •	102.5 •	102.5 •
Emission Rate, lb/hr	2.4 *	2.4 *	2.4 •	2.4 •
Acetone				
Concentration, ppmvd	218.4	102.5 *	102.5 *	107.0
Emission Rate, lb/hr	6.5	3.0 *	3.0 *	3.2
2-Propanol				
Concentration, ppmvd	102.5 *	102.5 *	102.5 *	102.5 •
Emission Rate, lb/hr	3.1 *	3.1 *	3.1 *	3.1 •

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE
Source Code: IO-TORV

Source: Tall Oil Reactor Scrubber Stack
Date: 7/13/92 EPN: 12

FIN: P-TOR
CIN: C-31

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	102.5 *	102.5 *	102.5 *	102.5 *
Emission Rate, lb/hr	3.8 *	3.8 *	3.8 *	3.8 *
Chloroform				
Concentration, ppmvd	205.0 *	205.0 *	205.0 *	205.0 *
Emission Rate, lb/hr	12.4 *	12.4 *	12.4 *	12.4 *
Benzene				
Concentration, ppmvd	102.5 *	102.5 *	102.5 *	102.5 *
Emission Rate, lb/hr	4.1 *	4.1 *	4.1 *	4.1 *
Bromodichloromethane				
Concentration, ppmvd	205.0 *	205.0 *	205.0 *	205.0 *
Emission Rate, lb/hr	17.1 *	17.1 *	17.1 *	17.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	102.5 *	102.5 *	102.5 *	102.5 *
Emission Rate, lb/hr	4.8 *	4.8 *	4.8 *	4.8 *
Ethyl benzene				
Concentration, ppmvd	102.5 *	102.5 *	102.5 *	102.5 *
Emission Rate, lb/hr	5.5 *	5.5 *	5.5 *	5.5 *
m-, p-Xylene				
Concentration, ppmvd	102.5 *	102.5 *	102.5 *	102.5 *
Emission Rate, lb/hr	5.5 *	5.5 *	5.5 *	5.5 *
o-Xylene				
Concentration, ppmvd	102.5 *	102.5 *	102.5 *	102.5 *
Emission Rate, lb/hr	5.5 *	5.5 *	5.5 *	5.5 *
Cumene				
Concentration, ppmvd	102.5 *	102.5 *	102.5 *	102.5 *
Emission Rate, lb/hr	6.3 *	6.3 *	6.3 *	6.3 *
alpha-Pinene				
Concentration, ppmvd	3109.9	3344.5	330.2	2261.5
Emission Rate, lb/hr	215.7	231.9	22.9	156.8
beta-Pinene				
Concentration, ppmvd	851.8	934.0	102.5 *	612.4
Emission Rate, lb/hr	59.1	64.8	7.1 *	42.5
3-Carene				
Concentration, ppmvd	102.5 *	102.5 *	139.1	80.5
Emission Rate, lb/hr	7.1 *	7.1 *	9.6	5.6
Terpenes (Unspecified)				
Concentration, ppmvd	751.4	1775.9	244.9	924.1
Emission Rate, lb/hr	52.1	123.2	17.0	64.1

*One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE	Source:	Tall Oil Reactor Scrubber Stack			FIN:	P-TOR
Source Code: IO-TORV	Date:	7/13/92	EPN:	12	CIN:	C-31

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	102.5 *	226.3	102.5 *	109.6
Emission Rate, lb/hr	7.0 *	15.5	7.0 *	7.5
Knowns as Carbon				
Concentration, ppmvd	59566.1	58235.0	7547.7	41783.0
Unknowns as Carbon				
Concentration, ppmvd	920.4	60.5	0.0	327.0
Sum M18 as Carbon, lb/hr	370.1	356.7	46.2	257.7
Unknown Compounds % of Total	1.5%	0.1%	0.0%	0.5%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	6500.5	8242.9	3465.8	6069.8
Emission Rate, lb/hr as C	39.8	50.4	21.2	37.1

COMMENTS :

Velocity data for 7/14 was taken from 7/13.

Detection limits due to dilution factors are as follows :

7/13 <0.5 ppm is <97.5 ppm ; <1.0 ppm is <195 ppm.
7/14 <0.5 ppm is <8.2 ppm ; <1.0 ppm is <16.3 ppm.
7/22 <0.5 ppm is <14.5 ppm ; <1.0 ppm is < 29 ppm.

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE	Source:	Tall Oil Reactor Scrubber Stack		FIN:	P-TOR
Source Code: IO-TORV	Date:	7/14/92	EPN: 12	CIN:	C-31

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1411	1511	1611	
Flow Data				
Stack Temperature, °F	106			106
Moisture Content, %	4.9			4.9
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	3.7			3.7
Volumetric Flow Rate, x10^3 DSCFM	3.3			3.3
Process Operating Conditions				
Production Rate, GPM	221.0	221.0	221.0	221.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	18.8	15.8	16.1	16.9
Emission Rate, lb/hr	0.3	0.3	0.3	0.3
Methyl mercaptan				
Concentration, ppmvd	8.2 *	8.2 *	8.2 *	8.2 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Dimethyl sulfide				
Concentration, ppmvd	9.2	8.2 *	10.0	7.8
Emission Rate, lb/hr	0.3	0.3 *	0.3	0.2
Carbon disulfide				
Concentration, ppmvd	8.2 *	8.2 *	8.2 *	8.2 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Dimethyl disulfide				
Concentration, ppmvd	8.2 *	8.2 *	8.2 *	8.2 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Method 18 Data				
Methanol				
Concentration, ppmvd	72.5	308.6	185.8	188.9
Emission Rate, lb/hr	1.2	5.0	3.0	3.1
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	8.6 *	8.6 *	8.6 *	8.6 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Acetone				
Concentration, ppmvd	8.6 *	8.6 *	8.6 *	8.6 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
2-Propanol				
Concentration, ppmvd	8.6 *	8.6 *	8.6 *	8.6 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE   Source: Tall Oil Reactor Scrubber Stack   FIN: P-TOR

Source Code: IO-TORV   Date: 7/14/92   EPN: 12   CIN: C-31

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	8.6 *	8.6 *	8.6 *	8.6 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 •	0.3 *
Chloroform				
Concentration, ppmvd	17.1 *	17.1 *	17.1 *	17.1 *
Emission Rate, lb/hr	1.0 *	1.0 *	1.0 *	1.0 *
Benzene				
Concentration, ppmvd	8.6 *	8.6 *	8.6 *	8.6 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Bromodichloromethane				
Concentration, ppmvd	17.1 *	17.1 *	17.1 *	17.1 *
Emission Rate, lb/hr	1.4 *	1.4 *	1.4 *	1.4 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	8.6 *	8.6 *	8.6 *	8.6 •
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Ethyl benzene				
Concentration, ppmvd	8.6 *	8.6 *	8.6 •	8.6 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
m-, p-Xylene				
Concentration, ppmvd	8.6 *	8.6 *	8.6 *	8.6 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
o-Xylene				
Concentration, ppmvd	8.6 •	8.6 *	8.6 •	8.6 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Cumene				
Concentration, ppmvd	8.6 *	8.6 •	8.6 •	8.6 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
alpha-Pinene				
Concentration, ppmvd	1048.2	1574.6	280.8	967.8
Emission Rate, lb/hr	72.7	109.2	19.5	67.1
beta-Pinene				
Concentration, ppmvd	330.2	506.6	59.2	298.7
Emission Rate, lb/hr	22.9	35.1	4.1	20.7
3-Carene				
Concentration, ppmvd	9.4	8.6 *	8.6 *	6.0
Emission Rate, lb/hr	0.7	0.6 •	0.6 *	0.4
Terpenes (Unspecified)				
Concentration, ppmvd	499.7	696.4	132.9	443.0
Emission Rate, lb/hr	34.7	48.3	9.2	30.7

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE	Source: Tall Oil Reactor Scrubber Stack			FIN:	P-TOR
Source Code: IO-TORV	Date: 7/14/92	EPN:	12	CIN:	C-31

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	46.3	69.8	17.2	44.4
Emission Rate, lb/hr	3.2	4.8	1.2	3.0
Knowns as Carbon				
Concentration, ppmvd	18022.6	27304.6	4674.4	16667.2
Unknowns as Carbon				
Concentration, ppmvd	189.6	389.9	8.2	195.9
Sum M18 as Carbon, lb/hr	111.4	169.5	28.7	103.2
Unknown Compounds % of Total	1.0%	1.4%	0.2%	0.9%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	7918.0	13711.9	1782.3	7804.1
Emission Rate, lb/hr as C	48.4	83.9	10.9	47.8

COMMENTS :

Velocity data for 7/14 was taken from 7/13.

Detection limits due to dilution factors are as follows :

7/13 <0.5 ppm is <97.5 ppm ; <1.0 ppm is <195 ppm.
7/14 <0.5 ppm is <8.2 ppm ; <1.0 ppm is <16.3 ppm.
7/22 <0.5 ppm is <14.5 ppm ; <1.0 ppm is < 29 ppm.

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: Tall Oil Reactor Scrubber Stack | FIN: P-TOR
Source Code: IO-TORV | Date: 7/22/92 | EPN: 12 | CIN: C-31

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	647	747	847	
Flow Data				
Stack Temperature, °F	127			127
Moisture Content, %	13.9			13.9
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	3.3			3.3
Volumetric Flow Rate, x10^3 DSCFM	2.6			2.6
Process Operating Conditions				
Production Rate, GPM	204.0	204.0	204.0	204.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd		14.5 *	17.4	12.3
Emission Rate, lb/hr		0.2 *	0.2	0.2
Methyl mercaptan				
Concentration, ppmvd		14.5 *	14.5 *	14.5 *
Emission Rate, lb/hr		0.3 *	0.3 *	0.3 *
Dimethyl sulfide				
Concentration, ppmvd		59.0	29.9	44.5
Emission Rate, lb/hr		1.5	0.7	1.1
Carbon disulfide				
Concentration, ppmvd		14.5 *	14.5 *	14.5 *
Emission Rate, lb/hr		0.4 *	0.4 *	0.4 *
Dimethyl disulfide				
Concentration, ppmvd		14.5 *	14.5 *	14.5 *
Emission Rate, lb/hr		0.5 *	0.5 *	0.5 *
Method 18 Data				
Methanol				
Concentration, ppmvd	67.4 *	74.7	67.4 *	47.3
Emission Rate, lb/hr	0.9 *	1.0	0.9 *	0.6
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	16.8 *	16.8 *	16.8 *	16.8 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Acetone				
Concentration, ppmvd	16.8 *	16.8 *	16.8 *	16.8 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
2-Propanol				
Concentration, ppmvd	16.8 *	16.8 *	16.8 *	16.8 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: INLAND - ORANGE | Source: Tall Oil Reactor Scrubber Stack | FIN: P-TOR
Source Code: IO-TORV | Date: 7/22/92 | EPN: 12 | CIN: C-31

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	16.8 *	16.8 *	16.8 *	16.8 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Chloroform				
Concentration, ppmvd	33.7 *	33.7 *	33.7 *	33.7 *
Emission Rate, lb/hr	1.6 *	1.6 *	1.6 *	1.6 *
Benzene				
Concentration, ppmvd	16.8 *	16.8 *	16.8 *	16.8 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Bromodichloromethane				
Concentration, ppmvd	33.7 *	33.7 *	33.7 *	33.7 *
Emission Rate, lb/hr	2.2 *	2.2 *	2.2 *	2.2 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	16.8 *	16.8 *	16.8 *	16.8 *
Emission Rate, lb/hr	0.6 *	0.6 *	0.6 *	0.6 *
Ethyl benzene				
Concentration, ppmvd	16.8 *	16.8 *	16.8 *	16.8 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
m-, p-Xylene				
Concentration, ppmvd	16.8 *	16.8 *	16.8 *	16.8 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
o-Xylene				
Concentration, ppmvd	16.8 *	16.8 *	16.8 *	16.8 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
Cumene				
Concentration, ppmvd	16.8 *	16.8 *	16.8 *	16.8 *
Emission Rate, lb/hr	0.8 *	0.8 *	0.8 *	0.8 *
alpha-Pinene				
Concentration, ppmvd	210.3	281.2	123.5	205.0
Emission Rate, lb/hr	11.4	15.3	6.7	11.1
beta-Pinene				
Concentration, ppmvd	53.1	80.0	29.6	54.2
Emission Rate, lb/hr	2.9	4.3	1.6	2.9
3-Carene				
Concentration, ppmvd	16.8 *	16.8 *	16.8 *	16.8 *
Emission Rate, lb/hr	0.9 *	0.9 *	0.9 *	0.9 *
Terpenes (Unspecified)				
Concentration, ppmvd	115.3	107.7	33.3	85.4
Emission Rate, lb/hr	6.3	5.8	1.8	4.6

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill:	INLAND - ORANGE	Source:	Tall Oil Reactor Scrubber Stack			FIN:	P-TOR
Source Code:	IO-TORV	Date:	7/22/92	EPN:	12	CIN:	C-31

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	16.8 *	16.8 *	16.8 *	16.8 *
Emission Rate, lb/hr	0.9 *	0.9 *	0.9 *	0.9 *
Knowns as Carbon				
Concentration, ppmvd	3652.5	4679.8	1807.9	3380.1
Unknowns as Carbon				
Concentration, ppmvd	133.1	0.0	10.3	47.8
Sum M18 as Carbon, lb/hr	18.1	22.4	8.7	16.4
Unknown Compounds % of Total	3.5%	0.0%	0.6%	1.4%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	1785.1	2391.4	1347.3	1841.3
Emission Rate, lb/hr as C	8.5	11.4	6.4	8.8

COMMENTS :

Velocity data for 7/14 was taken from 7/13.

Detection limits due to dilution factors are as follows :
7/13 <0.5 ppm is <97.5 ppm ; <1.0 ppm is <195 ppm.
7/14 <0.5 ppm is <8.2 ppm ; <1.0 ppm is <16.3 ppm.
7/22 <0.5 ppm is <14.5 ppm ; <1.0 ppm is < 29 ppm.

* One or more values were less than the detection limit.

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Section 10.2 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

SOURCE IO-TORV

QUALITY CONTROL SUMMARY
METHOD 25A

1. CALIBRATION

THEOR	7/13/92		7/14/92	
ppm	ppm	%ERR	ppm	%ERR
0.0	5.0	0.3	-17.0	-1.1
94.0	85.0	-0.6	87.0	-0.5
256.0	259.0	0.2	283.0	1.8
1506.0	1505.0	-0.1	1501.0	-0.3
CORR COEFF	0.9999		0.9996	

2. PROPANE LINE RECOVERY

	DATE	7/13/92		DATE	7/14/92	
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	91.7	102.2	111.5%	91.0	94.0	103.3%
AFTER	91.0	94.0	103.3%	*		

3. LINE BLANK

	7/13/92	7/14/92
	ppm	ppm
BEFORE	0.4	3.0
AFTER	3.0	4.0

* Not performed

SOURCE IO-TORV

QUALITY CONTROL SUMMARY
METHOD 25A

1. CALIBRATION

THEOR ppm	7/22/92 ppm	%ERR	
0.0	1.0	0.1	
94.0	89.0	-0.3	
256.0	267.0	0.2	
1506.0	1505.0	-0.1	
CORR COEFF	0.9999		

2. PROPANE LINE RECOVERY

	DATE INST	7/22/92 LINE	%REC	
BEFORE	*			
AFTER	1507.0	1559.0	103.5%	

3. LINE BLANK

	7/22/92 ppm	
BEFORE	*	
AFTER	6.0	

* Not performed

SOURCE IO-TORV

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR ppm	DATE 7/13/92 ppm	%REC	DATE 7/14/92 ppm	%REC
ethanol	41.9	25.6	61.0%	25.6	61.0%
acetone	33.5	24.7	73.6%	24.7	73.6%
isopropanol	32.2	29.4	91.5%	29.4	91.5%
benzene	27.5	27.6	100.4%	27.6	100.4%
bromodichloromethane	29.7	26.2	88.1%	26.2	88.1%
toluene	23.2	20.4	87.9%	20.4	87.9%
ethyl benzene	20.1	16.9	84.0%	16.9	84.0%
m-xylene	20.1	16.9	84.0%	16.9	84.0%
o-xylene	20.2	17.4	86.0%	17.4	86.0%
cumene	17.7	15.2	85.9%	15.2	85.9%
alpha-pinene	15.4	14.2	92.0%	14.2	92.0%
beta-pinene	15.5	14.1	91.2%	14.1	91.2%
3-carene	15.5	20.8	133.7%	20.8	133.7%
p-cymene	15.8	12.0	76.2%	12.0	76.2%

2. PROPANE RESPONSE

	THEOR		%REC		%REC
BEFORE	36.0	33.3	92.5%	33.3	92.5%
AFTER	36.0	** 87.2	92.6%	32.5	90.3%

3. METHANOL LINE RECOVERY

	7/13/92 GC	LINE	%REC	7/14/92 GC	LINE	%REC
BEFORE	9.4	8.8	93.6%	10.4	9.8	94.2%
AFTER	10.4	9.8	94.2%	*		

4. LINE BLANK

	[--------------FILE REF--------------]	
BEFORE	GEA2004	GDA2015
AFTER	GDA2015	*

* Not performed

** THEOR = 94.2 ppm

SOURCE IO-TORV

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR ppm	DATE ppm	7/22/92 %REC	
ethanol	41.9	21.6	51.4%	
acetone	33.5	20.3	60.5%	
isopropanol	32.2	31.7	98.5%	
benzene	27.5	27.9	101.1%	
bromodichloromethane	29.7	28.1	94.5%	
toluene	23.2	22.2	95.8%	
ethyl benzene	20.1	18.9	93.9%	
m-xylene	20.1	19.5	96.9%	
o-xylene	20.2	19.2	95.2%	
cumene	17.7	16.0	90.5%	
alpha-pinene	15.4	14.8	95.7%	
beta-pinene	15.5	14.4	92.8%	
3-carene	15.5	13.3	85.4%	
p-cymene	15.8	12.9	81.6%	

2. PROPANE RESPONSE

	THEOR		%REC	
BEFORE	36.0	33.5	93.1%	
AFTER	36.0	*		

3. METHANOL LINE RECOVERY

	GC	7/22/92 LINE	%REC	
BEFORE	9.5	7.7	81.1%	
AFTER	9.5	8.1	85.3%	

4. LINE BLANK

	[--------------FILE REF--------------]	
BEFORE	*	
AFTER	*	

* Not performed

SOURCE IO-TORV

QUALITY CONTROL SUMMARY
METHOD 16

1. CALIBRATION

ANALYTE	LO ppm	MED ppm	HI ppm	CORR COEFF
7/13/92				
hydrogen sulfide	2.0	3.7	6.2	0.9994
methyl mercaptan	1.9	3.5	5.7	0.9994
dimethyl sulfide	2.6	4.8	7.9	0.9995
carbon disulfide	0.8	1.5	2.5	0.9969
dimethyl disulfide	1.1	2.1	3.4	0.9996
7/14/92 *				
hydrogen sulfide	2.0	3.7	6.2	0.9994
methyl mercaptan	1.9	3.5	5.7	0.9994
dimethyl sulfide	2.6	4.8	7.9	0.9995
carbon disulfide	0.8	1.5	2.5	0.9969
dimethyl disulfide	1.1	2.1	3.4	0.9996

* Calibration from 7/13/92 checked and used

SOURCE IO-TORV

QUALITY CONTROL SUMMARY
METHOD 16

1. CALIBRATION

ANALYTE	LO ppm	MED ppm	HI ppm	CORR COEFF
7/22/92 *				
hydrogen sulfide	2.2	3.2	8.2	0.9996
methyl mercaptan	2.0	2.9	7.6	0.9998
dimethyl sulfide	2.8	4.1	10.6	0.9999
carbon disulfide	0.9	1.3	3.3	0.9999
dimethyl disulfide	1.2	1.8	4.6	0.9999

* Calibration from 7/21/92 was used

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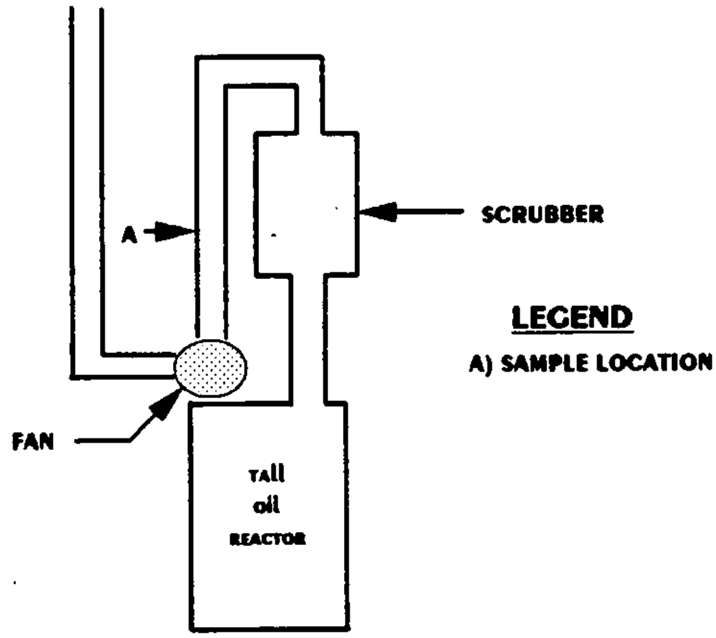
Section 10.3 Process Operating Data

TALL OIL RECOVERY SYSTEM STACK CONFIGURATION

INLAND-ORANGE ORANGE, TEXAS



TALL OIL ACIDULATION PLANT

The tall oil plant employs a batch process. Soap and sulfuric acid are pumped to the reactor which is maintained at a pH of about 13.0 during soap addition. The temperature is controlled to no more than about 200°F. After soap addition is completed, the acid pump continues to operate until the pH of the solution reaches 3.0, at which time the acid pump is shut off. The reactor temperature may then increase to no more than 210°F. At the completion of the reaction, the reactor contents are allowed to settle for four to sixteen hours. Oil is then pumped off the top to a settling tank, the brine is pumped from the reactor bottom to the brine storage tank and the lignan is recooked if not in great excess. Brine from the decanters is neutralized to a pH of 14 and and sent to weak black liquor storage for chemical recovery.

The vent gases from the reactor and the decanter are collected and scrubbed with 25 percent caustic in a packed scrubber. The scrubber is 38 ft. tall and has 26 ft. of packing material and is 4 feet in diameter. Scrubbing solution flow rate is 210 gpm. During the cook, 150 gallons of sixty (60) percent $Fe_2(SO_4)_3$ (12 percent iron) is fed to the tall oil to help control TRS emissions.

Representative Process Conditions

Production rate: 60 tons tall oil/cook

Cooking time: 2 hours

Acid/oil ratio: 0.25 (^{w}/w)

Scrubber type: A. H. Lundberg Croll-Reynolds counter-current packed tower

TALL OIL PLANTS - PROCESS OPERATING CONDITIONS

Mill: INLAND-ORANGE
Source: IO-TORV
FIN: P-TOR

Source: TALL Oil Reactor Scrub Stack
Date: 7/13/92 7/14/92
SPN: 12
CIN: C-31

INPUT DATA	Units	Run 1 7/13	Run 2 7/14	Run 3 7/22	Average
Beginning Time		4:55 PM	2:10 PM	6:45 AM	
Production Rate BATCH			221 BPM	204 BPM	0.00
Cooking Time			155 MIN.	155 MIN.	0.00
Acid/Oil Ratio					
Scrubber Data					
Type A.H. LUNDBERG					0.00
Scrubbing Media 20% Caustic Soda Solution					0.00
Gas Flow Rate 6000 ACFM					0.00
Liquid Flow Rate 198	GPM				0.00
Pressure Drop 5.6	in. H2O				

TALL OIL

	7/13	7/14	7/22
PRODUCTION RATE	-	221 GPM	204 GPM
COOKING TIME	-	155 MIN	155 MIN
ACID/OIL RATIO	-	-	-
SCRUBBER DATA			
TYPE	A. H. Lundberg		
SCRUBBING MEDIA	20% Caustic Soda Solution		
GAS FLOW RATE	6,000 ACFM		
LIQUID FLOW RATE	188 GPM		
PRESSURE DROP	5.6 in. H_2O		

TALL OIL PLANT DA(INVENTORY

Date: 7-13-92 Operator: Clint

Tank I.D.	Tank Height	Morning Innage	Evening Innage		
#1 T.O. Storge	30'	29.0	29.0	Stripped	1.0'=41.3
#2 T.O. Storage	30'	28.3	21.2	Acid Test	NO CHEM FOR TEST
#1 Settling Tank	20'	0	0	% Moisture	0.4
#2 Settling Tank	20'	0/14.9	14.9	% B. Liquor	—
Reactor	23'	23.0/0	22.9	Quaker Chemical	50
Soap Storage	43'	36.5	30.0	Ferric Sulfite Sol	150
Acid Storage	20'	4.0	9.0	Soap Used in Cook	3.6 FT
Brine Tank	29'	0/17.7	0	Acid Used in Cook	2375
Reactor Scrubber Sump	8'	60/0	60	Acid Rail Car #ZITLX	14450
Turpentine Storage	---	17345	LOADED CAR	Acid Car Gallons	13,701
Caustic Integrator		2444		Caustic Scrubber pH	
Turpentine Railcar ACPX-79861 (21035)				Before	After
Shipped To: Union Camp				14.0	

Tons Liq.

4 Tall Oil Trucks - Shipped To: HARIMA c/o STOLT-NIELSEN, HOUSTON, TX.

B/L No. 74527, 74528, 74529 & 74530.

HOOKED UP ACID CAR & STARTED UNLOADING.
FINISHED LOADING OUT TURP. CAR, READY TO SHIP.
RECLAIM SUMP PUMP WILL NOT PUMP!
BUTCH WORKED ON ACID COUNTER & FLOW.
CHECK VALVE IN ACID LINE IS NOT HOLDING,
COULD NOT USE SUMP TO STRIP TANKS, NO ONE
WORKED ON IT YET.

START - SCRUBBER RECIRC. + FAN — 4:55
Start cook — OPEN SOAP VALVE — 501 also STARTED SOAP PUMP. SOAP OUT 6:12 PM
START AJITATOR — 5:10
START REACTOR RECICULATION — 5:10 increased acidic
Steam on at 5:46 START ACID — 5:12 Acid control valve erratic
START STEAM — 5:35 STEAM 25% — 5:40 STEAM 50% 5:55 Steam 3/4
Temp — 5:35 150° 5:45 151° Temp 163 at 5:55
TROUBLE WITH ACID INT NO FLOW about 5:11

7-14-92

For
Tom Noble

2:10 pm STARTED SOAP PUMP.
2:20 pm TO 2:25 pm AGGITATOR SHOULD HAVE STARTED AGGITATING
2:27 STARTED ACID GOING INTO REACTOR
2:37 SHUT OFF ACID (HAVING TROUBLE WITH PH)
2:49 SHUT DOWN CIRCULATING PUMP TO CLEAN PH PROBE
2:51 STARTED UP CIRCULATING PUMP + ACID TO REACTOR.
3:19 PUT STEAM TO REACTOR (75% VALVE POSITION)
3:30 SHUT DOWN SOAP PUMP TO REACTOR.
3:32 PUT STEAM TO REACTOR ON AUTO.
3:54 ACID PUMP SHUT OFF AT 2000 GAL. STARTED
IT BACK UP.
4:11 SHUT ACID PUMP OFF.
4:30 SHUT CIRCULATING PUMP OFF.
4:45 SHUT DOWN. COOK COMPLETED.

TALL OIL PLANT DAILY INVENTORY

Date: Operator:

Tank I.D.	Tank Height	Morning Innage	Evening Innage		
#1 T.O. Storge	30'	22.1	14.9	Stripped	—
#2 T.O. Storage	30'	18.7	23.0	Acid Test	—
#1 Settling Tank	20'	14.2	0	% Moisture	—
#2 Settling Tank	20'	14.2	14.2	% B. Liquor	—
Reactor	23'	0	23.3	Quaker Chemical	50 gal
Soap Storage	43'	22.9	22.2	Ferric Sulfite Sol	151 gal
Acid Storage	20'	9.6	7.9	Soap Used in Cook	3.5 FT
Brine Tank	29'	7.4	0	Acid Used in Cook	2200 gal
Reactor Scrubber Sump	8'	58%	58%	Acid Rail Car #	
Turpentine Storage	---	13,734	?	Acid Car Gallons	
Caustic Integrator		5274	—	Caustic Scrubber pH	
Turpentine Railcar	GATX 92322			Before	After
Shipped To:	UNION CAMP			14.0	14.0

4 Tall Oil Trucks - Shipped To: HARIMAC/o STOLDT-Neilson HOUSTON TX

B/L No. 74562, 74563, 74564, 74565

6^{45} scrubber on ok

6^{50} started soap pump, Reactor Recic. pump & agitator

6^{56} started acid slow.

7^{05} steam 1/4 7^{15} steam to 1/2 - 7^{46} steam to 3/4

7^{15} increased acid 7^{52} increased acid.

8^{05} increased acid. Soap out 8^{06}

acid out 8^{23} Added 50 gal acid

at 8^{50} steam off 9^{00}

acid car UTLX 125080 Empty Ready To go

WESTON
MANAGERS DESIGNERS/CONSULTANTS

APPENDIX A PRELIMINARY SCREENING DATA

A.1 LIME KILN WITH NCG'S (VOST)

A.2 LIME KILN WITH NCG'S (SEMI-VOST)

A.3 BARK BOILER (VOST)

A.1 Lime Kiln With NCG'S (VOST)

EMISSION TEST RESULTS - VOST

Mill INLAND - ORANGE Source: Lime Kiln
Source Code: IO-LK EPN: FIN: CIN:

Sampling Date: March, 1992

Compound	LK-T (µg)	LK-TC (µg)	LK-C (µg/L)	Total (µg)	IO-LK (µg/m3)	Conc. (ppm)
TARGET COMPOUNDS						
Chloromethane		0.705		0.71	70.50	0.034
Bromomethane		0.203		0.20	20.30	0.005
Methylene Chloride		0.036	1.53	0.10	10.18	0.003
Acetone			10.18	0.44	43.77	0.018
Carbon Disulfide		2.567		2.57	256.70	0.081
Chloroform		0.554	4.17	0.73	73.33	0.015
Toluene		0.008		0.01	0.80	0.000
A-Pinene		0.010		0.01	1.00	0.000
TENTATIVELY IDENTIFIED CMPDS.						
Subst'd HC		0.529		0.53	52.90	
Furan		0.048		0.05	4.80	
Siloxane		0.047		0.05	4.70	
Subst'd Cyclic HC		0.022		0.02	2.20	
2-Butene		0.384		0.38	38.40	
SURROGATE STDS (% Recovery)						
Toluene-d8		103.8	99.1			
1,2-Dichloroethane-d4		92.8	93.1			
Benzene-d6		105.6	88.2			

NOTES:
- -T=Tenax
- -TC=Tenax/Charcoal
- -C = Condensate

Air Volume = 0.01000 cu.m.
Condensate Vol. = 43.0 mL

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME	HG952	SAMPLE ID.	ICLKV2 T
RF FILE:	ICAL 031692	TLI ID:	54,153.6
DATE:	03/20/92	ANALYSIS DATE:	03/16/92
TLI PROJ #:	20332	DILUTION FACTOR:	1

QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1 Bromochloromethane	0		0	1		IS	
2 Chloromethane	0	.872	0	1	IS NOT	DETECTED	.05
3 Bromomethane	0	.634	0	1	IS NOT	DETECTED	.05
4 Vinyl Chloride	0	1.005	0	1	IS NOT	DETECTED	.05
5 Chloroethane	0	.848	0	1	IS NOT	DETECTED	.05
6 Methylene Chloride	630	1.245	611	1	IS NOT	DETECTED	.05
7 Acetone	1527	.328	551	1	IS NOT	DETECTED	.05
8 Carbon Disulfide	74725	4.209	531	1	IS NOT	DETECTED	.05
9 1,1-Dichloroethene	0	1.090	0	1	IS NOT	DETECTED	.05
10 1,1-Dichloroethane	0	3.476	0	1	IS NOT	DETECTED	.05
11 trans-1,2-Dichloroethene	0	1.290	0	1	IS NOT	DETECTED	.05
12 Chloroform	203642	3.061	624	1	IS NOT	DETECTED	.05
13 1,2-Dichloroethane	0	2.165	0	1	IS NOT	DETECTED	.05
43 Trichlorofluoromethane	2320	1.480	426	1	IS NOT	DETECTED	.05
46 Acrylonitrile	0	.502	0	1	IS NOT	DETECTED	.05
47 cis-1,2-Dichloroethene	0	1.514	0	1	IS NOT	DETECTED	.05
52 1,3-butadiene	0	.495	0	1	IS NOT	DETECTED	.05
57 Allyl chloride	0	.770	0	1	IS NOT	DETECTED	.05
62 Dimethyl disulfide	982	3.226	1115	1	IS NOT	DETECTED	.05
63 Dimethyl sulfide	0	1.545	0	1	IS NOT	DETECTED	.05
65 Iodomethane	0	2.351	0	1	IS NOT	DETECTED	.05
66 Isooctane	0	11.661	0	1	IS NOT	DETECTED	.05
68 Tert-Butyl methyl ether	949	3.206	658	1	IS NOT	DETECTED	.05
69 Vinyl Bromide	0	.945	0	1	IS NOT	DETECTED	.05
70 n-Hexane	3262	3.111	693	1	IS NOT	DETECTED	.05
14 1,4-Difluorobenzene	0		0	14		IS	
15 2-Butanone	1223	.030	763	14	IS NOT	DETECTED	.05
16 1,1,1-Trichloroethane	0	.501	0	14	IS NOT	DETECTED	.05
17 Carbon Tetrachloride	0	.513	0	14	IS NOT	DETECTED	.05
18 Vinyl Acetate	0	.488	0	14	IS NOT	DETECTED	.05
19 Bromodichloromethane	15209	.509	1046	14	IS NOT	DETECTED	.05
20 1,2-Dichloropropane	0	.536	0	14	IS NOT	DETECTED	.05
21 cis-1,3-Dichloropropene	0	.757	0	14	IS NOT	DETECTED	.05
22 Trichloroethene	0	.545	0	14	IS NOT	DETECTED	.05
23 Dibromochloromethane	0	.500	0	14	IS NOT	DETECTED	.05
24 1,1,2-Trichloroethane	0	.314	0	14	IS NOT	DETECTED	.05
25 Benzene	63467	1.232	881	14	IS NOT	DETECTED	.05
26 trans-1,3-Dichloropropene	0	.569	0	14	IS NOT	DETECTED	.05
27 Bromoform	0	.352	0	14	IS NOT	DETECTED	.05
54 1,4-Dichloro-2-butene	0	.107	0	14	IS NOT	DETECTED	.05
60 Dibromomethane	0	.195	0	14	IS NOT	DETECTED	.05
28 Chlorobenzene-d5	0		0	28		IS	
29 4-Methyl-2-Pentanone	0	.146	0	28	IS NOT	DETECTED	.05
30 2-Hexanone	0	.123	0	28	IS NOT	DETECTED	.05
31 Tetrachloroethene	0	.394	0	28	IS NOT	DETECTED	.05
32 1,1,2,2-Tetrachloroethane	0	.245	0	28	IS NOT	DETECTED	.05
33 Toluene	8143	.635	1162	28	IS NOT	DETECTED	.05
34 Chlorobenzene	0	.936	0	28	IS NOT	DETECTED	.05

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

Triangle Laboratories of RTP, Inc.
601 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME:	HG952	SAMPLE ID:	IOLKV2 T
RF FILE:	ICAL 031692	TLI ID:	54.153.6
DATE:	03/20/92	ANALYSIS DATE:	03/16/92
TLI PROJ #:	20332	DILUTION FACTOR:	1

QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
35 Ethylbenzene	0	.486	0	28	IS NOT DETECTED		.05
36 Styrene	0	.984	0	28	IS NOT DETECTED		.05
37 o-Xylene	0	.586	0	28	IS NOT DETECTED		.05
38 m-/p-Xylene	437	.607	1430	28	IS NOT DETECTED		.05
49 1,2 Dichlorobenzene	0	.737	0	28	IS NOT DETECTED		.05
50 1,2,3-Trichloropropane	0	.232	0	28	IS NOT DETECTED		.05
51 1,3 Dichlorobenzene	0	.955	0	28	IS NOT DETECTED		.05
53 1,4 Dichlorobenzene	0	.800	0	28	IS NOT DETECTED		.05
56 A-Pinene	398	.964	1565	28	IS NOT DETECTED		.05
58 B-Pinene	0	1.001	0	28	IS NOT DETECTED		.05
59 Cumene (isopropylbenzene)	0	1.545	0	28	IS NOT DETECTED		.05
64 Ethyl methacrylate	0	.425	0	28	IS NOT DETECTED		.05
67 P-Cymene	0	2.159	0	28	IS NOT DETECTED		.05

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT,ug	CODE	% RECOVERY
39 Toluene-d8	76	1.008	1106	28	IS NOT DETECTED		N/A
41 1,2-Dichloroethane-d4	0	1.816	0	1	IS NOT DETECTED		0.0
48 Benzene-d6	362	1.231	839	14	IS NOT DETECTED		N/A

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TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HG952
DATE: 03/20/92
TLI PROJ #: 20332

SAMPLE ID: IOLKV2 T
TLI ID: 54.153.6
ANALYSIS DATE: 03/16/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

	NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
1	THIOPHENE	906	219650	ND	.25	N/A
2	SUBSTITUTED CYCLIC HYDROCARBON	1761	203641	ND	.25	N/A
3	SUBSTITUTED HYDROCARBON	1812	101512	ND	.25	N/A
4	SILOXANE	1275	84700	ND	.25	N/A
5	SUBSTITUTED HYDROCARBON	1792	61449	ND	.25	N/A
6	CYCLOHEXANE	661	50365	ND	.25	N/A
7	SUBSTITUTED HYDROCARBON	1187	46808	ND	.25	N/A
8	HEXANAL	1305	35966	ND	.25	N/A
9	SUBSTITUTED CYCLIC HYDROCARBON	919	36539	ND	.25	N/A
10	SUBSTITUTED HYDROCARBON	1020	17749	ND	.25	N/A

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	N/D	0	1
1,4-Difluorobenzene	N/D	0	14
Chlorobenzene-d5	N/D	0	28

Triangle Laboratories of RTP, Inc.	FILE NAME: HG936	SAMPLE ID. IOLKV2 TC
801 Capitola Drive	RF FILE. ICAL 031692	TLI ID 54.153 6
Durham, NC 27713	DATE: 03/20/92	ANALYSIS DATE: 03/14/92
Telephone: (919) 544-5729	TLI PROJ #: 20332	DILUTION FACTOR: 1

Q U A N T I T A T I O N   R E P O R T

	NAME	AREA	RF	SCAN	ISID	AMT,ug	CODE	QUAN LIMIT
1	Bromochloromethane	3012		810	1		IS	
2	Chloromethane	7406	.872	408	1	.705	D	.05
3	Bromomethane	1552	.634	495	1	.203	D	.05
4	Vinyl Chloride	0	1.005	0	1	.002	ND	.05
5	Chloroethane	0	.848	0	1	.002	ND	.05
6	Methylene Chloride	541	1.245	653	1	.036	E	.05
7	Acetone	0	.328	0	1	.005	ND	.05
8	Carbon Disulfide	130164	4.209	604	1	2.567	D	.05
9	1,1-Dichloroethene	0	1.090	0	1	.002	ND	.05
10	1,1-Dichloroethane	0	3.476	0	1	.001	ND	.05
11	trans-1,2-Dichloroethene	0	1.290	0	1	.001	ND	.05
12	Chloroform	20447	3.061	824	1	.554	D	.05
13	1,2-Dichloroethane	0	2.165	0	1	.001	ND	.05
43	Trichlorofluoromethane	0	1.480	0	1	.001	ND	.05
46	Acrylonitrile	0	.502	0	1	.003	ND	.05
47	cis-1,2-Dichloroethene	0	1.514	0	1	.001	ND	.05
52	1,3-butadiene	0	.495	0	1	.003	ND	.05
57	Allyl chloride	0	.770	0	1	.002	ND	.05
62	Dimethyl disulfide	0	3.226	0	1	.001	ND	.05
63	Dimethyl sulfide	0	1.545	0	1	.001	ND	.05
65	Iodomethane	0	2.351	0	1	.001	ND	.05
66	Isooctane	0	11.661	0	1	.001	ND	.05
68	Tert-Butyl methyl ether	0	3.206	0	1	.001	ND	.05
69	Vinyl Bromide	0	.945	0	1	.002	ND	.05
70	n-Hexane	0	3.111	0	1	.001	ND	.05
14	1,4-Difluorobenzene	13693		927	14		IS	
15	2-Butanone	0	.030	0	14	.012	ND	.05
16	1,1,1-Trichloroethane	0	.501	0	14	.001	ND	.05
17	Carbon Tetrachloride	0	.513	0	14	.001	ND	.05
18	Vinyl Acetate	0	.488	0	14	.001	ND	.05
19	Bromodichloromethane	0	.509	0	14	.001	ND	.05
20	1,2-Dichloropropane	0	.536	0	14	.001	ND	.05
21	cis-1,3-Dichloropropene	0	.757	0	14	.001	ND	.05
22	Trichloroethene	0	.545	0	14	.001	ND	.05
23	Dibromochloromethane	0	.500	0	14	.001	ND	.05
24	1,1,2-Trichloroethane	0	.314	0	14	.001	ND	.05
25	Benzene	0	1.232	0	14	.001	ND	.05
26	trans-1,3-Dichloropropene	0	.569	0	14	.001	ND	.05
27	Bromoform	0	.352	0	14	.001	ND	.05
54	1,4-Dichloro-2-butene	0	.107	0	14	.003	ND	.05
60	Dibromomethane	0	.195	0	14	.002	ND	.05
28	Chlorobenzene-d5	16625		1365	28		IS	
29	4-Methyl-2-Pentanone	0	.146	0	28	.002	ND	.05
30	2-Hexanone	0	.123	0	28	.002	ND	.05
31	Tetrachloroethene	0	.394	0	28	.001	ND	.05
32	1,1,2,2-Tetrachloroethane	0	.245	0	28	.001	ND	.05
33	Toluene	335	.635	1133	28	.008	E	.05
34	Chlorobenzene	0	.938	0	28	.001	ND	.05

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

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FILE NAME: HG936
RF FILE: ICAL 031692
DATE: 03/20/92
TLI PROJ #: 20332

SAMPLE ID. IOLKV2 TC
TLI ID: 54.153.6
ANALYSIS DATE: 03/14/92
DILUTION FACTOR: 1

QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT,ug	CODE	QUAN LIMIT
35 Ethylbenzene	0	.486	0	28	.001	ND	.05
36 Styrene	0	.984	0	28	.001	ND	.05
37 o-Xylene	0	.566	0	28	.001	ND	.05
38 m-/p-Xylene	0	.607	0	28	.001	ND	.05
49 1,2 Dichlorobenzene	0	.737	0	28	.001	ND	.05
50 1,2,3-Trichloropropane	0	.232	0	28	.001	ND	.05
51 1,3 Dichlorobenzene	0	.955	0	28	.001	ND	.05
53 1,4 Dichlorobenzene	0	.800	0	28	.001	ND	.05
56 A-Pinene	632	.964	1567	28	.010	E	.05
58 B-Pinene	0	1.001	0	28	.001	ND	.05
59 Cumene (isopropylbenzene)	0	1.545	0	28	.001	ND	.05
64 Ethyl methacrylate	0	.425	0	28	.001	ND	.05
67 P-Cymene	0	2.159	0	28	.001	ND	.05

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT,ug	CODE	% RECOVERY
39 Toluene-d8	17389	1.008	1123	28	.259	D	103.8
41 1,2-Dichloroethane-d4	5077	1.816	872	1	.232	D	92.8
48 Benzene-d6	17805	1.231	870	14	.264	D	105.6

CODES: ND = Not Detected: D = Detected: E = Estimated: IS = Internal Standard

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FILE NAME: HG936
DATE: 03/20/92
TLI PROJ #: 20332

SAMPLE ID: IOLKV2 TC
TLI ID: 54.153.6
ANALYSIS DATE: 03/14/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
1 SUBSTITUTED HYDROCARBON	537	20708	810	.25	.283
2 SUBSTITUTED HYDROCARBON	514	7762	810	.25	.106
3 SUBSTITUTED HYDROCARBON	716	6189	810	.25	.085
4 FURAN	574	3509	810	.25	.048
5 SILOXANE	1246	8756	1365	.25	.047
6 SUBSTITUTED HYDROCARBON	2249	5386	1365	.25	.029
7 SUBSTITUTED HYDROCARBON	774	1912	810	.25	.026
8 SUBSTITUTED CYCLIC HYDROCARBON	972	3259	927	.25	.022
9 2-BUTENE	422	28104	810	.25	.384

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	810	16274	1
1,4-Difluorobenzene	927	37614	14
Chlorobenzene-d5	1365	46861	28

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HG928
RF FILE: HG919
DATE: 03/18/92
TLI PROJ #: 20332

SAMPLE ID: IOLKV2
TLI ID: 54.153.6 (COND)
SAMPLE VOL: .005 L
ANALYSIS DATE: 03/13/92
DILUTION FACTOR: 1

QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	CONC, ug/L	CODE	QUAN LIMIT
1	Bromochloromethane	3760		783	1		IS	
2	Chloromethane	0	.685	0	1	.39	ND	10
3	Bromomethane	0	.705	0	1	.38	ND	10
4	Vinyl Chloride	0	.968	0	1	.27	ND	10
5	Chloroethane	0	.808	0	1	.33	ND	10
6	Methylene Chloride	145	1.255	590	1	1.53	E	10
7	Acetone	410	.536	532	1	10.18	D	10
8	Carbon Disulfide	0	4.454	0	1	.06	ND	10
9	1,1-Dichloroethene	0	1.072	0	1	.25	ND	10
10	1,1-Dichloroethane	0	3.212	0	1	.08	ND	10
11	trans-1,2-Dichloroethene	0	1.279	0	1	.21	ND	10
12	Chloroform	976	3.112	802	1	4.17	E	10
13	1,2-Dichloroethane	0	2.215	0	1	.12	ND	10
43	Trichlorofluoromethane	0	1.630	0	1	.16	ND	10
46	Acrylonitrile	0	.489	0	1	.54	ND	10
47	cis-1,2-Dichloroethene	0	1.403	0	1	.19	ND	10
52	1,3-butadiene	0	.541	0	1	.49	ND	10
57	Allyl chloride	0	.764	0	1	.35	ND	10
62	Dimethyl disulfide	0	3.165	0	1	.08	ND	10
63	Dimethyl sulfide	0	1.358	0	1	.20	ND	10
65	Iodomethane	0	2.492	0	1	.11	ND	10
66	Isooctane	0	10.102	0	1	.03	ND	10
68	Tert-Butyl methyl ether	0	3.243	0	1	.08	ND	10
69	Vinyl Bromide	0	.946	0	1	.28	ND	10
70	n-Hexane	0	2.666	0	1	.10	ND	10
14	1,4-Difluorobenzene	18496		917	14		IS	
15	2-Butanone	0	.047	0	14	1.14	ND	10
16	1,1,1-Trichloroethane	0	.549	0	14	.10	ND	10
17	Carbon Tetrachloride	0	.570	0	14	.09	ND	10
18	Vinyl Acetate	0	.570	0	14	.09	ND	10
19	Bromodichloromethane	0	.531	0	14	.10	ND	10
20	1,2-Dichloropropane	0	.537	0	14	.10	ND	10
21	cis-1,3-Dichloropropene	0	.819	0	14	.07	ND	10
22	Trichloroethene	0	.636	0	14	.09	ND	10
23	Dibromochloromethane	0	.595	0	14	.09	ND	10
24	1,1,2-Trichloroethane	0	.387	0	14	.14	ND	10
25	Benzene	0	1.288	0	14	.04	ND	10
26	trans-1,3-Dichloropropene	0	.641	0	14	.08	ND	10
27	Bromoform	0	.512	0	14	.11	ND	10
54	1,4-Dichloro-2-butene	0	.201	0	14	.27	ND	10
60	Dibromomethane	0	.228	0	14	.24	ND	10
28	Chlorobenzene-d5	23878		1359	28		IS	
29	4-Methyl-2-Pentanone	0	.261	0	28	.16	ND	10
30	2-Hexanone	0	.240	0	28	.17	ND	10
31	Tetrachloroethene	0	.439	0	28	.10	ND	10
32	1,1,2,2-Tetrachloroethane	0	.372	0	28	.11	ND	10
33	Toluene	0	.664	0	28	.06	ND	10
34	Chlorobenzene	0	1.004	0	28	.04	ND	10

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

Triangle Laboratories of RTP, Inc.
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Telephone: (919) 544-5729

FILE NAME: HG928
RF FILE: HG919
DATE: 03/18/92
TLI PROJ #: 20332

SAMPLE ID IOLKV2
TLI ID: 54.153.6 (COND)
SAMPLE VOL: .005 L
ANALYSIS DATE: 03/13/92
DILUTION FACTOR: 1

QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	CONC, ug/L	CODE	QUAN LIMIT
35 Ethylbenzene	0	.514	0	28	.08	ND	10
36 Styrene	0	1.079	0	28	.04	ND	10
37 o-Xylene	0	.611	0	28	.07	ND	10
38 m-/p-Xylene	0	.660	0	28	.06	ND	10
49 1,2 Dichlorobenzene	0	.986	0	28	.04	ND	10
50 1,2,3-Trichloropropane	0	.372	0	28	.11	ND	10
51 1,3 Dichlorobenzene	0	1.116	0	28	.04	ND	10
53 1,4 Dichlorobenzene	0	.956	0	28	.04	ND	10
56 A-Pinene	0	.993	0	28	.04	ND	10
58 B-Pinene	0	.997	0	28	.04	ND	10
59 Cumene (isopropylbenzene)	0	1.608	0	28	.03	ND	10
64 Ethyl methacrylate	0	.550	0	28	.08	ND	10
67 P-Cymene	0	2.247	0	28	.02	ND	10

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT,ug	CODE	% RECOVERY
39 Toluene-d8	24997	1.057	1118	28	.25	D	99.1
41 1,2-Dichloroethane-d4	6921	1.976	852	1	.23	D	93.1
48 Benzene-d6	21435	1.313	850	14	.22	D	88.2

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

A.2 Lime Kiln With NCG'S (SEMI-VOST)

EMISSION TEST RESULTS - SEMI-VOST

Mill INLAND - ORANGE Lime Kiln with NCGs Condition 1
Source Code: IO-LK FIN: CIN:

Compound	Sampling Date: IO-LK (ug)	March, 1992 IO-LK ($\mu g/m3$)	Conc. (ppm)
TARGET COMPOUNDS			
Clean Air Act Cmpds			
Phenol	110.48	3682.67	0.941
Butylbenzylphthalate	4.71	157.00	0.012
bis(2-Ethylhexyl)phthalate	12.47	415.67	0.026
Method 8270 Cmpds			
Phenol	98.76	3292.00	0.841
Butylbenzylphthalate	3.99	133.00	0.010
bis(2--Ethylhexyl)phthalate	11.17	372.33	0.023
TENTATIVELY IDENTIFIED CMPDS.			
Subst'd HCs	5373.35	179111.67	
Subst'd Alcohols	352.07	11735.67	
Subst'd Cyclic HCs	203.44	6781.33	
Molecular Sulfur	153.79	5126.33	
SURROGATE STDS			
(% Recovery)	CAA	Method 8270	
Phenol-d5	60.1	58.0	
Terphenyl-d14	83.6	72.3	
Nitrobenzene-d5	3.9	4.2	
1,3,5-Trichlorobenzene-d3	10.0	14.5	
1,4-Dibromobenzene-d4	31.5	28.6	
2-Fluorobiphenyl	49.5	60.8	
2,4,6-Tribromophenol	101.3	153.0	
Anthracene-d10	57.2	62.8	
Pyrene-d10	92.7	78.8	

NOTES:

Air Volume = 0.03000 cu.m.

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TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

DATA FILE:GH001
RF FILE: GG994
DATE: 03/30/92
TLI Project Number: 20333
ANALYSIS DATE: 03/21/92

SAMPLE ID: IOLKMS-1-6
DILN FACTOR: 1
TLI SAMPLE ID: 54-154-1,7

Q U A N T I T A T I O N   R E P O R T

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	1,4-Dichlorobenzene-d4	420		312	1		IS	
2	Naphthalene-d8	2776		494	2		IS	
3	Acenaphthene-d10	2332		746	3		IS	
4	Phenanthrene-d10	7676		945	4		IS	
5	Chrysene-d12	9747		1313	5		IS	
6	Perylene-d12	7095		1497	6		IS	
20	n-Nitrosodimethylamine	0	.507	0	1	3.75	ND	10
21	Cumene	0	3.200	0	1	.59	ND	10
22	a-Pinene	0	1.772	0	1	1.07	ND	10
23	b-Pinene	0	2.206	0	1	.86	ND	10
24	Aniline	0	3.447	0	1	.55	ND	10
25	1,2,4-Trimethylbenzene	0	2.819	0	1	.68	ND	10
26	Phenol	2897	2.495	308	1	110.48	D	10
27	Benzyl Chloride	0	3.772	0	1	.50	ND	10
28	bis-(2-Chloroethyl)ether	0	1.902	0	1	1.00	ND	10
29	n-Nitrosomorpholine	0	.764	0	1	2.49	ND	10
30	1,4-Dichlorobenzene	0	1.758	0	1	1.08	ND	10
31	p-Cymene	0	3.492	0	1	.54	ND	10
32	Acetophenone	0	2.326	0	1	.82	ND	10
33	1,2-Dibromo-3-chloropropane	0	.758	0	1	2.51	ND	10
34	Hexachloroethane	0	.781	0	1	2.44	ND	10
35	o-Toluidine	0	3.145	0	1	.61	ND	10
36	2-Methylphenol	0	1.849	0	1	1.03	ND	10
37	Nitrobenzene	0	.622	0	2	.46	ND	10
38	N,N-Dimethylaniline	0	.623	0	2	.46	ND	10
39	Isophorone	0	.714	0	2	.40	ND	10
40	Catechol	0	.315	0	2	.92	ND	10
41	3/4-Methylphenol	0	.394	0	2	.73	ND	10
42	1,2,4-Trichlorobenzene	0	.343	0	2	.84	ND	10
43	a-Terpineol	0	.210	0	2	1.37	ND	10
44	Naphthalene	0	1.308	0	2	.22	ND	10
45	o-Anisidine	0	.377	0	2	.77	ND	10
46	Hexachlorobutadiene	0	.168	0	2	1.72	ND	10
47	2-Chloroacetophenone	0	.821	0	2	.35	ND	10
48	a,a,a-Trichlorotoluene	0	.334	0	2	.86	ND	10
49	N,N-Diethylaniline	0	.622	0	2	.46	ND	10
50	1,4-Phenylenediamine	0	.403	0	2	.71	ND	10
51	Hydroquinone	0	.375	0	2	.77	ND	10
52	Pentamethylbenzene	0	.698	0	2	.41	ND	10
53	Hexachlorocyclopentadiene	0	.298	0	3	1.15	ND	10
54	Phthalic Anhydride	0	.012	0	3	28.05	ND	10
55	2,4,6-Trichlorophenol	0	.437	0	3	.78	ND	10
56	2,4,5-Trichlorophenol	0	.446	0	3	.77	ND	10

f: IOLKSVP1

Page: 2

TRIANGLE LABORATORIES OF RTP, INC.	DATA FILE: GH001	SAMPLE ID: IOLKM5-1-6
801 Capitola Drive	RF FILE: GG994	DILN FACTOR: 1
Durham, NC 27713	DATE: 03/30/92	TLI SAMPLE ID: 54-154-1,7
Telephone: (919) 544-5729	TLI Project Number: 20333	
	ANALYSIS DATE: 03/21/92	

QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
57	2,4-Toluenediamine	0	.570	0	3	.60	ND	10
58	2,4-Dichlorophenol	0	.434	0	3	.79	ND	10
59	2,3-Dichlorophenol	0	.418	0	3	.82	ND	10
60	2,6-Dichlorophenol	0	.458	0	3	.75	ND	10
61	3,5-Dichlorophenol	0	.706	0	3	.49	ND	10
62	3,4-Dichlorophenol	0	.630	0	3	.54	ND	10
63	Biphenyl	0	1.388	0	3	.25	ND	10
64	Dimethylphthalate	0	1.158	0	3	.30	ND	10
65	2,4-Dinitrotoluene	0	.474	0	3	.72	ND	10
66	2,4-Dinitrophenol	0	.182	0	3	1.89	ND	10
67	4,6-Dinitro-2-methylphenol	0	.302	0	3	1.14	ND	10
68	Dibenzofuran	0	1.981	0	3	.17	ND	10
69	4-Nitrophenol	0	.402	0	3	.85	ND	10
70	Trifluralin	0	.371	0	3	.92	ND	10
71	Hexachlorobenzene	0	.226	0	4	.46	ND	10
72	4-Aminobiphenyl	0	.933	0	4	.11	ND	10
73	Pentachlorophenol	0	.210	0	4	.50	ND	10
74	Pentachloronitrobenzene	0	.052	0	4	2.00	ND	10
75	4-Nitrobiphenyl	0	.428	0	4	.24	ND	10
76	Di-n-butylphthalate	0	1.323	0	4	.08	ND	10
77	Pyrene	0	1.145	0	5	.07	ND	10
78	Benzidine	0	.563	0	5	.15	ND	10
79	4,4'-Methylenedianiline	0	.295	0	5	.28	ND	10
80	Dimethylaminoazobenzene	0	.333	0	5	.25	ND	10
81	Butylbenzylphthalate	566	.493	1271	5	4.71	E ✓	10
82	3,3'-Dimethylbenzidine	0	.693	0	5	.12	ND	10
83	Methylene bis-chloroaniline	0	.240	0	5	.34	ND	10
84	Chrysene	0	1.059	0	5	.08	ND	10
85	3,3'-Dichlorobenzidine	0	.466	0	5	.18	ND	10
86	bis(2-Ethylhexyl)phthalate	2066	.680	1386	5	12.47	D ✓	10
87	3,3'-Dimethoxybenzidine	0	.309	0	5	.27	ND	10

	SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
10	Phenol-d5	1428	2.258	307	1	60.1	D	60.1
12	Nitrobenzene-d5	113	.423	401	2	3.9	E	3.9
13	1,3,5-Trichlorobenzene-d3	238	.342	446	2	10.0	D	10.0
14	1,4-Dibromobenzene-d4	397	1.197	500	1	31.5	D	31.5
15	2-Fluorobiphenyl	3515	1.218	661	3	49.5	D	49.5
16	2,4,6-Tribromophenol	1499	.254	862	3	101.3	D	101.3
17	Anthracene-d10	12272	1.119	952	4	57.2	D	57.2
18	Pyrene-d10	20598	.912	1138	5	92.7	D	92.7
19	Terphenyl-d14	19162	.941	1183	5	83.6	D	83.6

CODES: D = Detected; ND = Not Detected; E = Estimated; IS = Internal Standard

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

DATA FILE: GG986
RF FILE: GG982
DATE: 03/25/92
TLI PROJ #: 20333

SAMPLE ID: IOLKMS 1-6
TLI ID: 54.154.1-7
DILUTION FACTOR: 1
ANALYSIS DATE: 03/20/92

Q U A N T I T A T I O N   R E P O R T

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	1,4-Dichlorobenzene-d4	1760		325	1		IS	
2	Phenol	9132	2.1015	320	1	98.76	D ✓	10
3	bis(2-Chloroethyl)ether	0	1.7109	0	1	.27	ND	10
4	2-Chlorophenol	0	1.4483	0	1	.31	ND	10
5	1,3-Dichlorobenzene	0	1.5370	0	1	.30	ND	10
6	1,4-Dichlorobenzene	0	1.5918	0	1	.29	ND	10
7	Benzyl alcohol	0	.8285	0	1	.55	ND	10
8	1,2-Dichlorobenzene	0	1.5671	0	1	.29	ND	10
9	2-Methylphenol	0	1.5035	0	1	.30	ND	10
10	bis(2-Chloroisopropyl)ether	0	1.4983	0	1	.30	ND	10
11	4-Methylphenol	0	1.4513	0	1	.31	ND	10
12	N-Nitroso-di-n-propylamine	0	1.0398	0	1	.44	ND	10
13	Hexachloroethane	0	.6389	0	1	.71	ND	10
14	Naphthalene-d8	8289		508	14		IS	
15	Nitrobenzene	0	.5101	0	14	.19	ND	10
16	Isophorone	0	.7515	0	14	.13	ND	10
17	2-Nitrophenol	0	.2068	0	14	.47	ND	10
18	2,4-Dimethylphenol	0	.2655	0	14	.36	ND	10
19	Benzoic acid	0	.2198	0	14	.44	ND	10
20	bis(2-Chloroethoxy)methane	0	.4803	0	14	.20	ND	10
21	2,4-Dichlorophenol	0	.3133	0	14	.31	ND	10
22	1,2,4-Trichlorobenzene	0	.3615	0	14	.27	ND	10
23	Naphthalene	0	1.0753	0	14	.09	ND	10
24	4-Chloroaniline	0	.4336	0	14	.22	ND	10
25	Hexachlorobutadiene	0	.1584	0	14	.61	ND	10
26	4-Chloro-3-methylphenol	0	.2818	0	14	.34	ND	10
27	2-Methylnaphthalene	0	.7420	0	14	.13	ND	10
28	Acenaphthene-d10	6810		758	28		IS	
29	Hexachlorocyclopentadiene	0	.0861	0	28	1.37	ND	10
30	2,4,6-Trichlorophenol	0	.3087	0	28	.38	ND	10
31	2,4,5-Trichlorophenol	0	.3728	0	28	.32	ND	10
32	2-Chloronaphthalene	0	1.0700	0	28	.11	ND	10
33	2-Nitroaniline	0	.2668	0	28	.44	ND	10
34	Dimethylphthalate	0	1.1229	0	28	.10	ND	10
35	Acenaphthylene	0	1.7709	0	28	.07	ND	10
36	3-Nitroaniline	0	.3507	0	28	.33	ND	10
37	Acenaphthene	0	1.0825	0	28	.11	ND	10
38	2,4-Dinitrophenol	0	.1205	0	28	.97	ND	10
39	4-Nitrophenol	0	.0654	0	28	1.80	ND	10
40	Dibenzofuran	0	1.6617	0	28	.07	ND	10
41	2,4-Dinitrotoluene	0	.4360	0	28	.27	ND	10
42	2,6-Dinitrotoluene	0	.3368	0	28	.35	ND	10
43	Diethylphthalate	0	1.1677	0	28	.10	ND	10

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

In: IOLKSVP1   Inland-Ocean Lime Kiln Semi-Vost Phase 1

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

DATA FILE: GG986
RF FILE: GG982
DATE: 03/25/92
TLI PROJ #: 20333

SAMPLE ID: IOLKM5 1-6
TLI ID: 54.154.1-7
DILUTION FACTOR: 1
ANALYSIS DATE: 03/20/92

QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
44	4-Chlorophenyl-phenylether	0	.6221	0	28	.19	ND	10
45	Fluorene	0	1.5376	0	28	.08	ND	10
46	4-Nitroaniline	0	.4022	0	28	.29	ND	10
47	Phenanthrene-d10	19807		960	47		IS	
48	4,6-Dinitro-2-methylphenol	0	.1036	0	47	.39	ND	10
49	N-Nitrosodiphenylamine(1)	0	.4891	0	47	.08	ND	10
50	4-Bromophenyl-phenylether	0	.1754	0	47	.23	ND	10
51	Hexachlorobenzene	0	.2195	0	47	.18	ND	10
52	Pentachlorophenol	0	.1736	0	47	.23	ND	10
53	Phenanthrene	0	1.2237	0	47	.03	ND	10
54	Anthracene	0	1.2374	0	47	.03	ND	10
55	Di-n-butylphthalate	0	1.5171	0	47	.03	ND	10
56	Fluoranthene	0	1.6446	0	47	.02	ND	10
57	Chrysene-d12	23697		1328	57		IS	
58	Pyrene	0	1.3205	0	57	.03	ND	10
59	Butylbenzylphthalate	1479	.6266	1285	57	3.99	E ✓	10
60	3,3'-Dichlorobenzidine	0	.3276	0	57	.10	ND	10
61	Benzo(a)anthracene	0	1.2009	0	57	.03	ND	10
62	Chrysene	0	1.1572	0	57	.03	ND	10
63	bis(2-Ethylhexyl)phthalate	5342	.8071	1380	57	11.17	D ✓	10
64	Perylene-d12	15988		1513	64		IS	
65	Di-n-octylphthalate	0	3.0289	0	64	.02	ND	10
66	Benzo(b)fluoranthene	0	2.2113	0	64	.02	ND	10
67	Benzo(k)fluoranthene	0	2.8288	0	64	.02	ND	10
68	Benzo(a)pyrene	0	2.0379	0	64	.02	ND	10
69	Indeno(1,2,3-cd)pyrene	0	1.1975	0	64	.04	ND	10
70	Dibenz(a,h)anthracene	0	1.2919	0	64	.04	ND	10
71	Benzo(g,h,i)perylene	0	1.5286	0	64	.03	ND	10

	SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
72	Nitrobenzene-d5	354	.4055	413	14	4.20	D	4.2
73	2-Fluorobiphenyl	11605	1.1218	673	28	60.76	D	60.8
74	Terphenyl-d14	45784	1.0693	1198	57	72.27	D	72.3
75	Phenol-d5	4463	1.7484	318	1	58.01	D	58.0
77	2,4,6-Tribromophenol	4196	.1610	876	28	153.05	D	153.0
81	1,4-Dibromobenzene-d4	1348	1.0699	512	1	28.64	D	28.6
82	1,3,5-Trichlorobenzene-d3	986	.3285	458	14	14.48	D	14.5
83	Anthracene-d10	33886	1.0891	967	47	62.83	D	62.8
84	Pyrene-d10	49172	1.0526	1153	57	78.84	D	78.8

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
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FILE NAME: GG986
DATE: 03/25/92
TLI PROJ #: 20333

SAMPLE ID: IOLKM5 1-6
TLI ID: 54.154.1-7
DILUTION FACTOR: 1
ANALYSIS DATE: 03/20/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

	NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
1	SUBSTITUTED HYDROCARBON	776	1936112	505	40.00	771.09
2	SUBSTITUTED HYDROCARBON	847	1823157	505	40.00	726.10
3	SUBSTITUTED HYDROCARBON	812	1337590	505	40.00	532.72
4	SUBSTITUTED HYDROCARBON	738	1300889	505	40.00	518.10
5	SUBSTITUTED HYDROCARBON	938	995522	1329	40.00	422.43
6	SUBSTITUTED HYDROCARBON	708	992174	505	40.00	395.15
7	SUBSTITUTED HYDROCARBON	792	948976	505	40.00	377.94
8	SUBSTITUTED HYDROCARBON	714	943234	505	40.00	375.66
9	SUBSTITUTED ALCOHOL	1000	829704	1329	40.00	352.07
10	SUBSTITUTED HYDROCARBON	364	88050	325	40.00	280.75
11	SUBSTITUTED HYDROCARBON	785	667548	505	40.00	265.86
12	SUBSTITUTED HYDROCARBON	686	597789	505	40.00	238.08
13	SUBSTITUTED HYDROCARBON	754	590293	505	40.00	235.09
14	SUBSTITUTED HYDROCARBON	825	588493	505	40.00	234.38
15	SUBSTITUTED CYCLIC HYDROCARBON	654	510811	505	40.00	203.44
16	MOLECULAR SULFUR S8	1111	362422	1329	40.00	153.79

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
1,4-Dichlorobenzene-d4	325	12545	1
Naphthalene-d8	505	100436	14
Chrysene-d12	1329	94266	57
Perylene-d12	1513	56654	64

Σ subst'd HCs = 5373.35 μg
AIRVOL =

WESTON

A.3 Bark Boiler (VOST)

EMISSION TEST RESULTS - VOST

Mill	INLAND - ORANGE		Source:	Bark Boiler				
	Source Code:	IO-BB	EPN:	02	FIN:	P-BARKB	CIN:	C-33

Compound	BB-T (μg)	BB-TC (μg)	BB-C (μg/L)	Sampling Date: Total (μg)	March, 1992 IO-BB (μg/m3)	Conc. (ppm)
TARGET COMPOUNDS						
Chloromethane		2.591		2.59	259.10	0.123
Bromomethane		0.104		0.10	10.40	0.003
Methylene Chloride	0.945	0.015	2.66	1.07	107.44	0.030
Acetone	28.725		8.62	29.10	2909.57	1.204
Carbon Disulfide		0.008		0.01	0.80	0.000
Chloroform	27.032	0.008	3.73	27.20	2720.04	0.548
1,3-Butadiene	3.678	0.589		4.27	426.70	0.190
Iodomethane	2.673	0.019		2.69	269.20	0.046
Isooctane		0.003		0.00	0.30	0.000
n-Hexane	1.334	0.006		1.34	134.00	0.037
2-Butanone (MEK)	4.503			4.50	450.30	0.150
Bromodichloromethane	1.017			1.02	101.70	0.015
Benzene	333.048	0.047		333.10	33309.50	10.253
Toluene	49.514			49.51	4951.40	1.292
Chlorobenzene	0.805			0.81	80.50	0.017
Ethylbenzene	2.325			2.33	232.50	0.053
Styrene	4.073			4.07	407.30	0.094
o-Xylene	1.293			1.29	129.30	0.029
m-/p-Xylene	3.665			3.67	366.50	0.083
A-Pinene	11.606	0.029		11.64	1163.50	0.205
B-Pinene	1.942	0.005		1.95	194.70	0.034
Cumene	0.272			0.27	27.20	0.005
p-Cymene	1.995			2.00	199.50	0.036
TENTATIVELY IDENTIFIED CMPDS.						
Subst'd Cyclic HC	1.314			1.31	131.40	
Subst'd Aromatic HC	1.601			1.60	160.10	
Siloxane	2.912	0.044		2.96	295.60	
1-Buten-3-yne	3.647	0.389		4.04	403.60	
1,3-Butadiyne	4.616	0.270		4.89	488.60	
Furan	5.712	0.156		5.87	586.80	
Subst'd Ketone	3.107			3.11	310.70	
Methyl Furan	2.525			2.53	252.50	
Subst'd HC	1.538	0.029		1.57	156.70	
Propenal	2.500	0.022		2.52	252.20	
Dimethyl nonane		0.011		0.01	1.10	
SURROGATE STDS (% Recovery)						
Toluene-d8	91.5	101.7	98.9			
1,2-Dichloroethane-d4	439.7	100.6	95.6			
Benzene-d6	102.2	99.4	94.7			

EMISSION TEST RESULTS - VOST

Mill	INLAND - ORANGE		Source:	Bark Boiler			
	Source Code:	IO-BB	EPN:	02	FIN:	P-BARKB	CIN: C-33

Compound	BB-T (µg)	BB-TC (µg)	BB-C (µg/L)	Total (µg)	IO-BB (µg/m3)	Conc. (ppm)

Sampling Date: March, 1992

NOTES:
- -T=Tenax
- -TC=Tenax/Charcoal
- -C = Condensate

Air Volume = 0.01000 cu.m.

Condensate Vol. = 43.0 mL

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FILE NAME: HG951
RF FILE: ICAL 031692
DATE: 03/20/92
TLI PROJ #. 20332

SAMPLE ID: IOBBV2 T
TLI ID: 54.153.2
ANALYSIS DATE: 03/16/92
DILUTION FACTOR: 1

QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	51		798	1		IS	
2	Chloromethane	0	.872	0	1	.112	ND	.05
3	Bromomethane	0	.634	0	1	.154	ND	.05
4	Vinyl Chloride	0	1.005	0	1	.097	ND	.05
5	Chloroethane	0	.848	0	1	.115	ND	.05
6	Methylene Chloride	240	1.245	604	1	.945	D	.05
7	Acetone	1925	.328	544	1	28.725	D	.05
8	Carbon Disulfide	0	4.209	0	1	.023	ND	.05
9	1,1-Dichloroethene	0	1.090	0	1	.090	ND	.05
10	1,1-Dichloroethane	0	3.476	0	1	.028	ND	.05
11	trans-1,2-Dichloroethene	0	1.290	0	1	.076	ND	.05
12	Chloroform	16906	3.061	817	1	27.032	D	.05
13	1,2-Dichloroethane	0	2.185	0	1	.045	ND	.05
43	Trichlorofluoromethane	0	1.480	0	1	.066	ND	.05
46	Acrylonitrile	0	.502	0	1	.195	ND	.05
47	cis-1,2-Dichloroethene	0	1.514	0	1	.065	ND	.05
52	1,3-butadiene	372	.495	241	1	3.678	D	.05
57	Allyl chloride	0	.770	0	1	.127	ND	.05
62	Dimethyl disulfide	0	3.226	0	1	.030	ND	.05
63	Dimethyl sulfide	0	1.545	0	1	.063	ND	.05
65	Iodomethane	1284	2.351	526	1	2.673	D	.05
66	Isooctane	0	11.661	0	1	.008	ND	.05
68	Tert-Butyl methyl ether	0	3.206	0	1	.031	ND	.05
69	Vinyl Bromide	0	.945	0	1	.104	ND	.05
70	n-Hexane	848	3.111	686	1	1.334	D	.05
14	1,4-Difluorobenzene	371		934	14		IS	
15	2-Butanone	201	.030	785	14	4.503	D	.05
16	1,1,1-Trichloroethane	0	.501	0	14	.027	ND	.05
17	Carbon Tetrachloride	0	.513	0	14	.026	ND	.05
18	Vinyl Acetate	0	.488	0	14	.028	ND	.05
19	Bromodichloromethane	769	.509	1033	14	1.017	D	.05
20	1,2-Dichloropropane	0	.536	0	14	.025	ND	.05
21	cis-1,3-Dichloropropene	0	.757	0	14	.018	ND	.05
22	Trichloroethene	0	.545	0	14	.025	ND	.05
23	Dibromochloromethane	0	.500	0	14	.027	ND	.05
24	1,1,2-Trichloroethane	0	.314	0	14	.043	ND	.05
25	Benzene	609564	1.232	883	14	333.048	D	.05
26	trans-1,3-Dichloropropene	0	.569	0	14	.024	ND	.05
27	Bromoform	0	.352	0	14	.038	ND	.05
54	1,4-Dichloro-2-butene	0	.107	0	14	.126	ND	.05
60	Dibromomethane	0	.195	0	14	.069	ND	.05
28	Chlorobenzene-d5	482		1384	28		IS	
29	4-Methyl-2-Pentanone	0	.146	0	28	.074	ND	.05
30	2-Hexanone	0	.123	0	28	.088	ND	.05
31	Tetrachloroethene	0	.394	0	28	.027	ND	.05
32	1,1,2,2-Tetrachloroethane	0	.245	0	28	.044	ND	.05
33	Toluene	58159	.635	1147	28	49.514	D	.05
34	Chlorobenzene	1397	.938	1389	28	.805	D	.05

Triangle Laboratories of RTP, Inc.
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FILE NAME: HG951
RF FILE: ICAL 031692
DATE: 03/20/92
TLI PROJ #: 20332

SAMPLE ID: I088V2 T
TLI ID. 54.153.2
ANALYSIS DATE: 03/16/92
DILUTION FACTOR: 1

QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
35 Ethylbenzene	2090	.486	1419	28	2.325	D	.05
36 Styrene	7413	.984	1522	28	4.073	D	.05
37 o-Xylene	1354	.566	1517	28	1.293	D	.05
38 m-/p-Xylene	4115	.607	1443	28	3.665	D	.05
49 1,2 Dichlorobenzene	0	.737	0	28	.015	ND	.05
50 1,2,3-Trichloropropane	0	.232	0	28	.047	ND	.05
51 1,3 Dichlorobenzene	0	.955	0	28	.011	ND	.05
53 1,4 Dichlorobenzene	0	.800	0	28	.014	ND	.05
56 A-Pinene	20696	.964	1589	28	11.606	D	.05
58 B-Pinene	3596	1.001	1748	28	1.942	D	.05
59 Cumene (isopropylbenzene)	778	1.545	1867	28	.272	D	.05
64 Ethyl methacrylate	0	.425	0	28	.025	ND	.05
67 P-Cymene	7969	2.159	1997	28	1.995	D	.05

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT,ug	CODE	% RECOVERY
39 Toluene-d8	427	1.008	1137	28	.229	D	91.5
41 1,2-Dichloroethane-d4	408	1.816	881	1	1.099	D	439.7
48 Benzene-d6	467	1.231	900	14	.255	D	102.2

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
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FILE NAME: HG951
DATE: 03/20/92
TLI PROJ #: 20332

SAMPLE ID: IO8BV2 T
TLI ID: 54.153.2
ANALYSIS DATE: 03/16/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

	NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
1	SUBSTITUTED CYCLIC HYDROCARBON C10H16	1976	26869	1389	.25	1.314
2	SUBSTITUTED AROMATIC	1942	32750	1389	.25	1.601
3	SILOXANE	1263	17911	931	.25	2.912
4	1-BUTEN-3-YNE	295	21398	800	.25	3.647
5	1,3-BUTADIYNE	419	27083	800	.25	4.616
6	FURAN	489	33514	800	.25	5.712
7	PROPENAL	511	14670	800	.25	2.500
8	SUBSTITUTED KETONE	674	18231	800	.25	3.107
9	METHYL FURAN	737	14817	800	.25	2.525
10	SUBSTITUTED HYDROCARBON	764	9024	800	.25	1.538

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	800	1467	1
1,4-Difluorobenzene	931	1538	14
Chlorobenzene-d5	1389	5113	28

Triangle Laboratories of RTP, Inc.
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FILE NAME: HG935
RF FILE: ICAL 031692
DATE: 03/20/92
TLI PROJ #: 20332

SAMPLE ID: IO8BV2 TC
TLI ID: 54.153.2
ANALYSIS DATE: 03/14/92
DILUTION FACTOR: 1

Q U A N T I T A T I O N   R E P O R T

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1 Bromochloromethane	2760		786	1		IS	
2 Chloromethane	24950	.872	173	1	2.591	D	.05
3 Bromomethane	731	.634	307	1	.104	D	.05
4 Vinyl Chloride	0	1.005	0	1	.002	ND	.05
5 Chloroethane	0	.848	0	1	.002	ND	.05
6 Methylene Chloride	204	1.245	592	1	.015	E	.05
7 Acetone	0	.328	0	1	.006	ND	.05
8 Carbon Disulfide	389	4.209	512	1	.008	E	.05
9 1,1-Dichloroethene	0	1.090	0	1	.002	ND	.05
10 1,1-Dichloroethane	0	3.476	0	1	.001	ND	.05
11 trans-1,2-Dichloroethene	0	1.290	0	1	.001	ND	.05
12 Chloroform	263	3.081	804	1	.008	E	.05
13 1,2-Dichloroethane	0	2.165	0	1	.001	ND	.05
43 Trichlorofluoromethane	0	1.480	0	1	.001	ND	.05
46 Acrylonitrile	0	.502	0	1	.004	ND	.05
47 cis-1,2-Dichloroethene	0	1.514	0	1	.001	ND	.05
52 1,3-butadiene	3219	.495	233	1	.589	D	.05
57 Allyl chloride	0	.770	0	1	.002	ND	.05
62 Dimethyl disulfide	0	3.228	0	1	.001	ND	.05
63 Dimethyl sulfide	0	1.545	0	1	.001	ND	.05
65 Iodomethane	499	2.351	517	1	.019	E	.05
66 Isooctane	332	11.661	878	1	.003	E	.05
68 Tert-Butyl methyl ether	0	3.206	0	1	.001	ND	.05
69 Vinyl Bromide	0	.945	0	1	.002	ND	.05
70 n-Hexane	215	3.111	674	1	.006	E	.05
14 1,4-Difluorobenzene	13674		920	14		IS	
15 2-Butanone	0	.030	0	14	.012	ND	.05
16 1,1,1-Trichloroethane	0	.501	0	14	.001	ND	.05
17 Carbon Tetrachloride	0	.513	0	14	.001	ND	.05
18 Vinyl Acetate	0	.488	0	14	.001	ND	.05
19 Bromodichloromethane	0	.509	0	14	.001	ND	.05
20 1,2-Dichloropropane	0	.536	0	14	.001	ND	.05
21 cis-1,3-Dichloropropene	0	.757	0	14	.001	ND	.05
22 Trichloroethene	0	.545	0	14	.001	ND	.05
23 Dibromochloromethane	0	.500	0	14	.001	ND	.05
24 1,1,2-Trichloroethane	0	.314	0	14	.001	ND	.05
25 Benzene	3186	1.232	858	14	.047	E	.05
26 trans-1,3-Dichloropropene	0	.569	0	14	.001	ND	.05
27 Bromoform	0	.352	0	14	.001	ND	.05
54 1,4-Dichloro-2-butene	0	.107	0	14	.003	ND	.05
60 Dibromomethane	0	.195	0	14	.002	ND	.05
28 Chlorobenzene-d5	17728		1383	28		IS	
29 4-Methyl-2-Pentanone	0	.146	0	28	.002	ND	.05
30 2-Hexanone	0	.123	0	28	.002	ND	.05
31 Tetrachloroethene	0	.394	0	28	.001	ND	.05
32 1,1,2,2-Tetrachloroethane	0	.245	0	28	.001	ND	.05
33 Toluene	0	.635	0	28	.001	ND	.05
34 Chlorobenzene	0	.938	0	28	.001	ND	.05

Triangle Laboratories of RTP, Inc.	FILE NAME:	HG935	SAMPLE ID:	IO88V2 TC
801 Capitola Drive	RF FILE:	ICAL 031692	TLI ID:	54.153.2
Durham, NC 27713	DATE:	03/20/92	ANALYSIS DATE:	03/14/92
Telephone: (919) 544-5729	TLI PROJ #:	20332	DILUTION FACTOR:	1

QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
35 Ethylbenzene	0	.486	0	28	.001	ND	.05
36 Styrene	0	.984	0	28	.001	ND	.05
37 o-Xylene	0	.566	0	28	.001	ND	.05
38 m-/p-Xylene	0	.607	0	28	.001	ND	.05
49 1,2 Dichlorobenzene	0	.737	0	28	.001	ND	.05
50 1,2,3-Trichloropropane	0	.232	0	28	.001	ND	.05
51 1,3 Dichlorobenzene	0	.855	0	28	.001	ND	.05
53 1,4 Dichlorobenzene	0	.800	0	28	.001	ND	.05
56 A-Pinene	1991	.964	1564	28	.029	E	.05
58 B-Pinene	380	1.001	1712	28	.005	E	.05
59 Cumene (isopropylbenzene)	0	1.545	0	28	.001	ND	.05
64 Ethyl methacrylate	0	.425	0	28	.001	ND	.05
67 P-Cymene	0	2.159	0	28	.001	ND	.05

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT,ug	CODE	% RECOVERY
39 Toluene-d8	18179	1.008	1124	28	.254	D	101.7
41 1,2-Dichloroethane-d4	5045	1.818	855	1	.252	D	100.6
48 Benzene-d6	16737	1.231	854	14	.249	D	99.4

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
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Telephone: (919) 544-5729

FILE NAME: HG935T
DATE: 03/23/92
TLI PROJ #: 20332

SAMPLE ID: IOBBV2 TC
TLI ID: 54.153.2
ANALYSIS DATE: 3/14/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

	NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
1	SILOXANE	1247	8704	1364	.25	.044
2	PROPENAL	500	1552	786	.25	.022
3	1-BUTEN-3-YNE	286	27130	786	.25	.389
4	1,3-BUTADIYNE	402	18841	786	.25	.270
5	FURAN	478	10893	786	.25	.156
6	DIMETHYL NONANE	2147	2196	1364	.25	.011
7	SUBSTITUTED HYDROCARBON	2248	2334	1364	.25	.012
8	SUBSTITUTED HYDROCARBON	1173	1961	1364	.25	.010
9	SUBSTITUTED HYDROCARBON	1453	1376	1364	.25	.007

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	786	17437	1
1,4-Difluorobenzene	920	33331	14
Chlorobenzene-d5	1364	49334	28

Triangle Laboratories of RTP, Inc.
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FILE NAME: HG927
RF FILE: HG919
DATE: 03/18/92
TLI PROJ #: 20332

SAMPLE ID: IO88V2
TLI ID: 54.153.2 (COND)
SAMPLE VOL: .005 L
ANALYSIS DATE: 03/13/92
DILUTION FACTOR: 1

QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	CONC, ug/L	CODE	QUAN LIMIT
1 Bromochloromethane	3434		787	1		IS	
2 Chloromethane	0	.685	0	1	.43	ND	10
3 Bromomethane	0	.705	0	1	.41	ND	10
4 Vinyl Chloride	0	.968	0	1	.30	ND	10
5 Chloroethane	0	.808	0	1	.36	ND	10
6 Methylene Chloride	229	1.255	594	1	2.66	E	10
7 Acetone	317	.536	535	1	8.62	E	10
8 Carbon Disulfide	0	4.454	0	1	.07	ND	10
9 1,1-Dichloroethene	0	1.072	0	1	.27	ND	10
10 1,1-Dichloroethane	0	3.212	0	1	.09	ND	10
11 trans-1,2-Dichloroethene	0	1.279	0	1	.23	ND	10
12 Chloroform	797	3.112	805	1	3.73	E	10
13 1,2-Dichloroethane	0	2.215	0	1	.13	ND	10
43 Trichlorofluoromethane	0	1.630	0	1	.18	ND	10
46 Acrylonitrile	0	.489	0	1	.60	ND	10
47 cis-1,2-Dichloroethene	0	1.403	0	1	.21	ND	10
52 1,3-butadiene	0	.541	0	1	.54	ND	10
57 Allyl chloride	0	.764	0	1	.38	ND	10
62 Dimethyl disulfide	0	3.165	0	1	.09	ND	10
63 Dimethyl sulfide	0	1.358	0	1	.21	ND	10
65 Iodomethane	0	2.492	0	1	.12	ND	10
66 Isooctane	0	10.102	0	1	.03	ND	10
68 Tert-Butyl methyl ether	0	3.243	0	1	.09	ND	10
69 Vinyl Bromide	0	.946	0	1	.31	ND	10
70 n-Hexane	0	2.666	0	1	.11	ND	10
14 1,4-Difluorobenzene	16154		919	14		IS	
15 2-Butanone	0	.047	0	14	1.31	ND	10
16 1,1,1-Trichloroethane	0	.549	0	14	.11	ND	10
17 Carbon Tetrachloride	0	.570	0	14	.11	ND	10
18 Vinyl Acetate	0	.570	0	14	.11	ND	10
19 Bromodichloromethane	0	.531	0	14	.12	ND	10
20 1,2-Dichloropropane	0	.537	0	14	.12	ND	10
21 cis-1,3-Dichloropropene	0	.819	0	14	.08	ND	10
22 Trichloroethene	0	.636	0	14	.10	ND	10
23 Dibromochloromethane	0	.595	0	14	.10	ND	10
24 1,1,2-Trichloroethane	0	.387	0	14	.16	ND	10
25 Benzene	0	1.288	0	14	.05	ND	10
26 trans-1,3-Dichloropropene	0	.641	0	14	.10	ND	10
27 Bromoform	0	.512	0	14	.12	ND	10
54 1,4-Dichloro-2-butene	0	.201	0	14	.31	ND	10
60 Dibromomethane	0	.228	0	14	.27	ND	10
28 Chlorobenzene-d5	21352		1364	28		IS	
29 4-Methyl-2-Pentanone	0	.261	0	28	.18	ND	10
30 2-Hexanone	0	.240	0	28	.20	ND	10
31 Tetrachloroethene	0	.439	0	28	.11	ND	10
32 1,1,2,2-Tetrachloroethane	0	.372	0	28	.13	ND	10
33 Toluene	0	.664	0	28	.07	ND	10
34 Chlorobenzene	0	1.004	0	28	.05	ND	10

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HG927
RF FILE: HG919
DATE: 03/18/92
TLI PROJ #: 20332

SAMPLE ID: I088V2
TLI ID: 54.153.2 (COND)
SAMPLE VOL: .005 L
ANALYSIS DATE: 03/13/92
DILUTION FACTOR: 1

QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	CONC, ug/L	CODE	QUAN LIMIT
35 Ethylbenzene	0	.514	0	28	.09	ND	10
36 Styrene	0	1.079	0	28	.04	ND	10
37 o-Xylene	0	.611	0	28	.08	ND	10
38 m-/p-Xylene	0	.660	0	28	.07	ND	10
49 1,2 Dichlorobenzene	0	.986	0	28	.05	ND	10
50 1,2,3-Trichloropropane	0	.372	0	28	.13	ND	10
51 1,3 Dichlorobenzene	0	1.116	0	28	.04	ND	10
53 1,4 Dichlorobenzene	0	.956	0	28	.05	ND	10
56 A-Pinene	0	.993	0	28	.05	ND	10
58 B-Pinene	0	.997	0	28	.05	ND	10
59 Cumene (isopropylbenzene)	0	1.606	0	28	.03	ND	10
64 Ethyl methacrylate	0	.550	0	28	.09	ND	10
67 P-Cymene	0	2.247	0	28	.02	ND	10

SURROGATE SUMMARY

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT,ug	CODE	% RECOVERY
39 Toluene-d8	22321	1.057	1123	28	.25	D	98.9
41 1,2-Dichloroethane-d4	6488	1.976	855	1	.24	D	95.6
48 Benzene-d6	20099	1.313	854	14	.24	D	94.7

CODES: ND = Not Detected; [illegible]

APPENDIX B PROCESS STREAM SAMPLE RESULTS

APPENDIX B

WEST COAST REGIONAL CENTER
P.O. Box 458
Corvallis, OR 97339
(503) 752-8801

ncasi

NATIONAL COUNCIL OF THE PAPER INDUSTRY FOR AIR AND STREAM IMPROVEMENT, INC.

November 11, 1992

MEMO TO: Mr. Mike E. Franklin, Inland Container Corporation

FROM: Alex R. Gholson, NCASI ARG

SUBJECT: Corrected Results of Method 25D and Method 305 Analysis for the TACB Emissions Speciation Study, Inland-Orange Mill

In support of the TACB Emissions Speciation Study, NCASI analyzed selected samples using EPA Draft Method 25D. As part of a method development effort the samples were also analyzed for specific volatile organic compounds using an experimental method referred to as Method 305. This memo is an been updated from previous memos issued on September 10, 1992 and October 21, 1992 to clarify the discussion of the analytical methods used and reporting procedures.

Samples were collected by the contractor Roy F. Weston and sent to NCASI's West Coast Regional Center in Corvallis. Volatile organic sampling procedures were used to collect the samples instead of the sampling procedures specified by Method 25D so that compositing of the samples would be easier. I feel that the Method 25D sample procedures are prone to contamination from the outside environment during storage and shipment of sample containers half filled with polyethylene glycol (PEG) and a bias due to spillage of sample/PEG during sample collection. Samples were composited at NCASI and then carefully transferred to vials containing PEG in the laboratory. Table 1 list the samples received and how they were combined to form the samples analyzed.

The composited samples were analyzed as described by the draft Method 25D proposed in the Federal Register with the modifications mentioned above. Method 25D was proposed to determine if a sample has a total volatile organic emission potential below a specified limit (500 ppmwVO). The samples analyzed from Inland-Orange were found to be below that limit. However, for this study it was desired to use the method to provide an estimate of the actual level of volatile organic in each sample collected. Because this objective differs slightly from the define purpose of the method, a brief discussion of the method and the method results are in order. In Method 25D a sample is purged under specified conditions to remove the volatile compounds. The removed compounds are then analyzed for total organic carbon using a flame ionization detector (FID) resulting in a value expressed as parts-per-million carbon (as CH_4) by weight (ppmwC) or µgC/g. The total purged chlorine is measured with an electrolytic conductivity detector and reported as ppm chlorine by weight (ppmwCl) or µgCl/g. Method 25D then calculates a total volatile organic by summing the total organic carbon and the total organic chlorine and reports the total as parts-per-million volatile organic (ppmwVO). Because the method was designed to show that a value is below a level well within its standard working range, no guidance is provided for reporting values near or below the limit of detection (LOD) or adding values when one or both are below the LOD. For this study the American Chemical Society definition of LOD which is defined as three standard deviations of the measurement above the blank response was used. All Method 25D values are blank corrected so the blank level is well characterized and the standard deviation of multiple blank measurements is used to determine the LOD. The LOD for the total carbon value was 12.4 ppmwC for a 15 gram sample and 5.8 ppmwCl total chlorine value for a 15 gram sample. Actual LODs were dependant on the sample size which varied from 10.8 to 17.1 grams. When measured concentration values are below the LOD, they are reported as not detected (ND) and the LOD is then listed in parentheses. The total volatile organic which is the sum of two measure values was not reported for this study. Because proper guidance for handling values below the LOD is not provided by the method, the data user should choose the most appropriate method for determining the total which is consistent with the users data objectives and his best professional judgement. For example, in the case of an evaporator condensate, a non-detect for chlorine could be considered as a zero when determining a total. Likewise, for a bleach plant sewer, it might be prudent to assume the LOD as the best estimate of the chlorine level.

The experimental modifications made to speciate the volatile organics (Method 305) purged using Method 25D included removing a third slip stream from the sample purge line at approximately 100 mL/min through an ice cold aqueous impinger and into a Tenax/charcoal adsorbent trap. The aqueous impinger solution was analyzed for methanol, ethanol, acetone, 2-propanol, and 2-butanone by microdistillation followed by GC-FID analysis. The Tenax/charcoal trap was thermally desorbed and analyzed by GC/MS for a list of 28 compounds. Table 2 list the results of the Method 25D and Method 305 analyses. All Method 305 values are reported in the units of microgram of compound per gram of sample (µg/g). No effort was made to determine the LOD for this method because of the lack of historical data needed to characterize the background level or the analytical variance. Not detected (ND) was reported for all compounds not found or found but below a level generally considered reliable based on professional judgment of a limited database. This level was chosen to be 1.0 µg/g for the impinger values and 0.1 µg/g for the trap values.

The quality assurance checks of Method 25D for this program included two sets of sample duplicate analyses and a matrix spike duplicate. Only volatile carbon was detected by Method 25D in the duplicates and the difference between duplicates relative to the average expressed as a percent or relative percent difference (RPD) between duplicate samples were 8.1 and 5.6 percent indicating good precision. Only one set of duplicates were obtained using the experimental Method 305. Methanol duplicate results were found to have a RPD or 1.3 percent. Values of other compounds detected at lower levels and analyzed using the adsorbent trap and GC/MS were of lower precision. RPDs for compounds detected ranged from 112. percent for dimethyl sulfide to 10.2 percent for ß-pinene.

The matrix spike duplicate provided both recovery and precision information for the two methods. For Method 25D the total carbon average recovery was 61.6 percent with a RPD of 0.3 percent. This indicates good recovery because typical recovery for a QC spike in reagent water is 70 percent. The less than 100 percent recovery found is due to the large percentage of methanol in the spiking solution which is only 80 percent purged by Method 25D and has a poor FID response. The chlorine spike was near the LOD for chlorine and an average recovery of 47.8 percent with a RPD of 13.7 percent. It is believed the low recovery of the chlorine spike is due to the low concentration level spiked. The average recovery of methanol by Method 305 was found to be 82.6 percent with a RPD of 10.8 percent while acetone and 2-butanone had approximately 50 percent recoveries with 10 percent RPDs. Trap recoveries of compound more volatile than chloroform were generally less than 10 percent including dimethyl sulfide. Chloroforms recovery was 71 percent with a RPD of 58 percent. Recoveries of the other compounds ranged from 33 percent for ß-pinene to 134 percent for limonene with RPDs ranging from 8.9 percent to 56.8 percent. In summary, the Method 25D QA results are within an acceptable range while the Method 305 results other than the methanol values should be considered semi-quantitative at this time. More development of Method 305 is currently being performed to improve the overall data quality for Method 305.

cc: Ashok Jain
    Larry LaFleur

TABLE 1. SAMPLES COMPOSITED AND THEIR ANALYTICAL CODE NUMBERS

Analytical code #	Composited sample code #
IO-BB/SW/0708/1	IO-BB/SW/0708/1 IO-BB/SW/0709/2 IO-BB/SW/0710/2
IO-BB/SW/0708/2	IO-BB/SW/0708/2 IO-BB/SW/0708/3 IO-BB/SW/0709/1 IO-BB/SW/0709/3
IO-BB/SW/0710/1	IO-BB/SW/0710/1
IO-BB/SW/0710/3	IO-BB/SW/0710/3

TABLE 2. RESULTS OF METHOD 305 SPECIATION FOR INLAND-ORANGE MILL

Compound	Concentration (μg/g) IO-BB/SW /0708/1	IO-BB/SW /0708/2	IO-BB/SW /0710/1	IO-BB/SW /0710/3
Method 25D				
Total Carbon (ppmwC)	ND (13.9)	ND (13.5)	ND (17.4)	ND (15.7)
Total Chlorine (ppmwCl)	ND (4.2)	ND (4.1)	ND (5.3)	ND (4.8)
Method 305				
Impinger analysis				
Methanol	3.0	3.6	4.3	4.8
Ethanol	ND	ND	ND	ND
Impinger + Trap				
Acetone	0.293	0.826	ND	ND
2-Butanone	ND	ND	ND	ND
Trap analysis				
Dimethyl sulfide	ND	ND	ND	ND
Methylene chloride	ND	0.237	0.436	< 0.1
Chloroform	ND	ND	ND	ND
Benzene	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND
Dimethyl disulfide	ND	ND	ND	ND
Toluene	ND	ND	0.647	ND
α-Pinene	ND	ND	ND	ND
β-Pinene	ND	ND	ND	ND
Limonene	ND	ND	ND	ND

ND is not detected. The limit of detection is given in parenthesis when available (see text for explanation).

TEXAS EMISSIONS SPECIATION STUDY
EMISSION TEST RESULTS
SIMPSON-PASADENA
PASADENA, TEXAS

VOLUME 5 OF 6

Prepared For:

TEXAS PAPER INDUSTRY ENVIRONMENTAL COMMITTEE

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Prepared By:

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1635 Pumphrey Avenue
Auburn, AL 36830

JANUARY 1993

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(L) WWC (R) DW 18 December 1992

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APPENDICES

EXECUTIVE SUMMARY

This volume of the report presents the results of the sources tested at the Simpson Pasadena Paper mill in Pasadena, Texas. Volume 1 describes the objectives of the study, methodology used to collect the data, and the quality control results which are applicable to the entire study at the five mills. A copy of the project work plan is also included as a Section in Volume 1.

The table on the following page summarizes the sources tested for the various parameters. The testing was conducted during the time period of 18 May through 25 June by a WESTON test team led by Mr. Bobby Betts. Mr. A.J. Navarre of Simpson Pasadena Paper was responsible for collection of process operating data and coordination of testing activities with mill operations.

Data is presented by source as sections in this volume. Each section will include a brief narrative *SOURCE SUMMARY*, a tabular *SUMMARY OF RESULTS*, a graphic THC TREND PLOT (if applicable), and exhibits for all source data, quality control data and process operating conditions. Unit process descriptions are included as a separate appendix. Supporting data (chromatograms, calibration data, field data sheets, etc.) will remain on file for a period of three years.

SOURCES TESTED AT SIMPSON - PASADENA

SOURCE TESTED	SOURCE CODE	Phase 2 M16 TRS	M18 M25A	VOST	MM5	CH2O	Metals	Cr+6	HCl	Acid Mist	Chloro-form
SIMPSON - PASADENA											
TPIEC-POOLED SOURCES											
Gas-Fired Power Boilers											
Marine Boiler A	SP-PBMBA		Y			Y					
Marine Boiler B	SP-PBMBB		Y			Y					
Recovery Furnace (Cyclone) No.7	SP-RF7	Y	Y	Y	Y	Y					
Smelt Dissolving Tank Vent	SP-SDTV7	Y	Y	Y	Y						
MILL-SPECIFIC SOURCES											
Lime Kiln	SP-LK	Y	Y			Y					
Thermal Oxidation Plant Vent	SP-TOPV	Y	Y			Y					
NCG Bypass Scrubber Vent	SP-NCGBS	Y	Y								
Softwood Bleach Plant (11 vents)											
Extraction Tower Vent	SP-BPSETV		Y						Y		Y
Extraction Washer Vent	SP-BPSEWV		Y						Y		Y
Extraction Seal Box Vent	SP-BPSESB		Y						Y		Y
First NaOCl Tower Vent	SP-BPSFHT		Y						Y		Y
First NaOCl Washer Vent	SP-BPSFHW		Y						Y		Y
First NaOCl Seal Box Vent	SP-BPSFHS		Y						Y		Y
Combined Chlorination Scrubber Vent	SP-BPSCCS		Y						Y		Y
Combined ClO2 Scrubber Vent	SP-BPSCSV		Y						Y		Y
Second NaOCl Tower Vent	SP-BPSSHT		Y						Y		Y
Second NaOCl Washer Vent	SP-BPSSHW		Y						Y		Y
Second NaOCl Seal Box Vent	SP-BPSSHS		Y						Y		Y
Hardwood Bleach Plant (11 vents)											
Chlorination Washer Vent	SP-BPHCWV		Y						Y		Y
Extraction Washer Vent	SP-BPHEWV		Y						Y		Y
Extraction Seal Box Vent	SP-BPHESB		Y						Y		Y
First NaOCl Washer Vent	SP-BPHFHW		Y						Y		Y
First NaOCl Seal Box Vent	SP-BPHFHS		Y						Y		Y
ClO2 Tower Scrubber Vent	SP-BPHCTS		Y						Y		Y
ClO2 Washer Vent	SP-BPHDWV		Y						Y		Y
Second NaOCl Washer Vent	SP-BPHSHW		Y						Y		Y
Second NaOCl Seal Box Vent	SP-BPHSHS		Y						Y		Y
Chlorination Seal Box Scrubber Vent	SP-BPHCSS		Y						Y		Y
ClO2 Seal Box Scrubber Vent	SP-BPHCSB		Y						Y		Y

WESTON
MANAGERS DESIGNERS/CONSULTANTS

1. SP-PBMBA

SECTION 1
MARINE BOILER A
(SP-PBMBA)

SECTION 1
MARINE BOILER A
(SP-PBMBA)

The Marine Boiler A was tested on two different days. The source was sampled for volatile organic compounds using Methods 25A and 18. Aldehyde samples were also collected.

Total Hydrocarbons (M25A)

Figures 1.1 and 1.2 present the THC trends for the test periods on 5/18/92 and 5/19/92, respectively. On the first day, the total hydrocarbons ranged from 6 to 11 ppm. On the second day, they ranged from 13 to 27 ppm except for a concentration change that occurred at 1932.

Volatile Organic Compounds (M18)

Table 1.1 summarizes the results for the Method 18 target compounds, and Section 1.1 is a tabulation of the data. No target compounds were identified by the Method 18 analysis. The volumetric flow was measured during sampling using a pitot tube.

Miscellaneous Parameters

Table 1.2 summarizes the results of testing for aldehydes. Section 1.2 tabulates the results for each compound.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 1.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 1.4 includes the process operating data as recorded and provided by mill personnel. Not all process operating data were given for VOC run times. The data with the closest run time was used.

FIGURE 1.1

THC TREND ANALYSIS (5/18/92)
MARINE BOILER A (SP-PBMBA)

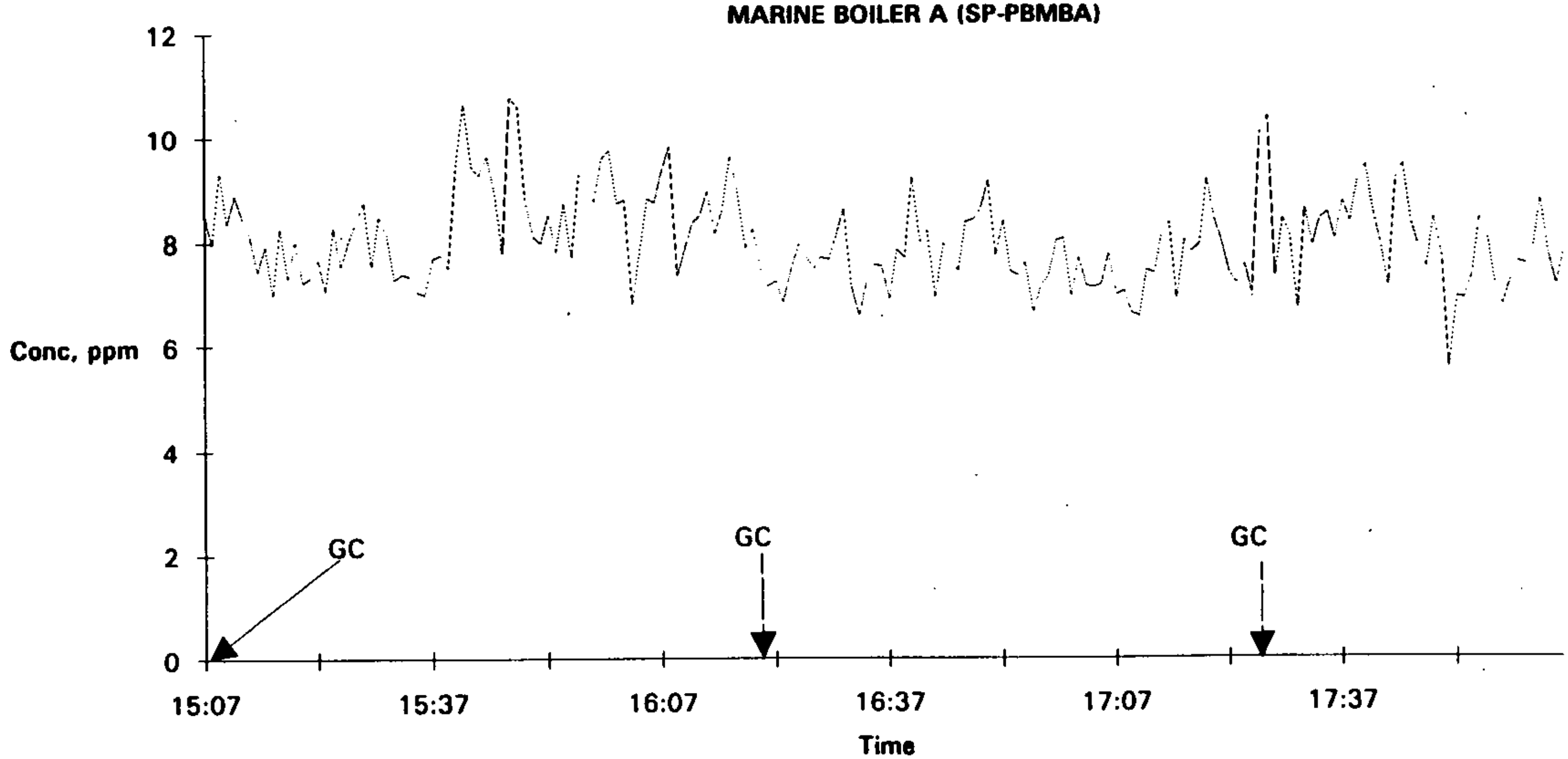
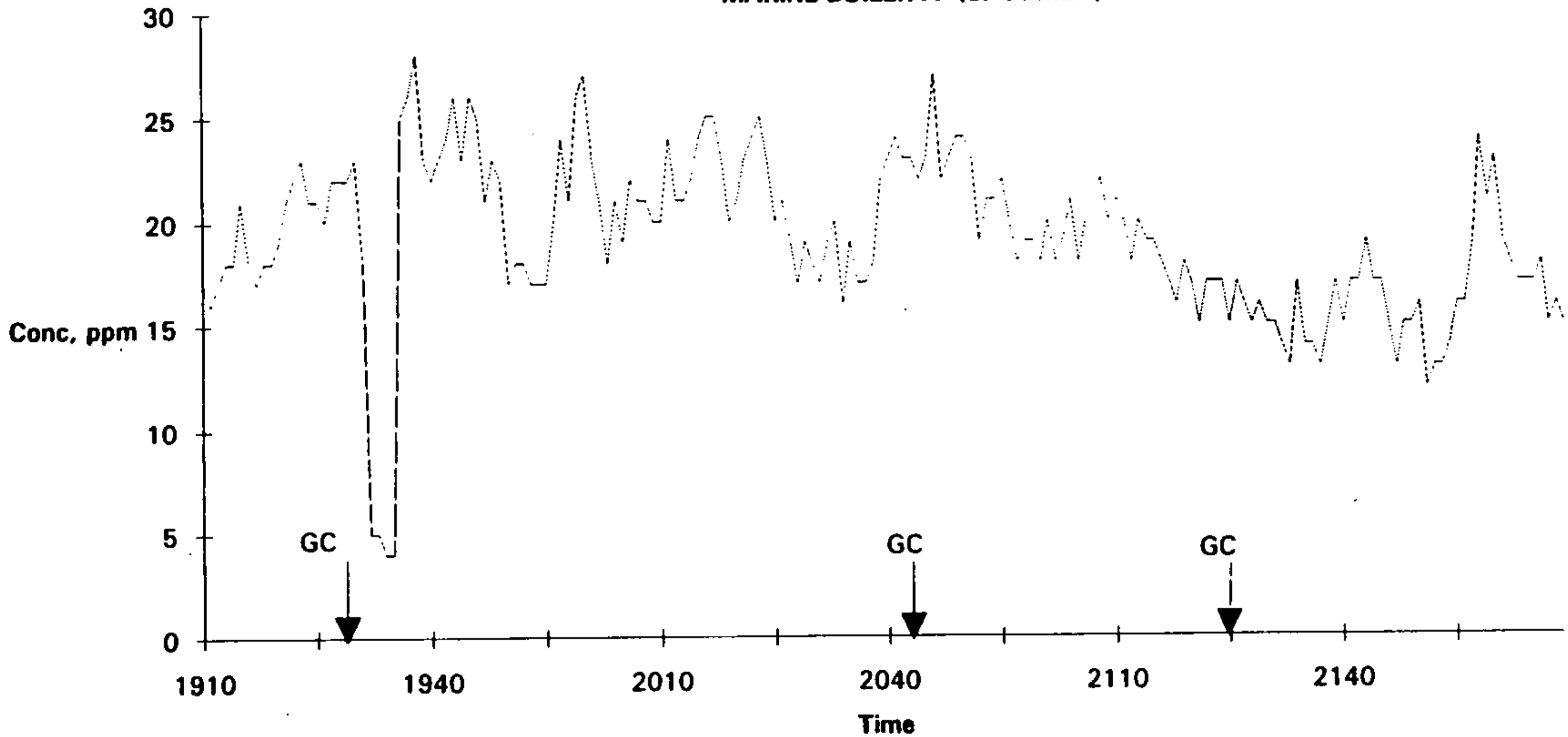


FIGURE 1.2

THC TREND ANALYSIS (5/19/92)
MARINE BOILER A (SP-PBMBA)



WESTON

TABLE 1.1 SUMMARY OF VOC RESULTS

Mill: SIMPSON - PASADENA
Source Code: SP-PBMBA
FIN: PN2301 CIN: NA

Source: Marine Boiler A
Test Dates: 5/18/92 5/19/92
EPN: SN47

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	434	442	438	
Volumetric Flow Rate, x10^3 DSCFM	23.3	23.3	23.3	
Process Operating Conditions				
Production Rate, x 10^6 BTU/hr	70.0	84.0	75.7	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.2
Method 18 Data, lb/hr				
Methanol	ND	ND	ND	0.2
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	ND	ND	ND	0.4
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.6
Toluene	ND	ND	ND	0.2
Ethyl benzene	ND	ND	ND	0.2
m-, p-Xylene	ND	ND	ND	0.2
o-Xylene	ND	ND	ND	0.2
Cumene	ND	ND	ND	0.2
alpha-Pinene	ND	ND	ND	0.3
beta-Pinene	ND	ND	ND	0.3
3-Carene	ND	ND	ND	0.3
Terpenes (Unspecified)	ND	ND	ND	0.3
p-Cymene	ND	ND	ND	0.3
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	ND	ND	ND	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	ND	ND	ND	0.1

ND=Not Detected
DL=Detection Limit

WESTON

TABLE 1.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: SIMPSON-PASADENA
Source Code: SP-PBMBA
FIN: PN2301 EPN: SN47

Source: Marine Boiler A
Test Dates: 5/18/92, 5/19/92
CIN: NA

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	434	442	438	
Volumetric Flow Rate, x 10^3 DSCFM	23.3	23.3	23.3	
Process Operating Conditions				
Production Rate, x 10^6 BTU/hr	70.0	84.0	77.0	
Emission Rate, lb/hr				
Formaldehyde	ND	ND	ND	0.1
Acetaldehyde	ND	ND	ND	0.1
Acetone (Impinger)	ND	ND	ND	0.1
Acetophenone	ND	ND	ND	0.2
2-Butanone (Impinger)	ND	ND	ND	0.1
Methyl isobutyl ketone	ND	ND	ND	0.2
Acrolein	ND	ND	ND	0.1
Benzaldehyde	ND	ND	ND	0.2

ND = Not Detected
DL = Detection Limit

Section 1.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill:	SIMPSON - PASADENA	Source:	Marine Boiler A	FIN:	PN2301
Source Code:	SP-PBMBA	Date:	5/18/92 EPN: SN47	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1506	1606	1706	
Flow Data				
Stack Temperature, °F			442	442
Moisture Content, %			4.8	4.8
Oxygen Concentration, %			10.5	10.5
Carbon Dioxide Concentration, %			6.5	6.5
Volumetric Flow Rate, x10^3 ACFM			42.1	42.1
Volumetric Flow Rate, x10^3 DSCFM			23.3	23.3
Process Operating Conditions				
Production Rate, x 10E+6 BTU/hr	80.0	80.0	84.0	81.3
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	2.1 *	2.1 •	2.1 *	2.1 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 •	0.5 *	0.5 •
Emission Rate, lb/hr	0.1 *	0.1 •	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 •	0.5 •	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source: Marine Boiler A		FIN: PN2301
Source Code: SP-PBMBA	Date: 5/18/92	EPN: SN47	CIN: NA

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.6 *	0.6 *	0.6 *	0.6 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source: Marine Boiler A		FIN: PN2301
Source Code: SP-PBMBA	Date: 5/18/92	EPN: SN47	CIN: NA

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Knowns as Carbon				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	8.4	8.4	8.4	8.4
Emission Rate, lb/hr as C	0.4	0.4	0.4	0.4

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA   Source: Marine Boiler A   FIN: PN2301
Source Code: SP-PBMBA   Date: 5/19/92   EPN: SN47   CIN: NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1909	2009	2109	
Flow Data				
Stack Temperature, °F			434	434
Moisture Content, %			1.6	1.6
Oxygen Concentration, %			8.5	8.5
Carbon Dioxide Concentration, %			6.5	6.5
Volumetric Flow Rate, x10^3 ACFM			40.2	40.2
Volumetric Flow Rate, x10^3 DSCFM			23.3	23.3
Process Operating Conditions				
Production Rate, x 10E+6 BTU/hr	70.0	70.0	70.0	70.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	2.0 *	2.0 *	2.0 *	2.0 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Marine Boiler A | FIN: PN2301
Source Code: SP-PBMBA | Date: 5/19/92 | EPN: SN47 | CIN: NA

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.0 *	1.0 *	1.0 *	1.0 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.0 *	1.0 *	1.0 *	1.0 *
Emission Rate, lb/hr	0.6 *	0.6 *	0.6 *	0.6 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *

*One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill:	SIMPSON - PASADENA	Source:	Marine Boiler A			FIN:	PN2301
Source Code:	SP-PBMBA	Date:	5/19/92	EPN:	SN47	CIN:	NA

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Knowns as Carbon				
Concentration, ppmvd	1.6	0.8	0.7	1.1
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	20.3	21.3	17.3	19.6
Emission Rate, lb/hr as C	0.9	0.9	0.8	0.9

* One or more values were less than the detection limit.

Section 1.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA	Source:	Marine Boiler A			FIN:	PN2301
Source Code: SP-PBMBA	Date:	5/18/92	EPN:	SN47	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1800			
Flow Data				
Stack Temperature, °F	442			442
Moisture Content, %	4.8			4.8
Oxygen Concentration, %	10.5			10.5
Carbon Dioxide Concentration, %	6.5			6.5
Volumetric Flow Rate, x10^3 ACFM	42.1			42.1
Volumetric Flow Rate, x10^3 DSCFM	23.3			23.3
Process Operating Conditions				
Production Rate, x 10E+6 BTU/hr	84.0			84.0
Miscellaneous Parameters				
Formaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acetaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acetone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acetophenone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.2 *			0.2 *
2-Butanone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Methyl isobutyl ketone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.2 *			0.2 *
Acrolein				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Benzaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.2 *			0.2 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA	Source:	Marine Boiler A		FIN:	PN2301
Source Code: SP-PBMBA	Date:	5/19/92	EPN: SN47	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	2120			
Flow Data				
Stack Temperature, °F	434			434
Moisture Content, %	1.6			1.6
Oxygen Concentration, %	8.5			8.5
Carbon Dioxide Concentration, %	6.5			6.5
Volumetric Flow Rate, x10^3 ACFM	40.2			40.2
Volumetric Flow Rate, x10^3 DSCFM	23.3			23.3
Process Operating Conditions				
Production Rate, x 10E+6 BTU/hr	70.0			70.0
Miscellaneous Parameters				
Formaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acetaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acetone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acetophenone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.2 *			0.2 *
2-Butanone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Methyl isobutyl ketone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.2 *			0.2 *
Acrolein				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Benzaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.2 *			0.2 *

* One or more values were less than the detection limit.

Section 1.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL SP **SOURCE** SP-PBMBA

1. CALIBRATION

THEOR	DATE 5/18/92		DATE 5/19/92	
ppm	ppm	%REC	ppm	%REC
0	0		2	
15	14	93.33%	12	80.00%
90	89	98.89%	90	100.00%
149	149	100.00%	149	100.00%

2. PROPANE LINE RECOVERY

	DATE 5/18/92			DATE 5/19/92		
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	89	94	106%	15	16	107%
AFTER	89	91	102%	15	16	107%

3. LINE BLANK

	DATE 5/18/92		DATE 5/19/92	
	INST	LINE	INST	LINE
BEFORE	0	3	0	2
AFTER	---	---	0	2

		WESTON QC SUMMARY			
		METHOD 18			
MILL	SIMPSON - PASADENA		SOURCE:	Power Boiler, Marine	
			THEOR	EXP	
CMPD			ppmV	ppmV	%RE
	PRETEST				
FILE NAME			EDA4004	EIA4003	
STD ID			917-40-3	917-40-3	
ethanol			55.64	55.09	99.01%
acetone			44.47	42.68	95.97%
isopropanol			42.65	44.13	103.46%
dimethyl sulfide			19.55	18.98	97.08%
benzene			36.54	33.16	90.75%
bromodichloromethane			40.17	40.95	101.95%
dimethyl disulfide			36.26	35.23	97.16%
toluene			30.73	30.18	98.22%
ethyl benzene			26.67	26.12	97.95%
m-xylene			26.64	26.19	98.32%
o-xylene			26.76	26.60	99.40%
cumene			23.47	23.05	98.20%
alpha-pinene			20.49	20.59	100.47%
beta-pinene			20.59	20.72	100.63%
3-carene			20.61	20.78	100.81%
p-cymene			20.92	36.96	176.64%
FILE NAME			EDA4004	EJA4001	
STD ID			917-40-3	917-40-3	
ethanol			55.64	54.98	98.81%
acetone			44.47	47.48	106.76%
isopropanol			42.65	43.97	103.09%
dimethyl sulfide			19.55	20.29	103.78%
benzene			36.54	38.51	105.39%
bromodichloromethane			40.17	42.56	105.96%
dimethyl disulfide			36.26	38.26	105.51%
toluene			30.73	28.55	92.91%
ethyl benzene			26.67	28.54	107.02%
m-xylene			26.64	28.73	107.86%
o-xylene			26.76	28.74	107.40%
cumene			23.47	25.18	107.27%
alpha-pinene			20.49	22.15	108.08%
beta-pinene			20.59	22.74	110.44%
3-carene			20.61	22.41	108.71%
p-cymene			20.92	39.93	190.83%

		WESTON QC SUMMARY			
		METHOD 18			
MILL	SIMPSON - PASADENA		SOURCE	Power Boiler, Marine	
1. CHECK STANDARD					
			[--------------	%REC	-----------]
FILE NAME			EIA4003	EJA4001	
ppm		THEOR	EXP 1	EXP 2	EXP 3
ethanol		55.64	99.01%	98.81%	
acetone		44.47	95.97%	106.76%	
isopropanol		42.65	103.46%	103.09%	
dimethyl sulfide		19.55	97.08%	103.78%	
benzene		36.54	90.75%	105.39%	
bromodichloromethane		40.17	101.95%	105.96%	
dimethyl disulfide		36.26	97.16%	105.51%	
toluene		30.73	98.22%	92.91%	
ethyl benzene		26.67	97.95%	107.02%	
m-xylene		26.64	98.32%	107.86%	
o-xylene		26.76	99.40%	107.40%	
cumene		23.47	98.20%	107.27%	
alpha-pinene		20.49	100.47%	108.08%	
beta-pinene		20.59	100.63%	110.44%	
3-carene		20.61	100.81%	108.71%	
p-cymene		20.92	176.64%	190.83%	
2. PROPANE RESPONSE					
		THEOR	%REC	%REC	%REC
BEFORE RUN		29.9			
AFTER RUN					
3. METHANOL RECOVERY					
		THEOR	%REC	%REC	%REC
BEFORE RUN		100	126.52%	101.35%	
AFTER RUN		127.13	101.35%		
4. LINE BLANK					
			[--------------	FILE REF	-----------]
BEFORE RUN				EJA4009	
AFTER RUN			EIA4013	EKA4002	
NOTES:					

Section 1.4 Process Operating Data

MILL: SIMPSON PAPER

SOURCE: MARINE BOILERS A&B

SOURCE		SP-PBMBA						SP- PBMBB					
FIN		PN2301						PN2302					
EPN		SN47						SN48					
DATE		5/18			5/20			5/18			5/19		
START TIME		1507	1607	1707	1124	1224	1324	2026	2126	2226	1159	1259	1359
	UNITS												
FUEL RATE	KSCFH	80	80	84	70	64	64	90	90	90	74	75	75
EMISSION OXYGEN	%	3.2	3.2	3.2	3.0	3.0	3.0	2.8	2.8	2.8	3.1	3.1	3.1

OPERATIONS

FUEL	NATURAL GAS
FUEL BTU CONTENT	1000 BTU/CF
BOILER TYPE	MARINE, RAPID STEAMING
SLUDGE BURNING	NO

Note: See Appendix D for Unit Process Description

SECTION 2
MARINE BOILER B
(SP-PBMBB)

SECTION 2
MARINE BOILER B
(SP-PBMBB)

The Marine Boiler B was tested on two different days. The source was sampled for volatile organic compounds using Methods 25A and 18. Aldehyde samples were collected.

Total Hydrocarbons (M25A)

Figures 2.1 and 2.2 present the THC trends for the test periods on 5/18/92 and 5/19/92, respectively. On the first day, the total hydrocarbon concentrations varied from 0 to 3 ppm. On the second day, they ranged from 1 to 4 ppm. However, between 1328 to 1411, an increase in concentration occurred attributed to the boiler room changing from 64% auto swing to 100% manual.

Volatile Organic Compounds (M18)

Table 2.1 summarizes the results for the Method 18 target compounds, and Section 2.1 is a tabulation of the data. No target compounds were identified. The volumetric flow was measured during sampling with a pitot tube.

Miscellaneous Parameters

Table 2.2 summarizes the results of testing for aldehydes. Section 2.2 tabulates the results for each compound.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 2.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 2.4 includes the process operating data as recorded and provided by mill personnel.

FIGURE 2.1

THC TREND ANALYSIS (5/18/92)
MARINE BOILER B (SP-PBMBB)

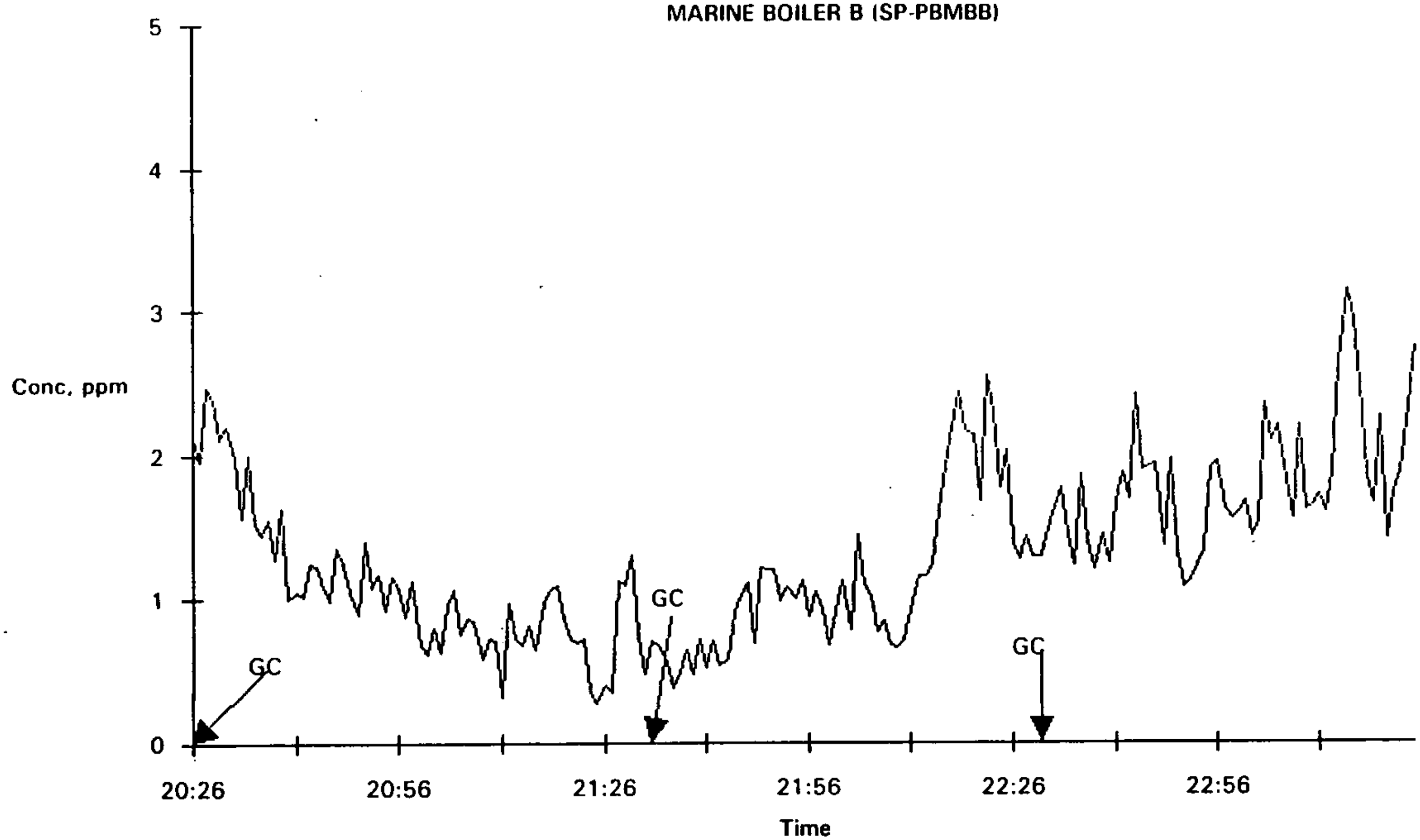
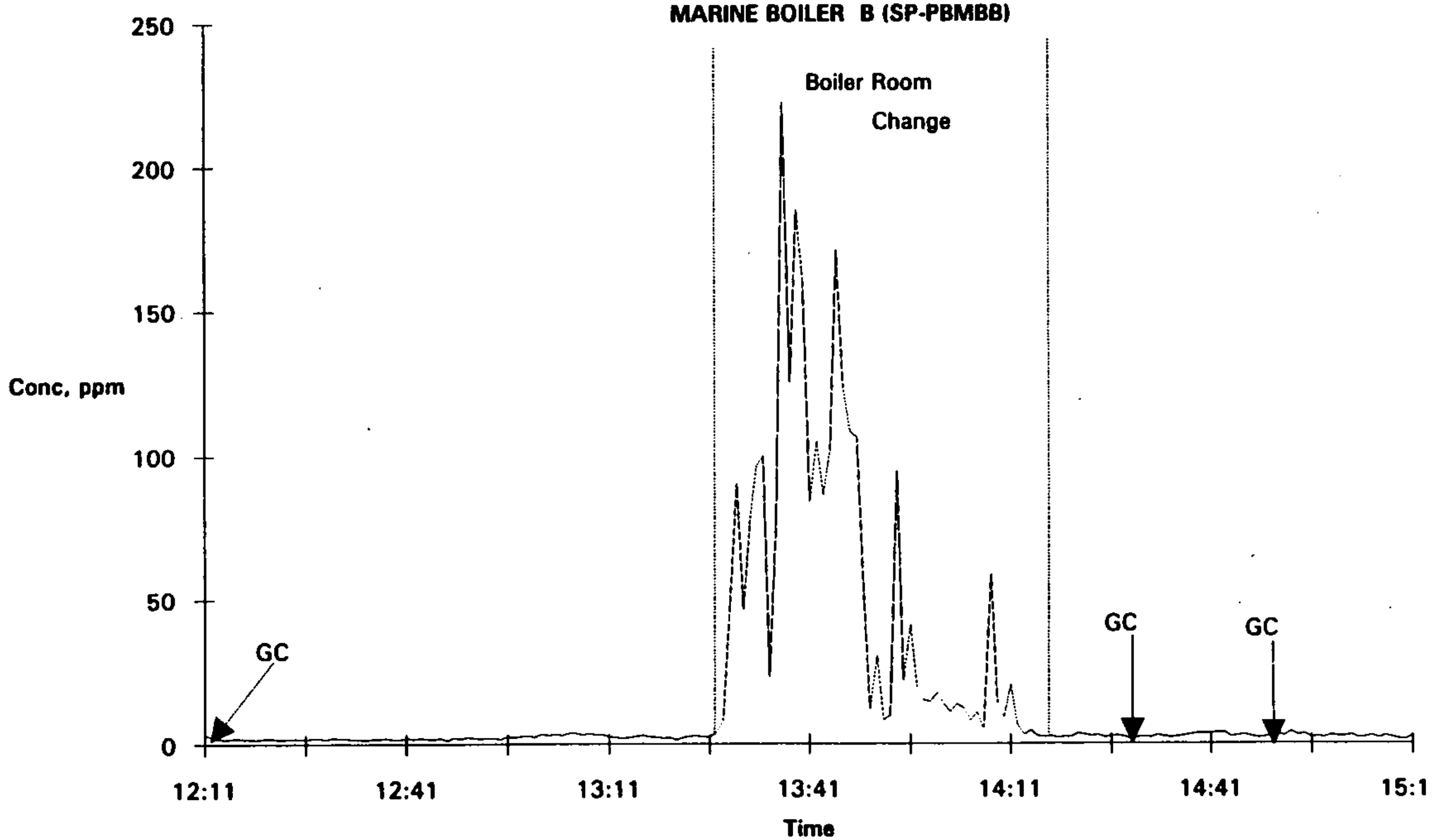


FIGURE 2.2

THC TREND ANALYSIS (5/19/92)
MARINE BOILER B (SP-PBMBB)



WESTON
MANAGERS DESIGNERS/CONSULTANTS

TABLE 2.1 SUMMARY OF VOC RESULTS

Mill: SIMPSON - PASADENA		Source:	Marine Boiler B
Source Code: SP-PBMBB		Test Dates:	5/18/92 5/19/92
FIN: PN2302	CIN: NA	EPN:	SN48

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	403	415	409	
Volumetric Flow Rate, x10^3 DSCFM	17.2	23.6	20.4	
Process Operating Conditions				
Production Rate, x 10^6 BTU/hr	74.0	90.0	82.3	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	ND	ND	ND	0.2
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	ND	ND	ND	0.4
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.6
Toluene	ND	ND	ND	0.2
Ethyl benzene	ND	ND	ND	0.2
m-, p-Xylene	ND	ND	ND	0.2
o-Xylene	ND	ND	ND	0.2
Cumene	ND	ND	ND	0.2
alpha-Pinene	ND	ND	ND	0.2
beta-Pinene	ND	ND	ND	0.2
3-Carene	ND	ND	ND	0.2
Terpenes (Unspecified)	ND	ND	ND	0.2
p-Cymene	ND	ND	ND	0.2
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	ND	ND	ND	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	ND	ND	ND	0.1

ND=Not Detected
DL=Detection Limit

WESTON

TABLE 2.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: SIMPSON-PASADENA
Source Code: SP-PBMBB
FIN: PN2302 EPN: SN48

Source: Marine Boiler B
Test Dates: 5/19/92
CIN: NA

	RUN 1	RUN 2	DL
Volumetric Flow Data			
Stack Temperature, °F	415	415	
Volumetric Flow Rate, x 10^3 DSCFM	23.6	23.6	
Process Operating Conditions			
Production Rate, x 10^6 BTU/hr	74.0	75.0	
Emission Rate, lb/hr			
Formaldehyde	ND	ND	0.1
Acetaldehyde	ND	ND	0.1
Acetone (Impinger)	ND	ND	0.1
Acetophenone	ND	ND	0.2
2-Butanone (Impinger)	ND	ND	0.1
Methyl isobutyl ketone	ND	ND	0.2
Acrolein	ND	ND	0.1
Benzaldehyde	ND	ND	0.2

ND = Not Detected
DL = Detection Limit

Section 2.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	Marine Boiler B		FIN:	PN2302
Source Code: SP-PBMBB	Date:	5/18/92	EPN: SN48	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	2025	2125	2225	
Flow Data				
Stack Temperature, °F	403			403
Moisture Content, %	5.5			5.5
Oxygen Concentration, %	9.0			9.0
Carbon Dioxide Concentration, %	7.0			7.0
Volumetric Flow Rate, x10^3 ACFM	29.9			29.9
Volumetric Flow Rate, x10^3 DSCFM	17.2			17.2
Process Operating Conditions				
Production Rate, x 10E+6 BTU/hr	90.0	90.0	90.0	90.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	2.1 *	2.1 *	2.1 *	2.1 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA   Source: Marine Boiler B   FIN: PN2302
Source Code: SP-PBMBB   Date: 5/18/92   EPN: SN48   CIN: NA

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	Marine Boiler B			FIN:	PN2302
Source Code: SP-PBMBB	Date:	5/18/92	EPN:	SN48	CIN:	NA

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Knowns as Carbon				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	1.1	1.1	2.1	1.4
Emission Rate, lb/hr as C	0.1 *	0.1 *	0.1 *	0.1 *

COMMENTS

Total hydrocarbons for 5/19 was not reported due to the control room changing from 64% auto swing to 100% manual.

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill:	SIMPSON - PASADENA	Source:	Marine Boiler B			FIN:	PN2302
Source Code:	SP-PBMBB	Date:	5/19/92	EPN:	SN48	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1211	1311	1411	
Flow Data				
Stack Temperature, °F		415		415
Moisture Content, %		5.5		5.5
Oxygen Concentration, %		7.0		7.0
Carbon Dioxide Concentration, %		8.0		8.0
Volumetric Flow Rate, x10^3 ACFM		41.5		41.5
Volumetric Flow Rate, x10^3 DSCFM		23.6		23.6
Process Operating Conditions				
Production Rate, x 10E+6 BTU/hr	74.0	75.0	75.0	74.7
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	2.1 *	2.1 *	2.1 *	2.1 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Marine Boiler B | FIN: PN2302
Source Code: SP-PBMBB | Date: 5/19/92 | EPN: SN48 | CIN: NA

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.6 *	0.6 *	0.6 *	0.6 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source: Marine Boiler B		FIN: PN2302
Source Code: SP-PBMBB	Date: 5/19/92	EPN: SN48	CIN: NA

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Knowns as Carbon				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	2.1		3.2	2.6
Emission Rate, lb/hr as C	0.1 *		0.1	0.1

COMMENTS

Total hydrocarbons for 5/19 was not reported due to the control room changing from 64% auto swing to 100% manual.

* One or more values were less than the detection limit.

Section 2.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA	Source:	Marine Boiler B		FIN:	PN2302
Source Code: SP-PBMBB	Date:	5/19/92	EPN: SN48	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1242	1416		
Flow Data				
Stack Temperature, °F	415			415
Moisture Content, %	5.5			5.5
Oxygen Concentration, %	6.8			6.8
Carbon Dioxide Concentration, %	8.0			8.0
Volumetric Flow Rate, x10^3 ACFM	41.5			41.5
Volumetric Flow Rate, x10^3 DSCFM	23.6			23.6
Process Operating Conditions				
Production Rate, x 10E+6 BTU/hr	74.0	75.0		74.5
Miscellaneous Parameters				
Formaldehyde				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Acetaldehyde				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Acetone (Impinger)				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Acetophenone				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *		0.2 *
2-Butanone (Impinger)				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Methyl isobutyl ketone				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *		0.2 *
Acrolein				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Benzaldehyde				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *		0.2 *

* One or more values were less than the detection limit.

Section 2.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL SP SOURCE SP-PBMBB

1. CALIBRATION

THEOR	DATE	5/18/92	DATE	5/19/92
ppm	ppm	%REC	ppm	%REC
0			0	
15		0.00%	13	86.67%
90		0.00%	90	100.00%
149		0.00%	148	99.33%

2. PROPANE LINE RECOVERY

	DATE	5/18/92		DATE	5/19/92	
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	90	83	92%	18	16	88.89%
AFTER	90	87	97%	15	16	106.67%

3. LINE BLANK

	DATE	5/18/92	DATE	5/19/92
	INST	LINE	INST	LINE
BEFORE			0	2
AFTER			0	2

		WESTON QC SUMMARY			
		METHOD 18			
MILL	SIMPSON - PASADENA		SOURCE:	Marine Boiler B	
			THEOR	EXP	
CMPD			ppmV	ppmV	%RE
	PRETEST				
FILE NAME			EDA4004	EIA4003	
STD ID			917-40-3	917-40-3	
ethanol			55.64	55.09	99.01%
acetone			44.47	42.68	95.97%
isopropanol			42.65	44.13	103.46%
dimethyl sulfide			19.55	18.98	97.08%
benzene			36.54	33.16	90.75%
bromodichloromethane			40.17	40.95	101.95%
dimethyl disulfide			36.26	35.23	97.16%
toluene			30.73	30.18	98.22%
ethyl benzene			26.67	26.12	97.95%
m-xylene			26.64	26.19	98.32%
o-xylene			26.76	26.60	99.40%
cumene			23.47	23.05	98.20%
alpha-pinene			20.49	20.59	100.47%
beta-pinene			20.59	20.72	100.63%
3-carene			20.61	20.78	100.81%
p-cymene			20.92	36.96	176.64%
FILE NAME			EDA4004	EJA4001	
STD ID			917-40-3	917-40-3	
ethanol			55.64	54.98	98.81%
acetone			44.47	47.48	106.76%
isopropanol			42.65	43.97	103.09%
dimethyl sulfide			19.55	20.29	103.78%
benzene			36.54	38.51	105.39%
bromodichloromethane			40.17	42.56	105.96%
dimethyl disulfide			36.26	38.26	105.51%
toluene			30.73	28.55	92.91%
ethyl benzene			26.67	28.54	107.02%
m-xylene			26.64	28.73	107.86%
o-xylene			26.76	28.74	107.40%
cumene			23.47	25.18	107.27%
alpha-pinene			20.49	22.15	108.08%
beta-pinene			20.59	22.74	110.44%
3-carene			20.61	22.41	108.71%
p-cymene			20.92	39.93	190.83%

		WESTON QC SUMMARY			
		METHOD 18			
MILL	SIMPSON - PASADENA		SOURCE	Marine Boiler B	
1. CHECK STANDARD					
			[-------------	%REC	-----------]
FILE NAME			EIA4003	EJA4001	
ppm		THEOR	EXP 1	EXP 2	EXP 3
ethanol		55.64	99.01%	98.81%	
acetone		44.47	95.97%	106.76%	
isopropanol		42.65	103.46%	103.09%	
dimethyl sulfide		19.55	97.08%	103.78%	
benzene		36.54	90.75%	105.39%	
bromodichloromethane		40.17	101.95%	105.96%	
dimethyl disulfide		36.26	97.16%	105.51%	
toluene		30.73	98.22%	92.91%	
ethyl benzene		26.67	97.95%	107.02%	
m-xylene		26.64	98.32%	107.86%	
o-xylene		26.76	99.40%	107.40%	
cumene		23.47	98.20%	107.27%	
alpha-pinene		20.49	100.47%	108.08%	
beta-pinene		20.59	100.63%	110.44%	
3-carene		20.61	100.81%	108.71%	
p-cymene		20.92	176.64%	190.83%	
2. PROPANE RESPONSE					
		THEOR	%REC	%REC	%REC
BEFORE RUN					
AFTER RUN					
3. METHANOL RECOVERY					
		THEOR	%REC	%REC	%REC
BEFORE RUN		100	101.98%	95.66%	
AFTER RUN		127.13	98.75%	101.35%	
4. LINE BLANK					
			[-------------	FILE REF	-----------]
BEFORE RUN			EIA4013	EJA4003	
AFTER RUN			EJA4019	EJA4009	
NOTES:					

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Section 2.4 Process Operating Data

MILL: SIMPSON PAPER SOURCE: MARINE BOILERS A&B

SOURCE		SP-PBMBA						SP- PBMBB					
FIN		PN2301						PN2302					
EPN		SN47						SN48					
DATE		5/18			5/20			5/18			5/19		
START TIME		1507	1607	1707	1124	1224	1324	2028	2128	2228	1159	1259	1359
	UNITS												
FUEL RATE	KSCFH	80	80	84	70	64	64	90	90	90	74	75	75
EMISSION OXYGEN	%	3.2	3.2	3.2	3.0	3.0	3.0	2.8	2.8	2.8	3.1	3.1	3.1

OPERATIONS

FUEL	NATURAL GAS
FUEL BTU CONTENT	1000 BTU/CF
BOILER TYPE	MARINE, RAPID STEAMING
SLUDGE BURNING	NO

Note: See Appendix D for Unit Process Description

WESTON MANAGERS DESIGNERS/CONSULTANTS

SECTION 3
RECOVERY FURNACE (CYCLONE) NO. 7
(SP-RF7)

3. SP-RF7

WESTON
MANAGERS DESIGNERS CONSULTANTS

SECTION 3
RECOVERY FURNACE (CYCLONE) NO. 7
(SP-RF7)

The Recovery Furnace (Cyclone) No. 7 was tested on two different days. The source was sampled for volatile organic compounds using Methods 25A, 18, and 16. VOST, Semi-VOST, and aldehyde samples were collected.

Total Hydrocarbons (M25A)

Figures 3.1 and 3.2 present the THC trends for the test periods on 6/23/92 and 6/24/92. On the first day, the total hydrocarbon concentrations exhibited a downward trend from 29 to 15 ppm. On the second day, they ranged from 27 to 33 ppm.

Volatile Organic Compounds (M16 and M18)

Table 3.1 summarizes the results for the Method 16 and Method 18 target compounds, and Section 3.1 is a tabulation of the data. Methanol was identified on day 1 by the Method 18 analyses. Methanol and chloroform were detected on day 2. Methyl mercaptan was identified on day 2 by the Method 16 analysis. The volumetric flow was measured during sampling with a pitot tube.

Volatile Organic Sampling Train (VOST)

Table 3.2 summarizes the result of the VOST sample collected on 6/23/92. Section 3.2 tabulates the results for target compounds and tentatively identified compounds (TICs).

The VOST analysis was used to confirm the identity of target compounds in Method 18 as well as to identify other organic constituents that may be present. Of the target compounds, chloromethane, trichlorofluoromethane, acetone, and dimethyl disulfide dominated, ranging from 3.0 to 0.2 ppm, respectively. All compounds except chloromethane were below the 0.5 ppm detection limit for Method 18.

Semivolatile Organic Compounds (MM5)

Table 3.3 summarizes the result of the semivolatile organic compounds sample collected using the Modified Method 5 (MM5) train on 6/23/92. Section 3.3 tabulates the results of the target compounds and the tentatively identified compounds (TICs) from the gas chromatography-mass spectrometry (GC-MS) analysis. Of the target compounds, phenol was predominant at 5.6 ppm. All other target compounds were below the 0.5 ppm detection limit for Method 18.

WESTON
MANAGERS DESIGNERS/CONSULTANTS

Miscellaneous Parameters

Table 3.4 summarizes the results of testing for aldehydes. Section 3.4 tabulates the results for each compound. Acetaldehyde was detected on day 2.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 3.5. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 3.6 includes the process operating data as recorded and provided by mill personnel.

FIGURE 3.1
THC TREND ANALYSIS (6/23/92)
RECOVERY FURNACE (CYCLONE) NO. 7
(SP-RF7)

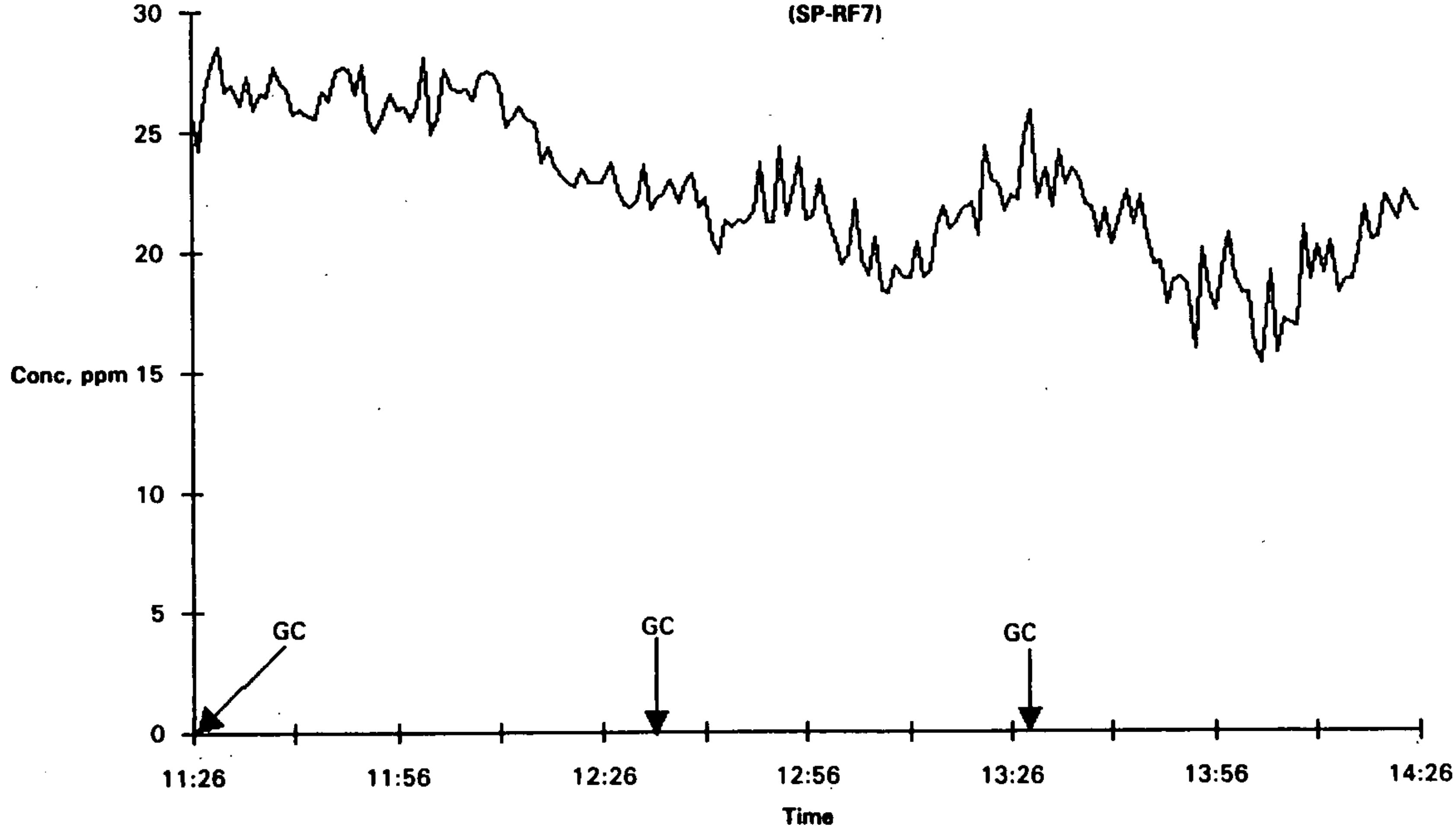

FIGURE 3.2
THC TREND ANALYSIS (6/24/92)
RECOVERY FURNACE (CYCLONE) NO. 7
(SP-RF7)

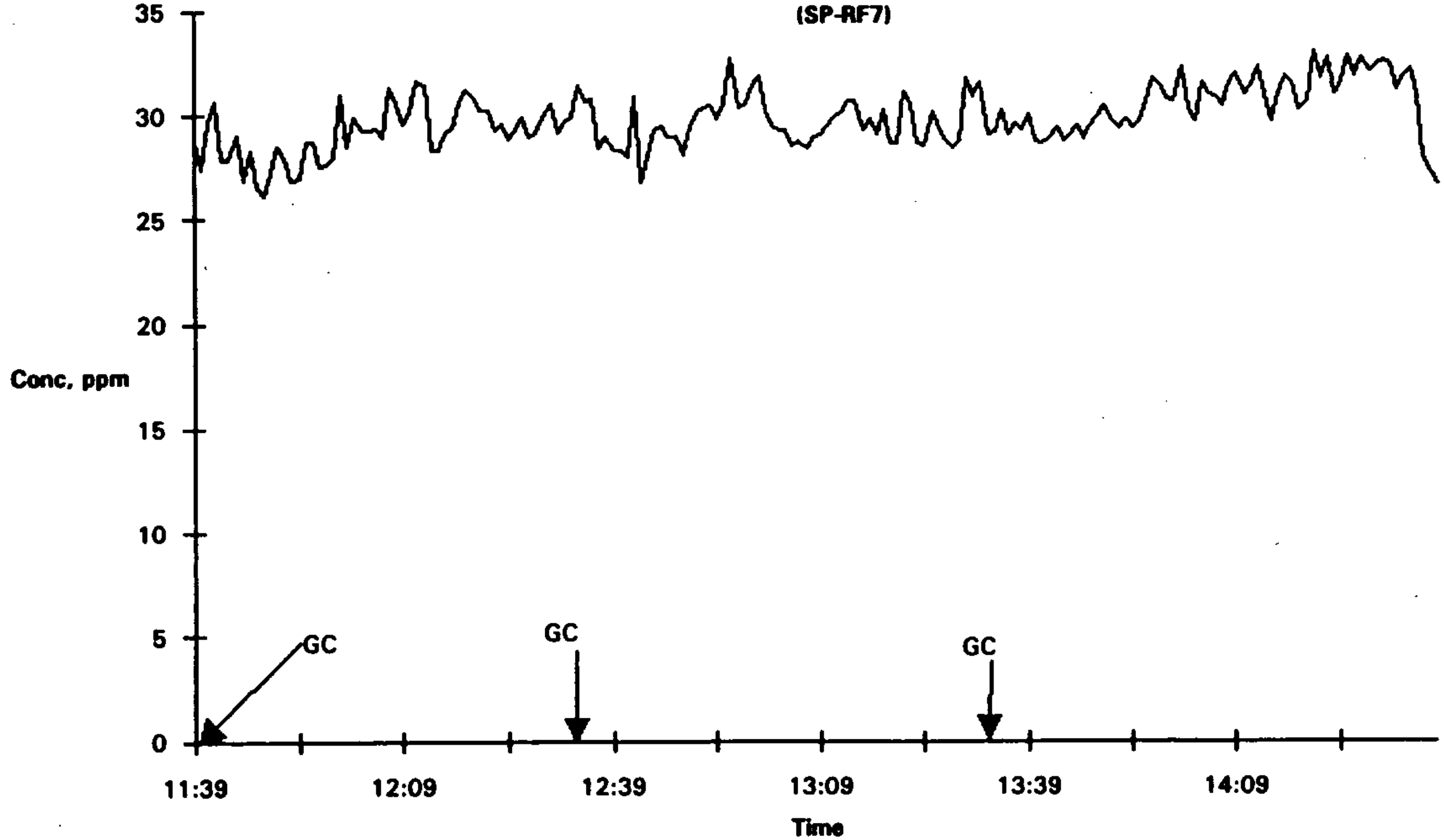

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TABLE 3.1 SUMMARY OF VOC RESULTS

Mill: SIMPSON - PASADENA
Source: Recovery Furnace (Cyclone) No.7
Source Code: SP-RF7
Test Dates: 6/23/92 6/24/92
FIN: PN1310 CIN: CN1311 & 2
EPN: SN17

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	309	309	309	
Volumetric Flow Rate, $x10^3$ DSCFM	148.2	148.3	148.3	
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	66.0	73.0	69.0	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.4
Methyl mercaptan	ND	1.1	0.6	0.6
Dimethyl sulfide	ND	ND	ND	0.7
Carbon disulfide	ND	ND	ND	0.9
Dimethyl disulfide	ND	ND	ND	1.1
Method 18 Data, lb/hr				
Methanol	13.0	18.9	16.1	1.9
Ethanol	ND	ND	ND	0.7
Acetone	ND	ND	ND	0.8
2-Propanol	ND	ND	ND	0.9
2-Butanone	ND	ND	ND	1
Chloroform	ND	10.0	3.1	3.4
Benzene	ND	ND	ND	1.1
Bromodichloromethane	ND	ND	ND	4.7
Toluene	ND	ND	ND	1.3
Ethyl benzene	ND	ND	ND	1.5
m-, p-Xylene	ND	ND	ND	1.5
o-Xylene	ND	ND	ND	1.5
Cumene	ND	ND	ND	1.7
alpha-Pinene	ND	ND	ND	2
beta-Pinene	ND	ND	ND	2
3-Carene	ND	ND	ND	2
Terpenes (Unspecified)	ND	ND	ND	2
p-Cymene	ND	ND	ND	1.9
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	3.7	6.4	4.8	0.2
Unknowns as C, lb/hr	ND	10.9	2.9	0.1
Sum of Compounds as C, lb/hr	3.9	15.5	7.8	0.1

ND=Not Detected
DL=Detection Limit

WESTON

TABLE 3.2 SUMMARY OF VOST RESULTS

Mill: SIMPSON-PASADENA
Source Code: SP-RF7
FIN: PN1310 EPN: SN17

Source: Recovery Furnace (Cyclone) No. 7
Test Dates: 6/23/92
CIN: CN1311 & 2

TIME	1252
Volumetric Flow Data	
Stack Temperature, °F	309
Volumetric Flow Rate, x 10^3 DSCFM	148.3
Process Operating Conditions	
Production Rate, 1000 lb BLS/hr	71.0
Target Compounds, ppm	
Chloromethane	2.959
Bromomethane	0.011
Methylene Chloride	0.387
Acetone	0.192
Carbon Disulfide	0.026
Chloroform	0.018
Trichlorofluoromethane	0.506
Dimethyl disulfide	0.190
Dimethyl sulfide	0.133
Iodomethane	0.007
Isooctane	0.010
n-Hexane	0.147
2-Butanone (MEK)	0.028
Benzene	0.016
Toluene	0.026
Ethylbenzene	0.001
Styrene	0.005
m-/p-Xylene	0.003
Acrolein	0.016
A-Pinene	0.133
B-Pinene	0.037
p-Cymene	0.003

WESTON

TABLE 3.3 SUMMARY OF SEMIVOLATILE RESULTS

Mill: SIMPSON-PASADENA
Source Code: SP-RF7
FIN: PN1310 EPN: SN17

Source: Recovery Furnace (Cyclone) No. 7
Test Dates: 6/23/92
CIN: CN1311 & 2

TIME	1123
Volumetric Flow Data	
Stack Temperature, °F	309
Volumetric Flow Rate, x 10^3 DSCFM	148.3
Process Operating Conditions	
Production Rate, 1000 lb BLS/hr	70.0
Target Compounds, ppm	
a-Pinene	0.072
B-Pinene	0.032
1,2,4-Trichlorobenzene	0.056
a-Terpineol	0.043
Naphthalene	0.067
Di-n-butylphthalate	0.008
bis(2-Ethylhexyl)phthalate	0.015
Phenol	5.597
2-Methylphenol	0.118
1,2,4-Trichlorobenzene	0.069
Naphthalene	0.090
Di-n-butylphthalate	0.012
bis(2-Ethylhexyl)phthalate	0.040

WESTON
MANAGERS DESIGNERS/CONSULTANTS

TABLE 3.4 SUMMARY OF MISCELLANEOUS RESULTS

Mill: SIMPSON-PASADENA
Source Code: SP-RF7
FIN: PN1310 EPN: SN17

Source: Recovery Furnace (Cyclone) No. 7
Test Dates: 6/23/92, 6/24/92
CIN: CN1311&2

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	309	309	309	
Volumetric Flow Rate, x 10^3 DSCFM	148.2	148.2	148.2	
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	66.0	70.0	68.0	
Emission Rate, lb/hr				
Formaldehyde	ND	ND	ND	0.3
Acetaldehyde	ND	0.6	0.6	0.5
Acetone (Impinger)	ND	0.7	0.5	0.7
Acetophenone	ND	ND	ND	1.4
2-Butanone (Impinger)	ND	ND	ND	0.8
Methyl isobutyl ketone	ND	ND	ND	1.2
Acrolein	ND	ND	ND	0.6
Benzaldehyde	ND	ND	ND	1.2

ND = Not Detected
DL = Detection Limit

Section 3.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source: Recovery Furnace (Cyclone) No.7		FIN: PN1310
Source Code: SP-RF7	Date: 6/23/92	EPN: SN17	CIN: CN1311 & 2

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1126	1226	1326	
Flow Data				
Stack Temperature, °F	309			309
Moisture Content, %	20.0			20.0
Oxygen Concentration, %	12.0			12.0
Carbon Dioxide Concentration, %	6.0			6.0
Volumetric Flow Rate, x10^3 ACFM	274.0			274.0
Volumetric Flow Rate, x10^3 DSCFM	148.3			148.3
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	70.0	71.0	73.0	71.3
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.6 *	0.6 *	0.6 *	0.6 *
Dimethyl sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.9 *	0.9 *	0.9 *	0.9 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	1.1 *	1.1 *	1.1 *	1.1 *
Method 18 Data				
Methanol				
Concentration, ppmvd	23.1	20.0	23.4	22.2
Emission Rate, lb/hr	17.1	14.8	17.3	16.4
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
Acetone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.8 *	0.8 *	0.8 *	0.8 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.9 *	0.9 *	0.9 *	0.9 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	Recovery Furnace (Cyclone) No.7		FIN:	PN1310
Source Code: SP-RF7	Date:	6/23/92	EPN: SN17	CIN:	CN1311 & 2

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.0 *	1.0 *	1.0 *	1.0 *
Chloroform				
Concentration, ppmvd	1.3 *	1.3 *	1.3 *	1.3 *
Emission Rate, lb/hr	3.4 *	3.4 *	3.4 *	3.4 *
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.1 *	1.1 *	1.1 *	1.1 *
Bromodichloromethane				
Concentration, ppmvd	1.3 *	1.3 *	1.3 *	1.3 *
Emission Rate, lb/hr	4.7 *	4.7 *	4.7 *	4.7 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.3 *	1.3 *	1.3 *	1.3 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.5 *	1.5 *	1.5 *	1.5 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.5 *	1.5 *	1.5 *	1.5 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.5 *	1.5 *	1.5 *	1.5 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.7 *	1.7 *	1.7 *	1.7 *
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	2.0 *	2.0 *	2.0 *	2.0 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	2.0 *	2.0 *	2.0 *	2.0 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	2.0 *	2.0 *	2.0 *	2.0 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	2.0 *	2.0 *	2.0 *	2.0 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	Recovery Furnace (Cyclone) No.7	FIN:	PN1310
Source Code: SP-RF7	Date:	6/23/92 EPN: SN17	CIN:	CN1311 & 2

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.9 *	1.9 *	1.9 *	1.9 *
Knowns as Carbon				
Concentration, ppmvd	15.6	13.5	15.8	15.0
Unknowns as Carbon				
Concentration, ppmvd	0.9	0.6 *	0.0	0.5
Sum M18 as Carbon, lb/hr	4.6	3.9	4.4	4.3
Unknown Compounds % of Total	5.3%	4.4%	0.0%	3.2%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	32.5	26.3	25.0	27.9
Emission Rate, lb/hr as C	9.0	7.3	6.9	7.7

COMMENTS :

Volumetric flow for 6/23 and 6/24 was taken from 6/22 data.

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Recovery Furnace (Cyclone) No.7 | FIN: PN1310
Source Code: SP-RF7 | Date: 6/24/92 | EPN: SN17 | CIN: CN1311 & 2

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1138	1238	1338	
Flow Data				
Stack Temperature, °F	309			309
Moisture Content, %	20.0			20.0
Oxygen Concentration, %	12.0			12.0
Carbon Dioxide Concentration, %	6.0			6.0
Volumetric Flow Rate, x10^3 ACFM	274.0			274.0
Volumetric Flow Rate, x10^3 DSCFM	148.2			148.2
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	67.0	67.0	66.0	66.7
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd	0.5 *	0.7	1.0	0.7
Emission Rate, lb/hr	0.6 *	0.8	1.1	0.7
Dimethyl sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.9 *	0.9 *	0.9 *	0.9 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	1.1 *	1.1 *	1.1 *	1.1 *
Method 18 Data				
Methanol				
Concentration, ppmvd	17.6	25.5	20.8	21.3
Emission Rate, lb/hr	13.0	18.9	15.4	15.8
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
Acetone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.8 *	0.8 *	0.8 *	0.8 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.9 *	0.9 *	0.9 *	0.9 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Recovery Furnace (Cyclone) No.7 | FIN: PN1310
Source Code: SP-RF7 | Date: 6/24/92 | EPN: SN17 | CIN: CN1311 & 2

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.0 *	1.0 *	1.0 *	1.0 *
Chloroform				
Concentration, ppmvd	1.3 *	1.3 *	3.6	1.6
Emission Rate, lb/hr	3.4 *	3.4 *	10.0	4.5
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.1 *	1.1 *	1.1 *	1.1 *
Bromodichloromethane				
Concentration, ppmvd	1.3 *	1.3 *	1.3 *	1.3 *
Emission Rate, lb/hr	4.7 *	4.7 *	4.7 *	4.7 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.3 *	1.3 *	1.3 *	1.3 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.5 *	1.5 *	1.5 *	1.5 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.5 *	1.5 *	1.5 *	1.5 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.5 *	1.5 *	1.5 *	1.5 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.7 *	1.7 *	1.7 *	1.7 *
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	2.0 *	2.0 *	2.0 *	2.0 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	2.0 *	2.0 *	2.0 *	2.0 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	2.0 *	2.0 *	2.0 *	2.0 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	2.0 *	2.0 *	2.0 *	2.0 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA   Source: Recovery Furnace (Cyclone) No.7   FIN: PN1310
Source Code: SP-RF7   Date: 6/24/92   EPN: SN17   CIN: CN1311 & 2

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.9 *	1.9 *	1.9 *	1.9 *
Knowns as Carbon				
Concentration, ppmvd	16.6	23.0	19.5	19.7
Unknowns as Carbon				
Concentration, ppmvd	39.1	14.8	8.1	20.7
Sum M18 as Carbon, lb/hr	15.5	10.5	7.7	11.2
Unknown Compounds % of Total	70.2%	39.1%	29.4%	46.2%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	36.3	37.5	38.8	37.5
Emission Rate, lb/hr as C	10.1	10.4	10.8	10.4

COMMENTS :

Volumetric flow for 6/23 and 6/24 was taken from 6/22 data.

* One or more values were less than the detection limit.

Section 3.2 Emission Test Results - VOST

EMISSION TEST RESULTS - VOST

Mill SIMPSON - PASADENA Source: Recovery Furnace (Cyclone) No.7
Source Code: SP-RF7 EPN: SN17 FIN: PN1310 CIN: N1311 & 2

Date: 6/23/92

Compound	RF/7-T (μg)	RF/7-TC (μg)	RF/7-C (μg/L)	Total μg	SP-RF7 (μg/m3)	Conc. (ppm)
TARGET COMPOUNDS						
Chloromethane	0.472	11.898		12.37	6216.08	2.959
Bromomethane	0.087			0.09	43.72	0.011
Methylene Chloride	2.099	0.422	4.75	2.73	1369.47	0.387
Acetone	0.711		4.91	0.92	463.38	0.192
Carbon Disulfide	0.160	0.004		0.16	82.41	0.026
Chloroform	0.006		4.02	0.18	89.88	0.018
Trichlorofluoromethane	4.424	1.335		5.76	2893.97	0.506
Dimethyl disulfide	1.383	0.099		1.48	744.72	0.190
Dimethyl sulfide	0.685			0.69	344.22	0.133
Iodomethane	0.085			0.09	42.71	0.007
Isooctane	0.093	0.005		0.10	49.25	0.010
n-Hexane	0.735	0.312	0.12	1.05	528.72	0.147
2-Butanone (MEK)	0.167			0.17	83.92	0.028
2-Chloro-1,3-butadiene						
Bromodichloromethane						
Trichloroethene						
tert-Butyl methyl ether						
Tetrachloroethene						
Benzene	0.104			0.10	52.26	0.016
Dibromomethane						
Toluene	0.174	0.025		0.20	100.00	0.026
Ethylbenzene	0.012			0.01	6.03	0.001
Styrene	0.047			0.05	23.62	0.005
m-/p-Xylene	0.025	0.002		0.03	13.57	0.003
o-Xylene						
Acrolein			1.69	0.07	36.52	0.016
A-Pinene	0.031	1.474		1.51	756.28	0.133
B-Pinene	0.010	0.405		0.42	208.54	0.037
Cumene						
p-Cymene	0.021	0.009		0.03	15.08	0.003
TENTATIVELY IDENTIFIED CMPDS.						
Acidic Esters	0.092			0.09	46.23	
Aromatic HC		0.094		0.09	47.24	
Branched HC						
Butene		0.020		0.02	10.05	
Cyclic HC	0.035	0.502		0.54	269.85	
Cyclohexane						
Furan	0.077			0.08	38.69	
Hydrocarbon	0.024	0.796		0.82	412.06	
Siloxane	0.189	0.011		0.20	100.50	
Subst'd HC	6.254			6.25	3142.71	
Methyl Thiophene	0.025			0.03	12.56	
Thiophene	0.413			0.41	207.54	

EMISSION TEST RESULTS - VOST

Mill SIMPSON - PASADENA Source: Recovery Furnace (Cyclone) No.7

Source Code: SP-RF7 EPN: SN17 FIN: PN1310 CIN: N1311 & 2

Date: 6/23/92

Compound	RF/7-T (μg)	RF/7-TC (μg)	RF/7-C (μg/L)	Total μg	SP-RF7 (μg/m3)	Conc. (ppm)
SURROGATE STDS						
(% Recovery)						
Toluene-d8	95.8	98.7	97.8			
1,2-Dichloroethane-d4	68.5	63.9	94.1			
Benzene-d6	110.8	99.2	104.3			

NOTES:

- -T=Tenax
- -TC=Tenax/Charcoal
- -C = Condensate

Air Volume = 0.00199 cu.m.

Condensate Vol. 43.0 mL

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HI216
RF FILE: HI212
DATE: 07/22/92
TLI PROJ #: 21278

SAMPLE ID: SP-RF7/1VOST/0623/1A T
TLI ID: 57.166.1
ANALYSIS DATE: 07/04/92

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1 Bromochloromethane	5172		770	1		IS	
2 Chloromethane	7834	.601	165	1	.472	D	.05
3 Bromomethane	1814	1.006	295	1	.087	D	.05
4 Vinyl Chloride	0	1.258	0	1	.001	ND	.05
5 Chloroethane	0	1.049	0	1	.001	ND	.05
6 Methylene Chloride	65980	1.520	577	1	2.099	E	.05
7 Acetone	7831	.532	516	1	.711	D	.05
8 Carbon Disulfide	15372	4.650	496	1	.160	D	.05
9 1,1-Dichloroethene	0	1.433	0	1	.001	ND	.05
10 1,1-Dichloroethane	0	4.122	0	1	.001	ND	.05
11 trans-1,2-Dichloroethene	0	1.756	0	1	.001	ND	.05
12 Chloroform	515	3.947	788	1	.006	E	.05
13 1,2-Dichloroethane	0	2.613	0	1	.001	ND	.05
43 Trichlorofluoromethane	218553	2.388	395	1	4.424	E	.05
46 Acrylonitrile	0	.337	0	1	.003	ND	.05
47 cis-1,2-Dichloroethene	0	2.018	0	1	.001	ND	.05
52 1,3-butadiene	0	1.273	0	1	.001	ND	.05
57 Allyl chloride	0	.919	0	1	.001	ND	.05
62 Dimethyl disulfide	109100	3.813	1066	1	1.383	E	.05
63 Dimethyl sulfide	24134	1.703	506	1	.685	D	.05
65 Iodomethane	4340	2.463	498	1	.085	D	.05
66 Isooctane	20752	10.750	881	1	.093	D	.05
68 Tert-Butyl methyl ether	0	3.625	0	1	.001	ND	.05
69 Vinyl Bromide	0	1.397	0	1	.001	ND	.05
70 n-Hexane	43529	2.661	658	1	.735	D	.05
14 1,4-Difluorobenzene	24745		902	14		IS	
15 2-Butanone	541	.033	754	14	.167	D	.05
16 1,1,1-Trichloroethane	0	.613	0	14	.001	ND	.05
17 Carbon Tetrachloride	0	.640	0	14	.001	ND	.05
18 Vinyl Acetate	0	.685	0	14	.001	ND	.05
19 Bromodichloromethane	0	.723	0	14	.001	ND	.05
20 1,2-Dichloropropane	0	.659	0	14	.001	ND	.05
21 cis-1,3-Dichloropropene	0	.854	0	14	.001	ND	.05
22 Trichloroethene	0	.568	0	14	.001	ND	.05
23 Dibromochloromethane	0	.585	0	14	.001	ND	.05
24 1,1,2-Trichloroethane	0	.380	0	14	.001	ND	.05
25 Benzene	14956	1.457	841	14	.104	D	.05
26 trans-1,3-Dichloropropene	0	.645	0	14	.001	ND	.05
27 Bromoform	0	.290	0	14	.001	ND	.05
54 1,4-Dichloro-2-butene	0	.122	0	14	.002	ND	.05
60 Dibromomethane	0	.290	0	14	.001	ND	.05
28 Chlorobenzene-d5	30239		1342	28		IS	
29 4-Methyl-2-Pentanone	0	.225	0	28	.001	ND	.05
30 2-Hexanone	0	.135	0	28	.001	ND	.05
31 Tetrachloroethene	0	.362	0	28	.001	ND	.05
32 1,1,2,2-Tetrachloroethane	0	.334	0	28	.001	ND	.05
33 Toluene	16706	.796	1112	28	.174	D	.05
34 Chlorobenzene	0	.998	0	28	.001	ND	.05

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

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801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HI216
RF FILE: HI212
DATE: 07/22/92
TLI PROJ #: 21278

SAMPLE ID: SP-RF7/1VOST/0623/1A T
TLI ID: 57.166.1
ANALYSIS DATE: 07/04/92

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
35 Ethylbenzene	710	.508	1377	28	.012	E	.05
36 Styrene	6301	1.099	1478	28	.047	E	.05
37 o-Xylene	0	.642	0	28	.001	ND	.05
38 m-/p-Xylene	2011	.657	1400	28	.025	E	.05
49 1,2 Dichlorobenzene	0	.635	0	28	.001	ND	.05
50 1,2,3-Trichloropropane	0	.241	0	28	.001	ND	.05
51 1,3 Dichlorobenzene	0	.848	0	28	.001	ND	.05
53 1,4 Dichlorobenzene	0	.742	0	28	.001	ND	.05
56 A-Pinene	4271	1.135	1543	28	.031	E	.05
58 B-Pinene	1378	1.179	1686	28	.010	E	.05
59 Cumene (isopropylbenzene)	0	1.538	0	28	.001	ND	.05
64 Ethyl methacrylate	0	.413	0	28	.001	ND	.05
67 P-Cymene	4575	1.774	1918	28	.021	E	.05

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	9348	2.638	838	1	.17	D	68.5
48 Benzene-d6	42194	1.539	837	14	.28	D	110.8
39 Toluene-d8	40806	1.408	1102	28	.24	D	95.8

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

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FILE NAME: HI216
DATE: 07/22/92
TLI PROJ #: 21278

SAMPLE ID: SP-RF7/1VOST/0623/1A
TLI ID: 57.168.1
ANALYSIS DATE: 07/04/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
SUBSTITUTED HYDROCARBON	358	1128222	770	.25	6.254
THIOPHENE	865	114631	902	.25	.413
SILOXANE	1228	70991	1342	.25	.189
FURAN	464	13930	770	.25	.077
UNKNOWN	621	12243	770	.25	.068
ACIDIC ESTER	725	9788	770	.25	.054
ACIDIC ESTER	803	6768	770	.25	.038
CYCLIC HYDROCARBON	1299	13082	1342	.25	.035
METHYL THIOPHENE	1155	9289	1342	.25	.025
HYDROCARBON	1609	9173	1342	.25	.024

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	770	45099	1
1,4-Difluorobenzene	902	69456	14
Chlorobenzene-d5	1342	93846	28

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FILE NAME: HI215
RF FILE: HI212
DATE: 07/22/92
TLI PROJ #: 21278

SAMPLE ID: SP-RF7/1VOST/0823/1A TC
TLI ID: 57.168.2
ANALYSIS DATE: 07/04/92

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1 Bromochloromethane	5111		771	1		IS	
2 Chloromethane	194956	.801	164	1	11.898	E	.05
3 Bromomethane	0	1.006	0	1	.001	ND	.05
4 Vinyl Chloride	0	1.258	0	1	.001	ND	.05
5 Chloroethane	0	1.049	0	1	.001	ND	.05
6 Methylene Chloride	13127	1.520	579	1	.422	D	.05
7 Acetone	0	.532	0	1	.002	ND	.05
8 Carbon Disulfide	408	4.850	497	1	.004	E	.05
9 1,1-Dichloroethene	0	1.433	0	1	.001	ND	.05
10 1,1-Dichloroethane	0	4.122	0	1	.001	ND	.05
11 trans-1,2-Dichloroethene	0	1.756	0	1	.001	ND	.05
12 Chloroform	0	3.947	0	1	.001	ND	.05
13 1,2-Dichloroethane	0	2.613	0	1	.001	ND	.05
43 Trichlorofluoromethane	65163	2.388	395	1	1.335	E	.05
46 Acrylonitrile	0	.337	0	1	.003	ND	.05
47 cis-1,2-Dichloroethene	0	2.018	0	1	.001	ND	.05
52 1,3-butadiene	0	1.273	0	1	.001	ND	.05
57 Allyl chloride	0	.919	0	1	.001	ND	.05
62 Dimethyl disulfide	7699	3.813	1067	1	.099	D	.05
63 Dimethyl sulfide	0	1.703	0	1	.001	ND	.05
65 Iodomethane	0	2.463	0	1	.001	ND	.05
66 Isooctane	1048	10.750	861	1	.005	E	.
68 Tert-Butyl methyl ether	0	3.625	0	1	.001	ND	.0_
69 Vinyl Bromide	0	1.397	0	1	.001	ND	.05
70 n-Hexane	18260	2.861	660	1	.312	D	.05
14 1,4-Difluorobenzene	25658		902	14		IS	
15 2-Butanone	0	.033	0	14	.006	ND	.05
16 1,1,1-Trichloroethane	0	.813	0	14	.001	ND	.05
17 Carbon Tetrachloride	0	.640	0	14	.001	ND	.05
18 Vinyl Acetate	0	.685	0	14	.001	ND	.05
19 Bromodichloromethane	0	.723	0	14	.001	ND	.05
20 1,2-Dichloropropane	0	.659	0	14	.001	ND	.05
21 cis-1,3-Dichloropropene	0	.854	0	14	.001	ND	.05
22 Trichloroethene	0	.568	0	14	.001	ND	.05
23 Dibromochloromethane	0	.585	0	14	.001	ND	.05
24 1,1,2-Trichloroethane	0	.380	0	14	.001	ND	.05
25 Benzene	0	1.457	0	14	.001	ND	.05
26 trans-1,3-Dichloropropene	0	.645	0	14	.001	ND	.05
27 Bromoform	0	.290	0	14	.001	ND	.05
54 1,4-Dichloro-2-butene	0	.122	0	14	.002	ND	.05
60 Dibromomethane	0	.290	0	14	.001	ND	.05
28 Chlorobenzene-d5	27175		1344	28		IS	
29 4-Methyl-2-Pentanone	0	.225	0	28	.001	ND	.05
30 2-Hexanone	0	.135	0	28	.001	ND	.05
31 Tetrachloroethene	0	.362	0	28	.001	ND	.0-
32 1,1,2,2-Tetrachloroethane	0	.334	0	28	.001	ND	
33 Toluene	2169	.796	1113	28	.025	E	.05
34 Chlorobenzene	0	.998	0	28	.001	ND	.05

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

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FILE NAME: HI215
RF FILE: HI212
DATE: 07/22/92
TLI PROJ #: 21278

SAMPLE ID: SP-RF7/1VOST/0623/1A TC
TLI ID: 57.166.2
ANALYSIS DATE: 07/04/92

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
35 Ethylbenzene	0	.508	0	28	.001	ND	.05
36 Styrene	0	1.089	0	28	.001	ND	.05
37 o-Xylene	0	.842	0	28	.001	ND	.05
38 m-/p-Xylene	142	-.857	1403	28	.002	E	.05
49 1,2 Dichlorobenzene	0	.835	0	28	.001	ND	.05
50 1,2,3-Trichloropropane	0	.241	0	28	.001	ND	.05
51 1,3 Dichlorobenzene	0	.846	0	28	.001	ND	.05
53 1,4 Dichlorobenzene	0	.742	0	28	.001	ND	.05
56 A-Pinene	181806	1.135	1547	28	1.474	E	.05
58 B-Pinene	51895	1.179	1690	28	.405	D	.05
59 Cumene (isopropylbenzene)	0	1.538	0	28	.001	ND	.05
64 Ethyl methacrylate	0	.413	0	28	.001	ND	.05
67 P-Cymene	1762	1.774	1924	28	.009	E	.05

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	8609	2.638	839	1	.16	D	63.9
48 Benzene-d6	39490	1.539	838	14	.25	D	99.2
39 Toluene-d8	37758	1.408	1103	28	.25	D	98.7

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

TRIANGLE LABORATORIES OF RTP, INC.	FILE NAME: HI215	SAMPLE ID:	SP-RF7/1VOST/0623/1A
801 Capitola Drive	DATE: 07/22/92	TLI ID:	57.166.2
Durham, NC 27713	TLI PROJ #: 21278	ANALYSIS DATE:	07/04/92
Telephone: (919) 544-5729			

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
HYDROCARBON	358	131771	771	.25	.787
CYCLIC HYDROCARBON	1596	74231	771	.25	.443
AROMATIC HYDROCARBON	1621	15824	771	.25	.094
CYCLIC HYDROCARBON	1512	9806	771	.25	.059
BUTENE	203	3408	771	.25	.020
SILOXANE	1230	1882	771	.25	.011
HYDROCARBON	1154	1519	771	.25	.009

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	771	41876	1

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FILE NAME: AC828A
RF FILE: AC826
DATE: 07/28/92
TLI PROJ #: 21278

SAMPLE ID: SP-RF7/1VOST/0623/1A
TLI ID: 57.166.9
SAMPLE VOL: .005 L
ANAL DATE: 07/03/92
DILN FACTOR: 1

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	CONC, ug/L	CODE	QUAN LIMIT
1 Bromochloromethane	1798		780	1		IS	
2 Chloromethane	0	1.547	0	1	.36	ND	10
3 Bromomethane	0	1.347	0	1	.41	ND	10
4 Vinyl Chloride	0	1.805	0	1	.31	ND	10
5 Chloroethane	0	1.382	0	1	.40	ND	10
6 Methylene Chloride	357	2.091	587	1	4.75	E	10
7 Acetone	397	2.252	530	1	4.91	E	10
8 Carbon Disulfide	0	6.160	0	1	.09	ND	10
9 1,1-Dichloroethene	0	1.692	0	1	.33	ND	10
10 1,1-Dichloroethane	0	4.450	0	1	.13	ND	10
11 trans-1,2-Dichloroethene	0	1.983	0	1	.28	ND	10
12 Chloroform	614	4.254	799	1	4.02	E	10
13 1,2-Dichloroethane	0	3.706	0	1	.15	ND	10
43 Trichlorofluoromethane	0	1.155	0	1	.48	ND	10
45 Acrolein	0	.329	0	1	1.69	ND	10
46 Acrylonitrile	0	.980	0	1	.57	ND	10
47 cis-1,2-Dichloroethene	0	2.217	0	1	.25	ND	10
53 1,3-butadiene	0	4.775	0	1	.12	ND	10
58 Allyl chloride	0	7.310	0	1	.08	ND	10
63 Dimethyl disulfide	0	2.286	0	1	.24	ND	10
64 Dimethyl sulfide	0	4.769	0	1	.12	ND	10
66 Iodomethane	0	13.365	0	1	.04	ND	10
67 Isooctane	0	10.446	0	1	.05	ND	10
69 Tert-Butyl methyl ether	0	1.467	0	1	.38	ND	10
70 Vinyl Bromide	0	4.065	0	1	.14	ND	10
71 n-Hexane	39	9.162	667	1	.12	E	10
14 1,4-Difluorobenzene	8072		913	14		IS	
15 2-Butanone	0	.097	0	14	1.27	ND	10
16 1,1,1-Trichloroethane	0	.695	0	14	.18	ND	10
17 Carbon Tetrachloride	0	.507	0	14	.24	ND	10
18 Vinyl Acetate	0	1.423	0	14	.09	ND	10
19 Bromodichloromethane	0	.790	0	14	.16	ND	10
20 1,2-Dichloropropane	0	.811	0	14	.15	ND	10
21 cis-1,3-Dichloropropene	0	.906	0	14	.14	ND	10
22 Trichloroethene	0	.472	0	14	.26	ND	10
23 Dibromochloromethane	0	.560	0	14	.22	ND	10
24 1,1,2-Trichloroethane	0	.537	0	14	.23	ND	10
25 Benzene	0	1.614	0	14	.08	ND	10
26 trans-1,3-Dichloropropene	0	.888	0	14	.14	ND	10
27 Bromoform	0	.357	0	14	.35	ND	10
55 1,4-Dichloro-2-butene	0	.242	0	14	.51	ND	10
61 Dibromomethane	0	.583	0	14	.21	ND	10
28 Chlorobenzene-d5	9907		1357	28		IS	
29 4-Methyl-2-Pentanone	0	.800	0	28	.13	ND	10
30 2-Hexanone	0	.590	0	28	.17	ND	10
31 Tetrachloroethene	0	.342	0	28	.30	ND	10
32 1,1,2,2-Tetrachloroethane	0	.849	0	28	.12	ND	10

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FILE NAME: AC828A
RF FILE: AC826
DATE: 07/28/92
TLI PROJ #: 21278

SAMPLE ID: SP-RF7/1VOST/0823/1A
TLI ID: 57.166.9
SAMPLE VOL: .005 L
ANAL DATE: 07/03/92
DILN FACTOR: 1

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	CONC, ug/L	CODE	QUAN LIMIT
33 Toluene	0	.985	0	28	.10	ND	10
34 Chlorobenzene	0	1.001	0	28	.10	ND	10
35 Ethylbenzene	0	.585	0	28	.17	ND	10
36 Styrene	0	1.142	0	28	.09	ND	10
37 o-Xylene	0	.694	0	28	.15	ND	10
38 m-/p-Xylene	0	.660	0	28	.15	ND	10
50 1,2 Dichlorobenzene	0	.623	0	28	.16	ND	10
51 1,2,3-Trichloropropane	0	.957	0	28	.11	ND	10
52 1,3 Dichlorobenzene	0	.419	0	28	.24	ND	10
54 1,4 Dichlorobenzene	0	.262	0	28	.39	ND	10
57 A-Pinene	0	.167	0	28	.60	ND	10
59 B-Pinene	0	1.753	0	28	.06	ND	10
60 Cumene (isopropylbenzene)	0	.310	0	28	.33	ND	10
65 Ethyl methacrylate	0	.314	0	28	.32	ND	10
68 P-Cymene	0	.921	0	28	.11	ND	10

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT,ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	5085	3.010	849	1	.24	D	94.1
48 Benzene-d6	13792	1.638	848	14	.26	D	104.3
39 Toluene-d8	14080	1.453	1116	28	.24	D	97.8

TRIANGLE LABORATORIES OF RTP, INC.
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FILE NAME: AC828A
DATE: 07/22/92
TLI PROJ #: 21278

SAMPLE ID: SP-RF7/1VOST/0623/1A
TLI ID: 57.166.9
ANALYSIS DATE: 07/03/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
SUBSTITUTED HYDROCARBON	1400	231	1357	.25	.002
UNKNOWN	1191	178	1357	.25	.001

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	781	17750	1
Chlorobenzene-d5	1357	37167	28

Section 3.3 Emission Test Results - SEMI-VOST

EMISSION TEST RESULTS - SEMI-VOST

Mill SIMPSON - PASADENA Recovery Furnace (Cyclone) No.7
Source Code: SP-RF7 SN17 FIN: PN1310 CIN: CN1311 & 2

Compound	SP-RF7 (ug)	Date: 6/23/92 SP-RF7 ($\mu g/m3$)	Conc. (ppm)
TARGET COMPOUNDS			
a-Pinene	15.91	408.79	0.072
B-Pinene	7.11	182.68	0.032
1,2,4-Trichlorobenzene	16.46	422.92	0.056
a-Terpineol	10.66	273.90	0.043
Naphthalene	13.83	355.34	0.067
Di-n-butylphthalate	3.40	87.36	0.008
bis(2-Ethylhexyl)phthalate	9.38	241.01	0.015
Phenol	852.75	21910.33	5.597
2-Methylphenol	20.69	531.60	0.118
1,2,4-Trichlorobenzene	20.15	517.73	0.069
Naphthalene	18.66	479.45	0.090
Di-n-butylphthalate	5.51	141.57	0.012
bis(2-Ethylhexyl)phthalate	25.15	646.20	0.040
TENTATIVELY IDENTIFIED CMPDS.			
Methoxyphenol	4829.06	124076.57	
Subst'd phenols	446.96	11484.07	
Subst'd benzaldehyde	183.10	4704.52	
Subst'd ketones	169.81	4363.05	
Subst'd HCs	343.48	8825.28	
Subst'd Aromatic HC	68.95	1771.58	

SURROGATE STDS
(% Recovery)

Compound		
Nitrobenzene-d5	—	—
1,3,5-Trichlorobenzene-d3	60	51
1,4-Dibromobenzene-d4	95	71
2-Fluorobiphenyl	77	79
Phenol-d5	103	74
2,4,6-Tribromophenol	81	78
Anthracene-d10	82	111
Pyrene-d10	61	93

NOTES:

Air Volume = 0.03892 cu.m.

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DATA FILE: GJ100
RF FILE: GJ098
DATE: 08/25/92
TLI PROJ #: 21285

SAMPLE ID: SP-RF7-1MM5-0623-1
TLI SAMPLE ID: 57.171.5-8
& 57.229.7
DILUTION FACTOR: 10
ANALYSIS DATE: 08/04/92

M E T H O D 8 2 7 0 Q U A N T I T A T I O N R E P O R T

	NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1	1,4-Dichlorobenzene-d4	31789		590	1		IS HIGH	
2	Phenol	108060	1.5945	547	1	852.75	D	100
3	bis(2-Chloroethyl)ether	0	1.2576	0	1	.20	ND	100
4	2-Chlorophenol	0	1.3380	0	1	.19	ND	100
5	1,3-Dichlorobenzene	0	1.5622	0	1	.16	ND	100
6	1,4-Dichlorobenzene	0	1.6127	0	1	.16	ND	100
7	Benzyl alcohol	0	.6782	0	1	.37	ND	100
8	1,2-Dichlorobenzene	0	1.5290	0	1	.16	ND	100
9	2-Methylphenol	1790	1.0885	626	1	20.69	E	100
10	bis(2-Chloroisopropyl)ether	0	1.0049	0	1	.25	ND	100
11	4-Methylphenol	0	1.1437	0	1	.22	ND	100
12	N-Nitroso-di-n-propylamine	0	.7030	0	1	.36	ND	100
13	Hexachloroethane	0	.5511	0	1	.46	ND	100
14	Naphthalene-d8	94028		762	14		IS HIGH	
15	Nitrobenzene	0	.2684	0	14	.32	ND	100
16	Isophorone	0	.5068	0	14	.17	ND	100
17	2-Nitrophenol	0	.1814	0	14	.47	ND	100
18	2,4-Dimethylphenol	0	.2535	0	14	.34	ND	100
19	Benzoic acid	0	.0891	0	14	.95	ND	100
20	bis(2-Chloroethoxy)methane	0	.3490	0	14	.24	ND	100
21	2,4-Dichlorophenol	0	.2833	0	14	.30	ND	100
22	1,2,4-Trichlorobenzene	1593	.3364	755	14	20.15	E	100
23	Naphthalene	4217	.9615	765	14	18.66	E	100
24	4-Chloroaniline	0	.4082	0	14	.21	ND	100
25	Hexachlorobutadiene	0	.1443	0	14	.59	ND	100
26	4-Chloro-3-methylphenol	0	.2371	0	14	.36	ND	100
27	2-Methylnaphthalene	0	.7443	0	14	.11	ND	100
28	Acenaphthene-d10	77786		1012	28		IS HIGH	
29	Hexachlorocyclopentadiene	0	.1699	0	28	.61	ND	100
30	2,4,6-Trichlorophenol	0	.2890	0	28	.36	ND	100
31	2,4,5-Trichlorophenol	0	.3184	0	28	.32	ND	100
32	2-Chloronaphthalene	0	1.0909	0	28	.09	ND	100
33	2-Nitroaniline	0	.2286	0	28	.45	ND	100
34	Dimethylphthalate	0	1.0854	0	28	.09	ND	100
35	Acenaphthylene	0	1.5908	0	28	.06	ND	100
36	3-Nitroaniline	0	.2901	0	28	.35	ND	100
37	Acenaphthene	0	.9199	0	28	.11	ND	100
38	2,4-Dinitrophenol	0	.0624	0	28	1.65	ND	100
39	4-Nitrophenol	0	.0688	0	28	1.49	ND	100
40	Dibenzofuran	0	1.4886	0	28	.07	ND	100
41	2,4-Dinitrotoluene	0	.3670	0	28	.28	ND	100
42	2,6-Dinitrotoluene	0	.2888	0	28	.36	ND	100
43	Diethylphthalate	0	1.0023	0	28	.10	ND	100
44	4-Chlorophenyl-phenylether	0	.5816	0	28	.18	ND	100
45	Fluorene	0	1.1655	0	28	.09	ND	100
46	4-Nitroaniline	0	.3100	0	28	.33	ND	100
47	Phenanthrene-d10	99689		1225	47		IS HIGH	

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

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801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

DATA FILE: GJ100
RF FILE: GJ098
DATE: 08/25/92
TLI PROJ #: 21285

SAMPLE ID: SP-RF7-1MM5-0623-1
TLI SAMPLE ID: 57.171.5-8 & 57.229.7
DILUTION FACTOR: 10
ANALYSIS DATE: 08/04/92

METHOD 8270 QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
48	4,6-Dinitro-2-methylphenol	0	.0700	0	47	1.15	ND	100
49	N-Nitrosodiphenylamine(1)	0	.5090	0	47	.16	ND	100
50	4-Bromophenyl-phenylether	0	.1843	0	47	.44	ND	100
51	Hexachlorobenzene	0	.2140	0	47	.37	ND	100
52	Pentachlorophenol	0	.0972	0	47	.83	ND	100
53	Phenanthrene	0	1.0706	0	47	.07	ND	100
54	Anthracene	0	1.0838	0	47	.07	ND	100
55	Di-n-butylphthalate	1584	1.1535	1321	47	5.51	E	100
56	Fluoranthene	0	1.2424	0	47	.06	ND	100
57	Chrysene-d12	93417		1611	57		IS HIGH	
58	Pyrene	0	1.5476	0	57	.06	ND	100
59	Butylbenzylphthalate	0	.6890	0	57	.12	ND	100
60	3,3'-Dichlorobenzidine	0	.4180	0	57	.20	ND	100
61	Benzo(a)anthracene	0	1.5053	0	57	.06	ND	100
62	Chrysene	0	1.3952	0	57	.06	ND	100
63	bis(2-Ethylhexyl)phthalate	4890	.8495	1632	57	25.15	E	100
64	Perylene-d12	100824		1892	64		IS HIGH	
65	Di-n-octylphthalate	0	1.5661	0	64	.05	ND	100
66	Benzo(b)fluoranthene	0	1.1947	0	64	.07	ND	100
67	Benzo(k)fluoranthene	0	1.5870	0	64	.05	ND	100
68	Benzo(a)pyrene	0	1.1662	0	64	.07	ND	100
69	Indeno(1,2,3-cd)pyrene	0	.9483	0	64	.08	ND	100
70	Dibenz(a,h)anthracene	0	.7149	0	64	.11	ND	100
71	Benzo(g,h,i)perylene	0	.8568	0	64	.09	ND	100

SURROGATE SUMMARY

	NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
72	Nitrobenzene-d5	0	.2861	0	14	.00	ND	
73	2-Fluorobiphenyl	18569	1.2091	918	28	78.98	D	79
75	Phenol-d5	8820	1.5090	545	1	73.55	D	74
77	2,4,6-Tribromophenol	2288	.1505	1125	28	78.16	D	78
81	1,4-Dibromobenzene-d4	4536	.8034	769	1	71.05	D	71
82	1,3,5-Trichlorobenzene-d3	5391	1.3295	710	1	51.03	D	51
83	Anthracene-d10	30906	1.1133	1233	47	111.39	D	111
84	Pyrene-d10	29052	1.3321	1430	57	93.38	D	93

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801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

DATA FILE: FI078
RF FILE: FI078
DATE: 08/24/92
TLI PROJ: 21285

SAMPLE ID: SP-RF7-1MM5-0623-1
TLI SAMPLE ID: 57.171.5-8 & 57.229.7
DILUTION FACTOR: 1
ANALYSIS DATE: 07/16/92

METHOD 8270 QUANTITATION REPORT

	NAME	AREA	RF	SCAN		AMT, ug	CODE	QUAN LIMIT
1	1,4-Dichlorobenzene-d4	2744		330	1		IS	
2	Naphthalene-d8	13105		512	2		IS	
3	Acenaphthene-d10	8704		756	3		IS	
4	Phenanthrene-d10	17400		958	4		IS	
5	Chrysene-d12	27858		1330	5		IS	
6	Perylene-d12	28193		1515	6		IS	
20	n-Nitrosodimethylamine	0	.796	0	1	.37	ND	10
21	Cumene	0	2.759	0	1	.11	ND	10
22	a-Pinene	1616	1.481	230	1	15.91	D	10
23	b-Pinene	790	1.620	288	1	7.11	E	10
24	Aniline	0	2.384	0	1	.12	ND	10
25	1,2,4-Trimethylbenzene	0	2.462	0	1	.12	ND	10
26	Phenol	0	1.912	0	1	.15	ND	10
27	Benzyl Chloride	0	3.068	0	1	.10	ND	10
28	bis-(2-Chloroethyl)ether	0	1.576	0	1	.18	ND	10
29	n-Nitrosomorpholine	0	1.097	0	1	.27	ND	10
30	1,4-Dichlorobenzene	0	1.430	0	1	.20	ND	10
31	p-Cymene	0	2.379	0	1	.12	ND	10
32	Acetophenone	0	1.768	0	1	.16	ND	10
33	1,2-Dibromo-3-chloropropane	0	.599	0	1	.49	ND	10
34	Hexachloroethane	0	.666	0	1	.44	ND	10
35	o-Toluidine	0	2.294	0	1	.13	ND	10
36	2-Methylphenol	0	1.371	0	1	.21	ND	10
37	Nitrobenzene	0	.473	0	2	.13	ND	10
38	N,N-Dimethylaniline	0	.476	0	2	.13	ND	10
39	Isophorone	0	.854	0	2	.07	ND	10
40	Catechol	0	.081	0	2	.75	ND	10
41	3/4-Methylphenol	0	.333	0	2	.18	ND	10
42	1,2,4-Trichlorobenzene	1530	.284	510	2	16.46	D	10
43	a-Terpineol	1211	.347	530	2	10.66	D	10
44	Naphthalene	4561	1.007	515	2	13.83	D	10
45	o-Anisidine	0	.258	0	2	.24	ND	10
46	Hexachlorobutadiene	0	.118	0	2	.52	ND	10
47	2-Chloroacetophenone	0	.649	0	2	.09	ND	10
48	a,a,a-Trichlorotoluene	0	.291	0	2	.21	ND	10
49	N,N-Diethylaniline	0	.502	0	2	.12	ND	10
50	1,4-Phenylenediamine	0	.346	0	2	.18	ND	10
51	Hydroquinone	0	.344	0	2	.18	ND	10
52	Pentamethylbenzene	0	.576	0	2	.11	ND	10
53	Hexachlorocyclopentadiene	0	.127	0	3	.72	ND	10
55	2,4,6-Trichlorophenol	0	.302	0	3	.30	ND	10
56	2,4,5-Trichlorophenol	0	.383	0	3	.24	ND	10
57	2,4-Toluenediamine	0	.403	0	3	.23	ND	10
58	2,4-Dichlorophenol	0	.378	0	3	.24	ND	10

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

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801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

DATA FILE: FI078
RF FILE: FI076
DATE: 08/24/92
TLI PROJ: 21285

SAMPLE ID: SP-RF7-1MM5-0623-1
TLI SAMPLE ID: 57.171.5-8
& 57.229.7
DILUTION FACTOR: 1
ANALYSIS DATE: 07/16/92

METHOD 8270 QUANTITATION REPORT

NAME	AREA	RF	SCAN		AMT, ug	CODE	QUAN LIMIT
59 2,3-Dichlorophenol	0	.534	0	3	.17	ND	10
60 2,6-Dichlorophenol	0	.538	0	3	.17	ND	10
61 3,5-Dichlorophenol	0	.643	0	3	.14	ND	10
62 3,4-Dichlorophenol	0	.609	0	3	.15	ND	10
63 Biphenyl	0	1.180	0	3	.08	ND	10
64 Dimethylphthalate	0	1.116	0	3	.08	ND	10
65 2,4-Dinitrotoluene	0	.445	0	3	.21	ND	10
66 2,4-Dinitrophenol	0	.124	0	3	.74	ND	10
67 4,6-Dinitro-2-methylphenol	0	.229	0	3	.40	ND	10
68 Dibenzofuran	0	1.846	0	3	.05	ND	10
69 4-Nitrophenol	0	.208	0	3	.44	ND	10
70 Trifluralin	0	.221	0	3	.42	ND	10
71 Hexachlorobenzene	0	.197	0	4	.23	ND	10
72 4-Aminobiphenyl	0	.790	0	4	.06	ND	10
73 Pentachlorophenol	0	.136	0	4	.34	ND	10
74 Pentachloronitrobenzene	0	.079	0	4	.58	ND	10
75 4-Nitrobiphenyl	0	.538	0	4	.09	ND	10
76 Di-n-butylphthalate	2440	1.651	1080	4	3.40	E	10
77 Pyrene	0	1.431	0	5	.02	ND	10
78 Benzidine	0	.744	0	5	.04	ND	10
79 4,4'-Methylenedianiline	0	.355	0	5	.08	ND	10
80 Dimethylaminoazobenzene	0	.511	0	5	.06	ND	10
81 Butylbenzylphthalate	0	.879	0	5	.03	ND	10
82 3,3'-Dimethylbenzidine	0	.862	0	5	.03	ND	10
83 Methylene bis-chloroaniline	0	.317	0	5	.09	ND	10
84 Chrysene	0	1.290	0	5	.02	ND	10
85 3,3'-Dichlorobenzidine	0	.608	0	5	.05	ND	10
86 bis(2-Ethylhexyl)phthalate	14818	2.267	1383	5	9.38	E	10
87 3,3'-Dimethoxybenzidine	0	.341	0	5	.08	ND	10

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
10 Phenol-d5	11911	1.683	335	1	103.19	D	103
12 Nitrobenzene-d5	0	.463	0	2	.00	ND	
13 1,3,5-Trichlorobenzene-d3	5136	.261	469	2	60.08	D	60
14 1,4-Dibromobenzene-d4	4169	.641	517	1	94.82	D	95
15 2-Fluorobiphenyl	17205	1.032	674	3	76.83	D	77
16 2,4,6-Tribromophenol	3329	.190	871	3	80.60	D	81
17 Anthracene-d10	36462	1.028	965	4	81.53	D	82
18 Pyrene-d10	46369	1.084	1154	5	61.40	D	61

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: FI078
DATE: 08/25/92
TLI PROJ #: 21285

SAMPLE ID: SP-RF7-1MM5-0623-1
TLI ID: 57.171.5-6
& 57.229.7
DILN FACTOR: 1
ANAL. DATE: 07/16/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

	NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
1	METHOXYPHENOL	456	6619412	512	40.00	4829.06
2	SUBSTITUTED PHENOL	609	304409	512	40.00	222.08
3	SUBSTITUTED BENZALDEHYDE	707	186575	756	40.00	183.10
4	SUBSTITUTED KETONE	773	148227	756	40.00	145.47
5	SUBSTITUTED PHENOL	672	119450	756	40.00	117.22
6	SUBSTITUTED HYDROCARBON	813	86438	756	40.00	84.83
7	SUBSTITUTED HYDROCARBON	1363	174408	1330	40.00	67.78
8	SUBSTITUTED AROMATIC	981	67350	958	40.00	50.07
9	SUBSTITUTED PHENOL	532	59989	512	40.00	43.77
10	SUBSTITUTED HYDROCARBON	1089	52919	958	40.00	39.34
11	SUBSTITUTED PHENOL	668	36552	756	40.00	35.87
12	SUBSTITUTED HYDROCARBON	849	32929	756	40.00	32.32
13	SUBSTITUTED HYDROCARBON	1190	73566	1330	40.00	28.59
14	SUBSTITUTED PHENOL	494	38410	512	40.00	28.02
15	BRANCHED HYDROCARBON	782	27805	756	40.00	27.29
16	SUBSTITUTED KETONE	943	32732	958	40.00	24.34
17	SUBSTITUTED HYDROCARBON	1630	67893	1515	40.00	22.75
18	SUBSTITUTED HYDROCARBON	1245	54655	1330	40.00	21.24
19	SUBSTITUTED HYDROCARBON	1237	49768	1330	40.00	19.34
20	SUBSTITUTED AROMATIC	1264	48570	1330	40.00	18.88

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Naphthalene-d8	512	54830	14
Acenaphthene-d10	756	40759	28
Phenanthrene-d10	958	53800	47
Chrysene-d12	1330	102929	57
Perylene-d12	1515	119376	64

Section 3.4 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA | Source: Recovery Furnace (Cyclone) No.7 | FIN: PN1310
Source Code: SP-RF7 | Date: 6/23/92 | EPN: SN17 | CIN: CN1311 & 2

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1125			
Flow Data				
Stack Temperature, °F	309			309
Moisture Content, %	20.0			20.0
Oxygen Concentration, %	12.0			12.0
Carbon Dioxide Concentration, %	6.0			6.0
Volumetric Flow Rate, x10^3 ACFM	274.0			274.0
Volumetric Flow Rate, x10^3 DSCFM	148.2			148.2
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	70.0			70.0
Miscellaneous Parameters				
Formaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.3 *			0.3 *
Acetaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.5 *			0.5 *
Acetone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.7 *			0.7 *
Acetophenone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.4 *			1.4 *
2-Butanone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.8 *			0.8 *
Methyl isobutyl ketone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.2 *			1.2 *
Acrolein				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.6 *			0.6 *
Benzaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.2 *			1.2 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA   Source: Recovery Furnace (Cyclone) No.7   FIN: PN1310
Source Code: SP-RF7   Date: 6/24/92   EPN: SN17   CIN: CN1311 & 2

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1315			
Flow Data				
Stack Temperature, °F	309			309
Moisture Content, %	20.0			20.0
Oxygen Concentration, %	12.0			12.0
Carbon Dioxide Concentration, %	6.0			6.0
Volumetric Flow Rate, x10^3 ACFM	274.0			274.0
Volumetric Flow Rate, x10^3 DSCFM	148.2			148.2
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	66.0			66.0
Miscellaneous Parameters				
Formaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.3 *			0.3 *
Acetaldehyde				
Concentration, ppmvd	0.6			0.6
Emission Rate, lb/hr	0.6			0.6
Acetone (Impinger)				
Concentration, ppmvd	0.5			0.5
Emission Rate, lb/hr	0.7			0.7
Acetophenone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.4 *			1.4 *
2-Butanone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.8 *			0.8 *
Methyl isobutyl ketone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.2 *			1.2 *
Acrolein				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.6 *			0.6 *
Benzaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.2 *			1.2 *

* One or more values were less than the detection limit.

Section 3.5 Quality Control Results

I:\TPIBC\REPORTS\A502\SP\684801-5.RPT
(L) WWC (R) DW 28 December 1992

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL SP SOURCE SP-RF7

1. CALIBRATION

THEOR	DATE	6/23/92	THEOR	Found	6/24/92
ppm	ppm	%REC	ppm	ppm	%REC
0	-10		0	0	
90	91	101.11%	15	14	93.33%
149	164	110.07%	90	90	100.00%
375	368	98.13%	149	148	99.33%

2. PROPANE LINE RECOVERY

	DATE	6/23/92		DATE	6/24/92	
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	393	385	98%	357	352	98.60%
AFTER	357	352	99%	150	158	105.33%

3. LINE BLANK

	DATE	6/23/92	DATE	6/24/92
	INST	LINE	INST	LINE
BEFORE	0	1	0	0
AFTER	0	0	1	2

WESTON QC SUMMARY
METHOD 18

MILL SIMPSON SOURCE SP-RF7

1. CHECK STANDARD

ppm	THEOR	EXP 1 (%REC)	EXP 2 (%REC)	EXP 3 (%REC)
FILE NAME		FMB4009	FOB4001	
DATE:		23-Jun-92	24-Jun-92	
ethanol	55.64	108.54%	80.14%	
acetone	44.47	104.30%	118.14%	
isopropanol	42.65	93.41%	84.09%	
dimethyl sulfide	19.55	99.39%	99.95%	
benzene	36.54	88.34%	92.99%	
bromodichloromethane	40.17	105.45%	119.36%	
dimethyl disulfide	36.26	102.81%	105.41%	
toluene	30.73	105.01%	103.91%	
ethyl benzene	26.67	103.11%	107.18%	
m-xylene	26.64	100.97%	105.57%	
o-xylene	26.76	103.22%	108.60%	
cumene	23.47	102.89%	108.46%	
alpha-pinene	20.49	104.36%	111.17%	
beta-pinene	20.59	95.67%	75.98%	
3-carene	20.61	96.99%	102.61%	
p-cymene	20.92	98.65%	105.97%	

2. PROPANE RESPONSE

	THEOR	%REC	%REC	%REC
BEFORE RUN	29.9	115.31%	114.05%	
AFTER RUN	29.9	114.05%	114.05%	

3. METHANOL RECOVERY

	THEOR	%REC	%REC	%REC
BEFORE RUN	100	113.23%	105.10%	
AFTER RUN	100	105.10%	92.46%	

4. LINE BLANK

	FILE REF		
BEFORE RUN	FNB4005	FNB4011	
AFTER RUN	FNB4011	FOB4012	

NOTES:

SOURCE SP-RF7

QUALITY CONTROL SUMMARY
METHOD 16

1. CALIBRATION

ANALYTE	LO ppm	MED ppm	HI ppm
6/23/92			
hydrogen sulfide	3.6	8.5	27.7
methyl mercaptan	3.5	8.3	27.0
dimethyl sulfide	4.7	11.2	36.6
carbon disulfide	1.4	5.2	10.5
dimethyl disulfide	2.2	3.2	17.0
6/24/92 *			
hydrogen sulfide	3.0	10.5	25.9
methyl mercaptan	2.9	10.2	25.2
dimethyl sulfide	3.9	13.8	34.1
carbon disulfide	1.1	4.0	9.8
dimethyl disulfide	1.8	6.4	15.9

* Calibration from 6/22/92 was used

Section 3.6 Process Operating Data

MILL: SIMPSON PAPER SOURCE: RECOVERY FURNACES No. 7 RECOVERY FURNACE MAIN STACK

	UNITS						
DATE		6/23	6/23	6/23	6/24	6/24	6/24
TIME, STARTING		1126	1225	1323	1133	1232	1333
SOURCE:	SPARRT						
PIN:	PN1310						
EPN:	SN17						
FURNACE DATA							
MANUFACTURER	B&W						
CONSTRUCTED	1973						
WHEN MODIFIED	NONE						
CONTACT	CYCLONE						
PRODUCTION DATA							
BLS DENSITY	LBS/GAL	12	12	12	12	12	12
BL SOLIDS CONTENT	%	60.9	61.3	63.1	65.7	66.0	65.5
LIQUOR FIRING RATE	LB BLS/HR	70,000	71,000	73,000	67,000	67,000	66,000
SULFIDITY (GREEN LIQUOR)	%	29.9	29.3	29.9	29.3	29.3	29.9
BL BTU CONTENT	BTU/LB	5830	5830	5830	5830	5830	5830
BL CHLORIDE CONTENT	% BY WT	N/A	N/A	N/A	N/A	N/A	N/A
EMISSION DATA							
OXYGEN	%	7.8	8.1	7.8	8.3	7.8	7.8
SO_2 *	PPM	106	111	111	101	58	58
TRS **	PPM	0.9	0.7	0.7	1.1	0.9	0.9

MAKE UP CHEMICALS -- SODIUM HYDROSULFIDE PLUS SODIUM HYDROXIDE

NOTES: * SO_2 CORRECTED FOR SAMPLE INTEGRITY

** TRS CORRECTED FOR SAMPLE INTEGRITY AND ADJUSTED TO 8% OXYGEN.

SECTION 4

SMELT DISSOLVING TANK VENT

(SP-SDTV7)

SECTION 4
SMELT DISSOLVING TANK VENT
(SP-SDTV7)

The Smelt Dissolving Tank Vent was tested on two different days. The source was sampled for Methods 25A, 16, and 18. VOST and Semi-VOST samples were collected. The entire mill was down during the second and third run.

Total Hydrocarbons (M25A)

Figures 4.1 and 4.2 present the THC trends for the test periods on 5/20/92 and 6/22/92. On the first day, the total hydrocarbon concentrations exhibited a downward trend from 12 to 4 ppm. On the second day, they exhibited a slight downward trend from 82 to 31 ppm.

Volatile Organic Compounds (M16 and M18)

Table 4.1 summarizes the results for the Method 16 and Method 18 target compounds, and Section 4.1 is a tabulation of the data. On the first day, methanol was detected by Method 18 analyses; hydrogen sulfide, methyl mercaptan, dimethyl sulfide and dimethyl disulfide by Method 16 analysis. On the second day, methanol, acetone and 3-carene were identified by Method 18 analyses; hydrogen sulfide and methyl mercaptan by Method 16 analysis. The volumetric flow was measured during sampling with a pitot tube.

Volatile Organic Sampling Train (VOST)

Table 4.2 summarizes the result of the VOST sample collected on 5/20/92. Section 4.2 tabulates the results for target compounds and tentatively identified compounds (TIC's).

The VOST analysis was used to confirm the identity of target compounds in Method 18 as well as to identify other organic constituents that may be present. The most predominant target compounds present in the emissions were n-hexane, chloroform, chloromethane and dimethyl disulfide ranging from 0.09 to 0.03 ppm, respectively. As 0.09 ppm corresponds to approximately 0.006 lb/hr, all identified compounds were well below the limit reported by Method 18.

Semivolatile Organic Compounds (MM5)

Table 4.3 summarizes the result of the semivolatile organic compounds sample collected using the Modified Method 5 (MM5) train on 6/22/92. Section 4.3 tabulates the results of the target compounds and the tentatively identified compounds (TIC's) from the gas chromatography-mass spectrometry (GC-MS) analysis. Compounds present in the emissions were a-terpineol, benzyl alcohol and bis (2-ethylhexyl) phthalate.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 4.4. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 4.5 includes the process operating data as recorded and provided by mill personnel. Not all process operating data was given for VOC run times. The data with the closest run time was used.

FIGURE 4.1
THC TREND ANALYSIS (5/20/92)
SMELT DISSOLVING TANK VENT (SP-SDTV7)

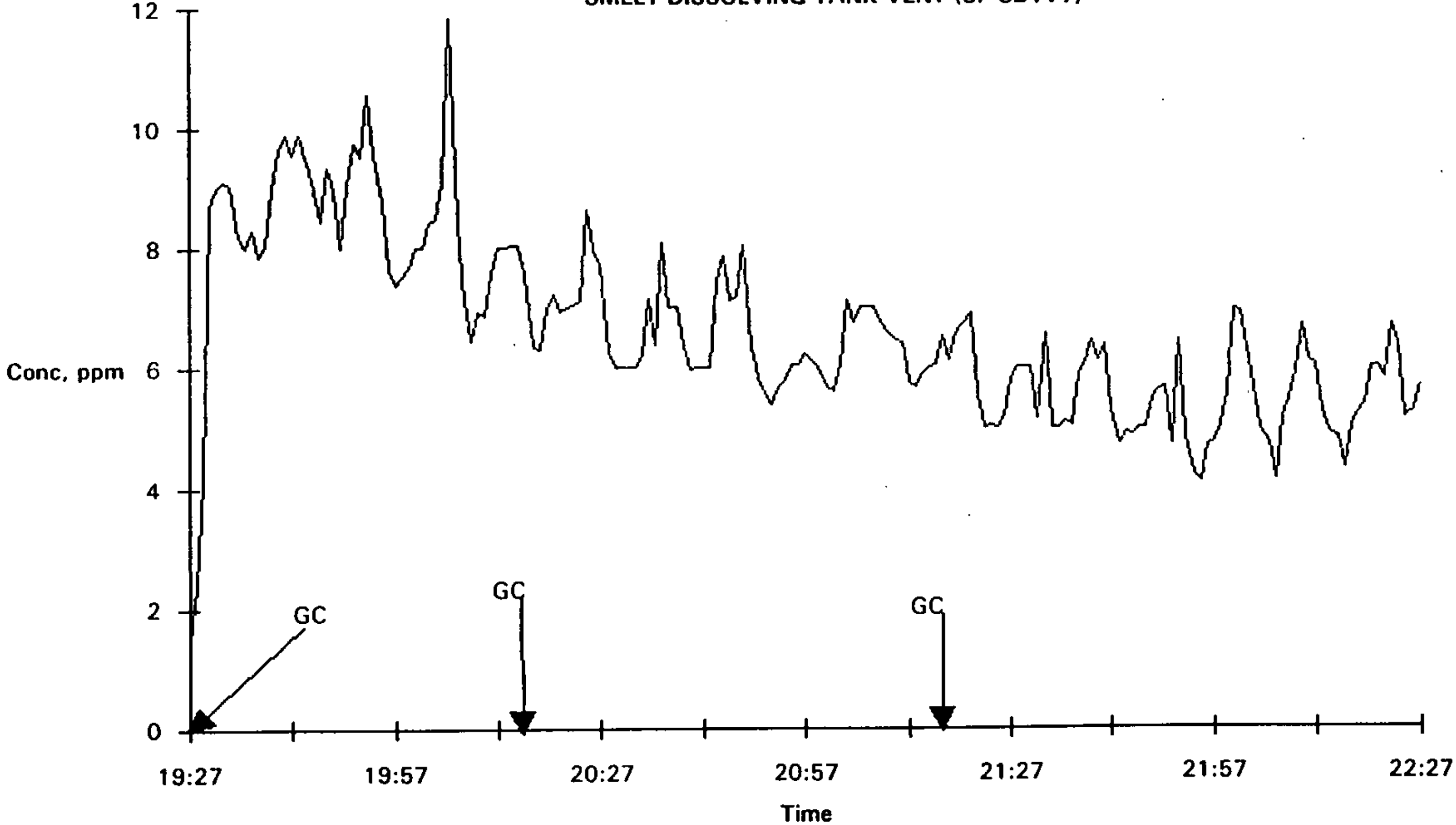
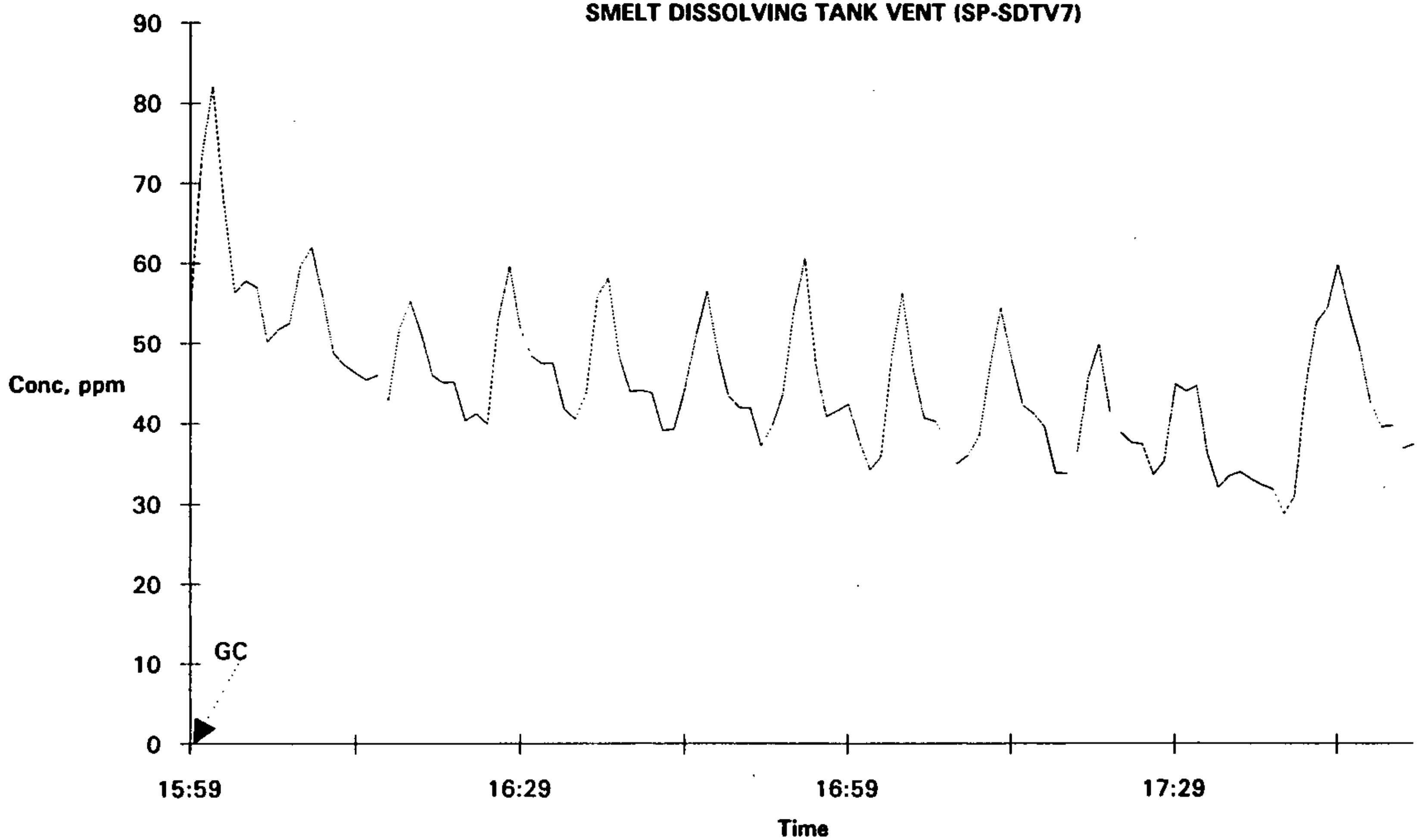


FIGURE 4.2
THC TREND ANALYSIS (6/22/92)
SMELT DISSOLVING TANK VENT (SP-SDTV7)



WESTON

TABLE 4.1 SUMMARY OF VOC RESULTS

Mill: SIMPSON - PASADENA | Source: Smelt Dissolving Tank Vent

Source Code: SP-SDTV7 | Test Dates: 5/20/92 6/22/92

FIN: PN1313 CIN: CN1314 | EPN: SN18

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	167	168	168	
Volumetric Flow Rate, $x10^3$ DSCFM	5.2	5.2	5.2	
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	70.0	70.0	70.0	
Method 16 Data, lb/hr				
Hydrogen sulfide	0.3	0.7	0.5	0.1
Methyl mercaptan	<0.1	0.3	0.1	0.1
Dimethyl sulfide	ND	<0.1	0.1	0.1
Carbon disulfide	ND	ND	ND	0.1
Dimethyl disulfide	ND	<0.1	0.1	0.1
Method 18 Data, lb/hr				
Methanol	ND	2.3	0.7	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	<0.1	0.1	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	ND	ND	ND	0.2
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.2
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	0.1	0.1	0.1
Terpenes (Unspecified)	ND	ND	ND	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	ND	1.0	0.3	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	<0.1	1.0	0.3	0.1

ND=Not Detected
DL=Detection Limit

TABLE 4.2 SUMMARY OF VOST RESULTS

Mill: SIMPSON-PASADENA
Source Code: SP-SDTV7
FIN: PN1313 EPN: SN18

Source: Smelt Dissolving Tank Vent
Test Dates: 5/20/92
CIN: CN1314

TIME	1950
Volumetric Flow Data	
Stack Temperature, °F	167
Volumetric Flow Rate, x 10^3 DSCFM	5.2
Process Operating Conditions	
Production Rate 1000 lb BLS/hr	70.0
Target Compounds, ppm	
Chloromethane	0.069
Bromomethane	0.006
Methylene Chloride	0.012
Acetone	0.020
Carbon Disulfide	0.019
Chloroform	0.077
Dimethyl disulfide	0.030
Dimethyl sulfide	0.003
Iodomethane	0.000
Isooctane	0.001
n-Hexane	0.092
2-Butanone (MEK)	0.002
2-Chloro-1,3-Butadiene	0.009
Bromodichloromethane	0.022
Trichloroethane	0.000
tert-Butyl methyl ether	0.000
Tetrachlorethene	0.000
Benzene	0.011
Dibromomethane	0.000
Toluene	0.003
Ethylbenzene	0.000
Styrene	0.000
o-Xylene	0.000
m-/p-Xylene	0.001
A-Pinene	0.001
B-Pinene	0.000
Cumene	0.000
p-Cymene	0.000

WESTON

MANAGERS DESIGNERS CONSULTANTS

TABLE 4.3 SUMMARY OF SEMIVOLATILE RESULTS

Mill: SIMPSON-PASADENA
Source Code: SP-SDTV7
FIN: PN1313 EPN: SN18

Source: Smelt Dissolving Tank Vent
Test Dates: 6/22/92
CIN: CN1314

TIME	1600
Volumetric Flow Data	
Stack Temperature, °F	168
Volumetric Flow Rate, x 10^3 DSCFM	5.2
Process Operating Conditions	
Production Rate, 1000 lb BLS/hr	70.0
Target Compounds, ppm	
a-Pinene	0.060
B-Pinene	0.031
1,2,4-Trichlorobenzene	0.062
a-Terpineol	1.446
Naphthalene	0.095
Di-n-butylphthalate	0.038
Butylbenzylphthalate	0.002
bis(2-Ethylhexyl)phthalate	0.387
Benzyl alcohol	0.923
1,2,4-Trichlorobenzene	0.053
Naphthalene	0.096
2-Methylnaphthalene	0.012
Di-n-butylphthalate	0.037
bis(2-Ethylhexyl)phthalate	1.895

Section 4.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Smelt Dissolving Tank Vent | FIN: PN1313
Source Code: SP-SDTV7 | Date: 5/20/92 | EPN: SN18 | CIN: CN1314

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1927	2027	2127	
Flow Data				
Stack Temperature, °F	167			167
Moisture Content, %	39.0			39.0
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	10.1			10.1
Volumetric Flow Rate, x10^3 DSCFM	5.2			5.2
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	70.0	70.0	70.0	70.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	21.6	17.2	11.7	16.8
Emission Rate, lb/hr	0.6	0.5	0.3	0.5
Methyl mercaptan				
Concentration, ppmvd	1.0	0.9	0.8	0.9
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl sulfide				
Concentration, ppmvd	0.5	1.4	1.8	1.2
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.8	1.2	0.8
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Method 18 Data				
Methanol				
Concentration, ppmvd	3.3 *	4.6	6.6	4.3
Emission Rate, lb/hr	0.1 *	0.1	0.2	0.1
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Smelt Dissolving Tank Vent | FIN: PN1313
Source Code: SP-SDTV7 | Date: 5/20/92 | EPN: SN18 | CIN: CN1314

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.6 *	1.6 *	1.6 *	1.6 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Benzene				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.6 *	1.6 *	1.6 *	1.6 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill:	SIMPSON - PASADENA	Source:	Smelt Dissolving Tank Vent			FIN:	PN1313
Source Code:	SP-SDTV7	Date:	5/20/92	EPN:	SN18	CIN:	CN1314

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.8 *	0.8 *	0.8 *	0.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 •	0.1 •
Knowns as Carbon				
Concentration, ppmvd	0.8 *	3.0	5.7	3.0
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.1 *	0.1 *	0.1 •	0.1 *
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	13.1	9.8	8.2	10.4
Emission Rate, lb/hr as C	0.1	0.1 *	0.1 •	0.1

COMMENTS :

Entire mill went down on 6/22/92 during second run - no VOC data.

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA   Source: Smelt Dissolving Tank Vent   FIN: PN1313
Source Code: SP-SDTV7   Date: 6/22/92   EPN: SN18   CIN: CN1314

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1558	1658		
Flow Data				
Stack Temperature, °F	168			168
Moisture Content, %	39.1			39.1
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	10.1			10.1
Volumetric Flow Rate, x10^3 DSCFM	5.2			5.2
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	70.0	70.0	70.0	70.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	25.2	20.8		23.0
Emission Rate, lb/hr	0.7	0.6		0.6
Methyl mercaptan				
Concentration, ppmvd	5.8	6.6		6.2
Emission Rate, lb/hr	0.2	0.3		0.2
Dimethyl sulfide				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Method 18 Data				
Methanol				
Concentration, ppmvd	89.8			89.8
Emission Rate, lb/hr	2.3			2.3
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.8 *			0.8 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acetone				
Concentration, ppmvd	2.1			2.1
Emission Rate, lb/hr	0.1 *			0.1 *
2-Propanol				
Concentration, ppmvd	0.8 *			0.8 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source: Smelt Dissolving Tank Vent		FIN: PN1313
Source Code: SP-SDTV7	Date: 6/22/92	EPN: SN18	CIN: CN1314

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.8 *			0.8 *
Emission Rate, lb/hr	0.1 *			0.1 *
Chloroform				
Concentration, ppmvd	1.6 •			1.6 •
Emission Rate, lb/hr	0.2 *			0.2 *
Benzene				
Concentration, ppmvd	0.8 *			0.8 *
Emission Rate, lb/hr	0.1 •			0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.6 *			1.6 *
Emission Rate, lb/hr	0.2 *			0.2 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.8 •			0.8 *
Emission Rate, lb/hr	0.1 *			0.1 *
Ethyl benzene				
Concentration, ppmvd	0.8 *			0.8 *
Emission Rate, lb/hr	0.1 *			0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.8 *			0.8 *
Emission Rate, lb/hr	0.1 *			0.1 *
o-Xylene				
Concentration, ppmvd	0.8 *			0.8 *
Emission Rate, lb/hr	0.1 *			0.1 *
Cumene				
Concentration, ppmvd	0.8 *			0.8 •
Emission Rate, lb/hr	0.1 *			0.1 *
alpha-Pinene				
Concentration, ppmvd	0.8 •			0.8 *
Emission Rate, lb/hr	0.1 *			0.1 *
beta-Pinene				
Concentration, ppmvd	0.8 *			0.8 *
Emission Rate, lb/hr	0.1 *			0.1 *
3-Carene				
Concentration, ppmvd	1.1			1.1
Emission Rate, lb/hr	0.1			0.1
Terpenes (Unspecified)				
Concentration, ppmvd	0.8 *			0.8 •
Emission Rate, lb/hr	0.1 *			0.1 •

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA		Source:	Smelt Dissolving Tank Vent		FIN:	PN1313
Source Code:	SP-SDTV7	Date:	6/22/92	EPN: SN18	CIN:	CN1314

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.8 *			0.8 *
Emission Rate, lb/hr	0.1 *			0.1 *
Knowns as Carbon				
Concentration, ppmvd	104.9			104.9
Unknowns as Carbon				
Concentration, ppmvd	0.0			0.0
Sum M18 as Carbon, lb/hr	1.0			1.0
Unknown Compounds % of Total	0.0%			0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	82.1	64.0		73.1
Emission Rate, lb/hr as C	0.8	0.6		0.7

COMMENTS :

Entire mill went down on 6/22/92 during second run - no VOC data.

* One or more values were less than the detection limit.

Section 4.2 Emission Test Results - VOST

EMISSION TEST RESULTS - VOST

Mill SIMPSON - PASADENA Source: Smelt Dissolving Tank Vent
Source Code: SP-SDTV7 EPN: SN18 FIN: PN1313 CIN: CN1314

Date: 5/20/92

Compound	SDTV-T (µg)	SDTV-TC (µg)	SDTV-C (µg/L)	Total µg	SP-SDTV (µg/m3)	Conc. (ppm)
TARGET COMPOUNDS						
Chloromethane		0.698		0.70	143.92	0.069
Bromomethane		0.109		0.11	22.47	0.006
Methylene Chloride	0.029	0.015	3.81	0.21	42.85	0.012
Acetone	0.155	0.015	1.58	0.24	49.06	0.020
Carbon Disulfide	0.229	0.069		0.30	61.44	0.019
Chloroform	1.613	0.032	4.75	1.85	381.29	0.077
Trichlorofluoromethane						
Dimethyl disulfide	0.541	0.037		0.58	119.18	0.030
Dimethyl sulfide	0.042			0.04	8.66	0.003
Iodomethane		0.010		0.01	2.06	0.000
Isooctane		0.013		0.01	2.68	0.001
n-Hexane	0.374	1.210	0.35	1.60	329.70	0.092
2-Butanone (MEK)	0.033			0.03	6.80	0.002
2-Chloro-1,3-butadiene		0.159		0.16	32.78	0.009
Bromodichloromethane	0.718	0.003		0.72	148.66	0.022
Trichloroethene		0.001		0.00	0.21	0.000
tert-Butyl methyl ether		0.005		0.01	1.03	0.000
Tetrachloroethene	0.001			0.00	0.21	0.000
Benzene	0.180			0.18	37.11	0.011
Dibromomethane		0.014		0.01	2.89	0.000
Toluene	0.025	0.019	0.40	0.06	12.62	0.003
Ethylbenzene	0.005			0.01	1.03	0.000
Styrene	0.002	0.002		0.00	0.82	0.000
m-/p-Xylene	0.015	0.003		0.02	3.71	0.001
o-Xylene	0.006			0.01	1.24	0.000
Acrolein						
A-Pinene	0.014	0.002		0.02	3.30	0.001
B-Pinene	0.012	0.001		0.01	2.68	0.000
Cumene	0.008	0.002		0.01	2.06	0.000
p-Cymene	0.005	0.001		0.01	1.24	0.000
TENTATIVELY IDENTIFIED CMPDS.						
Acidic Esters						
Aromatic HC						
Branched HC	0.050	0.040		0.09	18.56	
Butene						
Cyclic HC						
Cyclohexane	0.100	0.250		0.35	72.16	
Furan						
Hydrocarbon	0.110			0.11	22.68	
Siloxane	1.840			1.84	379.38	
Subst'd HC						
Methyl Thiophene						
Thiophene						

EMISSION TEST RESULTS - VOST

Mill SIMPSON - PASADENA Source: Smelt Dissolving Tank Vent
Source Code: SP-SDTV7 EPN: SN18 FIN: PN1313 CIN: CN1314

Date: 5/20/92

Compound	SDTV-T (µg)	SDTV-TC (µg)	SDTV-C (µg/L)	Total µg	SP-SDTV (µg/m3)	Conc. (ppm)
SURROGATE STDS						
(% Recovery)						
Toluene-d8	97.0	98.0	111.7			
1,2-Dichloroethane-d4	97.9	97.9	83.5			
Benzene-d6	98.0	98.1	97.4			

NOTES:
-T=Tenax
-TC=Tenax/Charcoal
-C = Condensate

Air Volume = 0.00485 cu.m.

Condensate Vol. 43.0 mL

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, N.C. 27713
Telephone: (919) 544-5729

FILE NAME:HH792 SAMPLE ID SP-SDTV/1VOST/0520/18 T
RF FILE: VOST0602 TLI Sample ID: 56-158-2
DATE: 06/11/92
ANALYSIS DATE: 06/03/92
TLI Project Number:20974

QUANTITATION REPORT VOST

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	5797		778	1		IS	
3	Chloromethane	0	1.302	0	1	.001	ND	.05
4	Bromomethane	0	1.253	0	1	.001	ND	.05
5	Vinyl chloride	0	1.464	0	1	.001	ND	.05
6	Methylene chloride	1398	2.073	585	1	.029	E	.05
7	Acetone	1903	.529	528	1	.155	D	.05
8	Carbon disulfide	30760	5.787	504	1	.229	D	.05
9	1,1-Dichloroethene	0	1.679	0	1	.001	ND	.05
10	1,1-Dichloroethane	0	3.871	0	1	.001	ND	.05
11	Chloroform	157268	4.206	796	1	1.613	D	.05
12	1,2-Dichloroethane	0	2.407	0	1	.001	ND	.05
13	1,4-Difluorobenzene	34215		911	1		IS	
14	2-Butanone	154	.034	763	13	.033	E	.05
15	1,1,1-Trichloroethane	0	.531	0	13	.001	ND	.05
16	Carbon tetrachloride	0	.474	0	13	.001	ND	.05
17	Vinyl acetate	0	.548	0	13	.001	ND	.05
18	Bromodichloromethane	61180	.623	1010	13	.718	D	.05
19	1,2-Dichloropropane	0	.527	0	13	.001	ND	.05
20	trans-1,3-Dichloropropene	0	.541	0	13	.001	ND	.05
21	Trichloroethene	0	.490	0	13	.001	ND	.05
22	1,1,2-Trichloroethane	0	.308	0	13	.001	ND	.05
23	Benzene	37322	1.513	849	13	.180	D	.05
24	cis-1,3-Dichloropropene	0	.716	0	13	.001	ND	.05
25	Bromoform	0	.331	0	13	.001	ND	.05
26	Chlorobenzene-d5	43402		1353	13		IS	
29	4-Methyl-2-pentanone	0	.181	0	26	.001	ND	.05
30	Tetrachloroethene	0	.352	0	26	.001	ND	.05
31	1,1,2,2-Tetrachloroethane	0	.275	0	26	.001	ND	.05
32	Toluene	3469	.803	1123	26	.025	E	.05
33	Chlorobenzene	0	.993	0	26	.001	ND	.05
34	Ethylbenzene	455	.519	1388	26	.005	E	.05
35	Styrene	429	1.036	1469	26	.002	E	.05
36	m-/p-Xylene	1620	.636	1412	26	.015	E	.05
37	o-Xylene	620	.630	1465	26	.006	E	.05
38	Acrolein	0	.084	0	1	.010	ND	.05
39	Acrylonitrile	0	.503	0	1	.002	ND	.05
40	Iodomethane	0	2.434	0	1	.001	ND	.05
41	1,4-Dichloro-2-butene	0	.085	0	13	.002	ND	.05
43	2-Chloro-1,3-Butadiene	0	.649	0	1	.001	ND	.05

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard (VOST_PCV)

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, N.C. 27713
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FILE NAME:HH792 SAMPLE ID SP-SDTV/1VOST/0520/18 T
RF FILE: VOST0602 TLI Sample ID: 56-158-2
DATE: 06/11/92
ANALYSIS DATE: 06/03/92
TLI Project Number:20974

QUANTITATION REPORT VOST

NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
44 n-Hexane	38452	4.433	666	1	.374	D	.05
45 Tert-Butyl methyl ether	0	4.190	0	1	.001	ND	.05
46 1,3-butadiene	0	.893	0	1	.001	ND	.05
47 Dibromomethane	0	.212	0	1	.004	ND	.05
48 Vinyl Bromide	0	1.612	0	1	.001	ND	.05
49 Isooctane	0	15.788	0	1	.001	ND	.05
50 Allyl chloride	0	1.055	0	1	.001	ND	.05
51 Cumene (isopropylbenzene)	2027	1.483	1814	26	.008	E	.05
52 Dimethyl sulfide	2027	2.090	515	1	.042	E	.05
53 Dimethyl disulfide	51976	4.147	1076	1	.541	D	.05
54 A-Pinene	2835	1.101	1555	26	.014	E	.05
55 B-Pinene	2367	1.129	1701	26	.012	E	.05
56 P-Cymene	1515	1.839	1939	26	.005	E	.05

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
2 1,2-Dichloroethane-d4	12375	2.180	847	1	.245	D	97.9
• 27 4-Bromofluorobenzene	29029	.654	1588	26	.256	D	102.3
28 Toluene-d8	53589	1.273	1113	26	.242	D	97.0
42 Benzene-d6	55979	1.669	845	13	.245	D	98.0
57 o-Xylene-d10	59933	1.376	1469	26	.251	D	100.4

• No QC criteria for VOST

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard (VOST_PCV)

TRIANGLE LABORATORIES of RTP, INC.
801 Capitola Drive
Durham, N.C. 27713
Telephone: (919) 544-5729

DATA FILE:HH792 SAMPLE ID SP-SDTV/1VOST/0520/18 T
RF FILE: VOST0602 TLI Sample ID: 56-158-2
DATE: 06/11/92
TLI Project Number: 20974
ANALYSIS DATE: 06/03/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

	NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
1	SILOXANE	1238	426366	1354	.25	.74
2	SILOXANE	875	191546	911	.25	.56
3	SILOXANE	2263	121794	1354	.25	.21
4	SILOXANE	1741	103745	1354	.25	.18
5	CYCLOHEXANE	732	17254	778	.25	.10
6	SILOXANE	1402	52374	1354	.25	.09
7	SILOXANE	2311	37314	1354	.25	.06
8	HYDROCARBON, POSSIBLY SUBSTITUTED	425	10550	778	.25	.06
9	HYDROCARBON, POSSIBLY SUBSTITUTED	362	8670.	778	.25	.05
10	HYDROCARBON, BRANCHED	623	8561	778	.25	.05

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	778	41856	1
1,4-Difluorobenzene	911	85190	14
Chlorobenzene-d5	1354	143824	28

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FILE NAME:HH791 SAMPLE ID SP-SDTV/1VOST/0520/18 TC
RF FILE: VOST0602 TLI Sample ID: 56-158-2
DATE: 06/11/92
ANALYSIS DATE: 06/03/92
TLI Project Number:20974

QUANTITATION REPORT VOST

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	5738		777	1		IS	
3	Chloromethane	20850	1.302	168	1	.698	D	.05
4	Bromomethane	3122	1.253	299	1	.109	D	.05
5	Vinyl chloride	0	1.464	0	1	.001	ND	.05
6	Methylene chloride	735	2.073	584	1	.015	E	.05
7	Acetone	185	.529	528	1	.015	E	.05
8	Carbon disulfide	9127	5.787	502	1	.069	D	.05
9	1,1-Dichloroethene	0	1.679	0	1	.001	ND	.05
10	1,1-Dichloroethane	0	3.871	0	1	.001	ND	.05
11	Chloroform	3086	4.206	796	1	.032	E	.05
12	1,2-Dichloroethane	0	2.407	0	1	.001	ND	.05
13	1,4-Difluorobenzene	33801		910	1		IS	
14	2-Butanone	0	.034	0	13	.004	ND	.05
15	1,1,1-Trichloroethane	0	.531	0	13	.001	ND	.05
16	Carbon tetrachloride	0	.474	0	13	.001	ND	.05
17	Vinyl acetate	0	.548	0	13	.001	ND	.05
18	Bromodichloromethane	217	.623	1010	13	.003	E	.05
19	1,2-Dichloropropane	0	.527	0	13	.001	ND	.05
20	trans-1,3-Dichloropropene	0	.541	0	13	.001	ND	.05
21	Trichloroethene	61	.490	937	13	.001	E	.05
22	1,1,2-Trichloroethane	0	.308	0	13	.001	ND	.05
23	Benzene	0	1.513	0	13	.001	ND	.05
24	cis-1,3-Dichloropropene	0	.716	0	13	.001	ND	.05
25	Bromoform	0	.331	0	13	.001	ND	.05
26	Chlorobenzene-d5	41528		1352	13		IS	
29	4-Methyl-2-pentanone	22	.181	1090	26	.001	E	.05
30	Tetrachloroethene	54	.352	1207	26	.001	E	.05
31	1,1,2,2-Tetrachloroethane	66	.275	1640	26	.001	E	.05
32	Toluene	2590	.803	1121	26	.019	E	.05
33	Chlorobenzene	0	.993	0	26	.001	ND	.05
34	Ethylbenzene	0	.519	0	26	.001	ND	.05
35	Styrene	425	1.036	1469	26	.002	E	.05
36	m-/p-Xylene	304	.636	1410	26	.003	E	.05
37	o-Xylene	0	.630	0	26	.001	ND	.05
38	Acrolein	0	.084	0	1	.010	ND	.05
39	Acrylonitrile	0	.503	0	1	.002	ND	.05
40	Iodomethane	557	2.434	508	1	.010	E	.05
41	1,4-Dichloro-2-butene	0	.085	0	13	.002	ND	.05
43	2-Chloro-1,3-Butadiene	2365	.649	846	1	.159	D	.05

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard (VOST_PCV)

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FILE NAME:HH791 SAMPLE ID SP-SDTV/1VOST/0520/1B TC
RF FILE: VOST0602 TLI Sample ID: 56-158-2
DATE: 06/11/92
ANALYSIS DATE: 06/03/92
TLI Project Number:20974

QUANTITATION REPORT VOST

NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
44 n-Hexane	123090	4.433	665	1	1.210	D	.05
45 Tert-Butyl methyl ether	436	4.180	631	1	.005	E	.05
46 1,3-butadiene	0	.893	0	1	.001	ND	.05
47 Dibromomethane	68	.212	978	1	.014	E	.05
48 Vinyl Bromide	0	1.612	0	1	.001	ND	.05
49 Isooctane	4824	15.788	868	1	.013	E	.05
50 Allyl chloride	0	1.055	0	1	.001	ND	.05
51 Cumene (isopropylbenzene)	383	1.483	1812	26	.002	E	.05
52 Dimethyl sulfide	0	2.090	0	1	.001	ND	.05
53 Dimethyl disulfide	3527	4.147	1075	1	.037	E	.05
54 A-Pinene	316	1.101	1554	26	.002	E	.05
55 B-Pinene	189	1.129	1699	26	.001	E	.05
56 P-Cymene	327	1.839	1938	26	.001	E	.05

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
2 1,2-Dichloroethane-d4	12240	2.180	846	1	.245	D	97.9
* 27 4-Bromofluorobenzene	27845	.654	1586	26	.256	D	102.5
28 Toluene-d8	51804	1.273	1111	26	.245	D	98.0
42 Benzene-d6	55343	1.669	844	13	.245	D	98.1
57 o-Xylene-d10	56183	1.376	1467	26	.246	D	98.3

* No QC criteria for VOST

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard (VOST_PCV)

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DATA FILE:HH791 SAMPLE ID SP-SDTV/1VOST/0520/18 TC
RF FILE: VOST0602 TLI Sample ID: 56-158-2
DATE: 06/11/92
TLI Project Number: 20974
ANALYSIS DATE: 06/03/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
1 CYCLOHEXANE	731	14253	777	.25	.09
2 HYDROCARBON, BRANCHED	623	6806	777	.25	.04

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	777	41197	1
1,4-Difluorobenzene	910	84145	14
Chlorobenzene-d5	1352	128118	28

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FILE NAME: AC661 SAMPLE ID SP-SDTV/1VOST/0520/1B
RF FILE: AC654 TLI Sample ID: 56-158-2
DATE: 06/11/92 SAMPLE VOL: .005 L
ANALYSIS DATE: 05/28/92
TLI Project Number: 20974

QUANTITATION REPORT VOST

	NAME	AREA	RF	SCAN	ISID	CONC, ug/L	CODE	QUAN LIMIT
1	Bromochloromethane	2182		775	1		IS	
3	Chloromethane	0	1.954	0	1	.23	ND	10
4	Bromomethane	0	1.591	0	1	.29	ND	10
5	Vinyl chloride	0	2.220	0	1	.21	ND	10
6	Methylene chloride	361	2.161	579	1	3.81	E	10
7	Acetone	128	1.645	521	1	1.58	E	10
8	Carbon disulfide	0	6.420	0	1	.07	ND	10
9	1,1-Dichloroethene	0	1.900	0	1	.24	ND	10
10	1,1-Dichloroethane	0	4.812	0	1	.09	ND	10
11	Chloroform	916	4.403	793	1	4.75	E	10
12	1,2-Dichloroethane	0	3.434	0	1	.13	ND	10
13	1,4-Difluorobenzene	10399		909	1		IS	
14	2-Butanone	0	.088	0	13	1.09	ND	10
15	1,1,1-Trichloroethane	0	.705	0	13	.14	ND	10
16	Carbon tetrachloride	0	.576	0	13	.17	ND	10
17	Vinyl acetate	0	1.483	0	13	.06	ND	10
18	Bromodichloromethane	0	.798	0	13	.12	ND	10
19	1,2-Dichloropropane	0	.826	0	13	.12	ND	10
20	trans-1,3-Dichloropropene	0	.931	0	13	.10	ND	10
21	Trichloroethene	0	.512	0	13	.19	ND	10
22	1,1,2-Trichloroethane	0	.563	0	13	.17	ND	10
23	Benzene	0	1.531	0	13	.06	ND	10
24	cis-1,3-Dichloropropene	0	.931	0	13	.10	ND	10
25	Bromoform	0	.454	0	13	.21	ND	10
26	Chlorobenzene-d5	12347		1353	13		IS	
29	4-Methyl-2-pentanone	0	.782	0	26	.11	ND	10
30	Tetrachloroethene	0	.348	0	26	.23	ND	10
31	1,1,2,2-Tetrachloroethane	0	.781	0	26	.10	ND	10
32	Toluene	87	.873	1122	26	.40	E	10
33	Chlorobenzene	0	1.012	0	26	.08	ND	10
34	Ethylbenzene	0	.569	0	26	.14	ND	10
35	Styrene	0	1.139	0	26	.07	ND	10
36	m-/p-Xylene	0	.672	0	26	.12	ND	10
37	o-Xylene	0	.682	0	26	.12	ND	10
38	Acrolein	0	.404	0	1	1.13	ND	10
39	Acrylonitrile	0	.937	0	1	.49	ND	10
40	Iodomethane	0	2.276	0	1	.20	ND	10
41	1,4-Dichloro-2-butene	0	.329	0	13	.29	ND	10
43	2-Chloro-1,3-Butadiene	0	.649	0	1	.70	ND	10

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard (VOST_PCV)

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FILE NAME:AC661 SAMPLE ID SP-SDTV/1VOST/0520/18
RF FILE: AC654 TLI Sample ID: 56-158-2
DATE: 06/11/92 SAMPLE VOL: .005 L
ANALYSIS DATE: 05/28/92
TLI Project Number:20974

QUANTITATION REPORT VOST

	NAME	AREA	RF	SCAN	ISID	CONC, ug/L	CODE	QUAN LIMIT
44	n-Hexane	74	4.767	661	1	.35	E	10
45	Tert-Butyl methyl ether	0	6.107	0	1	.07	ND	10
46	1,3-butadiene	0	2.569	0	1	.18	ND	10
47	Dibromomethane	0	2.084	0	1	.22	ND	10
48	Vinyl Bromide	0	1.836	0	1	.25	ND	10
49	Isooctane	0	13.942	0	1	.03	ND	10
50	Allyl chloride	0	1.083	0	1	.42	ND	10
51	Cumene (isopropylbenzene)	0	1.630	0	26	.05	ND	10
52	Dimethyl sulfide	0	2.636	0	1	.17	ND	10
53	Dimethyl disulfide	0	5.284	0	1	.09	ND	10
54	A-Pinene	0	1.151	0	26	.07	ND	10
55	B-Pinene	0	1.246	0	26	.07	ND	10
56	P-Cymene	0	1.675	0	26	.05	ND	10

	S U R R O G A T E S U M M A R Y	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	% RECOVERY
2	1,2-Dichloroethane-d4	6080	3.322	644	1	41.75	D	83.5
27	4-Bromofluorobenzene	10613	.832	1587	26	51.66	D	103.3
28	Toluene-d8	17676	1.282	1112	26	55.84	D	111.7
42	Benzene-d6	16953	1.673	843	13	48.72	D	97.4
57	o-Xylene-d10	18043	1.482	1466	26	49.30	D	98.6

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard (VOST_PCV)

Section 4.3 Emission Test Results - SEMI-VOST

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

DATA FILE: GJ101
RF FILE: GJ096
DATE: 08/25/92
TLI PROJ #: 21285

SAMPLE ID: SP-SDTV7-1MM5-0622-1
TLI SAMPLE ID: 57.171.1-2
& 57.229.1-3
DILUTION FACTOR: 1
ANALYSIS DATE: 08/04/92

METHOD 8270 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
48 4,6-Dinitro-2-methylphenol	0	.0700	0	47	.23	ND	10
49 N-Nitrosodiphenylamine(1)	0	.5090	0	47	.03	ND	10
50 4-Bromophenyl-phenylether	0	.1843	0	47	.09	ND	10
51 Hexachlorobenzene	0	.2140	0	47	.07	ND	10
52 Pentachlorophenol	0	.0972	0	47	.16	ND	10
53 Phenanthrene	0	1.0706	0	47	.01	ND	10
54 Anthracene	0	1.0838	0	47	.01	ND	10
55 Di-n-butylphthalate	18900	1.1535	1321	47	12.96	D	10
56 Fluoranthene	0	1.2424	0	47	.01	ND	10
57 Chrysene-d12	12083		1611	57		IS LOW	
58 Pyrene	0	1.5476	0	57	.04	ND	10
59 Butylbenzylphthalate	0	.6890	0	57	.10	ND	10
60 3,3'-Dichlorobenzidine	0	.4180	0	57	.16	ND	10
61 Benzo(a)anthracene	0	1.5053	0	57	.04	ND	10
62 Chrysene	0	1.3952	0	57	.05	ND	10
63 bis(2-Ethylhexyl)phthalate	237798	.8495	1632	57	926.72	E	10
64 Perylene-d12	10355		1891	64		IS	
65 Di-n-octylphthalate	0	1.5661	0	64	.05	ND	10
66 Benzo(b)fluoranthene	0	1.1947	0	64	.06	ND	10
67 Benzo(k)fluoranthene	0	1.5870	0	64	.05	ND	10
68 Benzo(a)pyrene	0	1.1662	0	64	.07	ND	10
69 Indeno(1,2,3-cd)pyrene	0	.9483	0	64	.08	ND	10
70 Dibenz(a,h)anthracene	0	.7149	0	64	.11	ND	10
71 Benzo(g,h,i)perylene	0	.8568	0	64	.09	ND	10

SURROGATE SUMMARY

	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
72 Nitrobenzene-d5	20817	.2861	664	14	57.33	D	57
73 2-Fluorobiphenyl	61291	1.2091	918	28	57.18	D	57
75 Phenol-d5	33738	1.5090	546	1	85.25	D	85
77 2,4,6-Tribromophenol	8380	.1505	1125	28	62.80	D	63
81 1,4-Dibromobenzene-d4	17470	.8034	769	1	82.92	D	83
82 1,3,5-Trichlorobenzene-d3	17810	1.3295	710	1	51.08	D	51
83 Anthracene-d10	80240	1.1133	1233	47	57.01	D	57
84 Pyrene-d10	46216	1.3321	1430	57	114.85	D	115

EMISSION TEST RESULTS - SEMI-VOST

Mill SIMPSON - PASADENA Smelt Dissolving Tank Vent
Source Code: SP-SDTV7 SN18 FIN: PN1313 CIN: CN1314

Date: 6/22/92

Compound	SP-SDTV7 (ug)	SP-SDTV7 ($\mu g/m3$)	Conc. (ppm)
TARGET COMPOUNDS			
a-Pinene	10.16	337.21	0.060
B-Pinene	5.22	173.25	0.031
1,2,4-Trichlorobenzene	14.11	468.30	0.062
a-Terpineol	279.67	9282.11	1.446
Naphthalene	15.20	504.48	0.095
Di-n-butylphthalate	13.37	443.74	0.038
Butylbenzylphthalate	0.89	29.54	0.002
bis(2-Ethylhexyl)phthalate	189.36	6284.77	0.387
Benzyl alcohol	123.88	4111.52	0.923
1,2,4-Trichlorobenzene	11.97	397.28	0.053
Naphthalene	15.45	512.78	0.096
2-Methylnaphthalene	2.17	72.02	0.012
Di-n-butylphthalate	12.96	430.14	0.037
bis(2-Ethylhexyl)phthalate	926.72	30757.38	1.895
TENTATIVELY IDENTIFIED CMPDS.			
Subst'd HC	1616.38	53646.86	
Molecular sulfur	239.37	7944.57	
Hexanedioic Acid Ester	84.25	2796.22	
Methoxyphenol	59.72	1982.08	
Thiophenecarboxaldehyde	84.95	2819.45	
Subst'd phenol	48.64	1614.34	
Subst'd Aromatic HC	38.56	1279.79	
Hydrocarbon	28.61	949.55	

SURROGATE STDS (% Recovery)

Nitrobenzene-d5	64	57
1,3,5-Trichlorobenzene-d3	54	51
1,4-Dibromobenzene-d4	74	83
2-Fluorobiphenyl	64	57
Phenol-d5	78	85
2,4,6-Tribromophenol	83	63
Anthracene-d10	81	27
Pyrene-d10	61	115

NOTES:

Air Volume = 0.03013 cu.m.

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DATA FILE: GJ101
RF FILE: GJ098
DATE: 08/25/92
TLI PROJ #: 21285

SAMPLE ID: SP-SDTV7-1MM5-0622-1
TLI SAMPLE ID: 57.171.1-2
& 57.229.1-3
DILUTION FACTOR: 1
ANALYSIS DATE: 08/04/92

M E T H O D 8 2 7 0 Q U A N T I T A T I O N R E P O R T

	NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1	1,4-Dichlorobenzene-d4	10491		590	1		IS	
2	Phenol	0	1.5945	0	1	.05	ND	10
3	bis(2-Chloroethyl)ether	0	1.2578	0	1	.06	ND	10
4	2-Chlorophenol	0	1.3380	0	1	.06	ND	10
5	1,3-Dichlorobenzene	0	1.5622	0	1	.05	ND	10
6	1,4-Dichlorobenzene	0	1.6127	0	1	.05	ND	10
7	Benzyl alcohol	21970	.6762	611	1	123.88	D	10
8	1,2-Dichlorobenzene	0	1.5290	0	1	.05	ND	10
9	2-Methylphenol	0	1.0885	0	1	.07	ND	10
10	bis(2-Chloroisopropyl)ether	0	1.0049	0	1	.08	ND	10
11	4-Methylphenol	0	1.1437	0	1	.07	ND	10
12	N-Nitroso-di-n-propylamine	0	.7030	0	1	.11	ND	10
13	Hexachloroethane	0	.5511	0	1	.14	ND	10
14	Naphthalene-d8	50765		762	14		IS	
15	Nitrobenzene	0	.2684	0	14	.06	ND	10
16	Isophorone	0	.5068	0	14	.03	ND	10
17	2-Nitrophenol	0	.1814	0	14	.09	ND	10
18	2,4-Dimethylphenol	0	.2535	0	14	.06	ND	10
19	Benzoic acid	0	.0891	0	14	.18	ND	10
20	bis(2-Chloroethoxy)methane	0	.3490	0	14	.05	ND	10
21	2,4-Dichlorophenol	0	.2833	0	14	.06	ND	10
22	1,2,4-Trichlorobenzene	5108	.3364	755	14	11.97	D	10
23	Naphthalene	18856	.9615	765	14	15.45	D	10
24	4-Chloroaniline	0	.4082	0	14	.04	ND	10
25	Hexachlorobutadiene	0	.1443	0	14	.11	ND	10
26	4-Chloro-3-methylphenol	0	.2371	0	14	.07	ND	10
27	2-Methylnaphthalene	2052	.7443	863	14	2.17	E	10
28	Acenaphthene-d10	35461		1012	28		IS HIGH	
29	Hexachlorocyclopentadiene	0	.1699	0	28	.13	ND	10
30	2,4,6-Trichlorophenol	0	.2890	0	28	.08	ND	10
31	2,4,5-Trichlorophenol	0	.3184	0	28	.07	ND	10
32	2-Chloronaphthalene	0	1.0909	0	28	.02	ND	10
33	2-Nitroaniline	0	.2286	0	28	.10	ND	10
34	Dimethylphthalate	0	1.0854	0	28	.02	ND	10
35	Acenaphthylene	0	1.5908	0	28	.01	ND	10
36	3-Nitroaniline	0	.2901	0	28	.08	ND	10
37	Acenaphthene	0	.9199	0	28	.02	ND	10
38	2,4-Dinitrophenol	0	.0624	0	28	.36	ND	10
39	4-Nitrophenol	0	.0688	0	28	.33	ND	10
40	Dibenzofuran	0	1.4886	0	28	.02	ND	10
41	2,4-Dinitrotoluene	0	.3670	0	28	.06	ND	10
42	2,6-Dinitrotoluene	0	.2888	0	28	.08	ND	10
43	Diethylphthalate	0	1.0023	0	28	.02	ND	10
44	4-Chlorophenyl-phenylether	0	.5816	0	28	.04	ND	10
45	Fluorene	0	1.1655	0	28	.02	ND	10
46	4-Nitroaniline	0	.3100	0	28	.07	ND	10
47	Phenanthrene-d10	50568		1225	47		IS	

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DATA FILE: FI079
RF FILE: FI078
DATE: 08/24/92
TLI PROJ: 21285

SAMPLE ID: SP-SDTV7-1MM5-0622-1
TLI SAMPLE ID: 57.171.1-2
& 57.229.1-3
DILUTION FACTOR: 1
ANALYSIS DATE: 07/16/92

M E T H O D 8 2 7 0 Q U A N T I T A T I O N R E P O R T

	NAME	AREA	RF	SCAN		AMT, ug	CODE	QUAN LIMIT
1	1,4-Dichlorobenzene-d4	2842		329	1		IS	
2	Naphthalene-d8	11380		509	2		IS	
3	Acenaphthene-d10	7298		755	3		IS	
4	Phenanthrene-d10	14817		957	4		IS	
5	Chrysene-d12	25375		1330	5		IS	
6	Perylene-d12	27555		1515	6		IS	
20	n-Nitrosodimethylamine	0	.798	0	1	.35	ND	10
21	Cumene	0	2.759	0	1	.10	ND	10
22	a-Pinene	1070	1.481	230	1	10.16	D	10
23	b-Pinene	601	1.620	287	1	5.22	E	10
24	Aniline	0	2.384	0	1	.12	ND	10
25	1,2,4-Trimethylbenzene	0	2.462	0	1	.11	ND	10
26	Phenol	0	1.912	0	1	.15	ND	10
27	Benzyl Chloride	0	3.068	0	1	.09	ND	10
28	bis-(2-Chloroethyl)ether	0	1.576	0	1	.18	ND	10
29	n-Nitrosomorpholine	0	1.097	0	1	.26	ND	10
30	1,4-Dichlorobenzene	0	1.430	0	1	.20	ND	10
31	p-Cymene	0	2.379	0	1	.12	ND	10
32	Acetophenone	0	1.768	0	1	.16	ND	10
33	1,2-Dibromo-3-chloropropane	0	.599	0	1	.47	ND	10
34	Hexachloroethane	0	.666	0	1	.42	ND	10
35	o-Toluidine	0	2.294	0	1	.12	ND	10
36	2-Methylphenol	0	1.371	0	1	.21	ND	10
37	Nitrobenzene	0	.473	0	2	.15	ND	10
38	N,N-Dimethylaniline	0	.476	0	2	.15	ND	10
39	Isophorone	0	.854	0	2	.08	ND	10
40	Catechol	0	.081	0	2	.87	ND	10
41	3/4-Methylphenol	0	.333	0	2	.21	ND	10
42	1,2,4-Trichlorobenzene	1138	.284	506	2	14.11	D	10
43	a-Terpineol	27580	.347	528	2	279.67	E	10
44	Naphthalene	4354	1.007	511	2	15.20	D	10
45	o-Anisidine	0	.258	0	2	.27	ND	10
46	Hexachlorobutadiene	0	.118	0	2	.60	ND	10
47	2-Chloroacetophenone	0	.649	0	2	.11	ND	10
48	a,a,a-Trichlorotoluene	0	.291	0	2	.24	ND	10
49	N,N-Diethylaniline	0	.502	0	2	.14	ND	10
50	1,4-Phenylenediamine	0	.348	0	2	.20	ND	10
51	Hydroquinone	0	.344	0	2	.20	ND	10
52	Pentamethylbenzene	0	.576	0	2	.12	ND	10
53	Hexachlorocyclopentadiene	0	.127	0	3	.86	ND	10
55	2,4,6-Trichlorophenol	0	.302	0	3	.36	ND	10
56	2,4,5-Trichlorophenol	0	.383	0	3	.29	ND	10
57	2,4-Toluenediamine	0	.403	0	3	.27	ND	10
58	2,4-Dichlorophenol	0	.378	0	3	.29	ND	10

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

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DATA FILE: FI079
RF FILE: FI076
DATE: 08/24/92
TLI PROJ: 21285

SAMPLE ID: SP-SDTV7-1MM5-0622-1
TLI SAMPLE ID: 57.171.1-2
& 57.229.1-3
DILUTION FACTOR: 1
ANALYSIS DATE: 07/16/92

METHOD 8270 QUANTITATION REPORT

	NAME	AREA	RF	SCAN		AMT, ug	CODE	QUAN LIMIT
59	2,3-Dichlorophenol	0	.534	0	3	.21	ND	10
60	2,6-Dichlorophenol	0	.538	0	3	.20	ND	10
61	3,5-Dichlorophenol	0	.643	0	3	.17	ND	10
62	3,4-Dichlorophenol	0	.609	0	3	.18	ND	10
63	Biphenyl	0	1.180	0	3	.09	ND	10
64	Dimethylphthalate	0	1.116	0	3	.10	ND	10
65	2,4-Dinitrotoluene	0	.445	0	3	.25	ND	10
66	2,4-Dinitrophenol	0	.124	0	3	.88	ND	10
67	4,6-Dinitro-2-methylphenol	0	.229	0	3	.48	ND	10
68	Dibenzofuran	0	1.846	0	3	.06	ND	10
69	4-Nitrophenol	0	.208	0	3	.53	ND	10
70	Trifluralin	0	.221	0	3	.50	ND	10
71	Hexachlorobenzene	0	.197	0	4	.27	ND	10
72	4-Aminobiphenyl	0	.790	0	4	.07	ND	10
73	Pentachlorophenol	0	.138	0	4	.40	ND	10
74	Pentachloronitrobenzene	0	.079	0	4	.68	ND	10
75	4-Nitrobiphenyl	0	.538	0	4	.10	ND	10
76	Di-n-butylphthalate	8181	1.651	1081	4	13.37	D	10
77	Pyrene	0	1.431	0	5	.02	ND	10
78	Benzidine	0	.744	0	5	.04	ND	10
79	4,4'-Methylenedianiline	0	.355	0	5	.09	ND	10
80	Dimethylaminoazobenzene	0	.511	0	5	.06	ND	10
81	Butylbenzylphthalate	497	.879	1285	5	.89	E	10
82	3,3'-Dimethylbenzidine	0	.662	0	5	.04	ND	10
83	Methylene bis-chloroaniline	0	.317	0	5	.10	ND	10
84	Chrysene	0	1.290	0	5	.02	ND	10
85	3,3'-Dichlorobenzidine	0	.608	0	5	.05	ND	10
86	bis(2-Ethylhexyl)phthalate	272364	2.267	1390	5	189.36	E	10
87	3,3'-Dimethoxybenzidine	0	.341	0	5	.09	ND	10

	SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
10	Phenol-d5	9307	1.663	334	1	77.83	D	78
12	Nitrobenzene-d5	8483	.463	415	2	64.43	D	64
13	1,3,5-Trichlorobenzene-d3	3974	.261	461	2	53.53	D	54
14	1,4-Dibromobenzene-d4	3391	.641	514	1	74.44	D	74
15	2-Fluorobiphenyl	12081	1.032	673	3	64.20	D	64
16	2,4,6-Tribromophenol	2857	.190	870	3	82.53	D	83
17	Anthracene-d10	30689	1.028	965	4	80.59	D	81
18	Pyrene-d10	41922	1.084	1153	5	60.94	D	61

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

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FILE NAME: FI079
DATE: 08/25/92
TLI PROJ #: 21285

SAMPLE ID: SP-SDTV7-1MM5-0822-1
TLI ID: 57.171.1-2
& 57.229.1-3
DILN FACTOR: 1
ANAL. DATE: 07/16/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

	NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
1	SUBSTITUTED HYDROCARBON	373	411777	329	40.00	874.18
2	MOLECULAR SULFUR	1108	309752	958	40.00	239.37
3	SUBSTITUTED HYDROCARBON	671	185069	755	40.00	238.20
4	HEXANEDIOIC ACID ESTER	1314	191862	1330	40.00	84.25
5	SUBSTITUTED HYDROCARBON	388	39287	329	40.00	83.40
6	SUBSTITUTED HYDROCARBON	1362	176386	1330	40.00	78.34
7	SUBSTITUTED HYDROCARBON	190	34986	329	40.00	74.27
8	SUBSTITUTED HYDROCARBON	398	28327	329	40.00	60.14
9	METHOXYPHENOL	427	122091	509	40.00	59.72
10	THIOPHENECARBOXALDEHYDE	320	25876	329	40.00	54.93
11	SUBSTITUTED HYDROCARBON	1089	64818	958	40.00	50.09
12	SUBSTITUTED PHENOL	827	37790	755	40.00	48.64
13	SUBSTITUTED AROMATIC	637	29962	755	40.00	38.56
14	SUBSTITUTED HYDROCARBON	781	25939	755	40.00	33.39
15	SUBSTITUTED HYDROCARBON	484	66328	509	40.00	32.45
16	SUBSTITUTED HYDROCARBON	1628	90261	1515	40.00	30.82
17	SUBSTITUTED HYDROCARBON	275	14478	329	40.00	30.74
18	SUBSTITUTED HYDROCARBON	844	23592	755	40.00	30.36
19	THIOPHENECARBOXALDEHYDE	308	14139	329	40.00	30.02
20	HYDROCARBON	454	58487	509	40.00	28.61

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
1,4-Dichlorobenzene-d4	329	18842	1
Naphthalene-d8	509	81772	14
Acenaphthene-d10	755	31078	28
Phenanthrene-d10	958	51762	47
Chrysene-d12	1330	91088	57
Perylene-d12	1515	117137	64

Σ Subst'd HC = 1616.38
Mol. sulfur

Section 4.4 Quality Control Results

	WESTON QC SUMMARY			
	METHOD 18			
MILL	SIMPSON - PASADENA	SOURCE	SDTV - 7	
1. CHECK STANDARD				
		[------------	%REC	-----------]
FILE NAME		EKA4001	EKA4014	
ppm	THEOR	EXP 1	EXP 2	EXP 3
ethanol	55.64	72.50%	98.81%	
acetone	44.47	82.25%	106.76%	
isopropanol	42.65	86.89%	103.09%	
dimethyl sulfide	19.55	85.31%	103.78%	
benzene	36.54	90.48%	105.39%	
bromodichloromethane	40.17	89.03%	105.96%	
dimethyl disulfide	36.26	88.28%	105.51%	
toluene	30.73	93.34%	92.91%	
ethyl benzene	26.67	93.86%	107.02%	
m-xylene	26.64	96.97%	107.86%	
o-xylene	26.76	93.50%	107.40%	
cumene	23.47	93.85%	107.27%	
alpha-pinene	20.49	95.05%	108.08%	
beta-pinene	20.59	97.14%	110.44%	
3-carene	20.61	100.81%	108.71%	
p-cymene	20.92	176.64%	190.83%	
2. PROPANE RESPONSE				
	THEOR	%REC	%REC	%REC
BEFORE RUN				
AFTER RUN				
3. METHANOL RECOVERY				
	THEOR	%REC	%REC	%REC
BEFORE RUN	100	101.98%	95.66%	
AFTER RUN	127.13	98.75%	101.35%	
4. LINE BLANK				
		[------------	FILE REF	-----------]
BEFORE RUN		EIA4013	EJA4003	
AFTER RUN		EJA4019	EJA4009	
NOTES:				

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. *The source test results have not been corrected for calibration error, sample line loss or other QC results.* The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL SP SOURCE SP-SDTV7

1. CALIBRATION

THEOR	DATE	5/20/92	DATE	6/20/92
ppm	ppm	%REC	ppm	%REC
0	3		-1	
15	12	80.00%	88	97.78%
90	88	97.78%	152	102.01%
149	150	100.67%	373	99.47%
	DATE:	6/22/92		
	ppm			
0	-3			
90	91	101.11%		
149	153	102.68%		
375	372	99.20%		

2. PROPANE LINE RECOVERY

	DATE 6/22/92 INST	LINE	%REC	DATE INST	LINE	%REC
BEFORE	364	344	95%			#DIV/0!
AFTER	393	385	98%			#DIV/0!

3. LINE BLANK

	DATE INST	LINE		DATE INST	LINE
BEFORE	0	0		0	0
AFTER	0	1		0	0

WESTON QC SUMMARY
METHOD 18

MILL SIMPSON SOURCE SP-SDTV7

1. CHECK STANDARD

FILE NAME		[------------ %REC	------------]	
ppm	THEOR	EXP 1	EXP 2	EXP 3
		FMB4001		
ethanol	55.64	58.58%		
acetone	44.47	87.71%		
isopropanol	42.65	67.33%		
dimethyl sulfide	19.55	81.35%		
benzene	36.54	115.86%		
bromodichloromethane	40.17	101.87%		
dimethyl disulfide	36.26	89.12%		
toluene	30.73	90.51%		
ethyl benzene	26.67	94.92%		
m-xylene	26.64	93.10%		
o-xylene	26.76	92.67%		
cumene	23.47	92.97%		
alpha-pinene	20.49	93.33%		
beta-pinene	20.59	90.40%		
3-carene	20.61	89.13%		
p-cymene	20.92	89.49%		

2. PROPANE RESPONSE

	THEOR	%REC	%REC	%REC
BEFORE RUN	29.9	84.95%		
AFTER RUN	29.9	115.31%		

3. METHANOL RECOVERY

	THEOR	%REC	%REC	%REC
BEFORE RUN	100	142.20%		
AFTER RUN	100	88.32%		

4. LINE BLANK

	[---------- FILE REF	----------]	
BEFORE RUN	FMB4004		
AFTER RUN	FNB4005		

NOTES: Entire mill went down during the second run. Only one good run for M18, M25 + TRS.

Printed June 23. 1992 09:19

SOURCE SP-SDTV7

QUALITY CONTROL SUMMARY
METHOD 16

1. CALIBRATION

ANALYTE	LO ppm	MED ppm	HI ppm
5/20/92			
hydrogen sulfide	3.6	8.5	27.7
methyl mercaptan	3.5	8.3	27.0
dimethyl sulfide	4.7	11.2	36.6
carbon disulfide	1.4	5.2	10.5
dimethyl disulfide	2.2	3.2	17.0
6/22/92			
hydrogen sulfide	3.0	10.5	25.9
methyl mercaptan	2.9	10.2	25.2
dimethyl sulfide	3.9	13.8	34.1
carbon disulfide	1.1	4.0	9.8
dimethyl disulfide	1.8	6.4	15.9

Section 4.5 Process Operating Conditions

WESTON
MANAGERS DESIGNERS/CONSULTANTS

SECTION 5

LIME KILN

(SP-LK)

MILL: SIMPSON PAPER SOURCE: SLUDGE REBURN KILN

SOURCE SP-LK
FIN PN1420
EPN SN22

PARTICULATE CONTROL EQUIPMENT
KOPPERS ELECTROSTATIC PRECIPITATOR.
TWO CHAMBERS. 6 FIELDS IN SERIES EACH

DATE	5/20 ->			5/21 ->		
START TIME OF TESTS	1125	1225	1325	1241	1341	1441
SAMPLES & OPERATIONS						
FUEL DATA						
FUEL TYPE	GAS	GAS	GAS	GAS	GAS	GAS
FUEL FIRING RATE. CFH X K	66	68	67	59	64	73
PRODUCTION DATA						
PRODUCTION RATE. TONS CaO/HR	9.0	9.0	9.0	9.0	9.0	8.2
SOLIDS CONTENT TO FILTER. %	22	22	22	22	22	22
FLOW. GPM TO FILTER. GPM	419	419	391	413	413	373
SOLIDS CONTENT OFF FILTER. %	65	65	65	73	73	73
Na_2S CONTENT	*			*		
SODA CONTENT. $\%Na_2O$	0.35	0.35	0.35	0.20	0.20	0.20
HOT END TEMPERATURE. F	2007	1937	1898	1836	1737	1888
COLD END TEMPERATURE. F	385	376	370	398	395	387
NCG BURNING. YES OR NO	NO	NO	NO	NO	NO	NO
KILN EXIT O_2. %	6.1	6.0	6.3	6.1	7.4	4.8
KILN EXIT COMBUSTIBLES. %	0	0	0	0	0	0
KILN EXIT CO. PPM	50	69	55	59	55	55
KILN EXIT CO_2. %	20	20	20	17	20	24
STACK EMISSION DATA						
TRS. RANGE. PPM @ 10% O_2 **	3.8	3.8	3.8	9.9	5.9	3.2
O_2. %	10.5	10.5	11.5	11.5	10.8	9.0

MUD SOLIDS CHECK METER 22%
OHAUS 19.5%

* Na_2S NOT MEASURED DURING TESTS. VARIES 0.1 - 0.5 % AS Na_2S
** TRS EMISSIONS CORRECTED FOR SAMPLE INTERGITY AND CALCULATED TO 10% OXYGEN

KILN: F.L. SMIDTH
KILN LENGTH = 275 FEET
EFFECTIVE I.D. = 10.0 FEET

Note: See Appendix D for Unit Process Description

SECTION 5
LIME KILN
(SP-LK)

The Lime Kiln was tested on two different days. The source was sampled for volatile organic compounds using Methods 25A, 16, and 18. Aldehyde samples were collected.

Total Hydrocarbons (M25A)

Figures 5.1 and 5.2 present the THC trends for the test periods on 5/20/92 and 5/21/92, respectively. On the first day, the total hydrocarbon concentration began at 34 ppm and started to decrease during run 2 to 6 ppm. The concentration increased to 27 ppm for run 3 before decreasing to 8 ppm.On the second day, the concentrations varied from 2 to 4 ppm with a spike occurring at 1307 of 175 ppm.

Volatile Organic Compounds (M16 and M18)

Table 5.1 summarizes the results for the Method 16 and Method 18 target compounds, and Section 5.1 is a tabulation of the data. Methanol and o-xylene were detected by the Method 18 analyses. Hydrogen sulfide and methyl mercaptan were identified in the Method 16 analysis. The volumetric flow was measured during sampling with a pitot tube.

Miscellaneous Parameters

Table 5.2 summarizes the results of testing for aldehydes. Section 5.2 tabulates the results for each compound.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 5.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 5.4 includes the process operating data as recorded and provided by mill personnel.

FIGURE 5.1
THC TREND ANALYSIS (5/20/92)
LIME KILN (SP-LK)

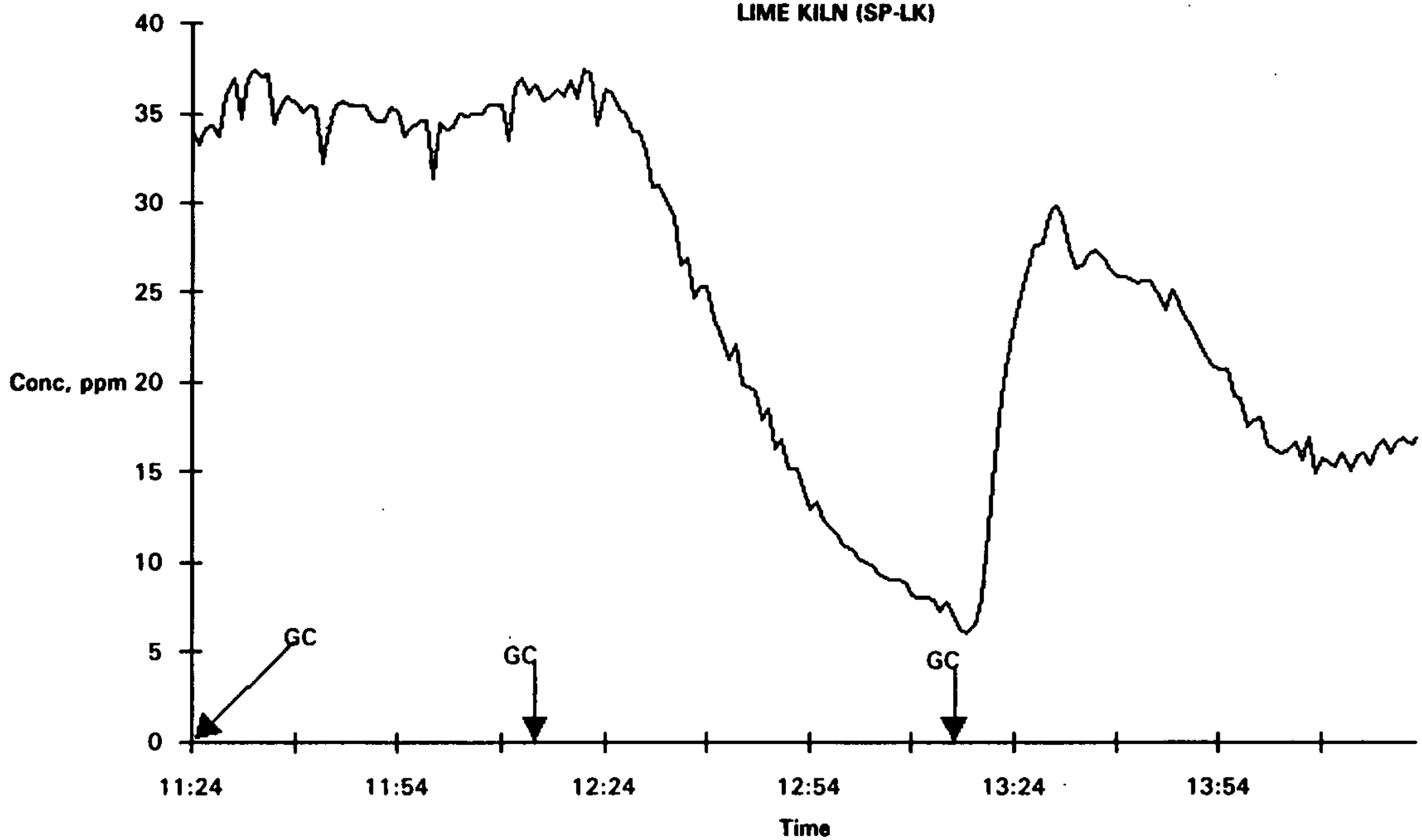

FIGURE 5.2
THC TREND ANALYSIS (5/21/92)
LIME KILN (SP-LK)

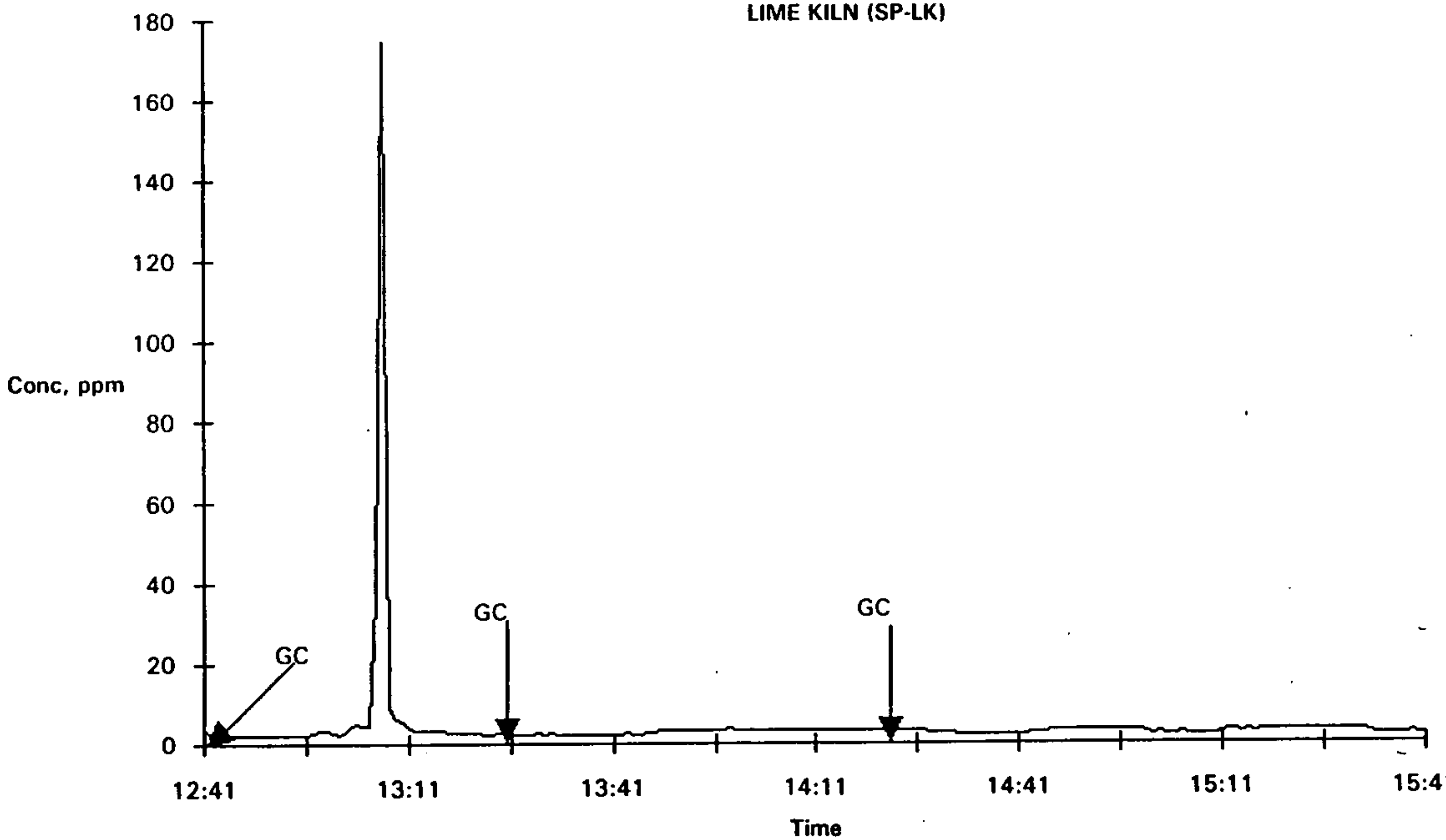

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TABLE 5.1 SUMMARY OF VOC RESULTS

Mill: SIMPSON - PASADENA		Source:	Lime Kiln
Source Code: SP-LK		Test Dates:	5/20/92 5/21/92
FIN: PN1414	CIN: CN1420	EPN:	SN22

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	337	367	352	
Volumetric Flow Rate, x10^3 DSCFM	14.4	17.0	15.7	
Process Operating Conditions				
Production Rate, T CaO/hr	8.2	9.0	8.9	
Method 16 Data, lb/hr				
Hydrogen sulfide	0.2	0.6	0.3	0.1
Methyl mercaptan	ND	0.2	0.1	0.1
Dimethyl sulfide	ND	ND	ND	0.1
Carbon disulfide	ND	ND	ND	0.1
Dimethyl disulfide	ND	ND	ND	0.1
Method 18 Data, lb/hr				
Methanol	ND	0.2	0.1	0.2
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	ND	ND	ND	0.4
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.6
Toluene	ND	ND	ND	0.2
Ethyl benzene	ND	ND	ND	0.2
m-, p-Xylene	ND	ND	ND	0.2
o-Xylene	ND	1.2	0.3	0.2
Cumene	ND	ND	ND	0.2
alpha-Pinene	ND	ND	ND	0.2
beta-Pinene	ND	ND	ND	0.2
3-Carene	ND	ND	ND	0.2
Terpenes (Unspecified)	ND	ND	ND	0.2
p-Cymene	ND	ND	ND	0.2
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	ND	<0.1	0.1	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	<0.1	<0.1	0.1	0.1

ND=Not Detected
DL=Detection Limit

WESTON

TABLE 5.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: SIMPSON-PASADENA
Source Code: SP-LK
FIN: PN1414 EPN: SN22

Source: Lime Kiln
Test Dates: 5/20/92, 5/21/92
CIN: CN1420

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	337	367	352	
Volumetric Flow Rate, x 10^3 DSCFM	14.4	17.0	15.7	
Process Operating Conditions				
Production Rate, T CaO/hr	9.0	9.0	9.0	
Emission Rate, lb/hr				
Formaldehyde	ND	<0.1	0.1	0.1
Acetaldehyde	ND	ND	ND	0.1
Acetone (Impinger)	ND	ND	ND	0.1
Acetophenone	ND	ND	ND	0.1
2-Butanone (Impinger)	ND	ND	ND	0.1
Methyl isobutyl ketone	ND	ND	ND	0.1
Acrolein	ND	ND	ND	0.1
Benzaldehyde	ND	ND	ND	0.1

ND = Not Detected
DL = Detection Limit

Section 5.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source: Lime Kiln		FIN: PN1414
Source Code: SP-LK	Date: 5/20/92	EPN: SN22	CIN: CN1420

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1123	1223	1323	
Flow Data				
Stack Temperature, °F	367			367
Moisture Content, %	29.9			29.9
Oxygen Concentration, %	6.0			6.0
Carbon Dioxide Concentration, %	16.0			16.0
Volumetric Flow Rate, x10^3 ACFM	38.2			38.2
Volumetric Flow Rate, x10^3 DSCFM	17.0			17.0
Process Operating Conditions				
Production Rate, T CaO/hr	9.0	9.0	9.0	9.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	6.6	4.0	2.1	4.2
Emission Rate, lb/hr	0.6	0.4	0.2	0.4
Methyl mercaptan				
Concentration, ppmvd	1.3	1.5	1.4	1.4
Emission Rate, lb/hr	0.2	0.2	0.2	0.2
Dimethyl sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Method 18 Data				
Methanol				
Concentration, ppmvd		2.9	2.9 *	2.1
Emission Rate, lb/hr		0.2	0.2 *	0.2
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd		0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd		0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd		0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	Lime Kiln			FIN:	PN1414
Source Code: SP-LK	Date:	5/20/92	EPN:	SN22	CIN:	CN1420

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd		0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd		1.4 *	1.4 *	1.4 *
Emission Rate, lb/hr		0.5 *	0.5 *	0.5 *
Benzene				
Concentration, ppmvd		0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd		1.4 *	1.4 *	1.4 *
Emission Rate, lb/hr		0.6 *	0.6 *	0.6 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd		0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
Ethyl benzene				
Concentration, ppmvd		0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
m-, p-Xylene				
Concentration, ppmvd		0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
o-Xylene				
Concentration, ppmvd		0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
Cumene				
Concentration, ppmvd		0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
alpha-Pinene				
Concentration, ppmvd		0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr		0.3 *	0.3 *	0.3 *
beta-Pinene				
Concentration, ppmvd		0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr		0.3 *	0.3 *	0.3 *
3-Carene				
Concentration, ppmvd		0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr		0.3 *	0.3 *	0.3 *
Terpenes (Unspecified)				
Concentration, ppmvd		0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr		0.3 *	0.3 *	0.3 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Lime Kiln | FIN: PN1414
Source Code: SP-LK | Date: 5/20/92 | EPN: SN22 | CIN: CN1420

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd		0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr		0.3 *	0.3 *	0.3 *
Knowns as Carbon				
Concentration, ppmvd		2.4	1.3	1.9
Unknowns as Carbon				
Concentration, ppmvd		0.0	0.0	0.0
Sum M18 as Carbon, lb/hr		0.1 *	0.1 *	0.1 *
Unknown Compounds % of Total		0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	49.9	25.7	30.0	35.2
Emission Rate, lb/hr as C	1.6	0.8	1.0	1.1

COMMENTS

M18 run 1 for 5/20/92 was rejected due to dirty system.

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	Lime Kiln		FIN:	PN1414
Source Code: SP-LK	Date:	5/21/92	EPN: SN22	CIN:	CN1420

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1241	1341	1441	
Flow Data				
Stack Temperature, °F		337		337
Moisture Content, %		32.1		32.1
Oxygen Concentration, %		7.5		7.5
Carbon Dioxide Concentration, %		17.0		17.0
Volumetric Flow Rate, x10^3 ACFM		33.7		33.7
Volumetric Flow Rate, x10^3 DSCFM		14.4		14.4
Process Operating Conditions				
Production Rate, T CaO/hr	9.0	9.0	8.2	8.7
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	2.9	4.6	3.6	3.7
Emission Rate, lb/hr	0.2	0.4	0.3	0.3
Methyl mercaptan				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Method 18 Data				
Methanol				
Concentration, ppmvd	2.9 *	2.9 *	2.9 *	2.9 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Lime Kiln | FIN: PN1414

Source Code: SP-LK | Date: 5/21/92 | EPN: SN22 | CIN: CN1420

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.5 *	1.5 *	1.5 *	1.5 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Benzene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.5 *	1.5 *	1.5 *	1.5 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Ethyl benzene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
m-, p-Xylene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
o-Xylene				
Concentration, ppmvd	0.7 *	4.9	0.7 *	1.9
Emission Rate, lb/hr	0.2 *	1.2	0.2 *	0.4
Cumene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
alpha-Pinene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
beta-Pinene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
3-Carene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	Lime Kiln			FIN:	PN1414
Source Code: SP-LK	Date:	5/21/92	EPN:	SN22	CIN:	CN1420

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Knowns as Carbon				
Concentration, ppmvd	0.9	1.2	0.9	1.0
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	8.8	4.4	4.4	5.9
Emission Rate, lb/hr as C	0.2	0.1	0.1	0.2

COMMENTS

M18 run 1 for 5/20/92 was rejected due to dirty system.

* One or more values were less than the detection limit.

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Section 5.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA		Source: Lime Kiln		FIN:	PN1414
Source Code:	SP-LK	Date: 5/20/92	EPN: SN22	CIN:	CN1420

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1143			
Flow Data				
Stack Temperature, °F	367			367
Moisture Content, %	29.9			29.9
Oxygen Concentration, %	6.0			6.0
Carbon Dioxide Concentration, %	16.0			16.0
Volumetric Flow Rate, x10^3 ACFM	38.2			38.2
Volumetric Flow Rate, x10^3 DSCFM	17.0			17.0
Process Operating Conditions				
Production Rate, T CaO/hr	9.0			9.0
Miscellaneous Parameters				
Formaldehyde				
Concentration, ppmvd	0.7			0.7
Emission Rate, lb/hr	0.1 *			0.1 *
Acetaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acetone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acetophenone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.2 *			0.2 *
2-Butanone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Methyl isobutyl ketone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acrolein				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Benzaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA | Source: Lime Kiln | FIN: PN1414
Source Code: SP-LK | Date: 5/21/92 | EPN: SN22 | CIN: CN1420

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1320			
Flow Data				
Stack Temperature, °F	337			337
Moisture Content, %	32.1			32.1
Oxygen Concentration, %	7.5			7.5
Carbon Dioxide Concentration, %	17.0			17.0
Volumetric Flow Rate, x10^3 ACFM	33.7			33.7
Volumetric Flow Rate, x10^3 DSCFM	14.4			14.4
Process Operating Conditions				
Production Rate, T CaO/hr	9.0			9.0
Miscellaneous Parameters				
Formaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acetaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acetone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acetophenone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
2-Butanone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Methyl isobutyl ketone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acrolein				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Benzaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

Section 5.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL SP SOURCE SP-LK

1. CALIBRATION

THEOR	DATE 5/20/92		DATE 5/21/92	
ppm	ppm	%REC	ppm	%REC
0	3		0	
15	12	80.00%	14	93.33%
90	88	97.78%	89	98.89%
149	150	100.67%	149	100.00%

2. PROPANE LINE RECOVERY

	DATE 5/20/92			DATE 5/21/92		
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	13	14	108%	16	15	93.75%
AFTER	16	15	94%	13	14	107.69%

3. LINE BLANK

	DATE 5/20/92			DATE 5/21/92		
	INST	LINE		INST	LINE	
BEFORE	1	1		3	1	
AFTER	3	1		2	0	

		WESTON QC SUMMARY			
		METHOD 18			
MILL	SIMPSON - PASADENA		SOURCE	LIME KILN	
1. CHECK STANDARD					
			[-------------	%REC	-----------]
FILE NAME			EKA4001	EKA4014	
ppm		THEOR	EXP 1	EXP 2	EXP 3
ethanol		55.64	72.50%	98.81%	
acetone		44.47	82.25%	106.76%	
isopropanol		42.65	86.89%	103.09%	
dimethyl sulfide		19.55	85.31%	103.78%	
benzene		36.54	90.48%	105.39%	
bromodichloromethane		40.17	89.03%	105.96%	
dimethyl disulfide		36.26	88.28%	105.51%	
toluene		30.73	93.34%	92.91%	
ethyl benzene		26.67	93.86%	107.02%	
m-xylene		26.64	96.97%	107.86%	
o-xylene		26.76	93.50%	107.40%	
cumene		23.47	93.85%	107.27%	
alpha-pinene		20.49	95.05%	108.08%	
beta-pinene		20.59	97.14%	110.44%	
3-carene		20.61	100.81%	108.71%	
p-cymene		20.92	176.64%	190.83%	
2. PROPANE RESPONSE					
		THEOR	%REC	%REC	%REC
BEFORE RUN					
AFTER RUN					
3. METHANOL RECOVERY					
		THEOR	%REC	%REC	%REC
BEFORE RUN		100	101.98%	95.66%	
AFTER RUN		127.13	98.75%	101.35%	
4. LINE BLANK					
			[-------------	FILE REF	-----------]
BEFORE RUN			EIA4013	EJA4003	
AFTER RUN			EJA4019	EJA4009	
NOTES:					

SOURCE SP-LK

QUALITY CONTROL SUMMARY
METHOD 16

1. CALIBRATION

ANALYTE	LO ppm	MED ppm	HI ppm
5/20/92			
hydrogen sulfide	3.6	8.5	27.7
methyl mercaptan	3.5	8.3	27.0
dimethyl sulfide	4.7	11.2	36.6
carbon disulfide	1.4	5.2	10.5
dimethyl disulfide	2.2	3.2	17.0
5/21/92			
hydrogen sulfide	3.5	18.0	27.5
methyl mercaptan	3.5	17.7	26.9
dimethyl sulfide	4.7	23.8	36.4
carbon disulfide	1.3	6.8	10.5
dimethyl disulfide	2.2	11.1	16.9

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Section 5.4 Process Operating Data

MILL: SIMPSON PAPER SOURCE: SLUDGE REBURN KILN

SOURCE SP-LK
FIN PN1420
EPN SN22

PARTICULATE CONTROL EQUIPMENT
KOPPERS ELECTROSTATIC PRECIPITATOR.
TWO CHAMBERS, 6 FIELDS IN SERIES EACH

DATE	5/20 ->			5/21 ->		
START TIME OF TESTS	1125	1225	1325	1241	1341	1441
SAMPLES & OPERATIONS						
FUEL DATA						
FUEL TYPE	GAS	GAS	GAS	GAS	GAS	GAS
FUEL FIRING RATE, CFH X K	68	68	67	59	64	73
PRODUCTION DATA						
PRODUCTION RATE, TONS CaO/HR	9.0	9.0	9.0	9.0	9.0	8.2
SOLIDS CONTENT TO FILTER, %	22	22	22	22	22	22
FLOW, GPM TO FILTER, GPM	419	419	391	413	413	373
SOLIDS CONTENT OFF FILTER, %	65	65	65	73	73	73
Na_2S CONTENT	*			*		
SODA CONTENT, $\%Na_2O$	0.35	0.35	0.35	0.20	0.20	0.20
HOT END TEMPERATURE, F	2007	1937	1898	1836	1737	1888
COLD END TEMPERATURE, F	385	376	370	398	395	387
NCG BURNING, YES OR NO	NO	NO	NO	NO	NO	NO
KILN EXIT O_2, %	6.1	6.0	6.3	8.1	7.4	4.8
KILN EXIT COMBUSTIBLES, %	0	0	0	0	0	0
KILN EXIT CO, PPM	50	69	55	59	55	55
KILN EXIT CO_2, %	20	20	20	17	20	24
STACK EMISSION DATA						
TRS, RANGE, PPM @ 10% O_2 **	3.8	3.8	3.8	9.9	5.9	3.2
O_2, %	10.5	10.5	11.5	11.5	10.8	9.0

MUD SOLIDS CHECK	**METER**	22%
	OHAUS	19.5%

* Na_2S NOT MEASURED DURING TESTS. VARIES 0.1 - 0.5 % AS Na_2S
** TRS EMISSIONS CORRECTED FOR SAMPLE INTERGITY AND CALCULATED TO 10% OXYGEN

KILN: F.L. SMIDTH
KILN LENGTH = 275 FEET
EFFECTIVE I.D. = 10.0 FEET

Note: See Appendix D for Unit Process Description

SECTION 6

THERMAL OXIDATION PLANT VENT

(SP-TOPV)

6. SP-TOPV

WESTON MANAGERS DESIGNERS CONSULTANTS

SECTION 6
THERMAL OXIDATION PLANT VENT
(SP-TOPV)

The Thermal Oxidation Plant Vent was tested one day. The source was sampled for volatile organic compounds using M25A, 16 and 18. An aldehyde sample was also collected.

Total Hydrocarbons (M25A)

Figure 6.1 presents the THC trend for the test period on 6/25/92. The total hydrocarbon concentration ranged from 0 to 5 ppm except for an increase of 102 ppm that occurred at 0917.

Volatile Organic Compounds (M16 and M18)

Table 6.1 summarizes the results for the Method 16 and Method 18 target compounds, and Section 6.1 is a tabulation of the data. No target compounds were identified by the Method 18 analyses. A small amount of methyl mercaptan, dimethyl sulfide, and dimethyl disulfide were identified in the Method 16 analysis. The volumetric flow was measured during sampling with a pitot tube.

Miscellaneous Parameters

Table 6.2 summarizes the results of testing for aldehydes. Section 6.2 tabulates the results for each compound.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 6.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 6.4 includes the process operating data as recorded and provided by mill personnel.

FIGURE 6.1
THC TREND ANALYSIS (6/25/92)
THERMAL OXIDATION PLANT VENT SP-TOPV)

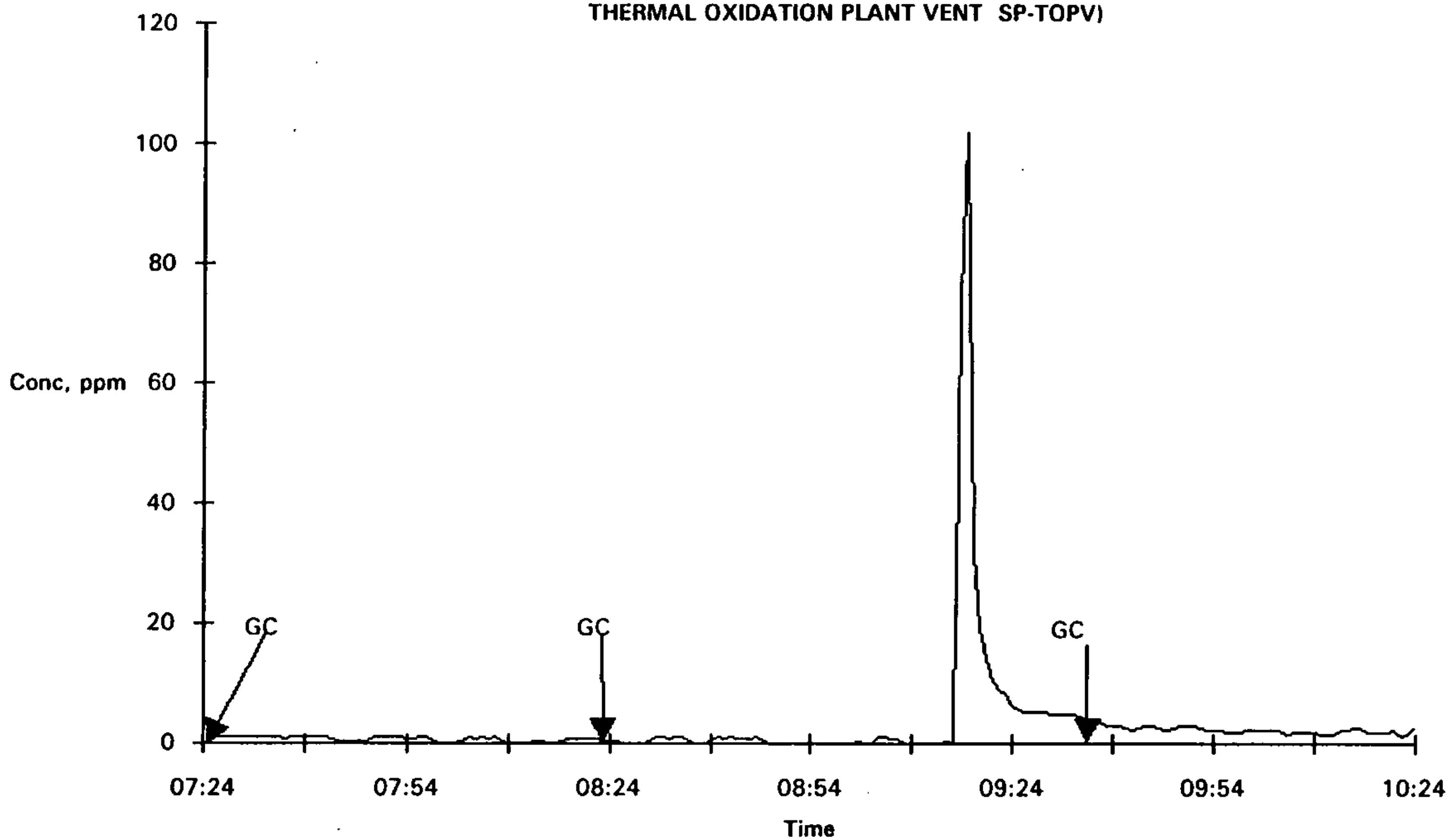

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TABLE 6.1 SUMMARY OF VOC RESULTS

Mill: SIMPSON - PASADENA | Source: Thermal Oxidation Plant Vent
Source Code: SP-TOPV | Test Dates: 6/25/92
FIN: PN1606 CIN: CN1607 & 8 | EPN: SN27

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	160	160	160	
Volumetric Flow Rate, x10^3 DSCFM	3.5	3.5	3.5	
Process Operating Conditions				
Production Rate				
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan	ND	<0.1	0.1	0.1
Dimethyl sulfide	ND	<0.1	0.1	0.1
Carbon disulfide				0.1
Dimethyl disulfide	ND	<0.1	0.1	0.1
Method 18 Data, lb/hr				
Methanol	ND	ND	ND	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	ND	ND	ND	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	ND	ND	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	ND	ND	ND	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	ND	ND	ND	0.1

ND=Not Detected
DL=Detection Limit

WESTON

TABLE 6.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: SIMPSON-PASADENA
Source Code: SP-TOPV
FIN: PN1606 EPN: SN27

Source: Thermal Oxidation Plant Vent
Test Dates: 6/25/92
CIN: CN1607&8

	RUN 1	DL
Volumetric Flow Data		
Stack Temperature, °F	160	
Volumetric Flow Rate, x 10^3 DSCFM	3.5	
Process Operating Conditions		
Production Rate		
Emission Rate, lb/hr		
Formaldehyde	ND	0.1
Acetaldehyde	ND	0.1
Acetone (Impinger)	ND	0.1
Acetophenone	ND	0.1
2-Butanone (Impinger)	ND	0.1
Methyl isobutyl ketone	ND	0.1
Acrolein	ND	0.1
Benzaldehyde	ND	0.1

ND = Not Detected
DL = Detection Limit

Section 6.1 Emission Test Results - VOC

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(L) WWC (R) DW 28 December 1992

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Thermal Oxidation Plant Vent | FIN: PN1606
Source Code: SP-TOPV | Date: 6/25/92 | EPN: SN27 | CIN: CN1607 & 8

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	724	824	924	
Flow Data				
Stack Temperature, °F		160		160
Moisture Content, %		32.0		32.0
Oxygen Concentration, %		16.0		16.0
Carbon Dioxide Concentration, %		1.0		1.0
Volumetric Flow Rate, x10^3 ACFM		6.1		6.1
Volumetric Flow Rate, x10^3 DSCFM		3.5		3.5
Process Operating Conditions				
Production Rate, tons/hr				
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd	0.5 *	1.0	0.5 *	0.5
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl sulfide				
Concentration, ppmvd	0.5 *	1.1	0.5 *	0.5
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.6	0.5 *	0.4
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Method 18 Data				
Methanol				
Concentration, ppmvd	2.9 *	2.9 *	2.9 *	2.9 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Thermal Oxidation Plant Vent | FIN: PN1606
Source Code: SP-TOPV | Date: 6/25/92 | EPN: SN27 | CIN: CN1607 & 8

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.5 *	1.5 *	1.5 *	1.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Benzene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.5 *	1.5 *	1.5 *	1.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA
Source Code: SP-TOPV

Source: Thermal Oxidation Plant Vent
Date: 6/25/92 EPN: SN27

FIN: PN1606
CIN: CN1607 & 8

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	1.8	1.5	1.6	1.6
Unknowns as Carbon				
Concentration, ppmvd	1.0	4.4	6.0	3.8
Sum M18 as Carbon, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Unknown Compounds % of Total	36.8%	75.0%	78.8%	63.6%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	1.5	7.4	4.4	4.4
Emission Rate, lb/hr as C	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

Section 6.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA | Source: Thermal Oxidation Plant Vent | FIN: PN1606
Source Code: SP-TOPV | Date: 6/25/92 | EPN: SN27 | CIN: CN1607 & 8

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	734			
Flow Data				
Stack Temperature, °F	160			160
Moisture Content, %	32.0			32.0
Oxygen Concentration, %	16.0			16.0
Carbon Dioxide Concentration, %	1.0			1.0
Volumetric Flow Rate, x10^3 ACFM	6.1			6.1
Volumetric Flow Rate, x10^3 DSCFM	3.5			3.5
Process Operating Conditions				
Production Rate, ton/hr				
Miscellaneous Parameters				
Formaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acetaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acetone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acetophenone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
2-Butanone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Methyl isobutyl ketone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acrolein				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Benzaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

Section 6.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL SP **SOURCE** SP-TOPV

1. CALIBRATION

THEOR	DATE	6/25/92	DATE	
ppm	ppm	%REC	ppm	%REC
0	0			
15	14	93.33%		0.00%
90	89	98.89%		0.00%
149	149	100.00%		0.00%

2. PROPANE LINE RECOVERY

	DATE	6/25/92		DATE		
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	13	13	100%			#DIV/0!
AFTER	13	14	108%			#DIV/0!

3. LINE BLANK

	DATE	6/25/92		DATE		
	INST	LINE		INST	LINE	
BEFORE	0	0		0	0	
AFTER	0	0		0	0	

WESTON QC SUMMARY
METHOD 18

MILL SIMPSON SOURCE SP-TOPV

1. CHECK STANDARD

		[---------- %REC ----------]		
FILE NAME		FOB4016		
ppm	THEOR	EXP 1	EXP 2	EXP 3
ethanol	55.64	73.45%		
acetone	44.47	114.29%		
isopropanol	42.65	80.61%		
dimethyl sulfide	19.55	101.13%		
benzene	36.54	108.77%		
bromodichloromethane	40.17	115.50%		
dimethyl disulfide	36.26	104.98%		
toluene	30.73	107.08%		
ethyl benzene	26.67	108.26%		
m-xylene	26.64	106.68%		
o-xylene	26.76	110.12%		
cumene	23.47	105.27%		
alpha-pinene	20.49	112.96%		
beta-pinene	20.59	57.44%		
3-carene	20.61	102.18%		
p-cymene	20.92	108.75%		

2. PROPANE RESPONSE

	THEOR	%REC	%REC	%REC
BEFORE RUN	29.9	109.99%		
AFTER RUN	5.03	97.36%		

3. METHANOL RECOVERY

	THEOR	%REC	%REC	%REC
BEFORE RUN		92.46%		
AFTER RUN		86.13%		

4. LINE BLANK

	[---------- FILE REF ----------]		
BEFORE RUN	FOB4012		
AFTER RUN	FPB4006		

NOTES:

SOURCE SP-TOPV

QUALITY CONTROL SUMMARY
METHOD 16

1. CALIBRATION

ANALYTE	LO ppm	MED ppm	HI ppm
6/25/92			
methyl mercaptan	2.7	•	25.5
dimethyl sulfide	3.7	•	34.4
carbon disulfide	1.1	•	9.9
dimethyl disulfide	1.7	•	16.0

NOTE: One day of testing only

• Not performed

Section 6.4 Process Operating Data

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(L) WWC (R) DW 28 December 1992

MILL: SIMPSON PAPER

SOURCE: THERMAL OXIDATION PLANT

DATE	6/23 ->		
TIME	1500	1503	1506
	BAG 1	BAG 2	BAG 3

SOURCE OF NCG	DIGESTER STRONG GASES ARE USUALLY ACCUMULATED IN THE GAS HOLDER UNLESS FULL. EVAPORATOR NONCONDENSIBLES BYPRODUCT PLANT GASES
SOURCE	SPNCGBS
FIN	PN1606
EPN	SN28
FUEL TYPE TYPE	NO COMBUSTION
FUEL USAGE SCFM	NOT APPLICABLE
O_2 CONCENTRATION	NOT MEASURED
CO_2 CONCENTRATION	NOT APPLICABLE
COMBUSTION TEMP	AMBIENT
RETENTION TIME	NOT APPLICABLE
SCRUBBER	
TYPE	PACKED COLUMN
SCRUBBER MEDIA	SADDLES
GAS FLOW RATE	500 SDCFM
LIQUID FLOW	10 GPM 8% CAUSTIC

NOTES: 1.0 THE GAS FLOWS TO THE AUXILIARY NONCONDENSABLE SCRUBBER ARE FIXED BY THE GENERAL OPERATION OF THE MILL.

Note: See Appendix D for Unit Process Description

WESTON. MANAGERS DESIGNERS/CONSULTANTS

SECTION 7
NCG BYPASS SCRUBBER VENT
(SP-NCGBS)

7. SP-NCGBS

WESTON MANAGERS DESIGNERS CONSULTANTS

SECTION 7
NCG BYPASS SCRUBBER VENT
(SP-NCGBS)

The NCG Bypass Scrubber Vent was tested on two different days. The source was sampled for volatile organic compounds using Methods 18 and 16. Samples had to be corrected for dilution factors resulting in high detection limits.

Volatile Organic Compounds (M16 and M18)

Table 7.1 summarizes the results for the Method 16 and Method 18 target compounds, and Section 7.1 is a tabulation of the data. Acetone and 2-Propanol were identified the first day by Method 18. Acetone was detected the second day. Methyl mercaptan and dimethyl disulfide were identified by Method 16 both days. The volumetric flow was measured during sampling with a pitot tube.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 7.2. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

No process conditions given.

WESTON

TABLE 7.1 SUMMARY OF VOC RESULTS

Mill: SIMPSON - PASADENA	Source: NCG Bypass Scrubber Vent
Source Code: SP-NCGBS	Test Dates: 6/23/92 6/24/92
FIN: PN1606 CIN: CN1609	EPN: SN28

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	103	110	107	
Volumetric Flow Rate, x10³ DSCFM	0.4	0.4	0.4	
Process Operating Conditions				
Production Rate,				
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan	ND	ND	ND	0.1
Dimethyl sulfide	54.3	78.4	65.7	0.1
Carbon disulfide	ND	ND	ND	0.1
Dimethyl disulfide	3.7	5.6	4.7	0.1
Method 18 Data, lb/hr				
Methanol	ND	ND	ND	0.1
Ethanol	ND	ND	ND	0.1
Acetone	1.4	221.4	94.9	0.1
2-Propanol	ND	5.0	2.5	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	ND	ND	ND	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	ND	ND	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	28.5	90.9	56.1	0.1
Unknowns as C, lb/hr	0.8	4.0	2.2	0.1
Sum of Compounds as C, lb/hr	29.9	93.5	58.3	0.1

ND=Not Detected
DL=Detection Limit

Section 7.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA		Source:	NCG Bypass Scrubber Vent	FIN:	PN1606
Source Code:	SP-NCGBS	Date:	6/23/92 EPN: SN28	CIN:	CN1609

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1714	1807	1905	
Flow Data				
Stack Temperature, °F	103			103
Moisture Content, %	7.0			7.0
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.4			0.4
Volumetric Flow Rate, x10^3 DSCFM	0.4			0.4
Process Operating Conditions				
Production Rate, tons/hr				
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd	376.0 *	376.0 *	376.0 *	376.0 *
Emission Rate, lb/hr	1.0 *	1.0 *	1.0 *	1.0 *
Dimethyl sulfide				
Concentration, ppmvd	21808.0	20981.0	20830.0	21206.3
Emission Rate, lb/hr	78.4	75.5	74.9	76.3
Carbon disulfide				
Concentration, ppmvd	376.0 *	376.0 *	376.0 *	376.0 *
Emission Rate, lb/hr	1.7 *	1.7 *	1.7 *	1.7 *
Dimethyl disulfide				
Concentration, ppmvd	963.0	1030.0	1000.0	997.7
Emission Rate, lb/hr	5.3	5.6	5.5	5.4
Method 18 Data				
Methanol				
Concentration, ppmvd	1617.2 *	1617.2 *	1617.2 *	1617.2 *
Emission Rate, lb/hr	3.0 *	3.0 *	3.0 *	3.0 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	404.3 *	404.3 *	404.3 *	404.3 *
Emission Rate, lb/hr	1.1 *	1.1 *	1.1 *	1.1 *
Acetone				
Concentration, ppmvd	65804.9	54201.0	45967.2	55324.4
Emission Rate, lb/hr	221.4	182.4	154.7	186.2
2-Propanol				
Concentration, ppmvd	1450.3	1246.9	985.7	1227.6
Emission Rate, lb/hr	5.0	4.3	3.4	4.3

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: NCG Bypass Scrubber Vent | FIN: PN1606
Source Code: SP-NCGBS | Date: 6/23/92 | EPN: SN28 | CIN: CN1609

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	404.3 *	404.3 *	404.3 *	404.3 *
Emission Rate, lb/hr	1.7 *	1.7 *	1.7 *	1.7 *
Chloroform				
Concentration, ppmvd	808.6 *	808.6 *	808.6 *	808.6 *
Emission Rate, lb/hr	5.6 *	5.6 *	5.6 *	5.6 *
Benzene				
Concentration, ppmvd	404.3 *	404.3 *	404.3 *	404.3 *
Emission Rate, lb/hr	1.8 *	1.8 *	1.8 *	1.8 *
Bromodichloromethane				
Concentration, ppmvd	808.6 *	808.6 *	808.6 *	808.6 *
Emission Rate, lb/hr	7.7 *	7.7 *	7.7 *	7.7 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	404.3 *	404.3 *	404.3 *	404.3 *
Emission Rate, lb/hr	2.2 *	2.2 *	2.2 *	2.2 *
Ethyl benzene				
Concentration, ppmvd	404.3 *	404.3 *	404.3 *	404.3 *
Emission Rate, lb/hr	2.5 *	2.5 *	2.5 *	2.5 *
m-, p-Xylene				
Concentration, ppmvd	404.3 *	404.3 *	404.3 *	404.3 *
Emission Rate, lb/hr	2.5 *	2.5 *	2.5 *	2.5 *
o-Xylene				
Concentration, ppmvd	404.3 *	404.3 *	404.3 *	404.3 *
Emission Rate, lb/hr	2.5 *	2.5 *	2.5 *	2.5 *
Cumene				
Concentration, ppmvd	404.3 *	404.3 *	404.3 *	404.3 *
Emission Rate, lb/hr	2.8 *	2.8 *	2.8 *	2.8 *
alpha-Pinene				
Concentration, ppmvd	404.3 *	404.3 *	404.3 *	404.3 *
Emission Rate, lb/hr	3.2 *	3.2 *	3.2 *	3.2 *
beta-Pinene				
Concentration, ppmvd	404.3 *	404.3 *	404.3 *	404.3 *
Emission Rate, lb/hr	3.2 *	3.2 *	3.2 *	3.2 *
3-Carene				
Concentration, ppmvd	404.3 *	404.3 *	404.3 *	404.3 *
Emission Rate, lb/hr	3.2 *	3.2 *	3.2 *	3.2 *
Terpenes (Unspecified)				
Concentration, ppmvd	404.3 *	404.3 *	404.3 *	404.3 *
Emission Rate, lb/hr	3.2 *	3.2 *	3.2 *	3.2 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	NCG Bypass Scrubber Vent		FIN:	PN1606
Source Code: SP-NCGBS	Date:	6/23/92	EPN: SN28	CIN:	CN1609

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	404.3 *	404.3 *	404.3 *	404.3 *
Emission Rate, lb/hr	3.1 *	3.1 *	3.1 *	3.1 *
Knowns as Carbon				
Concentration, ppmvd	130612.8	117391.3	106960.6	118321.6
Unknowns as Carbon				
Concentration, ppmvd	3712.2	2197.5	4249.0	3386.2
Sum M18 as Carbon, lb/hr	93.5	83.3	77.4	84.7
Unknown Compounds % of Total	2.8%	1.8%	3.8%	2.8%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C				
Emission Rate, lb/hr as C				

COMMENTS : Method 25A was not performed.

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	NCG Bypass Scrubber Vent		FIN:	PN1606
Source Code: SP-NCGBS	Date:	6/24/92	EPN: SN28	CIN:	CN1609

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1042	1519	1858	
Flow Data				
Stack Temperature, °F	110			110
Moisture Content, %	9.0			9.0
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.4			0.4
Volumetric Flow Rate, x10^3 DSCFM	0.4			0.4
Process Operating Conditions				
Production Rate, tons/hr				
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd	376.0 *	376.0 *	376.0 *	376.0 *
Emission Rate, lb/hr	1.1 *	1.1 *	1.1 *	1.1 *
Dimethyl sulfide				
Concentration, ppmvd	15040.0	15341.0	15491.0	15290.7
Emission Rate, lb/hr	54.3	55.4	55.9	55.2
Carbon disulfide				
Concentration, ppmvd	376.0 *	376.0 *	376.0 *	376.0 *
Emission Rate, lb/hr	1.7 *	1.7 *	1.7 *	1.7 *
Dimethyl disulfide				
Concentration, ppmvd	669.0	744.0	775.0	729.3
Emission Rate, lb/hr	3.7	4.1	4.2	4.0
Method 18 Data				
Methanol				
Concentration, ppmvd	413.2 *	413.2 *	413.2 *	413.2 *
Emission Rate, lb/hr	0.8 *	0.8 *	0.8 *	0.8 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	413.2 *	413.2 *	413.2 *	413.2 *
Emission Rate, lb/hr	1.1 *	1.1 *	1.1 *	1.1 *
Acetone				
Concentration, ppmvd	426.4	1400.0	1336.8	1054.4
Emission Rate, lb/hr	1.4	4.7	4.5	3.6
2-Propanol				
Concentration, ppmvd	413.2 *	413.2 *	413.2 *	413.2 *
Emission Rate, lb/hr	1.4 *	1.4 *	1.4 *	1.4 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: NCG Bypass Scrubber Vent | FIN: PN1606
Source Code: SP-NCGBS | Date: 6/24/92 | EPN: SN28 | CIN: CN1609

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	413.2 *	413.2 *	413.2 *	413.2 *
Emission Rate, lb/hr	1.7 *	1.7 *	1.7 *	1.7 *
Chloroform				
Concentration, ppmvd	826.4 *	826.4 *	826.4 *	826.4 *
Emission Rate, lb/hr	5.7 *	5.7 *	5.7 *	5.7 *
Benzene				
Concentration, ppmvd	413.2 *	413.2 *	413.2 *	413.2 *
Emission Rate, lb/hr	1.9 *	1.9 *	1.9 *	1.9 *
Bromodichloromethane				
Concentration, ppmvd	826.4 *	826.4 *	826.4 *	826.4 *
Emission Rate, lb/hr	7.9 *	7.9 *	7.9 *	7.9 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	413.2 *	413.2 *	413.2 *	413.2 *
Emission Rate, lb/hr	2.2 *	2.2 *	2.2 *	2.2 *
Ethyl benzene				
Concentration, ppmvd	413.2 *	413.2 *	413.2 *	413.2 *
Emission Rate, lb/hr	2.5 *	2.5 *	2.5 *	2.5 *
m-, p-Xylene				
Concentration, ppmvd	413.2 *	413.2 *	413.2 *	413.2 *
Emission Rate, lb/hr	2.5 *	2.5 *	2.5 *	2.5 *
o-Xylene				
Concentration, ppmvd	413.2 *	413.2 *	413.2 *	413.2 *
Emission Rate, lb/hr	2.5 *	2.5 *	2.5 *	2.5 *
Cumene				
Concentration, ppmvd	413.2 *	413.2 *	413.2 *	413.2 *
Emission Rate, lb/hr	2.9 *	2.9 *	2.9 *	2.9 *
alpha-Pinene				
Concentration, ppmvd	413.2 *	413.2 *	413.2 *	413.2 *
Emission Rate, lb/hr	3.3 *	3.3 *	3.3 *	3.3 *
beta-Pinene				
Concentration, ppmvd	413.2 *	413.2 *	413.2 *	413.2 *
Emission Rate, lb/hr	3.3 *	3.3 *	3.3 *	3.3 *
3-Carene				
Concentration, ppmvd	413.2 *	413.2 *	413.2 *	413.2 *
Emission Rate, lb/hr	3.3 *	3.3 *	3.3 *	3.3 *
Terpenes (Unspecified)				
Concentration, ppmvd	413.2 *	413.2 *	413.2 *	413.2 *
Emission Rate, lb/hr	3.3 *	3.3 *	3.3 *	3.3 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: NCG Bypass Scrubber Vent | FIN: PN1606
Source Code: SP-NCGBS | Date: 6/24/92 | EPN: SN28 | CIN: CN1609

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	413.2 *	413.2 *	413.2 *	413.2 *
Emission Rate, lb/hr	3.2 *	3.2 *	3.2 *	3.2 *
Knowns as Carbon				
Concentration, ppmvd	46372.6	41032.5	40858.2	42754.5
Unknowns as Carbon				
Concentration, ppmvd	1171.8	1743.2	5769.0	2894.7
Sum M18 as Carbon, lb/hr	33.2	29.9	32.6	31.9
Unknown Compounds % of Total	2.5%	4.1%	12.4%	6.3%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C				
Emission Rate, lb/hr as C				

COMMENTS : Method 25A was not performed.

* One or more values were less than the detection limit.

Section 7.2 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

WESTON QC SUMMARY
METHOD 18

MILL SIMPSON SOURCE SP-NCGBS

1. CHECK STANDARD

ppm	THEOR	%REC EXP 1	%REC EXP 2	%REC EXP 3
FILE NAME		FMB4009	FOB4001	
DATE:		23-Jun-92	24-Jun-92	
ethanol	55.64	108.54%	80.14%	
acetone	44.47	104.30%	118.14%	
isopropanol	42.65	93.41%	84.09%	
dimethyl sulfide	19.55	99.39%	99.95%	
benzene	36.54	88.34%	92.99%	
bromodichloromethane	40.17	105.45%	119.36%	
dimethyl disulfide	36.26	102.81%	105.41%	
toluene	30.73	105.01%	103.91%	
ethyl benzene	26.67	103.11%	107.18%	
m-xylene	26.64	100.97%	105.57%	
o-xylene	26.76	103.22%	108.60%	
cumene	23.47	102.89%	108.46%	
alpha-pinene	20.49	104.36%	111.17%	
beta-pinene	20.59	95.67%	75.98%	
3-carene	20.61	96.99%	102.61%	
p-cymene	20.92	98.65%	105.97%	

2. PROPANE RESPONSE

	THEOR	%REC	%REC	%REC
BEFORE RUN	29.9	115.31%	114.05%	
AFTER RUN	29.9	114.05%	114.05%	

3. METHANOL RECOVERY

	THEOR	%REC	%REC	%REC
BEFORE RUN	100	113.23%	105.10%	
AFTER RUN	100	105.10%	92.46%	

4. LINE BLANK

	FILE REF		
BEFORE RUN	FNB4005	FNB4011	
AFTER RUN	FNB4011	FOB4012	

NOTES:

SOURCE SP-NCGBS

QUALITY CONTROL SUMMARY
METHOD 16

1. CALIBRATION

ANALYTE	LO ppm	MED ppm	HI ppm
6/23/92			
hydrogen sulfide	3.6	8.5	27.7
methyl mercaptan	3.5	8.3	27.0
dimethyl sulfide	4.7	11.2	36.6
carbon disulfide	1.4	5.2	10.5
dimethyl disulfide	2.2	3.2	17.0
6/24/92 •			
hydrogen sulfide	3.0	10.5	25.9
methyl mercaptan	2.9	10.2	25.2
dimethyl sulfide	3.9	13.8	34.1
carbon disulfide	1.1	4.0	9.8
dimethyl disulfide	1.8	6.4	15.9

• Calibration from 6/22/92 was used

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SECTION 8

EXTRACTION TOWER VENT

(SP-BPSETV)

8. SP-BPSETV

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SECTION 8
EXTRACTION TOWER VENT
(SP-BPSETV)

The Extraction Tower Vent was tested on one day. The source was sampled for volatile organic compounds using Methods 25A and 18. Chloroform and hydrogen chloride samples were collected.

Total Hydrocarbons (M25A)

Figure 8.1 presents the THC trend for the test period on 6/8/92. The total hydrocarbon concentrations were erratic with a consistent downward trend. The initial concentration was 123 ppm with a final concentration of 3 ppm.

Volatile Organic Compounds (M18)

Table 8.1 summarizes the results for the Method 18 target compounds, and Section 8.1 is a tabulation of the data. Methanol and chloroform were detected by the Method 18 analyses. Unknowns were present before methanol and after chloroform. The volumetric flow was measured during sampling with a pitot tube.

Miscellaneous Parameters

Table 8.2 summarizes the results of testing for hydrogen chloride and chloroform. Section 8.2 tabulates the results for each compound. Chloroform results (lb/hr) were comparable to Method 18.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 8.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 8.4 includes the process operating data as recorded and provided by mill personnel.

FIGURE 8.1
THC TREND ANALYSIS (6/8/92)
EXTRACTION TOWER VENT (SP-BPSETV)

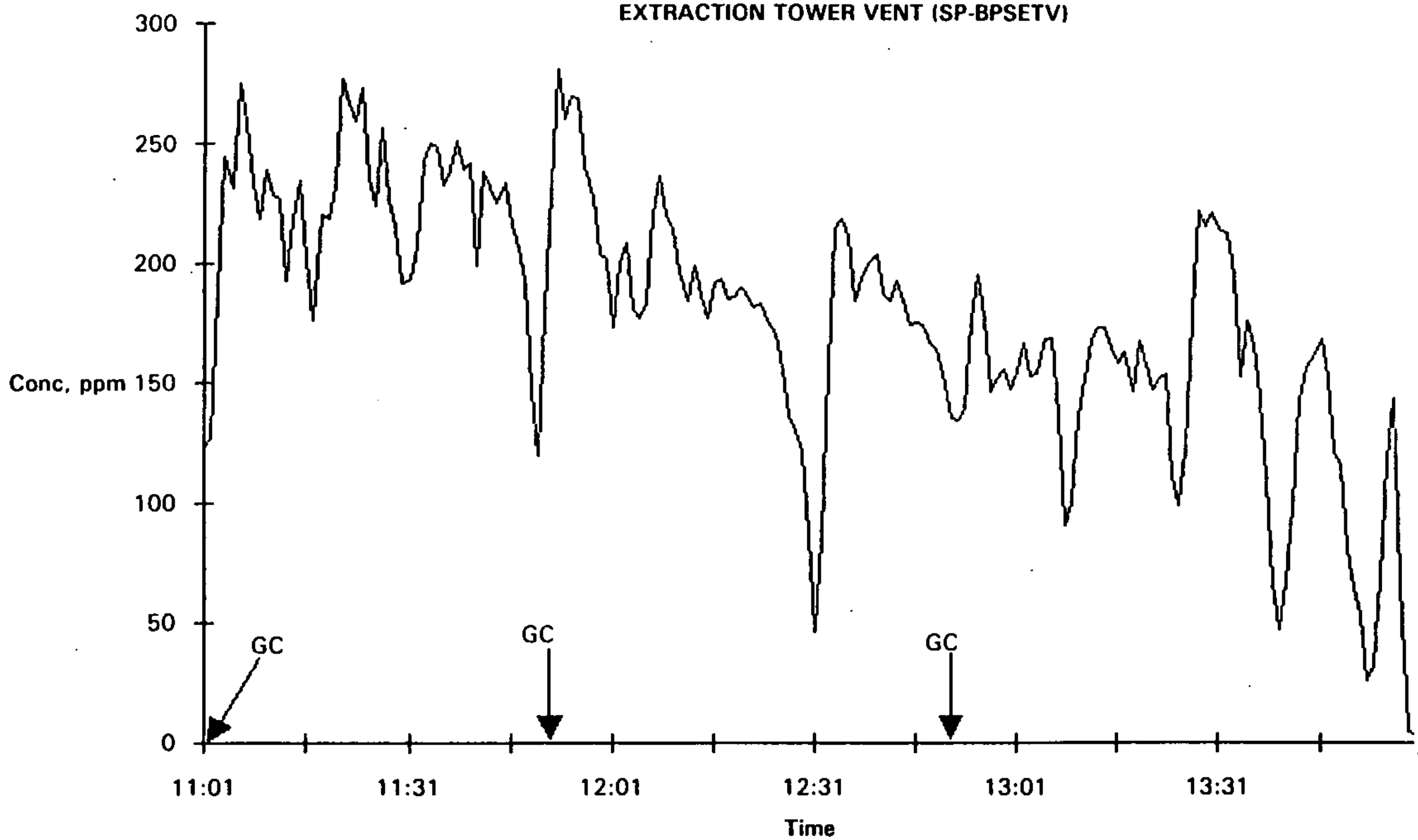

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TABLE 8.1 SUMMARY OF VOC RESULTS

Mill: SIMPSON - PASADENA
Source: Extraction Tower Vent
Source Code: SP-BPSETV
Test Dates: 6/8/92
FIN: PN2130 CIN: NA
EPN: SN56

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	162	162	162	
Volumetric Flow Rate, $x10^3$ DSCFM	0.1	0.1	0.1	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	20.8	20.8	20.8	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	0.1	0.3	0.2	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	<0.1	0.1	0.1
2-Propanol	ND	<0.1	0.1	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	0.2	0.3	0.2	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	<0.1	<0.1	0.1	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	0.1	0.1	0.1	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	<0.1	0.1	0.1	0.1

ND=Not Detected
DL=Detection Limit

TABLE 8.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: SIMPSON-PASADENA
Source Code: SP-BPSETV
FIN: PN2130 EPN: SN56

Source: Extraction Tower Vent
Test Dates: 6/8/92
CIN: NA

	RUN 1	DL
Volumetric Flow Data		
Stack Temperature, °F	162	
Volumetric Flow Rate, x 10^3 DSCFM	0.1	
Process Operating Conditions		
Production Rate, ADT pulp/hr	20.8	
Emission Rate, lb/hr		
Chloroform	0.3	0.1
Hydrogen chloride	ND	0.1

ND = Not Detected
DL = Detection Limit

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Section 8.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	Extraction Tower Vent		FIN:	PN2130
Source Code: SP-BPSETV	Date:	6/8/92	EPN: SN56	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1100	1200	1300	
Flow Data				
Stack Temperature, °F	162			162
Moisture Content, %	24.8			24.8
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.2			0.2
Volumetric Flow Rate, x10^3 DSCFM	0.1			0.1
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8	20.8	20.8	20.8
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	183.1	458.0	359.6	333.6
Emission Rate, lb/hr	0.1	0.3	0.3	0.2
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.7 *	0.7 *	2.3	1.0
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.7 *	1.1	0.7 *	0.6
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Extraction Tower Vent | FIN: PN2130
Source Code: SP-BPSETV | Date: 6/8/92 | EPN: SN56 | CIN: NA

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	88.6	101.1	56.1	81.9
Emission Rate, lb/hr	0.2	0.3	0.2	0.2
Benzene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.3 *	1.3 *	1.3 *	1.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	1.3	4.8	2.5	2.9
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Extraction Tower Vent | FIN: PN2130
Source Code: SP-BPSETV | Date: 6/8/92 | EPN: SN56 | CIN: NA

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	196.0	392.3	289.4	292.6
Unknowns as Carbon				
Concentration, ppmvd	3.6	4.8	9.4	5.9
Sum M18 as Carbon, lb/hr	0.1 *	0.1	0.1 *	0.1
Unknown Compounds % of Total	1.8%	1.2%	3.2%	2.1%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	297.9	231.4	176.9	235.4
Emission Rate, lb/hr as C	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

Section 8.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA		Source:	Extraction Tower Vent	FIN:	PN2130
Source Code:	SP-BPSETV	Date:	6/8/92 EPN: SN56	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1135			
Flow Data				
Stack Temperature, °F	162			162
Moisture Content, %	24.8			24.8
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.2			0.2
Volumetric Flow Rate, x10^3 DSCFM	0.1			0.1
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8			20.8
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	127.4			127.4
Emission Rate, lb/hr	0.3			0.3
Hydrogen chloride				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

Section 8.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL SP SOURCE SP-BPSETV

1. CALIBRATION

THEOR	DATE	6/8/92	DATE	
ppm	ppm	%REC	ppm	%REC
0	-5	-0.5%		
90	91	101.1%		
149	156	104.7%		
375	371	98.9%		

2. PROPANE LINE RECOVERY

	DATE	6/8/92		DATE		
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	376	383	102%			
AFTER	372	374	101%			

3. LINE BLANK

	DATE	6/8/92	DATE	
	INST	LINE	INST	LINE
BEFORE	0	0		
AFTER	1	0		

QUALITY CONTROL SUMMARY
METHOD 18

MILL SP SOURCE SP-BPSETV

1. CHECK STANDARD

ANALYTE	THEOR	DATE	6/8/92	THEOR	DATE	
	ppm	ppm	%REC	ppm	ppm	%REC
ethanol	55.64	38.50	69.20%			
acetone	44.47	36.27	81.55%			
isopropanol	42.65	39.97	93.71%			
dimethyl sulfide	9.78	8.93	91.31%			
benzene	36.54	35.21	96.37%			
bromodichloromethane	20.08	18.55	92.36%			
dimethyl disulfide	36.26	32.87	90.64%			
toluene	30.73	29.23	95.12%			
ethyl benzene	26.67	25.40	95.24%			
m-xylene	53.27	51.10	95.93%			
o-xylene	26.76	25.36	94.77%			
cumene	23.47	22.65	96.50%			
alpha-pinene	20.49	20.25	98.79%			
beta-pinene	20.59	20.40	99.06%			
3-carene	20.61	20.11	97.58%			
p-cymene	20.92	19.99	95.53%			

2. PROPANE RESPONSE

	THEOR		% REC	
BEFORE RUN	89.7	86.8	96.8%	
AFTER RUN	89.7	87.2	97.3%	

3. METHANOL LINE RECOVERY

	THEOR		% REC	
BEFORE RUN	94.1188	99.361	105.6%	
AFTER RUN	108.1614	106.65	98.6%	

4. LINE BLANK

	[-------------FILE REF-------------]	
BEFORE RUN	F8A4004	
AFTER RUN	F8A4010	

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Section 8.4 Process Operating Data

MILL: SIMPSON PAPER SOURCE: PINE BLEACH PLANT

DATE		6/05 ->						6/05 ->							
TIME		0923	1023	1123	0923	1023	1123	1351	1451	1551	1651	1351	1451	1551	1651
SOURCE		BPSSHS	BPSSHS	BPSSHS	BPSSHW	BPSSHW	BPSSHW	BPSETV	BPSETV	BPSETV	BPSETV	BPSFHW	BPSFHW	BPSFHW	BPSFHW
FIN		PN2142 ->			PN2141 ->			PN1232 ->				PN2134 ->			
EPN		SN64	SN64	SN64	SN63	SN63	SN63	SN58	SN58	SN58	SN58	SN60	SN60	SN60	SN60
	UNITS														
WOOD		PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE
PRODUCT	T/D	500	500	500	500	500	500	500	500	500	500	500	500	500	500
KAPPA		32.4	30.5	30.5	30.5	30.5	30.5	36.7	36.7	36.7	30.8	30.8	36.7	36.7	30.8
CE K		3.2	3.2	3.2	3.2	3.2	3.2	2.8	2.8	3.2	3.2	2.8	2.8	3.3	3.3
CHEM USAGE															
Cl_2	LB/T	50	54	46	50	54	46	58	74	62	54	58	74	62	54
ClO_2	LB/T	44	48	41	44	48	41	51	66	55	48	51	66	55	48
NaOH	LB/T	40	40	40	40	40	40	52	52	52	60	52	52	52	60
OXYGEN	LB/T	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NaOCl	LB/T	14	12	12	14	12	12	12	12	12	12	12	12	12	12
NaOH	LB/T	1.2	1.2	1.2	1.2	1.2	1.2	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0
ClO_2	LB/T	20	20	20	20	20	20	20	20	20	20	20	20	20	20
NaOH	LB/T	6.4	6.4	6.4	6.4	6.4	6.4	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
NAOCl	LB/T	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NaOH	LB/T	4.6	4.2	4.2	4.6	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
TOWER TEMP	F														
Dc STOCK	F	134	134	134	134	134	134	131	131	131	131	131	131	131	131
Eo MIXER	F	165	169	170	165	169	170	160	164	164	162	160	164	164	162
H_1 MIXER	F	154	163	161	154	163	161	161	159	161	163	161	159	161	163
D UPFLOW	F	171	171	174	171	171	174	171	173	170	171	171	173	170	171
H_2 MIXER	F	118	122	123	118	122	123	125	125	124	124	125	125	124	124
pH LEVEL															
Eo		10.7	10.7	10.3	10.7	10.7	10.3	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
H_1		9.5	9.4	9.4	9.5	9.4	9.4	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
D		3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
H_2		9.7	9.7	9.7	9.7	9.7	9.7	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5

SCRUBBER, Cl_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW 4000 SCFM DESIGN
LIQ FLOW 5 GPM 5% CAUSTIC
DP 3.5 IN H_2O

SCRUBBER, ClO_2
TYPE - COLUMN
SCB MED - TELLERETTES
GAS FLOW 4000 SCFM DESIGN
LIQ FLOW 1 GPM WHITE LIQUOR
DP 3.5 INCHES H_2O

NOTES: 1.0 BLEACHING SEQUENCE -	RETENTION TIMES, MIN @ 550 T/D
CHLORINE WITH CLORINE DIOXIDE, Dc	30
CAUSTIC SODA & OXYGEN, Eo	80
#1 SODIUM HYPOCHLORITE, H_1	50
CHLORINE DIOXIDE, D	220
#2 SODIUM HYPOCHLORITE, H_2	120

2.0 ClO_2 SUBSITITUTION MAINTAINED AT 70%
3.0 ALL VALUES ONE HOUR READINGS FROM OPERATIONS LOG
4.0 PRODUCTION IS IN OVEN DRY UNBLEACHED SHORT TONS/DAY
5.0 ClO_2 IS AS ClO_2

Note: See Apendix D for Unit Process Description

MILL: SIMPSON PAPER SOURCE: PINE BLEACH PLANT

	UNITS										
DATE		6/08 ->						6/08	6/08 ->		
TIME		1100	1200	1300	1519	1556	1756	1856	1656	1756	1856
SOURCE		BPSETV ->			BPSSHT	BPSCSV ->			BPSCCS ->		
FIN		PN2130 ->			PN2140	PN2319 ->			PN2128 ->		
EPN		SN56 ->			SN62	SN81->			SN80->		
WOOD		PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE
PRODUCT	T/D	500	500	500	500	500	500	500	500	500	500
KAPPA		24.8	24.8	36.3	32.1	43.1	43.1	43.1	43.1	43.1	33.3
CE K		3.0	3.1	3.2	3.0	3.1	3.2	3.2	3.2	3.4	3.2
CHEM USAGE											
Cl_2	LB/T	44	36	44	56	64	66	52	64	66	52
ClO_2	LB/T	39	32	39	50	57	59	55	48	59	55
NaOH	LB/T	40	40	48	44	60	60	60	60	60	60
OXYGEN	LB/T	0	0	0	0	0	0	0	0	0	0
NaOCl	LB/T	12	12	12	12	12	12	12	12	12	12
NaOH	LB/T	0	0	0	0	0	0	0	0	0	0
ClO_2	LB/T	19	19	19	19	19	19	19	19	19	19
NaOH	LB/T	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
NAOCl	LB/T	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
NaOH	LB/T	2.0	2.0	2.0	3.6	3.2	2.8	2.8	3.2	2.8	2.8
Dc STOCK	F	132	131	133	132	133	133	134	133	133	134
Eo MIXER	F	179	180	179	167	168	168	169	168	168	169
H_1 MIXER	F	159	157	159	160	158	158	158	158	158	158
D UPFLOW	F	170	170	171	174	170	174	172	170	174	171
H_2 MIXR	F	125	125	125	125	127	126	127	127	126	127
pH LEVEL											
Eo		10.3	10.3	10.4	10.4	9.8	10.1	10.1	9.8	10.1	10.1
H_1		9.5	9.7	9.7	9.5	9.7	9.4	9.7	9.7	9.4	9.7
D		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
H_2		9.1	9.1	9.0	8.5	9.8	9.8	9.8	9.8	9.8	9.6

SCRUBBER, Cl_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW 4000 SCFM
LIQ FLOW 5.0 GPM 5% CAUSTIC
DP 3.5 INCHES H_2O

SCRUBBER, ClO_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW 4000 SCFM
LIQ FLOW 1 GPM WHITE LIQUOR
DP 3.5 INCHES H_2O

NOTES: 1.0 BLEACHING SEQUENCE -	RETENTION TIMES, MIN @ 550 T/D
CHLORINE WITH CLORINE DIOXIDE, Dc	30
CAUSTIC SODA & OXYGEN, Eo	80
1st SODIUM HYPOCHLORITE, H_1	50
CHLORINE DIOXIDE, D	220
2nd SODIUM HYPOCHLORITE, H_2	120

2.0 ClO_2 SUBSITITUTION MAINTAINED AT 70%
3.0 ALL VALUES ONE HOUR READINGS FROM OPERATIONS LOG
4.0 PRODUCTION IS IN OVEN DRY UNBLEACHED SHORT TONS
5.0 ClO_2 IS AS ClO_2 USAGE

Note: See Appendix D for Unit Process Description

SECTION 9

EXTRACTION WASHER VENT

(SP-BPSEWV)

9. SP-BPSEWV

SECTION 9
EXTRACTION WASHER VENT
(SP-BPSEWV)

The Extraction Washer Vent was tested on two different days. The source was sampled for volatile organic compounds using Methods 25A and 18. Chloroform and hydrogen chloride samples were collected.

Total Hydrocarbons (M25A)

Figures 9.1 and 9.2 present the THC trends for the test periods on 6/5/92 and 6/6/92. On the first day, concentrations ranged from 11 to 21 ppm with a downward plunge to 3 ppm at 1600. On the second day, they varied from 5 to 9 ppm.

Volatile Organic Compounds (M18)

Table 9.1 summarizes the results for the Method 18 target compounds, and Section 9.1 is a tabulation of the data. Methanol and chloroform were detected by the Method 18 analyses. The volumetric flow was measured during sampling with a pitot tube.

Miscellaneous Parameters

Table 9.2 summarizes the results of testing for hydrogen chloride and chloroform. Section 9.2 tabulates the results for each compound. Chloroform results (lb/hr) were comparable to Method 18 data.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 9.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 9.4 includes the process operating data as recorded and provided by mill personnel. Not all process operating data were given for VOC run times. The data with the closet run time was used.

FIGURE 9.1
THC TREND ANALYSIS (6/5/92)
EXTRACTION WASHER VENT (SP-BPSEWV)

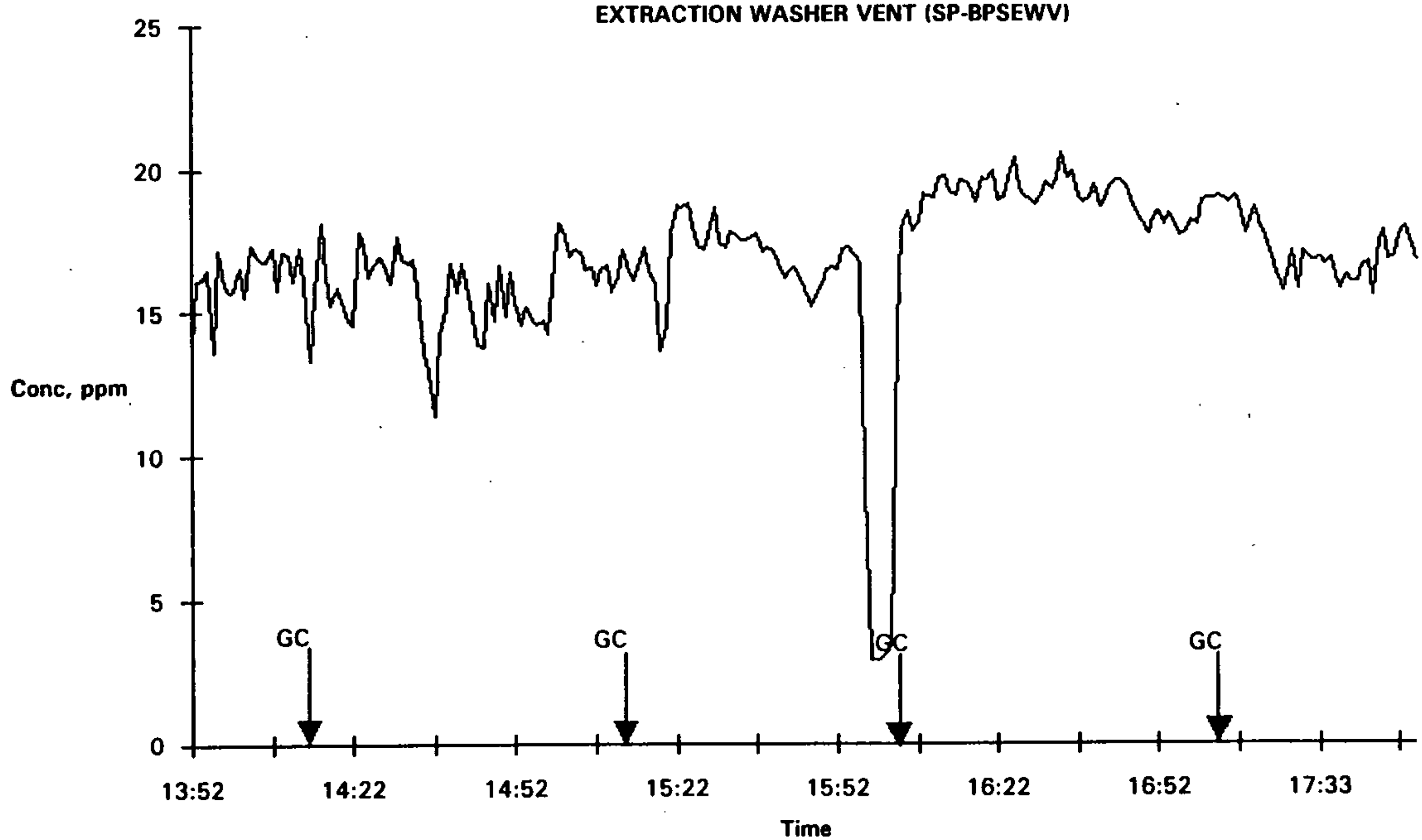

FIGURE 9.2

THC TREND ANALYSIS (6/6/92)
EXTRACTION WASHER VENT (SP-BPSEWV)

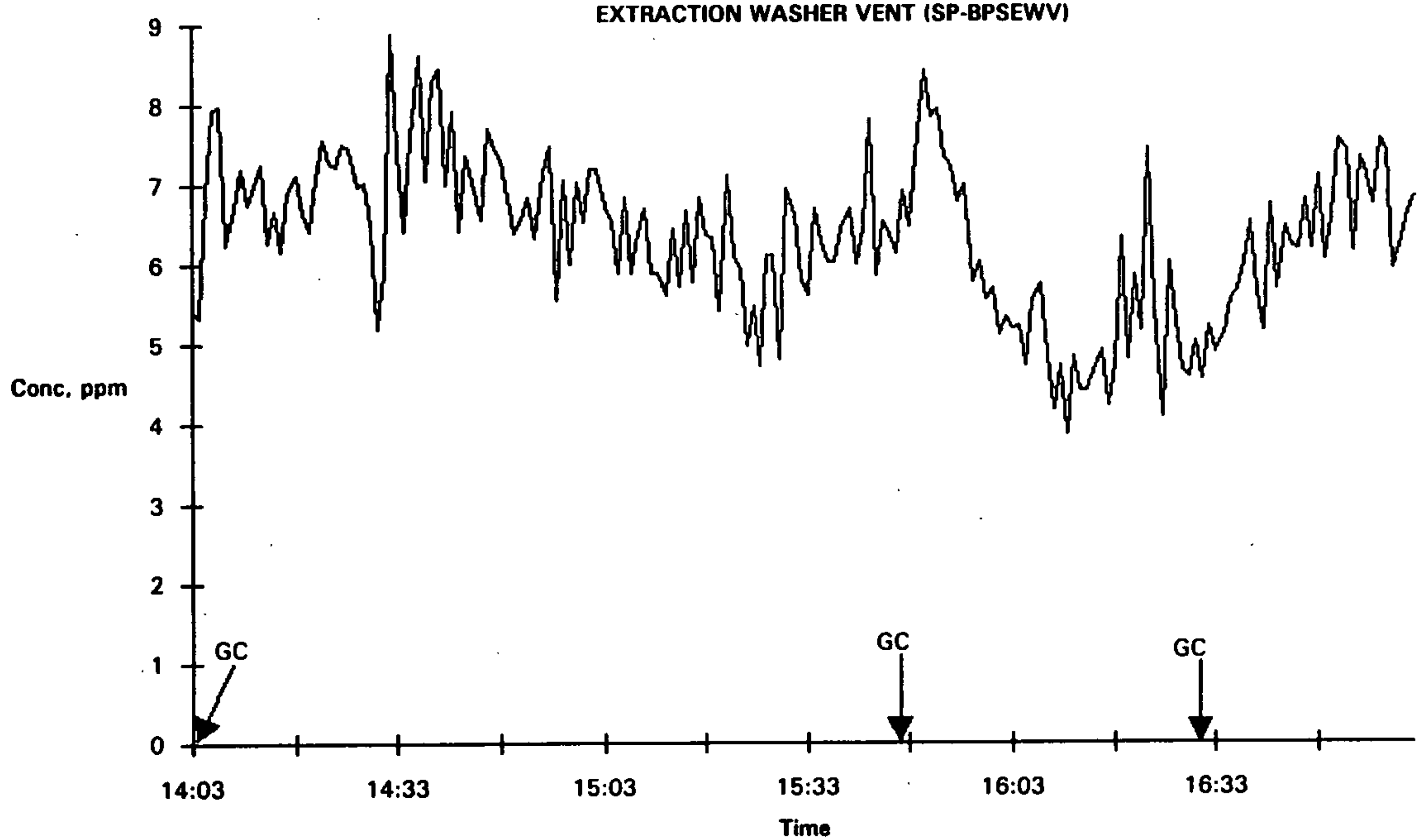

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TABLE 9.1 SUMMARY OF VOC RESULTS

Mill: SIMPSON - PASADENA | Source: Extraction Washer Vent
Source Code: SP-BPSEWV | Test Dates: 6/5/92 6/6/92
FIN: PN2131 CIN: NA | EPN: SN57

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	109	120	115	
Volumetric Flow Rate, x10³ DSCFM	2.2	2.6	2.4	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	20.8	20.8	20.8	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	0.2	0.4	0.3	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	0.4	0.5	0.5	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	ND	ND	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	0.1	0.1	0.1	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	ND	0.1	0.1	0.1

ND=Not Detected
DL=Detection Limit

WESTON

TABLE 9.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: SIMPSON-PASADENA
Source Code: SP-BPSEWV
FIN: PN2131   EPN: SN57

Source: Extraction Washer Vent
Test Dates: 6/5/92, 6/6/92
CIN: NA

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	109	120	114	
Volumetric Flow Rate, x 10^3 DSCFM	2.1	2.6	2.4	
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8	20.8	20.8	
Emission Rate, lb/hr				
Chloroform	0.5	0.5	0.5	0.1
Hydrogen chloride	ND	ND	ND	0.1

ND = Not Detected
DL = Detection Limit

Section 9.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA		Source:	Extraction Washer Vent		FIN:	PN2131
Source Code:	SP-BPSEWV	Date:	6/5/92	EPN: SN57	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1351	1451	1551	
Flow Data				
Stack Temperature, °F	120			120
Moisture Content, %	10.1			10.1
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	2.8			2.8
Volumetric Flow Rate, x10^3 DSCFM	2.2			2.2
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8	20.8	20.8	20.8
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	28.3	28.6	31.6	29.5
Emission Rate, lb/hr	0.3	0.3	0.4	0.3
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Extraction Washer Vent | FIN: PN2131
Source Code: SP-BPSEWV | Date: 6/5/92 | EPN: SN57 | CIN: NA

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	10.7	9.5	11.9	10.7
Emission Rate, lb/hr	0.4	0.4	0.5	0.4
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source: Extraction Washer Vent	FIN: PN2131
Source Code: SP-BPSEWV	Date: 6/5/92 EPN: SN57	CIN: NA

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	29.1	26.8	31.3	29.1
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.1	0.1	0.1	0.1
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	17.8	18.9	18.9	18.5
Emission Rate, lb/hr as C	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	Extraction Washer Vent		FIN:	PN2131
Source Code: SP-BPSEWV	Date:	6/6/92	EPN: SN57	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1402	1502	1602	
Flow Data				
Stack Temperature, °F	109			109
Moisture Content, %	8.5			8.5
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	3.1			3.1
Volumetric Flow Rate, x10^3 DSCFM	2.6			2.6
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8	20.8	20.8	20.8
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	16.6	17.5	20.0	18.0
Emission Rate, lb/hr	0.2	0.2	0.3	0.2
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Extraction Washer Vent | FIN: PN2131
Source Code: SP-BPSEWV | Date: 6/6/92 | EPN: SN57 | CIN: NA

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	10.4	9.9	8.3	9.5
Emission Rate, lb/hr	0.5	0.5	0.4	0.5
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Extraction Washer Vent | FIN: PN2131
Source Code: SP-BPSEWV | Date: 6/6/92 | EPN: SN57 | CIN: NA

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	20.1	20.2	20.1	20.1
Unknowns as Carbon				
Concentration, ppmvd	0.5	0.0	0.0	0.2
Sum M18 as Carbon, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Unknown Compounds % of Total	2.6%	0.0%	0.0%	0.9%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	7.7	6.6	6.6	6.9
Emission Rate, lb/hr as C	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

Section 9.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA	Source:	Extraction Washer Vent		FIN:	PN2131
Source Code: SP-BPSEWV	Date:	6/5/92	EPN: SN57	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1449			
Flow Data				
Stack Temperature, °F	120			120
Moisture Content, %	10.1			10.1
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	2.8			2.8
Volumetric Flow Rate, x10^3 DSCFM	2.2			2.2
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8			20.8
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	12.7			12.7
Emission Rate, lb/hr	0.5			0.5
Hydrogen chloride				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA	Source:	Extraction Washer Vent			FIN:	PN2131
Source Code: SP-BPSEWV	Date:	6/6/92	EPN:	SN57	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1408			
Flow Data				
Stack Temperature, °F	109			109
Moisture Content, %	8.5			8.5
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	3.1			3.1
Volumetric Flow Rate, x10^3 DSCFM	2.6			2.6
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8			20.8
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	11.0			11.0
Emission Rate, lb/hr	0.5			0.5
Hydrogen chloride				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

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Section 9.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL SP SOURCE SP-BPSEWV

1. CALIBRATION

THEOR	DATE	6/5/92	DATE	6/6/92
ppm	ppm	%REC	ppm	%REC
0	-7	-0.7%	-6	-0.6%
90	94	104.4%	94	104.4%
149	155	104.0%	155	104.0%
375	371	98.9%	371	98.9%

2. PROPANE LINE RECOVERY

	DATE	6/5/92		DATE	6/6/92	
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	376	363	96.5%	405	324	80.0%
AFTER	405	324	80.0%	314	310	98.7%

3. LINE BLANK

	DATE	6/5/92	DATE	6/6/92
	INST	LINE	INST	LINE
BEFORE	0	0	1	5
AFTER	1	5	0	0

QUALITY CONTROL SUMMARY
METHOD 18

MILL SP SOURCE SP-BPSEWV

1. CHECK STANDARD

ANALYTE	THEOR	DATE	6/5/92	THEOR	DATE	6/6/92
	ppm	ppm	%REC	ppm	ppm	%REC
ethanol	55.64	46.69	83.90%	55.64	38.63	69.42%
acetone	44.47	42.04	94.52%	44.47	36.70	82.53%
isopropanol	42.65	39.81	93.34%	42.65	37.70	88.40%
dimethyl sulfide	9.78	9.19	94.00%	9.78	8.44	86.37%
benzene	36.54	36.15	98.92%	36.54	32.83	89.85%
bromodichloromethane	20.08	18.95	94.37%	20.08	17.87	88.98%
dimethyl disulfide	36.26	32.98	90.95%	36.26	31.52	86.92%
toluene	30.73	29.14	94.84%	30.73	27.71	90.17%
ethyl benzene	26.67	25.20	94.48%	26.67	24.07	90.25%
m-xylene	53.27	50.65	95.08%	53.27	48.36	90.77%
o-xylene	26.76	25.11	93.83%	26.76	24.08	89.99%
cumene	23.47	22.35	95.21%	23.47	21.48	91.52%
alpha-pinene	20.49	19.76	96.42%	20.49	19.14	93.37%
beta-pinene	20.59	20.28	98.51%	20.59	19.40	94.23%
3-carene	20.61	19.60	95.06%	20.61	19.16	92.94%
p-cymene	20.92	19.33	92.40%	20.92	19.02	90.88%

2. PROPANE RESPONSE

	THEOR			THEOR		
BEFORE RUN	89.7	86.14	96.03%	89.7	84.99	94.75%
AFTER RUN	89.7	84.99	94.75%	89.7	84.72	94.44%

3. METHANOL LINE RECOVERY

	THEOR			THEOR		
BEFORE RUN	103.89	102.82	98.97%	90.62	98.59	108.80%
AFTER RUN	90.62	98.59	108.79%	92.43	86.96	94.09%

4. LINE BLANK

	[--------------FILE REF--------------]	
BEFORE RUN	F5A4008	F6A4001
AFTER RUN	F6A4001	F6A4014

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Section 9.4 Process Operating Data

MILL: SIMPSON PAPER SOURCE: PINE BLEACH PLANT

	UNITS														
DATE		6/05 ->						6/05 ->							
TIME		0923	1023	1123	0923	1023	1123	1351	1451	1551	1651	1351	1451	1551	1651
SOURCE		BPSSHS	BPSSHS	BPSSHS	BPSSHW	BPSSHW	BPSSHW	BPSETV	BPSETV	BPSETV	BPSETV	BPSFHW	BPSFHW	BPSFHW	BPSFHW
FIN		PN2142 ->			PN2141 ->			PN1232 ->				PN2134 ->			
EPN		SN64	SN64	SN64	SN63	SN63	SN63	SN58	SN58	SN58	SN58	SN60	SN60	SN60	SN60
WOOD		PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE
PRODUCT	T/D	500	500	500	500	500	500	500	500	500	500	500	500	500	500
KAPPA		32.4	30.5	30.5	30.5	30.5	30.5	36.7	36.7	36.7	30.8	30.8	36.7	36.7	30.8
CE K		3.2	3.2	3.2	3.2	3.2	3.2	2.8	2.8	3.2	3.2	2.8	2.8	3.3	3.3
CHEM USAGE															
Cl_2	LB/T	50	54	46	50	54	46	58	74	62	54	58	74	62	54
ClO_2	LB/T	44	48	41	44	48	41	51	66	55	48	51	66	55	48
NaOH	LB/T	40	40	40	40	40	40	52	52	52	60	52	52	52	60
OXYGEN	LB/T	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NaOCl	LB/T	14	12	12	14	12	12	12	12	12	12	12	12	12	12
NaOH	LB/T	1.2	1.2	1.2	1.2	1.2	1.2	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0
ClO_2	LB/T	20	20	20	20	20	20	20	20	20	20	20	20	20	20
NaOH	LB/T	6.4	6.4	6.4	6.4	6.4	6.4	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
NAOCl	LB/T	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NaOH	LB/T	4.6	4.2	4.2	4.6	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
TOWER TEMP	F														
Dc STOCK	F	134	134	134	134	134	134	131	131	131	131	131	131	131	131
Eo MIXER	F	165	169	170	165	169	170	160	164	164	162	160	164	164	162
H_1 MIXER	F	154	163	161	154	163	161	161	159	161	163	161	159	161	163
D UPFLOW	F	171	171	174	171	171	174	171	173	170	171	171	173	170	171
H_2 MIXER	F	118	122	123	118	122	123	125	125	124	124	125	125	124	124
pH LEVEL															
Eo		10.7	10.7	10.3	10.7	10.7	10.3	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
H_1		9.5	9.4	9.4	9.5	9.4	9.4	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
D		3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
H_2		9.7	9.7	9.7	9.7	9.7	9.7	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5

SCRUBBER, Cl_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW 4000 SCFM DESIGN
LIQ FLOW 5 GPM 5% CAUSTIC
DP 3.5 IN H_2O

SCRUBBER, ClO_2
TYPE - COLUMN
SCB MED - TELLERETTES
GAS FLOW 4000 SCFM DESIGN
LIQ FLOW 1 GPM WHITE LIQUOR
DP 3.5 INCHES H_2O

NOTES: 1.0 BLEACHING SEQUENCE -	RETENTION TIMES, MIN @ 550 T/D
CHLORINE WITH CLORINE DIOXIDE, Dc	30
CAUSTIC SODA & OXYGEN, Eo	60
#1 SODIUM HYPOCHLORITE, H_1	50
CHLORINE DIOXIDE, D	220
#2 SODIUM HYPOCHLORITE, H_2	120

2.0 ClO_2 SUBSITITUTION MAINTAINED AT 70%
3.0 ALL VALUES ONE HOUR READINGS FROM OPERATIONS LOG
4.0 PRODUCTION IS IN OVEN DRY UNBLEACHED SHORT TONS/DAY
5.0 ClO_2 IS AS ClO_2

Note: See Apendix D for Unit Process Description

MILL: SIMPSON PAPER   SOURCE: PINE BLEACH PLANT

DATE		6/06 ->					
TIME		1400	1500	1600	1400	1500	1600
SOURCE		BPSEWV ->			BPSFHV ->		
FIN		PN2131 ->			PN2134 ->		
EPN		SN57 ->			SN60 ->		
	UNITS						
WOOD		PINE	PINE	PINE	PINE	PINE	PINE
PRODUCT	T/D	500	500	500	500	500	500
KAPPA		33.1	30.7	36.1	33.1	30.7	36.1
CE K		3.4	2.8	3.7	3.4	2.8	3.7
CHEM USAGE							
Cl_2	LB/T	38	42	46	38	42	46
ClO_2	LB/T	34	46	41	34	37	41
NaOH	LB/T	40	40	40	40	40	40
OXYGEN	LB/T	0	0	0	0	0	0
NaOCl	LB/T	10	10	10	10	10	10
NaOH	LB/T	1	1	1	1	1	1
ClO_2	LB/T	19	19	19	19	19	19
NaOH	LB/T	6.6	6.6	6.6	6.6	6.6	6.6
NAOCl	LB/T	2	2	2	2	2	2
NaOH	LB/T	3.2	3.2	3.2	3.2	3.2	3.2
TOWER TEMP	F						
Dc STOCK	F	125	125	126	125	125	126
Eo MIXER	F	171	171	170	171	171	170
H_1 MIXER	F	147	147	154	147	147	154
D UPFLOW	F	163	167	172	163	167	172
H_2 MIXR	F	113	115	115	113	115	115
pH LEVEL							
Eo		10.8	10.8	10.8	10.8	10.8	10.8
H_1		9.8	9.8	9.8	9.8	9.8	9.8
D		3.5	3.5	3.5	3.5	3.5	3.5
H_2		10.0	10.0	10.0	10.0	10.0	10.0

SCRUBBER, Cl_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW 4000 SDCFM
LIQ FLOW 5 GPM 5% CAUSTIC
DP 3.5 INCHES H_2O

SCRUBBER, ClO_2
TYPE - COLUMN
SCR MED - TELLERETTES
GAS FLOW 4000 SCFM
LIQ FLOW 1 GPM WHITE LIQUOR
DP 3.5 INCHES H_2O

NOTES: 1.0 BLEACHING SEQUENCE -	RETENTION TIMES, MIN @ 550 T/D
CHLORINE WITH CLORINE DIOXIDE, Dc	30
CAUSTIC SODA & OXYGEN, Eo	80
1st SODIUM HYPOCHLORITE, H_1	50
CHLORINE DIOXIDE, D	220
2nd SODIUM HYPOCHLORITE, H_2	120

2.0 ClO_2 SUBSITITUTION MAINTAINED AT 70%
3.0 ALL VALUES ONE HOUR READINGS FROM OPERATIONS LOG
4.0 PRODUCTION IS IN OVEN DRY UNBLEACHED SHORT TONS/DAY
5.0 ClO_2 IS AS ClO_2 USAGE

Note: See Appendix D for Unit Process Description

SECTION 10

EXTRACTION SEAL BOX VENT

(SP-BPSESB)

10. SP-BPSESB

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SECTION 10
EXTRACTION SEAL BOX VENT
(SP-BPSESB)

The Extraction Seal Box Vent was tested on two different days. The source was sampled for volatile organic compounds using Methods 25A and 18. Chloroform and hydrogen chloride samples were collected.

Total Hydrocarbons (M25A)

Figures 10.1 and 10.2 present the THC trends for the test periods on 6/3/92 and 6/4/92. On the first day, the total hydrocarbons ranged from 296 to 428 ppm exhibiting a slight upward trend. On the second day, a downward trend was observed ranging from 523 to 354 ppm.

Volatile Organic Compounds (M18)

Table 10.1 summarizes the results for the Method 18 target compounds, and Section 10.1 is a tabulation of the data. Methanol and chloroform were detected by the Method 18 analyses. Recurring unknowns were present before methanol (~1 to 3 ppm as carbon) and after bromodichloromethane (~2 to 5 ppm as carbon). The volumetric flow was measured during sampling with a pitot tube.

Miscellaneous Parameters

Table 10.2 summarizes the results of testing for hydrogen chloride and chloroform. Section 10.2 tabulates the results for each compound. Chloroform results (lb/hr) were comparable to Method 18 data. The results for the second day of testing was twice as high as the first day. Hydrogen chloride was detected on day 1 (<0.1 lb/hr).

VOC Quality Control Results

The VOC quality control data are tabulated in Section 10.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 10.4 includes the process operating data as recorded and provided by mill personnel.

FIGURE 10.1
THC TREND ANALYSIS (6/3/92)
EXTRACTION SEAL BOX VENT (SP-BPSESB)

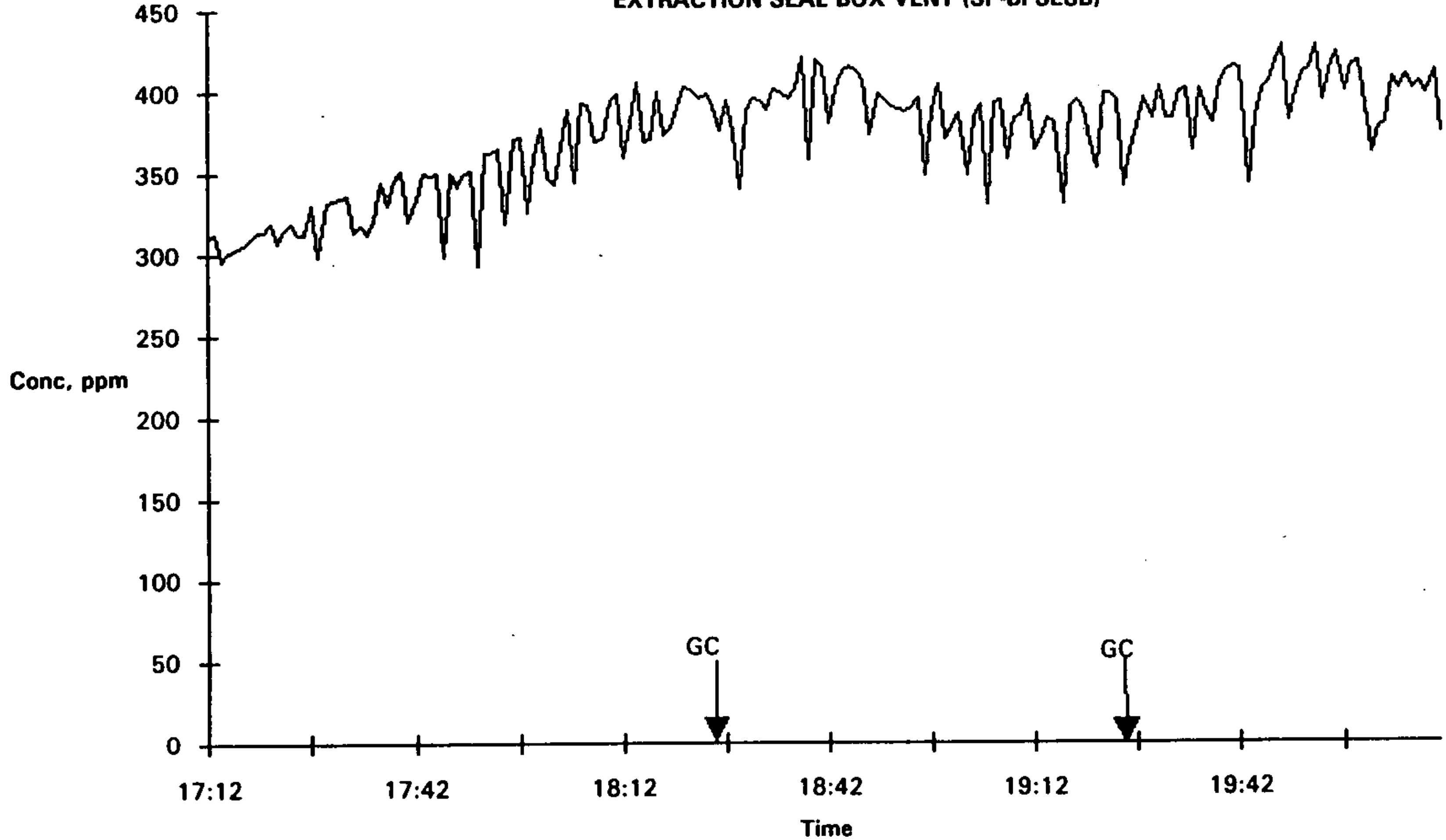

FIGURE 10.2
THC TREND ANALYSIS (6/4/92)
EXTRACTION SEAL BOX VENT (SP-BPSESB)

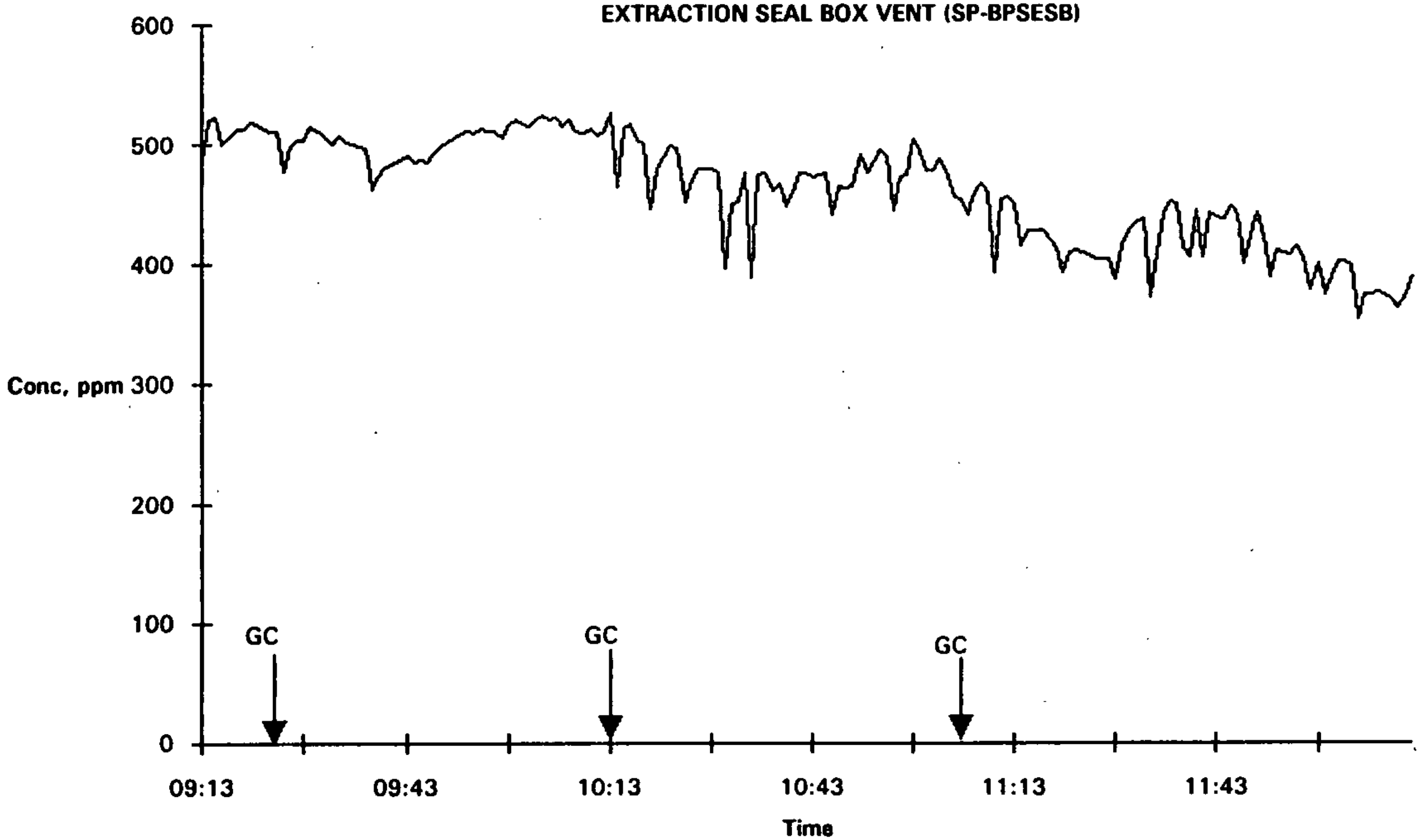

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TABLE 10.1 SUMMARY OF VOC RESULTS

Mill: SIMPSON - PASADENA
Source Code: SP-BPSESB
FIN: PN2132 CIN: NA

Source: Extraction Seal Box Vent
Test Dates: 6/3/92 6/4/92
EPN: SN58

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	154	156	155	
Volumetric Flow Rate, $x10^3$ DSCFM	0.5	0.5	0.5	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	20.8	22.9	21.9	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	0.7	1.3	0.9	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	<0.1	0.1	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	<0.1	0.1	0.1
Chloroform	8.2	12.3	9.9	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	<0.1	<0.1	0.1	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	0.9	1.3	1.1	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	0.9	1.3	1.1	0.1

ND=Not Detected
DL=Detection Limit

TABLE 10.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: SIMPSON-PASADENA
Source Code: SP-BPSESB
FIN: PN2132 EPN: SN58

Source: Extraction Seal Box Vent
Test Dates: 6/3/92, 6/4/92
CIN: NA

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	154	156	155	
Volumetric Flow Rate, x 10^3 DSCFM	0.5	0.5	0.5	
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8	22.9	21.9	
Emission Rate, lb/hr				
Chloroform	6.4	12.6	9.5	0.1
Hydrogen chloride	ND	<0.1	0.1	0.1

ND = Not Detected
DL = Detection Limit

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Section 10.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA		Source:	Extraction Seal Box Vent		FIN:	PN2132
Source Code:	SP-BPSESB	Date:	6/3/92	EPN: SN58	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1711	1811	1911	
Flow Data				
Stack Temperature, °F	154			154
Moisture Content, %	28.2			28.2
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.8			0.8
Volumetric Flow Rate, x10^3 DSCFM	0.5			0.5
Process Operating Conditions				
Production Rate, ADT pulp/hr	22.9	22.9	22.9	22.9
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd		317.4	300.0	308.7
Emission Rate, lb/hr		0.8	0.7	0.7
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd		0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd		2.5	2.1	2.3
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd		0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA　　Source: Extraction Seal Box Vent　　FIN: PN2132
Source Code: SP-BPSESB　　Date: 6/3/92　　EPN: SN58　　CIN: NA

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd		0.7 *	0.7 •	0.7 *
Emission Rate, lb/hr		0.1 *	0.1 •	0.1 *
Chloroform				
Concentration, ppmvd		935.8	930.8	933.3
Emission Rate, lb/hr		8.2	8.2	8.2
Benzene				
Concentration, ppmvd		0.7 •	0.7 •	0.7 •
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 •
Bromodichloromethane				
Concentration, ppmvd		1.4 *	1.4 *	1.4 •
Emission Rate, lb/hr		0.1 •	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd		0.7 *	0.7 *	0.7 •
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd		0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd		0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd		0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd		0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr		0.1 *	0.1 •	0.1 *
alpha-Pinene				
Concentration, ppmvd		0.7 •	0.7 •	0.7 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd		0.7 *	0.7 •	0.7 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd		0.7 •	0.7 •	0.7 •
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd		4.2	2.2	3.2
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Extraction Seal Box Vent | FIN: PN2132
Source Code: SP-BPSESB | Date: 6/3/92 | EPN: SN58 | CIN: NA

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd		0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd		1033.6	1005.0	1019.3
Unknowns as Carbon				
Concentration, ppmvd		15.7	5.2	10.4
Sum M18 as Carbon, lb/hr		0.9	0.9	0.9
Unknown Compounds % of Total		1.5%	0.5%	1.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	470.8	540.4	546.0	519.0
Emission Rate, lb/hr as C	0.4	0.5	0.5	0.5

COMMENTS

M18 run 1 for 6/3/92 was rejected.

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	Extraction Seal Box Vent		FIN:	PN2132
Source Code: SP-BPSESB	Date:	6/4/92	EPN: SN58	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	912	1012	1112	
Flow Data				
Stack Temperature, °F	156			156
Moisture Content, %	28.7			28.7
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.8			0.8
Volumetric Flow Rate, x10^3 DSCFM	0.5			0.5
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8	20.8	20.8	20.8
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	345.6	569.0	487.2	467.3
Emission Rate, lb/hr	0.8	1.3	1.1	1.1
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	6.9	0.7 *	7.9	5.0
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Extraction Seal Box Vent | FIN: PN2132
Source Code: SP-BPSESB | Date: 6/4/92 | EPN: SN58 | CIN: NA

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.7 *	1.1	0.7 *	0.6
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1409.4	1240.8	1130.2	1260.1
Emission Rate, lb/hr	12.3	10.9	9.9	11.0
Benzene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.4 *	1.4 *	1.4 *	1.4 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	3.5	3.8	2.4	3.2
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	Extraction Seal Box Vent			FIN:	PN2132
Source Code: SP-BPSESB	Date:	6/4/92	EPN:	SN58	CIN:	NA

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	1433.0	1440.0	1289.6	1387.5
Unknowns as Carbon				
Concentration, ppmvd	8.1	20.5	6.7	11.8
Sum M18 as Carbon, lb/hr	1.3	1.3	1.1	1.2
Unknown Compounds % of Total	0.6%	1.4%	0.5%	0.8%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	708.3	659.2	573.6	647.0
Emission Rate, lb/hr as C	0.6	0.6	0.5	0.6

COMMENTS

M18 run 1 for 6/3/92 was rejected.

* One or more values were less than the detection limit.

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Section 10.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA	Source:	Extraction Seal Box Vent		FIN:	PN2132
Source Code: SP-BPSESB	Date:	6/3/92	EPN: SN58	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1727			
Flow Data				
Stack Temperature, °F	154			154
Moisture Content, %	28.2			28.2
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.8			0.8
Volumetric Flow Rate, x10^3 DSCFM	0.5			0.5
Process Operating Conditions				
Production Rate, ADT pulp/hr	22.9			22.9
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	727.5			727.5
Emission Rate, lb/hr	6.4			6.4
Hydrogen chloride				
Concentration, ppmvd	0.6			0.6
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA | Source: Extraction Seal Box Vent | FIN: PN2132
Source Code: SP-BPSESB | Date: 6/4/92 | EPN: SN58 | CIN: NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	934			
Flow Data				
Stack Temperature, °F	156			156
Moisture Content, %	28.7			28.7
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.8			0.8
Volumetric Flow Rate, x10^3 DSCFM	0.5			0.5
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8			20.8
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	1439.2			1439.2
Emission Rate, lb/hr	12.6			12.6
Hydrogen chloride				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

Section 10.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL SP SOURCE SP-BPSESB

1. CALIBRATION

THEOR	DATE 6/3/92		DATE 6/4/92	
ppm	ppm	%REC	ppm	%REC
0	0	0.0%	-2	-0.2%
90	88	97.8%	89	98.9%
149	152	102.0%	154	103.4%
375	373	99.5%	373	99.5%

2. PROPANE LINE RECOVERY

	DATE 6/3/92			DATE 6/4/92		
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	381	360	94%	381	380	100%
AFTER	381	380	100%	356	324	91%

3. LINE BLANK

	DATE 6/3/92		DATE 6/4/92	
	INST	LINE	INST	LINE
BEFORE	0	0	0	1
AFTER	0	1	0	0

QUALITY CONTROL SUMMARY
METHOD 18

MILL SP SOURCE SP-BPSESB

1. CHECK STANDARD

ANALYTE	THEOR	DATE	6/3/92	THEOR	DATE	6/4/92
	ppm	ppm	%REC	ppm	ppm	%REC
ethanol	55.64	53.85	96.78%	55.64	56.25	101.09%
acetone	44.47	45.60	102.53%	44.47	49.98	112.38%
isopropanol	42.65	39.39	92.34%	42.65	45.81	107.40%
dimethyl sulfide	9.78	9.09	92.94%	9.78	10.58	108.22%
benzene	36.54	31.86	87.20%	36.54	43.38	118.72%
bromodichloromethane	20.08	17.67	87.97%	20.08	22.19	110.50%
dimethyl disulfide	36.26	32.06	88.40%	36.26	39.45	108.81%
toluene	30.73	28.85	93.87%	30.73	34.07	110.88%
ethyl benzene	26.67	24.58	92.16%	26.67	29.53	110.74%
m-xylene	53.27	49.25	92.44%	53.27	60.00	112.63%
o-xylene	26.76	24.87	92.93%	26.76	29.48	110.18%
cumene	23.47	21.72	92.55%	23.47	25.96	110.61%
alpha-pinene	20.49	19.27	94.03%	20.49	22.90	111.73%
beta-pinene	20.59	19.22	93.34%	20.59	23.47	113.99%
3-carene	20.61	20.57	99.80%	20.61	23.13	112.22%
p-cymene	20.92	18.79	89.82%	20.92	22.87	109.30%

2. PROPANE RESPONSE

	THEOR			THEOR		
BEFORE RUN	89.7	88.5	98.6%	89.7	84.3	94.0%
AFTER RUN	89.7	83.6	93.2%	89.7	86.3	96.2%

3. METHANOL LINE RECOVERY

	THEOR			THEOR		
BEFORE RUN	103.3	105.8	102.4%	100.1	95.9	95.8%
AFTER RUN	101.7	104.1	102.4%	91.6	98.8	107.8%

4. LINE BLANK

	[--------------FILE REF--------------]	
BEFORE RUN	F3A4007	F4A4008
AFTER RUN	F3A4013	F4A4014

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Section 10.4 Process Operating Data

MILL: SIMPSON PAPER SOURCE: PINE BLEACH PLANT

DATE		6/03 ->			6/03 ->			6/04 ->			6/04 ->		
TIME		1200	1300	1400	1700	1800	1900	0912	1012	1112	1331	1431	1531
SOURCE		BPSFHS ->			BPSESB ->			BPSESB ->			BPSFHS ->		
FIN		PN2135 ->			PN2132 ->			PN2132 ->			PN2135 ->		
EPN		SN61 ->			SN58 ->			SN58 ->			SN61 ->		
	UNITS												
WOOD		PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE
PRODUCT	T/D	550	550	550	550	550	550	500	500	500	500	500	500
KAPPA		30.1	30.1	33.5	33.5	26.7	26.7	27.6	27.6	27.6	27.6	27.6	27.6
CE K		2.6	2.8	2.5	2.4	2.4	2.7	2.8	1.8	2.0	2.0	2.0	3.1
CHEM USAGE													
Cl_2	LB/T	36	32	40	36	32	40	48	48	46	52	52	52
ClO_2	LB/T	32	28	35	32	28	35	43	43	41	46	46	46
NaOH	LB/T	56	40	32	40	48	60	40	40	40	40	40	40
OXYGEN	LB/T	0	0	0	0	0	0	0	0	0	0	0	0
NaOCl	LB/T	10	10	10	10	10	10	12	12	12	12	12	12
NaOH	LB/T	0.6	0.6	0.8	0	0	0	0.8	0.8	0.6	0	0	0
ClO_2	LB/T	19	19	19	19	19	19	19	19	19	19	19	19
NaOH	LB/T	5.8	5.6	5.8	5.2	5.2	5.2	6.5	5.9	5.9	0	0	0
NAOCl	LB/T	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
NaOH	LB/T	4.0	3.0	2.0	3.0	4.0	4.8	3.0	3.0	3.0	0	0	0
Dc STOCK	F	127	129	130	130	130	130	133	133	133	134	134	134
Eo MIXER	F	159	162	168	164	162	161	159	167	166	166	166	166
H_1 MIXER	F	160	160	161	159	160	160	161	162	158	161	161	161
D UPFLOW	F	168	174	177	174	175	174	175	175	175	174	174	174
H_2 MIXR	F	120	120	120	118	119	120	129	128	128	126	126	126
pH LEVEL													
Eo		10.8	10.9	10.8	9.6	8.6	8.5	10.8	10.8	10.6	11.0	11.0	11.3
H_1		9.6	9.6	10.3	9.8	9.8	9.5	9.3	9.3	9.1	9.1	9.1	9.2
D		3.6	3.8	3.8	3.8	3.8	3.9	3.8	4.0	4.1	4.1	4.1	4.0
H_2		9.6	9.6	10.1	9.8	9.8	8.8	9.5	9.5	9.8	9.8	9.8	9.2

SCRUBBER, Cl_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW 4000 SCFM DESIGN
LIQ FLOW 5 GPM 5% CAUSTIC
DP 3.5 INCHES H_2O

SCRUBBER, ClO_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW 4000 SCFM DESIGN
LIQ FLOW 1 GPM WHITE LIQUOR
DP 3.5 INCHES H_2O

NOTES: 1.0 BLEACHING SEQUENCE -	RETENTION TIMES, MIN @ 550 T/D
CHLORINE WITH CLORINE DIOXIDE, Dc	30
CAUSTIC SODA & OXYGEN, Eo	80
1st SODIUM HYPOCHLORITE, H_1	50
CHLORINE DIOXIDE, D	220
2nd SODIUM HYPOCHLORITE, H_2	120

2.0 ClO_2 SUBSITITUTION MAINTAINED AT 70%
3.0 ALL VALUES ONE HOUR READINGS FROM OPERATIONS LOG
4.0 PRODUCTION IS IN OVEN DRY UNBLEACHED SHORT TONS
5.0 ClO_2 IS AS ClO_2 USAGE

Note: See Apendix D for Unit Process Descriptions

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SECTION 11
FIRST NaOCl TOWER VENT
(SP-BPSFHT)

SECTION 11
FIRST NaOCl TOWER VENT
(SP-BPSFHT)

The First NaOCl Tower Vent was tested on one day. The source was sampled for volatile organic compounds using Methods 25A and 18. Chloroform and hydrogen chloride samples were collected.

Total Hydrocarbons (M25A)

Figure 11.1 presents the THC trend for the test period on 6/7/92. The total hydrocarbon trend was erratic with concentrations ranging from 211 to 796 ppm.

Volatile Organic Compounds (M18)

Table 11.1 summarizes the results for the Method 18 target compounds, and Section 11.1 is a tabulation of the data. Methanol and chloroform were detected by the Method 18 analyses. Unknowns were present before methanol and after chloroform. The volumetric flow was measured during sampling with a pitot tube.

Miscellaneous Parameters

Table 11.2 summarizes the results of testing for hydrogen chloride and chloroform. Section 11.2 tabulates the results for each compound. Average chloroform results from Method 18 were twice as high as obtained by the adsorption tube. Hydrogen chloride was detected (<0.1 lb/hr).

VOC Quality Control Results

The VOC quality control data are tabulated in Section 11.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 11.4 includes the process operating data as recorded and provided by mill personnel. Not all process operating data were given for miscellaneous parameters. The data with the closest run time was used.

FIGURE 11.1
THC TREND ANALYSIS (6/7/92)
FIRST NaOCl TOWER VENT (SP-BPSFHT)

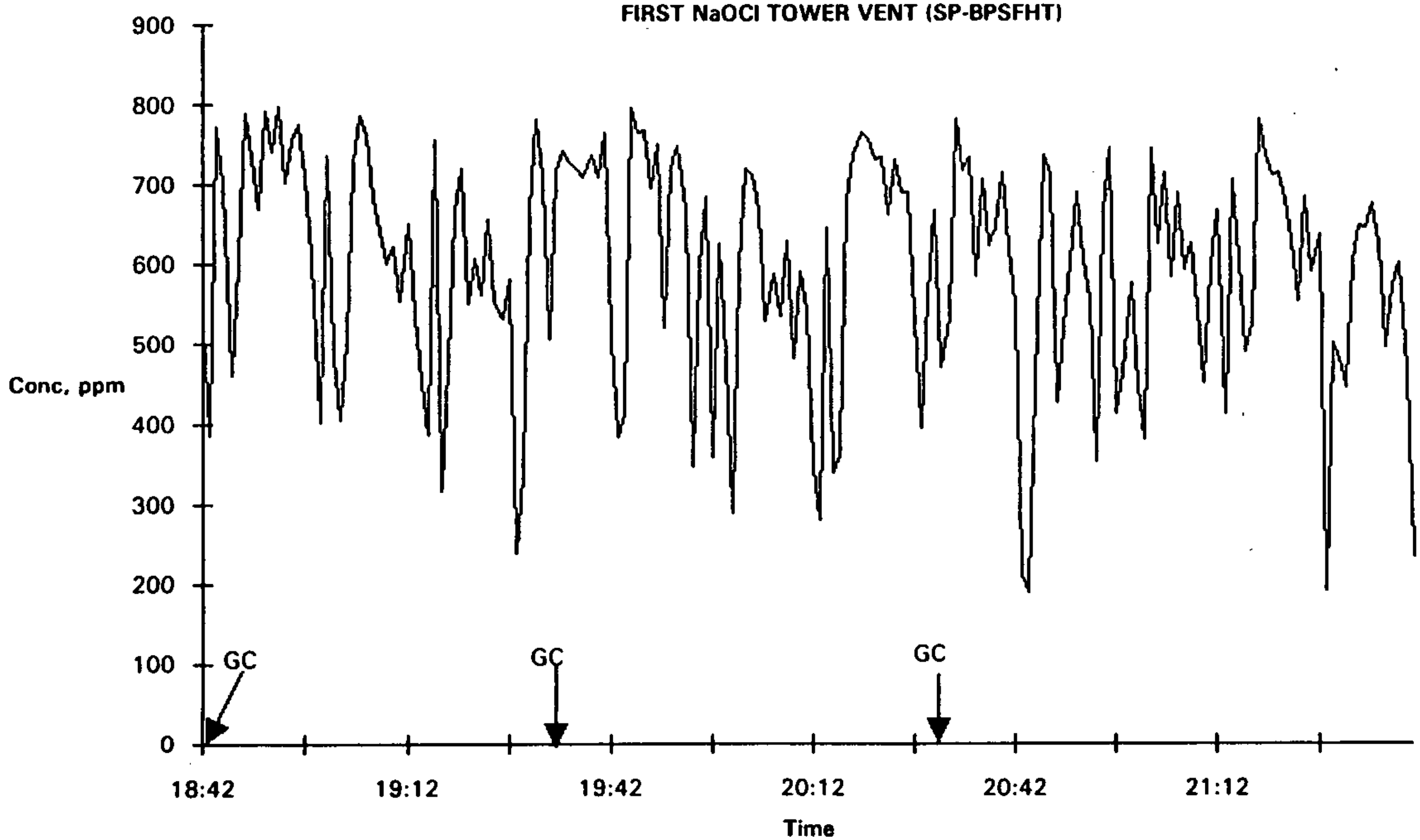

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TABLE 11.1 SUMMARY OF VOC RESULTS

Mill: SIMPSON - PASADENA Source: First NaOCl Tower Vent
Source Code: SP-BPSFHT Test Dates: 6/7/92
FIN: PN2133 CIN: NA EPN: SN59

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	128	128	128	
Volumetric Flow Rate, x10^3 DSCFM	0.4	0.4	0.4	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	20.8	20.8	20.8	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	<0.1	<0.1	0.1	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	8.8	13.0	10.6	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	ND	ND	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	0.8	1.1	0.9	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	0.8	1.1	0.9	0.1

ND=Not Detected
DL=Detection Limit

TABLE 11.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: SIMPSON-PASADENA
Source Code: SP-BPSFHT
FIN: PN2133 EPN: SN59

Source: First NaOCl Tower Vent
Test Dates: 6/7/92
CIN: NA

	RUN 1	DL
Volumetric Flow Data		
Stack Temperature, °F	128	
Volumetric Flow Rate, x 10^3 DSCFM	0.4	
Process Operating Conditions		
Production Rate, ADT pulp/hr	20.8	
Emission Rate, lb/hr		
Chloroform	5.3	0.1
Hydrogen chloride	<0.1	0.1

ND = Not Detected
DL = Detection Limit

Section 11.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source: First NaOCl Tower Vent		FIN: PN2133
Source Code: SP-BPSFHT	Date: 6/7/92	EPN: SN59	CIN: NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1841	1941	2041	
Flow Data				
Stack Temperature, °F	128			128
Moisture Content, %	14.5			14.5
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.5			0.5
Volumetric Flow Rate, x10^3 DSCFM	0.4			0.4
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8	20.8	20.8	20.8
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	22.6	31.7	25.3	26.5
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

*One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA Source: First NaOCl Tower Vent FIN: PN2133
Source Code: SP-BPSFHT Date: 6/7/92 EPN: SN59 CIN: NA

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1294.0	1897.7	1438.0	1543.2
Emission Rate, lb/hr	8.8	13.0	9.8	10.6
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.2 *	1.2 *	1.2 *	1.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: First NaOCl Tower Vent | FIN: PN2133
Source Code: SP-BPSFHT | Date: 6/7/92 | EPN: SN59 | CIN: NA

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	1090.4	1595.2	1210.2	1298.6
Unknowns as Carbon				
Concentration, ppmvd	1.3	5.8	3.3	3.5
Sum M18 as Carbon, lb/hr	0.8	1.1	0.8	0.9
Unknown Compounds % of Total	0.1%	0.4%	0.3%	0.3%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	729.8	702.9	656.1	696.3
Emission Rate, lb/hr as C	0.5	0.5	0.5	0.5

* One or more values were less than the detection limit.

Section 11.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA	Source:	First NaOCl Tower Vent		FIN:	PN2133
Source Code: SP-BPSFHT	Date:	6/7/92	EPN: SN59	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1524			
Flow Data				
Stack Temperature, °F	128			128
Moisture Content, %	14.5			14.5
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.5			0.5
Volumetric Flow Rate, x10^3 DSCFM	0.4			0.4
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8			20.8
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	782.1			782.1
Emission Rate, lb/hr	5.3			5.3
Hydrogen chloride				
Concentration, ppmvd	0.8			0.8
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

Section 11.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL SP SOURCE SP-BPSFHT

1. CALIBRATION

THEOR	DATE 6/7/92		DATE 6/7/92	
ppm	ppm	%REC	ppm	%REC
0	-7	-0.7%	-3	-0.3%
90	94	104.4%	86	95.6%
149	155	104.0%	159	106.7%
375	371	98.9%	371	98.9%

2. PROPANE LINE RECOVERY

	DATE 6/7/92			DATE 6/7/92		
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	356	338	95%			
AFTER	376	383	102%			

3. LINE BLANK

	[---------------- PPM	----------------]	
BEFORE RUN	0	0	
AFTER RUN	0	0	

QUALITY CONTROL SUMMARY
METHOD 18

MILL SP SOURCE SP-BPSFHT

1. CHECK STANDARD

ANALYTE	THEOR	DATE	6/7/92	THEOR	DATE	6/7/92
	ppm	ppm	%REC	ppm	ppm	%REC
ethanol	55.64	43.79	78.70%	55.64		
acetone	44.47	37.36	84.00%	44.47		
isopropanol	42.65	38.53	90.34%	42.65		
dimethyl sulfide	9.78	8.55	87.41%	9.78		
benzene	36.54	29.41	80.48%	36.54		
bromodichloromethane	20.08	18.09	90.08%	20.08		
dimethyl disulfide	36.26	31.84	87.80%	36.26		
toluene	30.73	28.29	92.07%	30.73		
ethyl benzene	26.67	24.57	92.13%	26.67		
m-xylene	53.27	49.60	93.11%	53.27		
o-xylene	26.76	24.56	91.80%	26.76		
cumene	23.47	21.93	93.41%	23.47		
alpha-pinene	20.49	19.59	95.60%	20.49		
beta-pinene	20.59	19.70	95.69%	20.59		
3-carene	20.61	19.44	94.29%	20.61		
p-cymene	20.92	19.33	92.37%	20.92		

2. PROPANE RESPONSE

	THEOR			THEOR	
BEFORE RUN	89.7	84.7	94.4%	89.7	
AFTER RUN	89.7	88.3	98.4%	89.7	

3. METHANOL LINE RECOVERY

	THEOR			THEOR	
BEFORE RUN	92.4	87.0	94.1%		
AFTER RUN	104.4	108.5	103.9%		

4. LINE BLANK

	[-------------FILE REF-------------]	
BEFORE RUN	F6A4014	
AFTER RUN	F7A4007	

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Section 11.4 Process Operating Data

MILL: SIMPSON PAPER SOURCE: PINE BLEACH PLANT

	UNITS															
DATE		6/07 ->						6/07 ->								
TIME		0900	1000	1100	0900	1000	1100	1334	1434	1534	1334	1434	1534	1841	1941	2041
SOURCE		BPSSHW ->			BPSSHS ->			BPSCCS ->			BPSCSV ->			BPSFHT ->		
FIN		PN2141 ->			PN2142 ->			PN2126-2127-2128 ->			PN2136-2137-2138 ->			PN2133 ->		
EPN		SN63 ->			SN64 ->			SN80 ->			SN81 ->			SN59 ->		
WOOD		PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE
PRODUCT	T/D	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
KAPPA		31.9	31.8	33.7	31.9	31.8	33.7	33.7	37.2	34.7	33.7	37.2	35.7	36.6	40.8	30.5
CE K		3.1	3.7	3.4	3.1	3.7	3.4	3.4	3.5	3.3	3.4	3.5	3.3	3.7	3.1	3.1
CHEM USAGE																
Cl_2	LB/T	74	70	70	74	70	70	54	66	70	70	66	70	72	76	64
ClO_2	LB/T	66	62	62	66	62	62	48	59	62	62	59	62	64	67	57
NaOH	LB/T	44	44	44	44	44	44	40	40	44	40	40	44	52	52	52
OXYGEN	LB/T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NaOCl	LB/T	13	13	13	13	13	13	13	13	13	12	12	12	12	12	10
NaOH	LB/T	.8	.8	.8	.8	.8	.8	0	0	0	0	0	0	0	0	0
ClO_2	LB/T	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
NaOH	LB/T															
NAOCl	LB/T	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NaOH	LB/T	2.0	2.0	2.0	2.0	2.0	2.0	1.2	1.2	1.4	1.2	1.2	1.4	3.2	3.2	3.2
Dc STOCK	F	124	123	122	124	123	122	131	131	131	131	131	131	131	131	128
Eo MIXER	F	158	154	161	158	154	161	165	164	168	165	164	166	165	160	158
H_1 MIXER	F	146	158	160	146	158	160	154	153	159	154	153	159	161	162	161
D UPFLOW	F	159	152	158	159	152	158	157	172	171	157	172	171	172	170	172
H_2 MIXR	F	100	99	100	100	99	100	116	117	118	116	117	118	123	124	126
pH LEVEL																
Eo		10.0	10.0	10.0	10.0	10.0	10.00	10.5	10.4	10.0	10.5	10.4	10.0	10.2	10.2	10.1
H_1		9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.6	9.7	9.8	10.4	9.0	10.3	9.80	9.8
D		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
H_2		9.5	9.6	9.5	9.5	9.6	9.5	9.5	9.8	9.4	9.5	9.8	9.4	9.1	9.7	9.7

SCRUBBER, Cl_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW 4000 SCFM
LIQ FLOW 5 GPM 5% CAUSTIC
DP 3.5 IN H_2O

SCRUBBER, ClO_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW 4000 SCFM
LIQ FLOW 1 GPM WHITE LIQUOR
DP 3.5 IN H_2O

NOTES:		RETENTION TIMES, MIN @ 550 T/D
1.0 BLEACHING SEQUENCE -	CHLORINE WITH CLORINE DIOXIDE, Dc	30
	CAUSTIC SODA & OXYGEN, Eo	80
	1st SODIUM HYPOCHLORITE, H_1	50
	CHLORINE DIOXIDE, D	220
	2nd SODIUM HYPOCHLORITE, H_2	120

2.0 ClO_2 SUBSITITUTION MAINTAINED AT 70%
3.0 ALL VALUES ONE HOUR READINGS FROM OPERATIONS LOG
4.0 PRODUCTION IS IN OVEN DRY UNBLEACHED SHORT TONS
5.0 ClO_2 AS ClO_2 USAGE

Note: See Appendix D for Unit Process Description

SECTION 12

FIRST NaOCl WASHER VENT

(SP-BPSFHW)

SECTION 12
FIRST NaOCl WASHER VENT
(SP-BPSFHW)

The First NaOCl Washer Vent was tested on two different days. The source was sampled for volatile organic compounds using Methods 25A and 18. Chloroform and hydrogen chloride samples were collected.

Total Hydrocarbons (M25A)

Figures 12.1 and 12.2 present the THC trends for the test periods on 6/5/92 and 6/6/92. On the first day, the total hydrocarbon concentrations varied from 9 to 43 ppm with an upward trend. During the second and third hours of testing, two dips occurred at 1628 and 1730 of 0 and 3 ppm, respectively. On the second day, they ranged from 22 to 36 ppm.

Volatile Organic Compounds (M18)

Table 12.1 summarizes the results for the Method 18 target compounds, and Section 12.1 is a tabulation of the data. Method 18 runs for 6/5/92 were rejected. Methanol and chloroform were detected by the Method 18 analyses. The volumetric flow was measured during sampling with a pitot tube.

Miscellaneous Parameters

Table 12.2 summarizes the results of testing for hydrogen chloride and chloroform. Section 12.2 tabulates the results for each compound. Chloroform results (lb/hr) were consistent with Method 18 data. Hydrogen chloride was detected (<0.1 lb/hr).

VOC Quality Control Results

The VOC quality control data are tabulated in Section 12.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 12.4 includes the process operating data as recorded and provided by mill personnel.

FIGURE 12.1
THC TREND ANALYSIS (6/5/92)
FIRST NaOCl WASHER VENT (SP-BPSFHW)

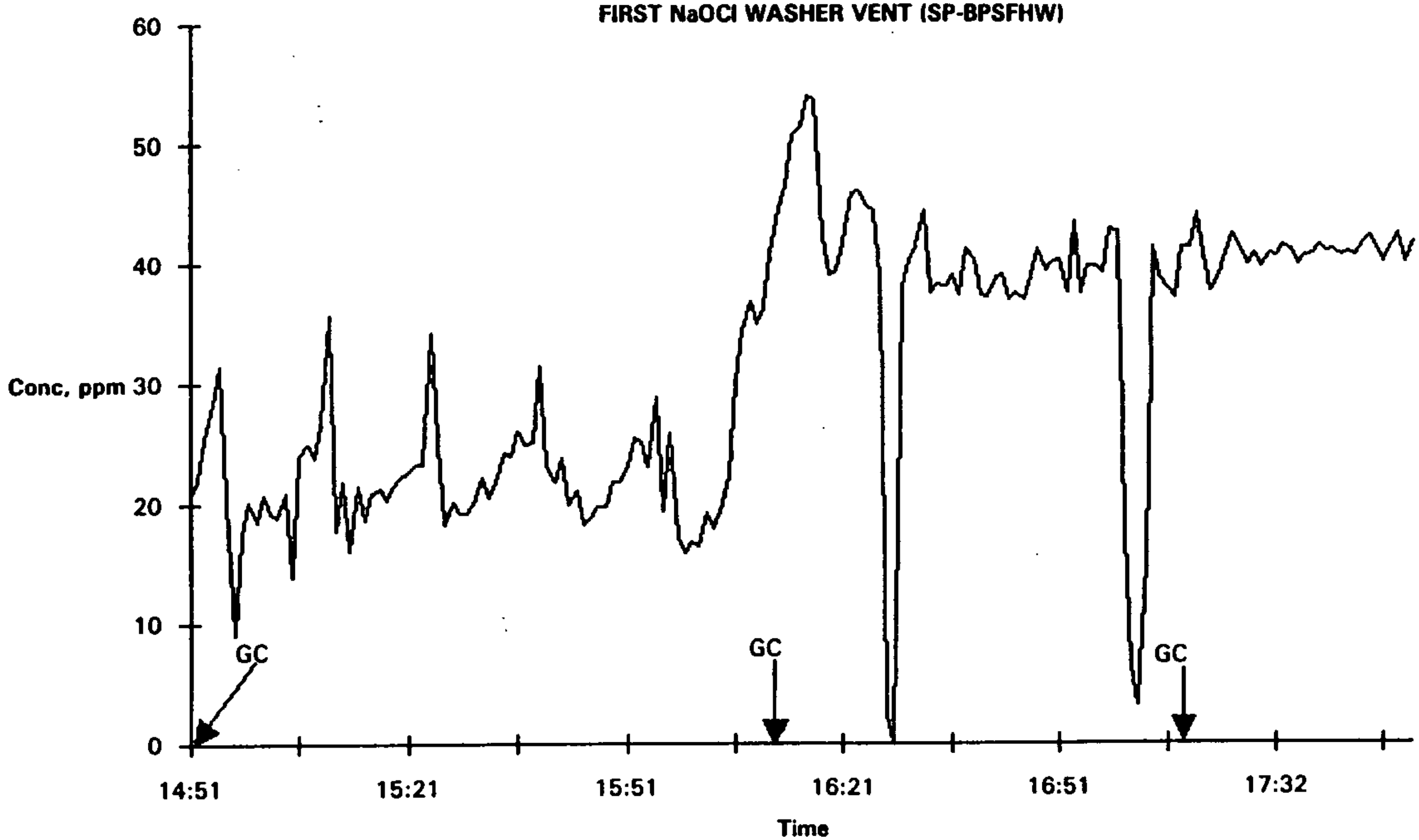
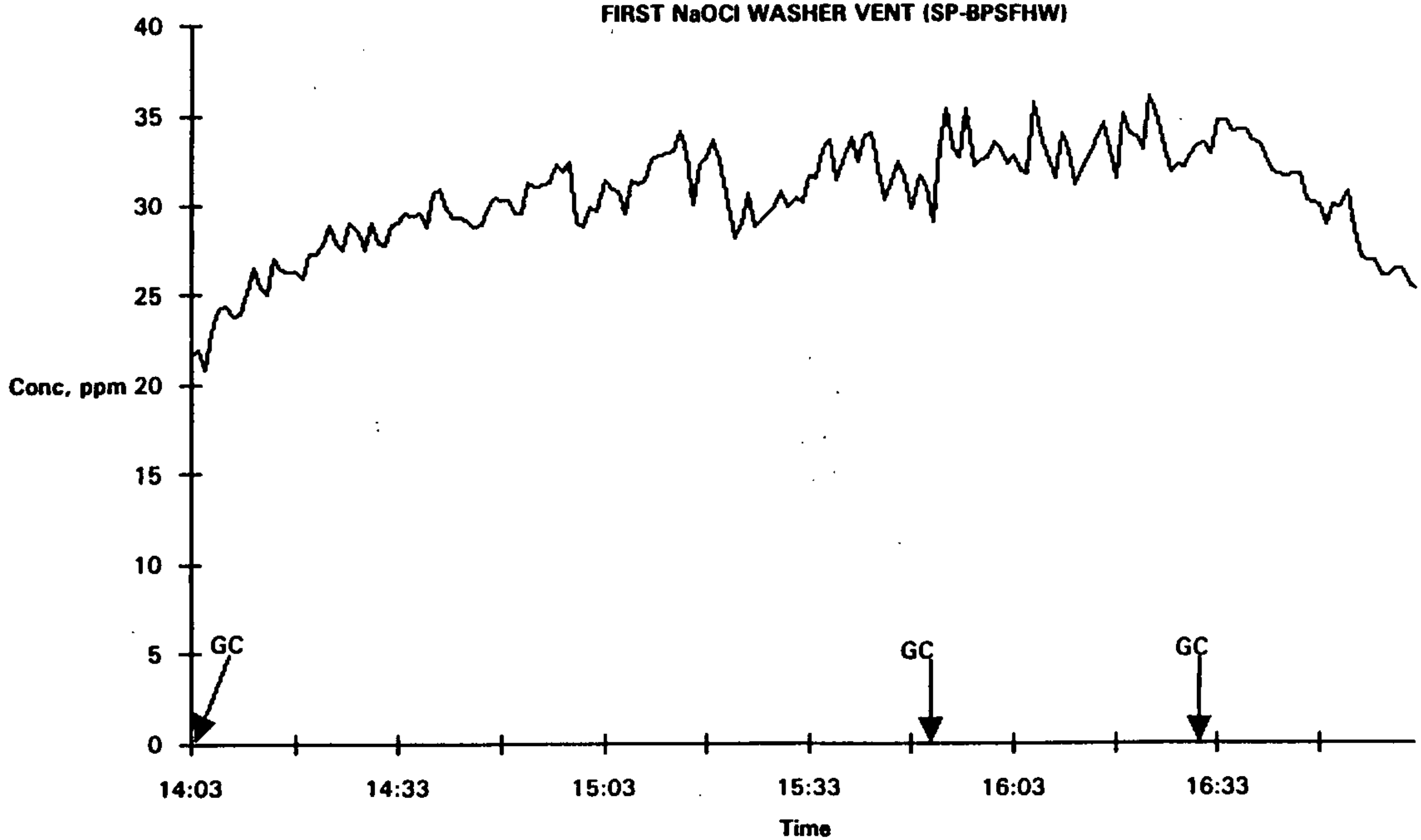


FIGURE 12.2
THC TREND ANALYSIS (6/6/92)
FIRST NaOCl WASHER VENT (SP-BPSFHW)



WESTON

TABLE 12.1 SUMMARY OF VOC RESULTS

Mill: SIMPSON - PASADENA
Source Code: SP-BPSFHW
FIN: PN2134 CIN: NA

Source: First NaOCl Washer Vent
Test Dates: 6/5/92 6/6/92
EPN: SN60

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	122	131	127	
Volumetric Flow Rate, $x10^3$ DSCFM	2.3	2.4	2.4	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	20.8	20.8	20.8	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	0.5	0.6	0.6	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	0.2	0.2	0.2	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	ND	ND	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	0.2	0.2	0.2	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	0.2	0.2	0.2	0.1

ND=Not Detected
DL=Detection Limit

TABLE 12.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: SIMPSON-PASADENA
Source Code: SP-BPSFHW
FIN: PN2134 EPN: SN60

Source: First NaOCl Washer Vent
Test Dates: 6/5/92, 6/6/92
CIN: NA

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	122	131	127	
Volumetric Flow Rate, x 10^3 DSCFM	2.3	2.4	2.3	
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8	20.8	20.8	
Emission Rate, lb/hr				
Chloroform	0.2	0.2	0.2	0.1
Hydrogen chloride	<0.1	<0.1	0.1	0.1

ND = Not Detected
DL = Detection Limit

Section 12.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	First NaOCl Washer Vent		FIN:	PN2134
Source Code: SP-BPSFHW	Date:	6/5/92	EPN: SN60	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1451	1551	1651	
Flow Data				
Stack Temperature, °F	131			131
Moisture Content, %	15.7			15.7
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	3.0			3.0
Volumetric Flow Rate, x10^3 DSCFM	2.3			2.3
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8	20.8	20.8	20.8
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd				
Emission Rate, lb/hr				
Acetone				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Propanol				
Concentration, ppmvd				
Emission Rate, lb/hr				

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: First NaOCl Washer Vent | FIN: PN2134
Source Code: SP-BPSFHW | Date: 6/5/92 | EPN: SN60 | CIN: NA

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd				
Emission Rate, lb/hr				
Chloroform				
Concentration, ppmvd				
Emission Rate, lb/hr				
Benzene				
Concentration, ppmvd				
Emission Rate, lb/hr				
Bromodichloromethane				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethyl benzene				
Concentration, ppmvd				
Emission Rate, lb/hr				
m-, p-Xylene				
Concentration, ppmvd				
Emission Rate, lb/hr				
o-Xylene				
Concentration, ppmvd				
Emission Rate, lb/hr				
Cumene				
Concentration, ppmvd				
Emission Rate, lb/hr				
alpha-Pinene				
Concentration, ppmvd				
Emission Rate, lb/hr				
beta-Pinene				
Concentration, ppmvd				
Emission Rate, lb/hr				
3-Carene				
Concentration, ppmvd				
Emission Rate, lb/hr				
Terpenes (Unspecified)				
Concentration, ppmvd				
Emission Rate, lb/hr				

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	First NaOCl Washer Vent		FIN:	PN2134
Source Code: SP-BPSFHW	Date:	6/5/92	EPN: SN60	CIN:	NA

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd				
Emission Rate, lb/hr				
Knowns as Carbon				
Concentration, ppmvd				
Unknowns as Carbon				
Concentration, ppmvd				
Sum M18 as Carbon, lb/hr				
Unknown Compounds % of Total				
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	26.1	41.5	45.1	37.6
Emission Rate, lb/hr as C	0.1	0.2	0.2	0.2

COMMENTS

M18 runs for 6/5/92 were rejected due to dirty system.

*One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill:	SIMPSON - PASADENA	Source:	First NaOCl Washer Vent	FIN:	PN2134
Source Code:	SP-BPSFHW	Date:	6/6/92 EPN: SN60	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1402	1502	1602	
Flow Data				
Stack Temperature, °F		122		122
Moisture Content, %		12.2		12.2
Oxygen Concentration, %		20.8		20.8
Carbon Dioxide Concentration, %		0.0		0.0
Volumetric Flow Rate, x10^3 ACFM		3.1		3.1
Volumetric Flow Rate, x10^3 DSCFM		2.4		2.4
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8	20.8	20.8	20.8
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	38.5	50.1	51.9	46.8
Emission Rate, lb/hr	0.5	0.6	0.6	0.6
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	First NaOCl Washer Vent		FIN:	PN2134
Source Code: SP-BPSFHW	Date:	6/6/92	EPN: SN60	CIN:	NA

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	4.6	4.6	4.0	4.4
Emission Rate, lb/hr	0.2	0.2	0.2	0.2
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

*One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	First NaOCl Washer Vent		FIN:	PN2134
Source Code: SP-BPSFHW	Date:	6/6/92	EPN: SN60	CIN:	NA

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	33.3	41.7	42.6	39.2
Unknowns as Carbon				
Concentration, ppmvd	0.6	0.0	0.0	0.2
Sum M18 as Carbon, lb/hr	0.2	0.2	0.2	0.2
Unknown Compounds % of Total	1.7%	0.0%	0.0%	0.6%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	31.9	36.4	36.4	34.9
Emission Rate, lb/hr as C	0.1	0.2	0.2	0.2

COMMENTS

M18 runs for 6/5/92 were rejected due to dirty system.

* One or more values were less than the detection limit.

WESTON
MANAGERS DESIGNERS/CONSULTANTS

Section 12.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA | Source: First NaOCl Washer Vent | FIN: PN2134
Source Code: SP-BPSFHW | Date: 6/5/92 | EPN: SN60 | CIN: NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1635			
Flow Data				
Stack Temperature, °F	131			131
Moisture Content, %	15.7			15.7
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	3.0			3.0
Volumetric Flow Rate, x10^3 DSCFM	2.3			2.3
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8			20.8
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	5.3			5.3
Emission Rate, lb/hr	0.2			0.2
Hydrogen chloride				
Concentration, ppmvd	1.4			1.4
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill:	SIMPSON - PASADENA	Source:	First NaOCl Washer Vent		FIN:	PN2134
Source Code:	SP-BPSFHW	Date:	6/6/92	EPN: SN60	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1520			
Flow Data				
Stack Temperature, °F	122			122
Moisture Content, %	12.2			12.2
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	3.1			3.1
Volumetric Flow Rate, x10^3 DSCFM	2.4			2.4
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8			20.8
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	3.9			3.9
Emission Rate, lb/hr	0.2			0.2
Hydrogen chloride				
Concentration, ppmvd	1.5			1.5
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

Section 12.3 Quality Control Results

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QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL SP SOURCE SP-BPSFHW

1. CALIBRATION

THEOR	DATE 6/5/92		DATE 6/6/92	
ppm	ppm	%REC	ppm	%REC
0	-7	-0.7%	-8	-0.8%
90	94	104.4%	95	105.6%
149	154	103.4%	156	104.7%
375	371	98.9%	370	98.7%

2. PROPANE LINE RECOVERY

	DATE 6/5/92			DATE 6/6/92		
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	404	373	92.3%	419	357	85.2%
AFTER	419	357	85.2%	340	329	96.8%

3. LINE BLANK

	[------------------ PPM	------------------]		
BEFORE RUN	0	0	1	4
AFTER RUN	1	4	0	0

QUALITY CONTROL SUMMARY
METHOD 18

MILL SP SOURCE SP-BPSFHW

1. CHECK STANDARD

ANALYTE	THEOR	DATE	6/5/92	THEOR	DATE	6/6/92
	ppm	ppm	%REC	ppm	ppm	%REC
ethanol	55.64	49.60	89.14%	55.64	41.02	73.72%
acetone	44.47	48.98	110.13%	44.47	42.00	94.44%
isopropanol	42.65	37.74	88.48%	42.65	34.18	80.14%
dimethyl sulfide	9.78	9.80	100.19%	9.78	8.30	84.93%
benzene	36.54	43.86	120.03%	36.54	38.55	105.51%
bromodichloromethane	20.08	22.65	112.78%	20.08	19.60	97.57%
dimethyl disulfide	36.26	36.25	99.97%	36.26	31.77	87.61%
toluene	30.73	30.28	98.55%	30.73	27.10	88.21%
ethyl benzene	26.67	26.72	100.21%	26.67	23.74	89.03%
m-xylene	53.27	52.30	98.18%	53.27	46.08	86.50%
o-xylene	26.76	27.33	102.12%	26.76	23.96	89.53%
cumene	23.47	23.76	101.23%	23.47	23.27	99.14%
alpha-pinene	20.49	20.52	100.12%	20.49	20.16	98.36%
beta-pinene	20.59	19.95	96.91%	20.59	17.77	86.29%
3-carene	20.61	19.96	96.85%	20.61	21.08	102.28%
p-cymene	20.92	20.36	97.29%	20.92	18.14	86.70%

2. PROPANE RESPONSE

	THEOR			THEOR		
BEFORE RUN	89.7	82.1	91.54%	89.7	7.4	8.24%
AFTER RUN	89.7	79.4	88.51%	89.7	81.2	90.58%

3. METHANOL LINE RECOVERY

	THEOR			THEOR		
BEFORE RUN	99.6	100.3	100.76%	92.3	95.0	95.43%
AFTER RUN	92.3	95.0	102.93%	84.1	80.9671	87.72%

4. LINE BLANK

	[---------------- FILE	----------------]
BEFORE RUN	F5B4008	F6B4001
AFTER RUN	F6B4001	F6B4014

Section 12.4 Process Operating Data

MILL: SIMPSON PAPER SOURCE: PINE BLEACH PLANT

	UNITS														
DATE		6/05 ->						6/05 ->							
TIME		0923	1023	1123	0923	1023	1123	1351	1451	1551	1651	1351	1451	1551	1651
SOURCE		BPSSHS	BPSSHS	BPSSHS	BPSSHW	BPSSHW	BPSSHW	BPSETV	BPSETV	BPSETV	BPSETV	BPSFHW	BPSFHW	BPSFHW	BPSFHW
FIN		PN2142 ->			PN2141 ->			PN1232 ->				PN2134 ->			
EPN		SN64	SN64	SN64	SN63	SN63	SN63	SN58	SN58	SN58	SN58	SN60	SN60	SN60	SN60
WOOD		PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE
PRODUCT	T/D	500	500	500	500	500	500	500	500	500	500	500	500	500	500
KAPPA		32.4	30.5	30.5	30.5	30.5	30.5	36.7	36.7	36.7	30.8	30.8	36.7	36.7	30.8
CE K		3.2	3.2	3.2	3.2	3.2	3.2	2.8	2.8	3.2	3.2	2.8	2.8	3.3	3.3
CHEM USAGE															
Cl_2	LB/T	50	54	48	50	54	46	58	74	62	54	58	74	62	54
ClO_2	LB/T	44	48	41	44	48	41	51	66	55	48	51	66	55	48
NaOH	LB/T	40	40	40	40	40	40	52	52	52	60	52	52	52	60
OXYGEN	LB/T	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NaOCl	LB/T	14	12	12	14	12	12	12	12	12	12	12	12	12	12
NaOH	LB/T	1.2	1.2	1.2	1.2	1.2	1.2	1.6	2.0	1.8	2.0	1.6	2.0	1.6	2.0
ClO_2	LB/T	20	20	20	20	20	20	20	20	20	20	20	20	20	20
NaOH	LB/T	6.4	6.4	6.4	6.4	6.4	6.4	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
NAOCl	LB/T	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NaOH	LB/T	4.8	4.2	4.2	4.8	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
TOWER TEMP	F														
Dc STOCK	F	134	134	134	134	134	134	131	131	131	131	131	131	131	131
Eo MIXER	F	165	169	170	165	169	170	160	164	164	162	160	164	164	162
H_1 MIXER	F	154	163	161	154	163	161	161	159	161	163	161	159	161	163
D UPFLOW	F	171	171	174	171	171	174	171	173	170	171	171	173	170	171
H_2 MIXER	F	118	122	123	118	122	123	125	125	124	124	125	125	124	124
pH LEVEL															
Eo		10.7	10.7	10.3	10.7	10.7	10.3	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
H_1		9.5	9.4	9.4	9.5	9.4	9.4	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
D		3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
H_2		9.7	9.7	9.7	9.7	9.7	9.7	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5

SCRUBBER, Cl_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW 4000 SCFM DESIGN
LIQ FLOW 5 GPM 5% CAUSTIC
DP 3.5 IN H_2O

SCRUBBER, ClO_2
TYPE - COLUMN
SCB MED - TELLERETTES
GAS FLOW 4000 SCFM DESIGN
LIQ FLOW 1 GPM WHITE LIQUOR
DP 3.5 INCHES H_2O

NOTES: 1.0 BLEACHING SEQUENCE -	RETENTION TIMES, MIN @ 550 T/D
CHLORINE WITH CLORINE DIOXIDE, Dc	30
CAUSTIC SODA & OXYGEN, Eo	80
#1 SODIUM HYPOCHLORITE, H_1	50
CHLORINE DIOXIDE, D	220
#2 SODIUM HYPOCHLORITE, H_2	120

2.0 ClO_2 SUBSITITUTION MAINTAINED AT 70%
3.0 ALL VALUES ONE HOUR READINGS FROM OPERATIONS LOG
4.0 PRODUCTION IS IN OVEN DRY UNBLEACHED SHORT TONS/DAY
5.0 ClO_2 IS AS ClO_2

Note: See Apendix D for Unit Process Description

MILL: SIMPSON PAPER　　　　SOURCE: PINE BLEACH PLANT

DATE		6/06 ->					
TIME		1400	1500	1600	1400	1500	1600
SOURCE		BPSEWV ->			BPSFHV ->		
FIN		PN2131 ->			PN2134 ->		
EPN		SN57 ->			SN60 ->		
	UNITS						
WOOD		PINE	PINE	PINE	PINE	PINE	PINE
PRODUCT	T/D	500	500	500	500	500	500
KAPPA		33.1	30.7	36.1	33.1	30.7	36.1
CE K		3.4	2.8	3.7	3.4	2.8	3.7
CHEM USAGE							
Cl_2	LB/T	38	42	46	38	42	46
ClO_2	LB/T	34	46	41	34	37	41
NaOH	LB/T	40	40	40	40	40	40
OXYGEN	LB/T	0	0	0	0	0	0
NaOCl	LB/T	10	10	10	10	10	10
NaOH	LB/T	1	1	1	1	1	1
ClO_2	LB/T	19	19	19	19	19	19
NaOH	LB/T	6.6	6.6	6.6	6.6	6.6	6.6
NAOCl	LB/T	2	2	2	2	2	2
NaOH	LB/T	3.2	3.2	3.2	3.2	3.2	3.2
TOWER TEMP	F						
Dc STOCK	F	125	125	126	125	125	126
Eo MIXER	F	171	171	170	171	171	170
H_1 MIXER	F	147	147	154	147	147	154
D UPFLOW	F	163	167	172	163	167	172
H_2 MIXR	F	113	115	115	113	115	115
pH LEVEL							
Eo		10.8	10.8	10.8	10.8	10.8	10.8
H_1		9.8	9.8	9.8	9.8	9.8	9.8
D		3.5	3.5	3.5	3.5	3.5	3.5
H_2		10.0	10.0	10.0	10.0	10.0	10.0

SCRUBBER, Cl_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW　4000 SDCFM
LIQ FLOW　5 GPM 5% CAUSTIC
DP　3.5 INCHES H_2O

SCRUBBER, ClO_2
TYPE - COLUMN
SCR MED - TELLERETTES
GAS FLOW　4000 SCFM
LIQ FLOW　1 GPM WHITE LIQUOR
DP　3.5 INCHES H_2O

NOTES: 1.0 BLEACHING SEQUENCE -

	RETENTION TIMES, MIN @ 550 T/D
CHLORINE WITH CLORINE DIOXIDE, Dc	30
CAUSTIC SODA & OXYGEN, Eo	80
1st SODIUM HYPOCHLORITE, H_1	50
CHLORINE DIOXIDE, D	220
2nd SODIUM HYPOCHLORITE, H_2	120

2.0 ClO_2 SUBSITITUTION MAINTAINED AT 70%
3.0 ALL VALUES ONE HOUR READINGS FROM OPERATIONS LOG
4.0 PRODUCTION IS IN OVEN DRY UNBLEACHED SHORT TONS/DAY
5.0 ClO_2 IS AS ClO_2 USAGE

Note: See Appendix D for Unit Process Description

WESTON
MANAGERS DESIGNERS/CONSULTANTS

SECTION 13
FIRST NaOCl SEAL BOX VENT
(SP-BPSFHS)

13. SP-BPSFHS

SECTION 13
FIRST NaOCl SEAL BOX VENT
(SP-BPSFHS)

The First NaOCl Seal Box Vent was tested on two different days. The source was sampled for volatile organic compounds using Methods 25A and 18. Chloroform and hydrogen chloride samples were collected.

Total Hydrocarbons (M25A)

Figures 13.1 and 13.2 present the THC trends for the test periods on 6/3/92 and 6/4/92, respectively. On the first day, the total hydrocarbon concentrations exhibited a slight downward trend from 498 to 339 ppm. On the second day, the concentrations varied from 469 to 593 ppm.

Volatile Organic Compounds (M18)

Table 13.1 summarizes the results for the Method 18 target compounds, and Section 13.1 is a tabulation of the data. Methanol and chloroform were detected by the Method 18 analyses. Recurring unknowns were present before methanol and after chloroform (~0.4-1 ppm as carbon). The volumetric flow was measured during sampling with a pitot tube.

Miscellaneous Parameters

Table 13.2 summarizes the results of testing for hydrogen chloride and chloroform. Section 13.2 tabulates the results for each compound. Chloroform results (lb/hr) were comparable to Method 18 results. Hydrogen chloride was detected on day 1 (<0.1 lb/hr).

VOC Quality Control Results

The VOC quality control data are tabulated in Section 13.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 13.4 includes the process operating data as recorded and provided by mill personnel.

FIGURE 13.1
THC TREND ANALYSIS (6/3/92)
FIRST NaOCl SEAL BOX VENT (SP-BPSFHS)

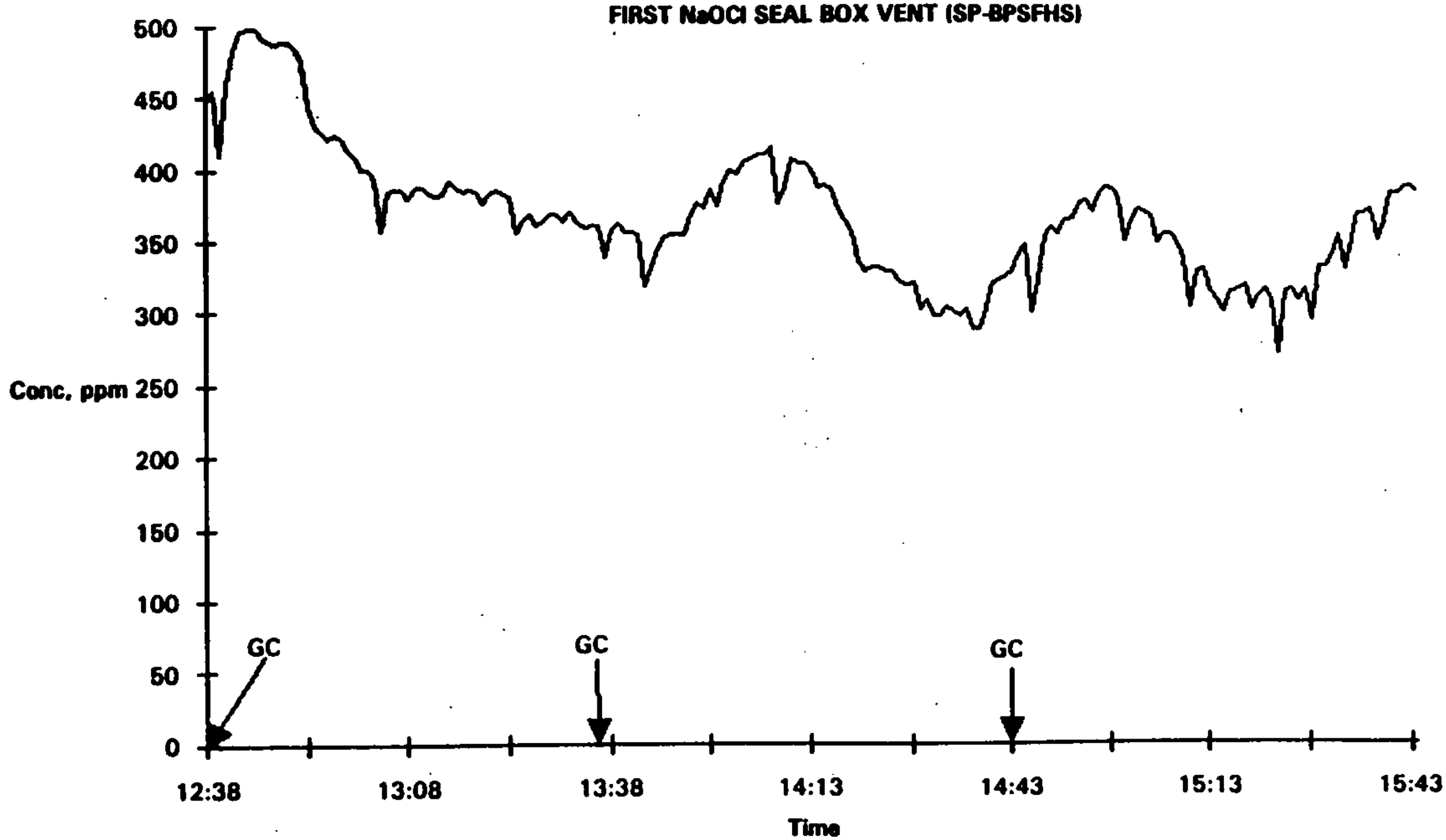
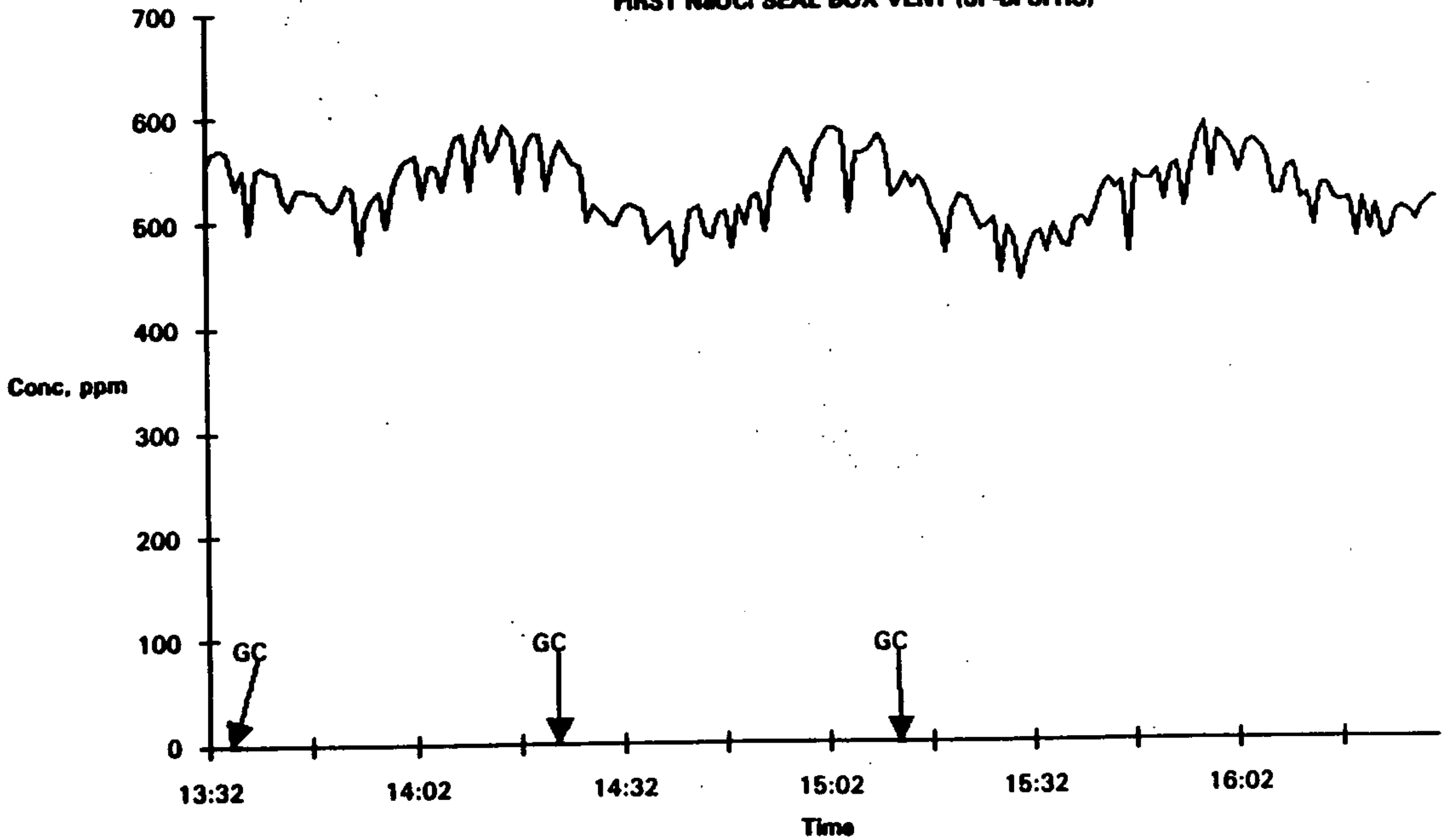


FIGURE 13.2
THC TREND ANALYSIS (6/4/92)
FIRST NaOCl SEAL BOX VENT (SP-BPSFHS)



WESTON

TABLE 13.1 SUMMARY OF VOC RESULTS

Mill:	SIMPSON - PASADENA	Source:	First NaOCl Seal Box Vent
Source Code:	SP-BPSFHS	Test Dates:	6/3/92 6/4/92
FIN: PN2135	CIN: NA	EPN:	SN61

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	136	145	141	
Volumetric Flow Rate, $x10^3$ DSCFM	0.5	0.7	0.6	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	20.8	22.9	21.9	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	[illegible]	[illegible]	0.2	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	[illegible]	0.1	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	7.3	[illegible]	12.9	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	[illegible]	0.1	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	[illegible]	1.8	1.2	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	[illegible]	1.8	1.2	0.1

ND=Not Detected
DL=Detection Limit

WESTON

TABLE 13.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: SIMPSON-PASADENA
Source Code: SP-BPSFHS
FIN: PN2135 EPN: SN61

Source: First NaOCl Seal Box Vent
Test Dates: 6/3/92, 6/4/92
CIN: NA

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	136	145	141	
Volumetric Flow Rate, x 10^3 DSCFM	0.5	0.7	0.6	
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8	22.9	21.9	
Emission Rate, lb/hr				
Chloroform	9.0	[illegible]	[illegible]	0.1
Hydrogen chloride	ND	<0.1	0.1	0.1

ND = Not Detected
DL = Detection Limit

Section 13.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	First NaOCl Seal Box Vent		FIN:	PN2135
Source Code: SP-BPSFHS	Date:	6/3/92	EPN: SN61	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1238	1344	1444	
Flow Data				
Stack Temperature, °F	136			136
Moisture Content, %	17.8			17.8
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.6			0.6
Volumetric Flow Rate, x10^3 DSCFM	0.5			0.5
Process Operating Conditions				
Production Rate, ADT pulp/hr	22.9	22.9	22.9	22.9
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	58.6	82.6	81.5	74.2
Emission Rate, lb/hr	0.1	0.2	0.2	0.2
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.6 *	0.7	1.0	0.7
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	First NaOCl Seal Box Vent		FIN:	PN2135
Source Code: SP-BPSFHS	Date:	6/3/92	EPN: SN61	CIN:	NA

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1089.5	860.3	830.9	926.9
Emission Rate, lb/hr	9.3	7.3	7.1	7.9
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.2 *	1.2 *	1.2 *	1.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

*One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: First NaOCl Seal Box Vent | FIN: PN2135
Source Code: SP-BPSFHS | Date: 6/3/92 | EPN: SN61 | CIN: NA

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	944.4	771.2	746.6	820.7
Unknowns as Carbon				
Concentration, ppmvd	2.1	3.8	3.6	3.2
Sum M18 as Carbon, lb/hr	0.8	0.7	0.6	0.7
Unknown Compounds % of Total	0.2%	0.5%	0.5%	0.4%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	493.9	428.2	419.7	447.3
Emission Rate, lb/hr as C	0.4	0.4	0.4	0.4

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: First NaOCl Seal Box Vent | FIN: PN2135
Source Code: SP-BPSFHS | Date: 6/4/92 | EPN: SN61 | CIN: NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1331	1431	1531	
Flow Data				
Stack Temperature, °F		145		145
Moisture Content, %		22.5		22.5
Oxygen Concentration, %		20.8		20.8
Carbon Dioxide Concentration, %		0.0		0.0
Volumetric Flow Rate, x10^3 ACFM		1.0		1.0
Volumetric Flow Rate, x10^3 DSCFM		0.7		0.7
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8	20.8	20.8	20.8
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	98.5	93.4	49.4	80.4
Emission Rate, lb/hr	0.3	0.3	0.2	0.3
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.6	0.6 *	0.6 *	0.4
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	First NaOCl Seal Box Vent		FIN:	PN2135
Source Code: SP-BPSFHS	Date:	6/4/92	EPN: SN61	CIN:	NA

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 •	0.6 •	0.6 •
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1568.5	1490.1	1078.3	1379.0
Emission Rate, lb/hr	20.5	19.4	14.1	18.0
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 •	0.6 •
Emission Rate, lb/hr	0.1 *	0.1 •	0.1 •	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.3 *	1.3 •	1.3 •	1.3 •
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 •	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 •
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 •	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.6 •	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 •	0.1 •	0.1 •	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.6 •	0.6 •	0.6 •	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 •	0.1 •
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 •	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 •	0.1 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 •	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.9	3.5	4.5	3.0
Emission Rate, lb/hr	0.1 *	0.1 •	0.1 *	0.1 *

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source: First NaOCl Seal Box Vent		FIN: PN2135
Source Code: SP-BPSFHS	Date: 6/4/92	EPN: SN61	CIN: NA

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	1373.0	1322.8	960.9	1218.9
Unknowns as Carbon				
Concentration, ppmvd	2.3	2.3	7.7	4.1
Sum M18 as Carbon, lb/hr	1.8	1.7	1.3	1.6
Unknown Compounds % of Total	0.2%	0.2%	0.8%	0.4%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	700.6	667.1	674.8	680.9
Emission Rate, lb/hr as C	0.9	0.9	0.9	0.9

* One or more values were less than the detection limit.

Section 13.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA	Source:	First NaOCl Seal Box Vent		FIN:	PN2135
Source Code: SP-BPSFHS	Date:	6/3/92	EPN: SN61	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1241			
Flow Data				
Stack Temperature, °F	136			136
Moisture Content, %	17.8			17.8
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.6			0.6
Volumetric Flow Rate, x10^3 DSCFM	0.5			0.5
Process Operating Conditions				
Production Rate, ADT pulp/hr	22.9			22.9
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	1126.6			1126.6
Emission Rate, lb/hr	9.6			9.6
Hydrogen chloride				
Concentration, ppmvd	1.2			1.2
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA	Source:	First NaOCl Seal Box Vent		FIN:	PN2135
Source Code: SP-BPSFHS	Date:	6/4/92	EPN: SN61	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1456			
Flow Data				
Stack Temperature, °F	145			145
Moisture Content, %	22.5			22.5
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	1.0			1.0
Volumetric Flow Rate, x10^3 DSCFM	0.7			0.7
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8			20.8
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	1598.4			1598.4
Emission Rate, lb/hr	20.9			20.9
Hydrogen chloride				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

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Section 13.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL SP SOURCE SP-BPSFHS

1. CALIBRATION

THEOR	DATE 6/3/92		DATE 6/4/92	
ppm	ppm	%REC	ppm	%REC
0	0	0.0%	-2	-0.2%
90	88	97.8%	89	98.9%
149	152	102.0%	154	103.4%
375	373	99.5%	373	99.5%

2. PROPANE LINE RECOVERY

	DATE 6/3/92			DATE 6/4/92		
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	84	78	93%	356	324	91%
AFTER	381	360	94%	365	346	95%

3. LINE BLANK

	DATE 6/3/92		DATE 6/4/92	
	INST	LINE	INST	LINE
BEFORE	0	0	0	0
AFTER	0	0	0	0

QUALITY CONTROL SUMMARY
METHOD 18

MILL SP SOURCE SP-BPSFHS

1. CHECK STANDARD

ANALYTE	THEOR ppm	DATE ppm	6/3/92 %REC	THEOR ppm	DATE ppm	6/4/92 %REC
ethanol	55.64	53.85	96.78%	55.64	56.25	101.09%
acetone	44.47	45.60	102.53%	44.47	49.98	112.38%
isopropanol	42.65	39.39	92.34%	42.65	45.81	107.40%
dimethyl sulfide	9.78	9.09	92.94%	9.78	10.58	108.22%
benzene	36.54	31.86	87.20%	36.54	43.38	118.72%
bromodichloromethane	20.08	17.67	87.97%	20.08	22.19	110.50%
dimethyl disulfide	36.26	32.06	88.40%	36.26	39.45	108.81%
toluene	30.73	28.85	93.87%	30.73	34.07	110.88%
ethyl benzene	26.67	24.58	92.16%	26.67	29.53	110.74%
m-xylene	53.27	49.25	92.44%	53.27	60.00	112.63%
o-xylene	26.76	24.87	92.93%	26.76	29.48	110.18%
cumene	23.47	21.72	92.55%	23.47	25.96	110.61%
alpha-pinene	20.49	19.27	94.03%	20.49	22.90	111.73%
beta-pinene	20.59	19.22	93.34%	20.59	23.47	113.99%
3-carene	20.61	20.57	99.80%	20.61	23.13	112.22%
p-cymene	20.92	18.79	89.82%	20.92	22.87	109.30%

2. PROPANE RESPONSE

	THEOR			THEOR		
BEFORE RUN	89.7	88.5	98.6%	89.7	84.3	94.0%
AFTER RUN	89.7	83.6	93.2%	89.7	86.3	96.2%

3. METHANOL LINE RECOVERY

	THEOR			THEOR		
BEFORE RUN	103.3	105.8	102.4%	100.1	95.9	95.8%
AFTER RUN	101.7	104.1	102.4%	91.6	98.8	107.8%

4. LINE BLANK

	[--------------FILE REF--------------]	
BEFORE RUN	F3A4007	F4A4008
AFTER RUN	F3A4013	F4A4014

Section 13.4 Process Operating Data

MILL: SIMPSON PAPER SOURCE: PINE BLEACH PLANT

	UNITS												
DATE		8/03 ->			8/03 ->			8/04 ->			8/04 ->		
TIME		1200	1300	1400	1700	1800	1900	0912	1012	1112	1331	1431	1531
SOURCE		BPSFHS ->			BPSESB ->			BPSESB ->			BPSFHS ->		
FIN		PN2135 ->			PN2132 ->			PN2132 ->			PN2135 ->		
EPN		SN61 ->			SN58 ->			SN58 ->			SN61 ->		
WOOD		PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE
PRODUCT	T/D	550	550	550	550	550	550	500	500	500	500	500	500
KAPPA		30.1	30.1	33.5	33.5	26.7	26.7	27.6	27.6	27.6	27.6	27.6	27.6
CE K		2.6	2.6	2.5	2.4	2.4	2.7	2.8	1.8	2.0	2.0	2.0	3.1
CHEM USAGE													
Cl_2	LB/T	36	32	40	36	32	40	48	48	46	52	52	52
ClO_2	LB/T	32	28	35	32	28	35	43	43	41	46	46	46
NaOH	LB/T	56	40	32	40	48	60	40	40	40	40	40	40
OXYGEN	LB/T	0	0	0	0	0	0	0	0	0	0	0	0
NaOCl	LB/T	10	10	10	10	10	10	12	12	12	12	12	12
NaOH	LB/T	0.8	0.8	0.8	0	0	0	0.8	0.6	0.8	0	0	0
ClO_2	LB/T	19	19	19	19	19	19	19	19	19	19	19	19
NaOH	LB/T	5.8	5.8	5.8	5.2	5.2	5.2	6.5	5.9	5.9	0	0	0
NAOCl	LB/T	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
NaOH	LB/T	4.0	3.0	2.0	3.0	4.0	4.8	3.0	3.0	3.0	0	0	0
Dc STOCK	F	127	129	130	130	130	130	133	133	133	134	134	134
Eo MIXER	F	159	162	168	164	162	161	159	167	166	166	166	168
H_1 MIXER	F	160	160	161	159	160	160	161	162	158	161	161	161
D UPFLOW	F	168	174	177	174	175	174	175	175	175	174	174	174
H_2 MIXR	F	120	120	120	118	119	120	129	128	128	126	126	126
pH LEVEL													
Eo		10.6	10.9	10.8	9.6	8.6	8.5	10.8	10.8	10.6	11.0	11.0	11.3
H_1		9.6	9.6	10.3	9.8	9.8	9.5	9.3	9.3	9.1	9.1	9.1	9.2
D		3.6	3.6	3.8	3.8	3.8	3.9	3.8	4.0	4.1	4.1	4.1	4.0
H_2		9.6	9.6	10.1	9.8	9.8	8.8	9.5	9.5	9.8	9.8	9.8	9.2

SCRUBBER. Cl_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW 4000 SCFM DESIGN
LIQ FLOW 5 GPM 5% CAUSTIC
DP 3.5 INCHES H_2O

SCRUBBER. ClO_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW 4000 SCFM DESIGN
LIQ FLOW 1 GPM WHITE LIQUOR
DP 3.5 INCHES H_2O

NOTES: 1.0 BLEACHING SEQUENCE -	RETENTION TIMES. MIN @ 550 T/D
CHLORINE WITH CLORINE DIOXIDE. Dc	30
CAUSTIC SODA & OXYGEN. Eo	60
1st SODIUM HYPOCHLORITE. H_1	50
CHLORINE DIOXIDE. D	220
2nd SODIUM HYPOCHLORITE. H_2	120

2.0 ClO_2 SUBSITITUTION MAINTAINED AT 70%
3.0 ALL VALUES ONE HOUR READINGS FROM OPERATIONS LOG
4.0 PRODUCTION IS IN OVEN DRY UNBLEACHED SHORT TONS
5.0 ClO_2 IS AS ClO_2 USAGE

Note: See Apendix D for Unit Process Descriptions

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SECTION 14
COMBINED CHLORINATION SCRUBBER VENT
(SP-BPSCCS)

14. SP-BPSCCS

SECTION 14
COMBINED CHLORINATION SCRUBBER VENT
(SP-BPSCCS)

The Combined Chlorination Scrubber Vent was tested on two different days. The source was sampled for Methods 25A and 18. Chloroform and hydrogen chloride samples were collected.

Total Hydrocarbons (M25A)

Figures 14.1 and 14.2 present the THC trends for the test periods on 6/7/92 and 6/8/92, respectively. On the first day, the total hydrocarbon concentrations exhibited an upward trend from 85 to 151 ppm. A decrease in concentration occurred at 1413 to 47 ppm. On the second day, they ranged from 0 to 2 ppm with a significant increase at 1850 to 207 ppm.

Volatile Organic Compounds (M18)

Table 14.1 summarizes the results for the Method 18 target compounds, and Section 14.1 is a tabulation of the data. Methanol and chloroform were detected by the Method 18 analyses. Unknowns were present before methanol on day 1. Concentrations of methanol and chloroform on day 2 were considerably lower than day 1. The volumetric flow was measured during sampling with a pitot tube.

Miscellaneous Parameters

Table 14.2 summarizes the results of testing for hydrogen chloride and chloroform. Section 14.2 tabulates the results for each compound. Chloroform results (lb/hr) were comparable to Method 18 data. Hydrogen chloride was detected on day 1 (<0.1 lb/hr).

VOC Quality Control Results

The VOC quality control data are tabulated in Section 14.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 14.4 includes the process operating data as recorded and provided by mill personnel.

FIGURE 14.1
THC TREND ANALYSIS (6/7/92)
COMBINED CHLORINATION SCRUBBER VENT
(SP-BPSCCS)

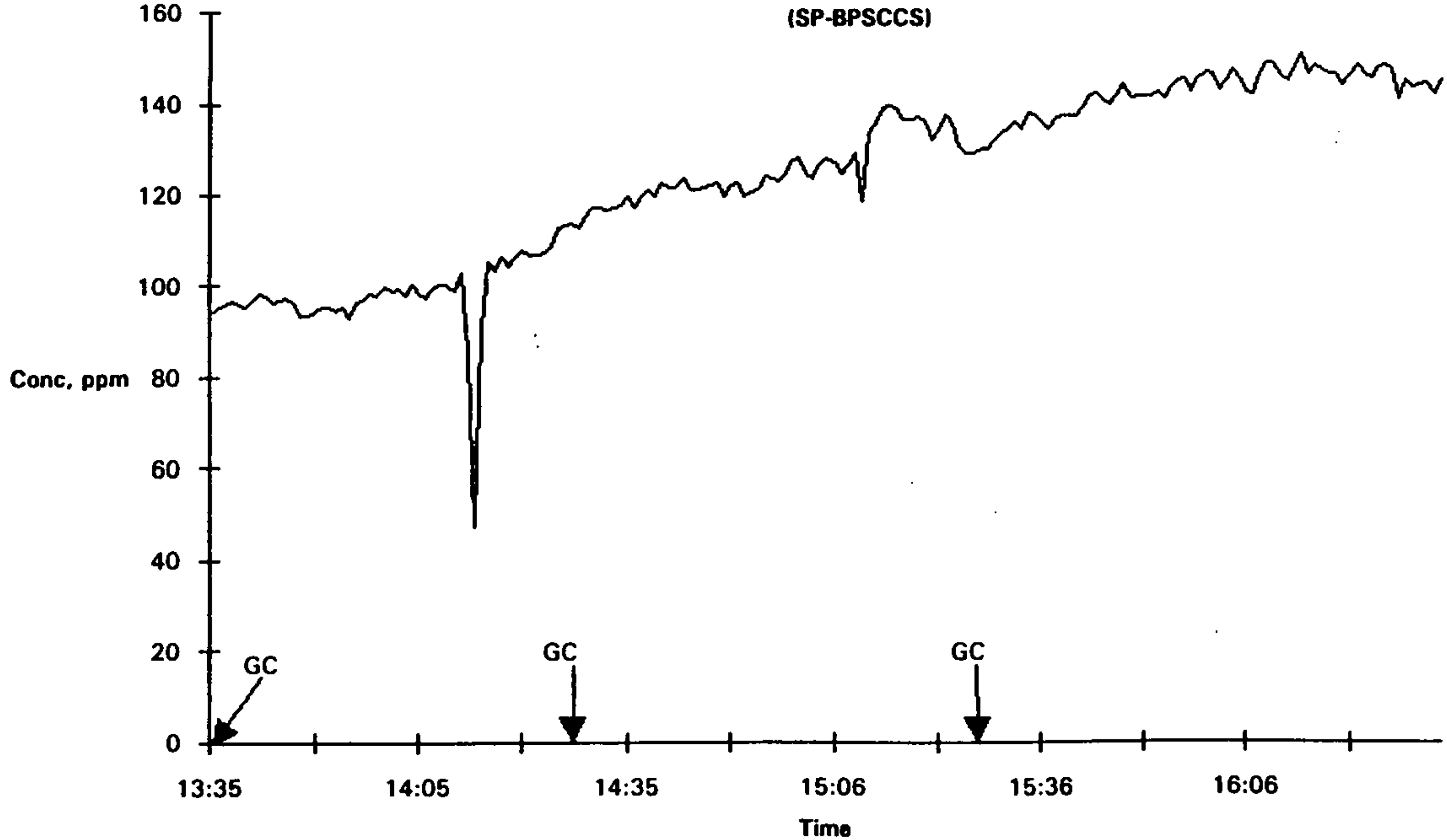

FIGURE 14.2
THC TREND ANALYSIS (6/8/92)
COMBINED CHLORINATION SCRUBBER VENT
(SP-BPSCCS)

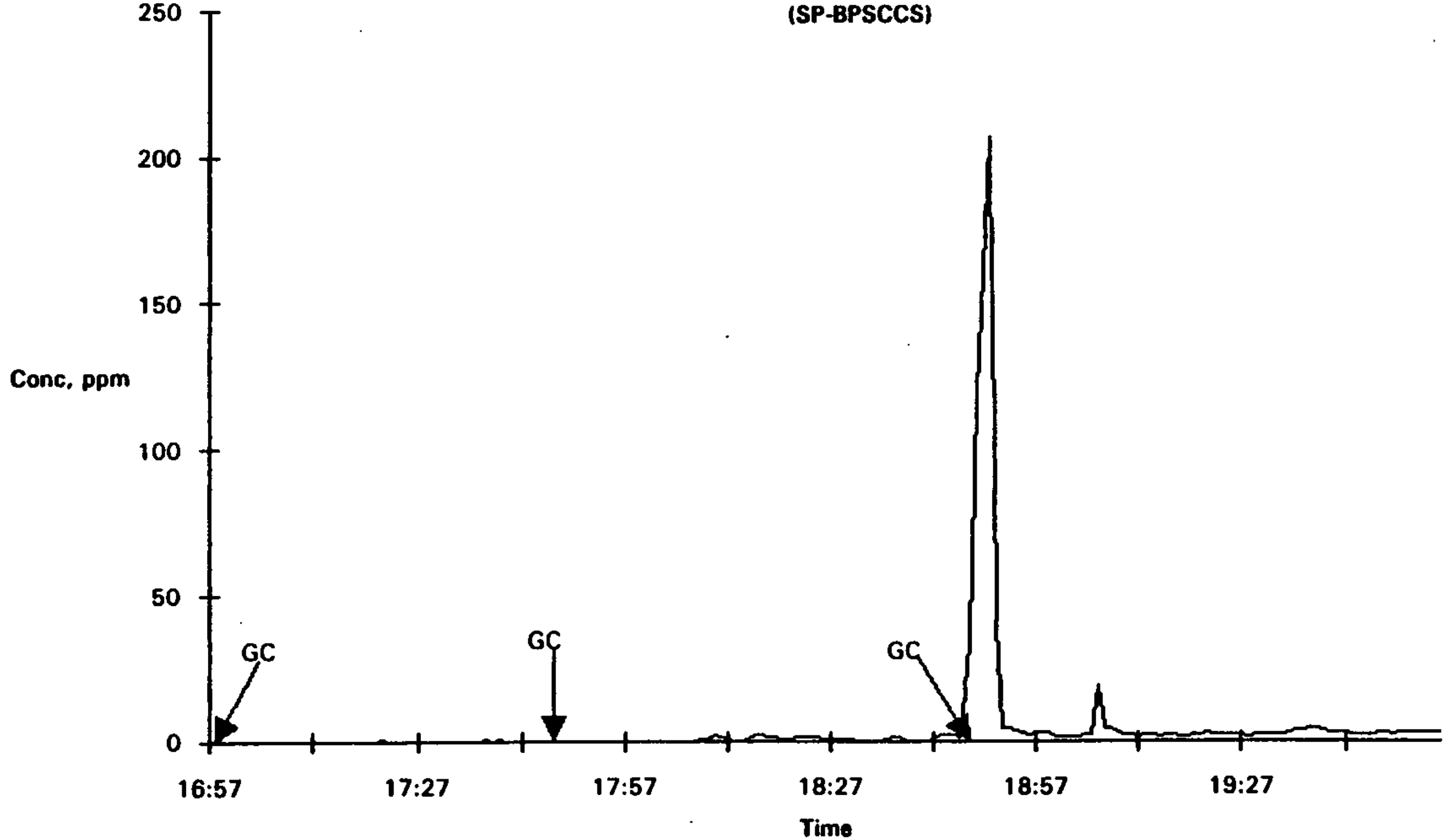

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TABLE 14.1 SUMMARY OF VOC RESULTS

Mill: SIMPSON - PASADENA
Source: Combined Chlorination Scrubber Vent
Source Code: SP-BPSCCS
Test Dates: 6/7/92 6/8/92
FIN: PN2128 CIN: CN2129
EPN: SN80

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	103	121	112	
Volumetric Flow Rate, x10^3 DSCFM	1.4	1.7	1.6	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	20.8	20.8	20.8	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	ND	0.8	0.4	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	ND	1.3	0.6	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	ND	ND	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	ND	0.3	0.1	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	ND	0.4	0.2	0.1

ND=Not Detected
DL=Detection Limit

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TABLE 14.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: SIMPSON-PASADENA
Source Code: SP-BPSCCS
FIN: PN2128 EPN: SN80

Source: Combined Chlorination Scrubber Vent
Test Dates: 6/7/92, 6/8/92
CIN: CN2129

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	103	121	112	
Volumetric Flow Rate, x 10^3 DSCFM	1.4	1.7	1.6	
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8	20.8	20.8	
Emission Rate, lb/hr				
Chloroform	0.3	1.7	1.0	0.1
Hydrogen chloride	ND	<0.1	0.1	0.1

ND = Not Detected
DL = Detection Limit

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Section 14.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Combined Chlorination Scrubber Vent | FIN: PN2128
Source Code: SP-BPSCCS | Date: 6/7/92 | EPN: SN80 | CIN: CN2129

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1334	1434	1534	
Flow Data				
Stack Temperature, °F		121		121
Moisture Content, %		10.8		10.8
Oxygen Concentration, %		20.8		20.8
Carbon Dioxide Concentration, %		0.0		0.0
Volumetric Flow Rate, x10^3 ACFM		1.8		1.8
Volumetric Flow Rate, x10^3 DSCFM		1.4		1.4
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8	20.8	20.8	20.8
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	76.9	99.3	114.2	96.8
Emission Rate, lb/hr	0.5	0.7	0.8	0.7
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

*One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA
Source Code: SP-BPSCCS

Source: Combined Chlorination Scrubber Vent
Date: 6/7/92 EPN: SN80

FIN: PN2128
CIN: CN2129

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	30.5	40.1	49.4	40.0
Emission Rate, lb/hr	0.8	1.1	1.3	1.1
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	Combined Chlorination Scrubber Vent		FIN:	PN2128
Source Code: SP-BPSCCS	Date:	6/7/92	EPN: SN80	CIN:	CN2129

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	88.9	110.3	127.4	108.9
Unknowns as Carbon				
Concentration, ppmvd	3.3	5.5	6.6	5.1
Sum M18 as Carbon, lb/hr	0.2	0.3	0.4	0.3
Unknown Compounds % of Total	3.5%	4.7%	4.9%	4.4%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	112.1	142.4	161.4	138.6
Emission Rate, lb/hr as C	0.3	0.4	0.4	0.4

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	Combined Chlorination Scrubber Vent		FIN:	PN2128
Source Code: SP-BPSCCS	Date:	6/8/92	EPN: SN80	CIN:	CN2129

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1656	1756	1856	
Flow Data				
Stack Temperature, °F	103			103
Moisture Content, %	7.1			7.1
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	1.9			1.9
Volumetric Flow Rate, x10^3 DSCFM	1.7			1.7
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8	20.8	20.8	20.8
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	3.4	3.2	2.2 *	2.6
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Combined Chlorination Scrubber Vent | FIN: PN2128
Source Code: SP-BPSCCS | Date: 6/8/92 | EPN: SN80 | CIN: CN2129

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.1 *	1.1 *	2.6	1.2
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Combined Chlorination Scrubber Vent | FIN: PN2128
Source Code: SP-BPSCCS | Date: 6/8/92 | EPN: SN80 | CIN: CN2129

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 •	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	2.3	3.9	3.4	3.2
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.5 *	4.4	1.7
Sum M18 as Carbon, lb/hr	0.1 *	0.1 •	0.1 *	0.1 •
Unknown Compounds % of Total	0.0%	12.2%	56.2%	22.8%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	0.5 •	10.8	3.2	4.8
Emission Rate, lb/hr as C	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

Section 14.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA Source: Combined Chlorination Scrubber Vent FIN: PN2128
Source Code: SP-BPSCCS Date: 6/7/92 EPN: SN80 CIN: CN2129

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1500			
Flow Data				
Stack Temperature, °F	121			121
Moisture Content, %	10.8			10.8
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	1.8			1.8
Volumetric Flow Rate, x10^3 DSCFM	1.4			1.4
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8			20.8
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	66.4			66.4
Emission Rate, lb/hr	1.7			1.7
Hydrogen chloride				
Concentration, ppmvd	1.2			1.2
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA		Source:	Combined Chlorination Scrubber Vent	FIN:	PN2128
Source Code:	SP-BPSCCS	Date:	6/8/92 EPN: SN80	CIN:	CN2129

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1830			
Flow Data				
Stack Temperature, °F	103			103
Moisture Content, %	7.1			7.1
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	1.9			1.9
Volumetric Flow Rate, x10^3 DSCFM	1.7			1.7
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8			20.8
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	8.8			8.8
Emission Rate, lb/hr	0.3			0.3
Hydrogen chloride				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

Section 14.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL SP SOURCE SP-BPSCCS

1. CALIBRATION

THEOR	DATE 6/7/92		DATE 6/8/92	
ppm	ppm	%REC	ppm	%REC
0	-6	-0.6%	-5	-0.5%
90	91	101.1%	89	98.9%
149	157	105.4%	157	105.4%
375	371	98.9%	371	98.9%

2. PROPANE LINE RECOVERY

	DATE	6/7/92		DATE	6/8/92	
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	390	376	96%	397	398	100%
AFTER	397	398	100%	384	368	96%

3. LINE BLANK

	DATE	6/7/92	DATE	6/8/92
	INST	LINE	INST	LINE
BEFORE	1	0	0	0
AFTER	0	0	0	0

QUALITY CONTROL SUMMARY
METHOD 18

MILL SP SOURCE SP-BPSCCS

1. CHECK STANDARD

ANALYTE	THEOR	DATE	6/7/92	THEOR	DATE	6/8/92
	ppm	ppm	%REC	ppm	ppm	%REC
ethanol	55.64	49.80	89.49%	55.64	43.83	78.77%
acetone	44.47	49.46	111.21%	44.47	44.68	100.46%
isopropanol	42.65	40.36	94.62%	42.65	35.91	84.20%
dimethyl sulfide	9.78	10.31	105.47%	9.78	8.90	91.06%
benzene	36.54	32.21	88.16%	36.54	35.24	96.43%
bromodichloromethane	20.08	22.80	113.54%	20.08	21.05	104.82%
dimethyl disulfide	36.26	37.58	103.63%	36.26	34.27	94.51%
toluene	30.73	35.52	115.60%	30.73	29.67	96.55%
ethyl benzene	26.67	28.16	105.60%	26.67	25.79	96.70%
m-xylene	53.27	55.27	103.74%	53.27	50.62	95.02%
o-xylene	26.76	28.68	107.17%	26.76	26.21	97.96%
cumene	23.47	25.11	106.98%	23.47	22.99	97.93%
alpha-pinene	20.49	21.85	106.63%	20.49	19.99	97.53%
beta-pinene	20.59	21.43	104.08%	20.59	19.54	94.93%
3-carene	20.61	21.30	103.32%	20.61	19.40	94.11%
p-cymene	20.92	21.92	104.74%	20.92	19.96	95.41%

2. PROPANE RESPONSE

	THEOR			THEOR		
BEFORE RUN	89.7	84.3	94.0%	89.7	82.3	91.8%
AFTER RUN	89.7	82.9	92.4%	89.7	82.2	91.6%

3. METHANOL LINE RECOVERY

	THEOR			THEOR		
BEFORE RUN	103.1	•		108.5	•	
AFTER RUN	95.6	103.6	108.3%	106.2	82.9	78.0%

4. LINE BLANK

	[--------------FILE REF--------------]	
BEFORE RUN	F7B4007	F8B4010
AFTER RUN	F7B4013	F8B4017

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Section 14.4 Process Operating Data

MILL: SIMPSON PAPER SOURCE: PINE BLEACH PLANT

DATE		6/07 ->						6/07 ->								
TIME		0900	1000	1100	0900	1000	1100	1334	1434	1534	1334	1434	1534	1841	1941	2041
SOURCE		BPSSHW ->			BPSSHS ->			BPSCCS ->			BPSCSV ->			BPSFHT ->		
FIN		PN2141 ->			PN2142 ->			PN2126-2127-2128 ->			PN2136-2137-2138 ->			PN2133 ->		
EPN		SN63 ->			SN64 ->			SN80 ->			SN61 ->			SN59 ->		
	UNITS															
WOOD		PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE
PRODUCT	T/D	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
KAPPA		31.9	31.8	33.7	31.9	31.8	33.7	33.7	37.2	34.7	33.7	37.2	35.7	36.6	40.8	30.5
CE K		3.1	3.7	3.4	3.1	3.7	3.4	3.4	3.5	3.3	3.4	3.5	3.3	3.7	3.1	3.1
CHEM USAGE																
Cl_2	LB/T	74	70	70	74	70	70	54	68	70	70	68	70	72	76	64
ClO_2	LB/T	66	62	62	66	62	62	48	59	62	62	59	62	64	67	57
NaOH	LB/T	44	44	44	44	44	44	40	40	44	40	40	44	52	52	52
OXYGEN	LB/T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NaOCl	LB/T	13	13	13	13	13	13	13	13	13	12	12	12	12	12	10
NaOH	LB/T	.8	.8	.8	.8	.8	.8	0	0	0	0	0	0	0	0	0
ClO_2	LB/T	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
NaOH	LB/T															
NAOCl	LB/T	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NaOH	LB/T	2.0	2.0	2.0	2.0	2.0	2.0	1.2	1.2	1.4	1.2	1.2	1.4	3.2	3.2	3.2
Dc STOCK	F	124	123	122	124	123	122	131	131	131	131	131	131	131	131	128
Eo MIXER	F	158	154	161	158	154	161	165	164	166	165	164	166	165	160	158
H_1 MIXER	F	146	158	160	146	158	160	154	153	159	154	153	159	161	162	161
D UPFLOW	F	159	152	158	159	152	158	157	172	171	157	172	171	172	170	172
H_2 MIXR	F	100	99	100	100	99	100	116	117	118	116	117	118	123	124	126
pH LEVEL																
Eo		10.0	10.0	10.0	10.0	10.0	10.00	10.5	10.4	10.0	10.5	10.4	10.0	10.2	10.2	10.1
H_1		9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.7	9.8	10.4	3.0	10.3	9.80	9.8
D		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
H_2		9.5	9.6	9.5	9.5	9.6	9.5	9.5	9.8	9.4	9.5	9.8	3.4	9.1	9.7	9.7

SCRUBBER, Cl_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW 4000 SCFM
LIQ FLOW 5 GPM 5% CAUSTIC
DP 3.5 IN H_2O

SCRUBBER, ClO_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW 4000 SCFM
LIQ FLOW 1 GPM WHITE LIQUOR
DP 3.5 IN H_2O

NOTES: 1.0 BLEACHING SEQUENCE -	RETENTION TIMES, MIN @ 550 T/D
CHLORINE WITH CLORINE DIOXIDE, Dc	30
CAUSTIC SODA & OXYGEN, Eo	80
1st SODIUM HYPOCHLORITE, H_1	50
CHLORINE DIOXIDE, D	220
2nd SODIUM HYPOCHLORITE, H_2	120

2.0 ClO_2 SUBSITITUTION MAINTAINED AT 70%
3.0 ALL VALUES ONE HOUR READINGS FROM OPERATIONS LOG
4.0 PRODUCTION IS IN OVEN DRY UNBLEACHED SHORT TONS
5.0 ClO_2 AS ClO_2 USAGE

Note: See Appendix D for Unit Process Description

MILL: SIMPSON PAPER SOURCE: PINE BLEACH PLANT

	UNITS										
DATE		6/08 ->						6/08	6/08 ->		
TIME		1100	1200	1300	1519	1556	1756	1356	1556	1756	1356
SOURCE		BPSETV ->			BPSSHT	BPSCSV ->			BPSCCS ->		
PIN		PN2130 ->			PN2140	PN2319 ->			PN2128 ->		
SPN		SN56 ->			SN62	SN81->			SN80->		
WOOD		PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE
PRODUCT	T/D	500	500	500	500	500	500	500	500	500	500
KAPPA		24.8	24.8	36.3	32.1	43.1	43.1	43.1	43.1	43.1	33.9
CE K		3.0	3.1	3.2	3.0	3.1	3.2	3.2	3.2	3.4	3.2
CHEM USAGE											
Cl_2	LB/T	44	36	44	56	64	66	52	64	58	62
ClO_2	LB/T	39	32	39	50	57	59	55	48	59	55
NaOH	LB/T	40	40	48	44	50	60	60	60	60	60
OXYGEN	LB/T	0	0	0	0	0	0	0	0	0	0
NaOCl	LB/T	12	12	12	12	12	12	12	12	12	12
NaOH	LB/T	0	0	0	0	0	0	0	0	0	0
ClO_2	LB/T	19	19	19	19	19	19	19	19	19	19
NaOH	LB/T	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
NAOCl	LB/T	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
NaOH	LB/T	2.0	2.0	2.0	3.6	3.2	2.8	2.8	3.2	2.8	2.8
Dc STOCK	F	132	131	133	132	133	133	134	133	133	134
Eo MIXER	F	179	180	179	167	168	168	169	168	168	169
H_1 MIXER	F	159	157	159	160	158	158	158	158	158	158
D UPFLOW	F	170	170	171	174	170	174	172	170	174	171
H_2 MIXR	F	125	125	125	125	127	126	127	127	126	127
pH LEVEL											
Eo		10.3	10.3	10.4	10.4	9.8	10.1	10.1	9.8	10.1	10.1
H_1		9.5	9.7	9.7	9.5	9.7	9.4	9.7	9.7	9.4	9.7
D		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
H_2		9.1	9.1	9.0	8.5	9.8	9.8	9.6	9.8	9.8	9.6

SCRUBBER, Cl_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW 4000 SCFM
LIQ FLOW 5.0 GPM 5% CAUSTIC
DP 3.5 INCHES H_2O

SCRUBBER, ClO_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW 4000 SCFM
LIQ FLOW 1 GPM WHITE LIQUOR
DP 3.5 INCHES H_2O

NOTES: 1.0 BLEACHING SEQUENCE -	RETENTION TIMES, MIN @ 550 T/D
CHLORINE WITH CLORINE DIOXIDE, Dc	30
CAUSTIC SODA & OXYGEN, Eo	80
1st SODIUM HYPOCHLORITE, H_1	50
CHLORINE DIOXIDE, D	220
2nd SODIUM HYPOCHLORITE, H_2	120

2.0 ClO_2 SUBSITITUTION MAINTAINED AT 70%
3.0 ALL VALUES ONE HOUR READINGS FROM OPERATIONS LOG
4.0 PRODUCTION IS IN OVEN DRY UNBLEACHED SHORT TONS
5.0 ClO_2 IS AS ClO_2 USAGE

Note: See Appendix D for Unit Process Description

SECTION 15

COMBINED ClO_2 SCRUBBER VENT

(SP-BPSCSV)

15. SP-BPSCSV

SECTION 15
COMBINED ClO_2 SCRUBBER VENT
(SP-BPSCSV)

The Combined ClO_2 Scrubber Vent was tested on two different days. The source was sampled for volatile organic compounds by Methods 25A and 18. Chloroform and hydrogen chloride samples were collected.

Total Hydrocarbons (M25A)

Figures 15.1 and 15.2 present the THC trends for the test periods on 6/7/92 and 6/8/92, respectively. One the first day, the total hydrocarbon concentrations ranged from 45 to 66 ppm with a decrease in concentration at 1357 to 38 ppm. On the second day, they varied from 55 to 86 ppm.

Volatile Organic Compounds (M18)

Table 15.1 summarizes the results for the Method 18 target compounds, and Section 15.1 is a tabulation of the data. Methanol and chloroform were detected by the Method 18 analyses. Unknowns were present before methanol at ~1 ppm as carbon. The volumetric flow was measured during sampling with a pitot tube.

Miscellaneous Parameters

Table 15.2 summarizes the results of testing for hydrogen chloride and chloroform. Section 15.2 tabulates the results for each compound. Chloroform results (lb/hr) were 1 1/2 times more than Method 18 results for the two day period. Hydrogen chloride was detected on day 1 (<0.1 lb/hr).

VOC Quality Control Results

The VOC quality control data are tabulated in Section 15.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 15.4 includes the process operating data as recorded and provided by mill personnel.

FIGURE 15.1
THC TREND ANALYSIS (6/7/92)
COMBINED ClO2 SCRUBBER VENT (SP-BPSCSV)

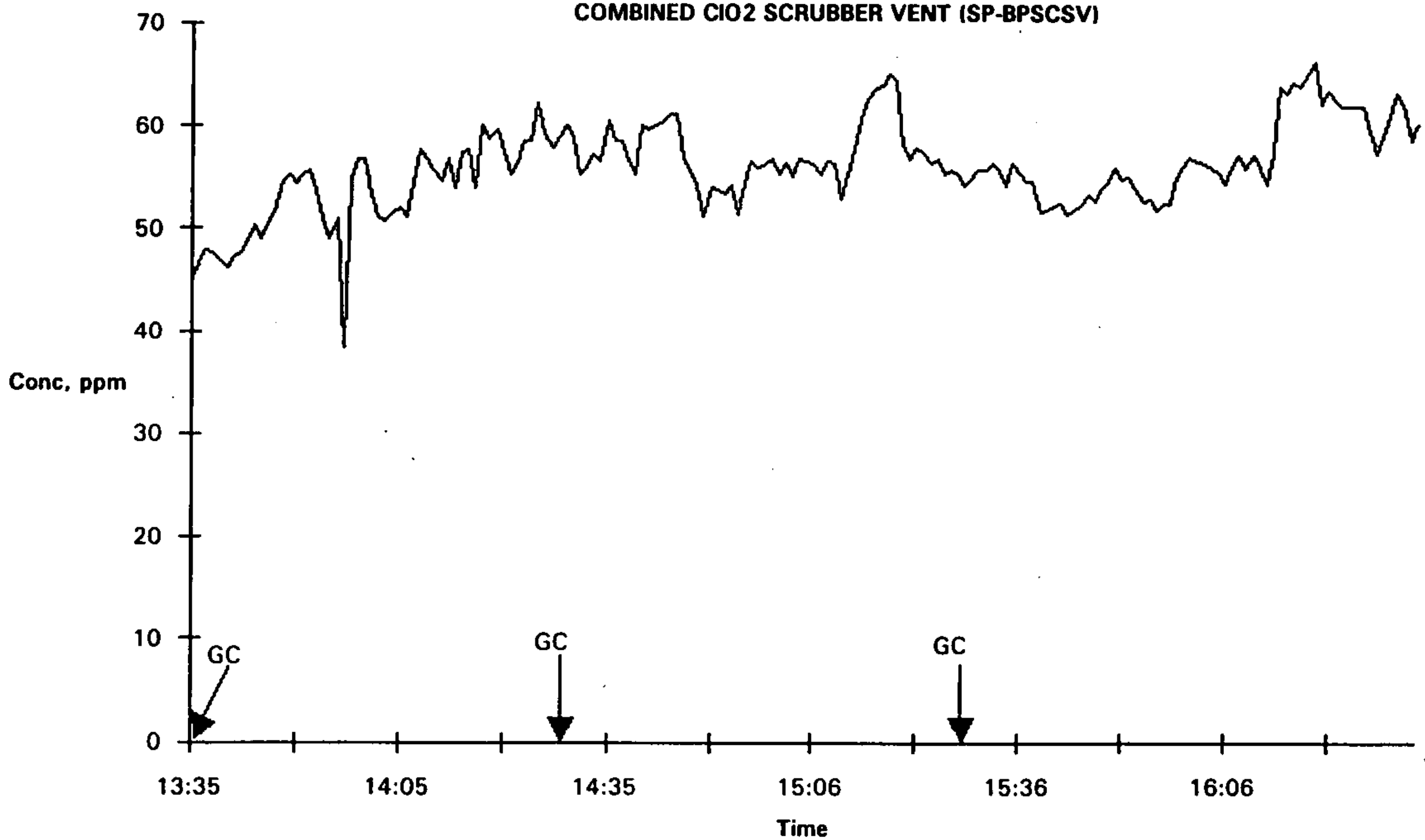

FIGURE 15.2
THC TREND ANALYSIS (6/8/92)
COMBINED ClO2 SCRUBBER VENT (SP-BPSCSV)

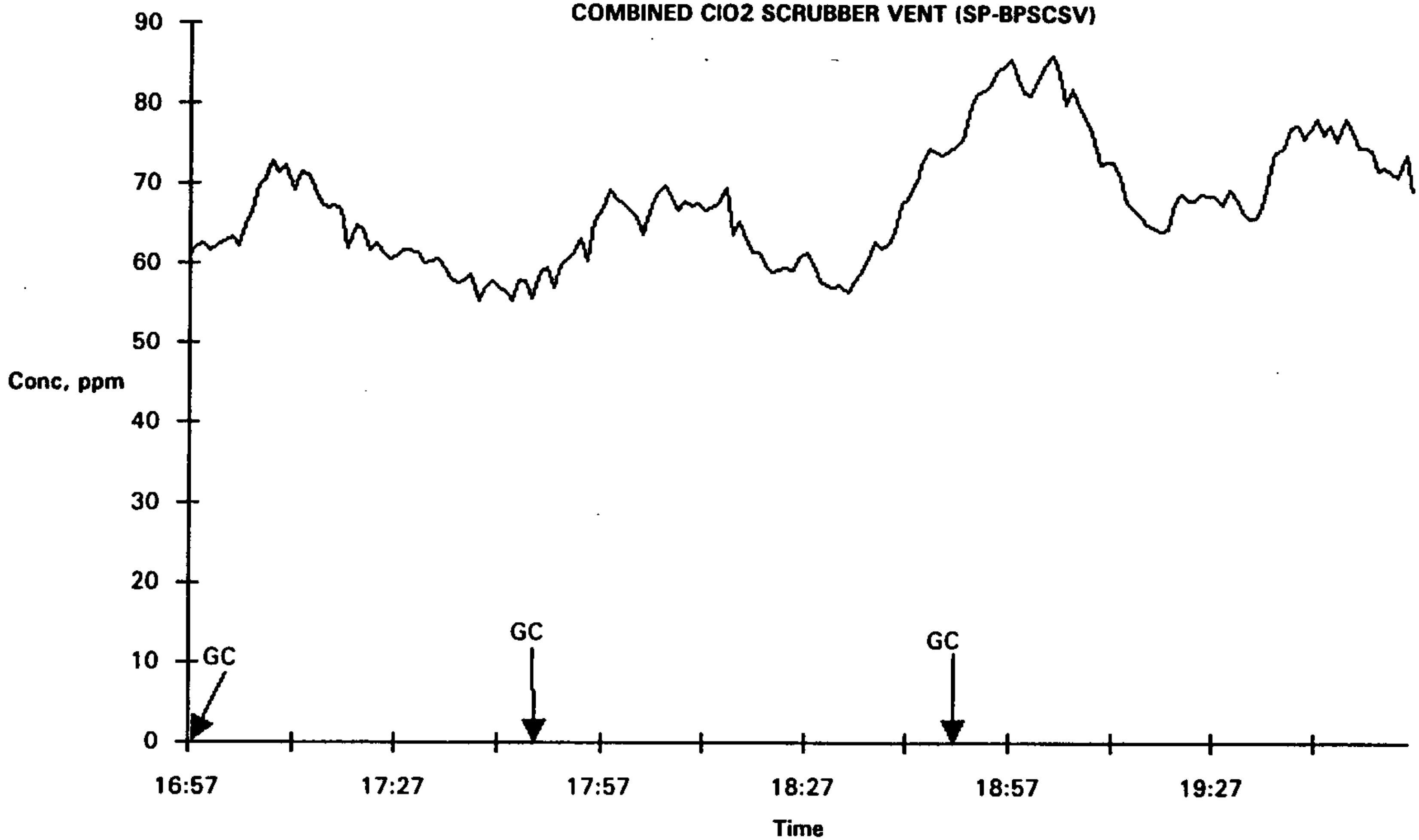

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TABLE 15.1 SUMMARY OF VOC RESULTS

Mill:	SIMPSON - PASADENA	Source:	Combined ClO2 Scrubber Vent
Source Code:	SP-BPSCSV	Test Dates:	6/7/92 6/8/92
FIN: PN2138	CIN: CN2139	EPN:	SN81

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	124	125	125	
Volumetric Flow Rate, $x10^3$ DSCFM	4.3	4.4	4.4	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	20.8	20.8	20.8	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	1.2	2.0	1.7	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	1.1	1.9	1.4	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	ND	ND	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	0.5	0.7	0.7	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	0.5	0.7	0.7	0.1

ND=Not Detected
DL=Detection Limit

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TABLE 15.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: SIMPSON-PASADENA
Source Code: SP-BPSCSV
FIN: PN2138 EPN: SN81

Source: Combined ClO_2 Scrubber Vent
Test Dates: 6/7/92, 6/8/92
CIN: CN2139

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	124	125	125	
Volumetric Flow Rate, x 10^3 DSCFM	4.2	4.6	4.4	
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8	20.8	20.8	
Emission Rate, lb/hr				
Chloroform	0.7	3.4	2.1	0.1
Hydrogen chloride	ND	<0.1	0.1	0.1

ND = Not Detected
DL = Detection Limit

Section 15.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Combined ClO2 Scrubber Vent | FIN: PN2138
Source Code: SP-BPSCSV | Date: 6/7/92 | EPN: SN81 | CIN: CN2139

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1334	1434	1534	
Flow Data				
Stack Temperature, °F		124		124
Moisture Content, %		9.0		9.0
Oxygen Concentration, %		20.8		20.8
Carbon Dioxide Concentration, %		0.0		0.0
Volumetric Flow Rate, x10^3 ACFM		5.6		5.6
Volumetric Flow Rate, x10^3 DSCFM		4.6		4.6
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8	20.8	20.8	20.8
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	50.4	71.1	77.4	66.3
Emission Rate, lb/hr	1.2	1.6	1.8	1.5
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Combined ClO2 Scrubber Vent | FIN: PN2138
Source Code: SP-BPSCSV | Date: 6/7/92 | EPN: SN81 | CIN: CN2139

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 •	0.5 *	0.5 •
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	14.4	22.4	21.0	19.3
Emission Rate, lb/hr	1.2	1.9	1.8	1.6
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 •	0.1 •	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 •
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 •	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 •	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 •	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 •	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 •
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.5 •	0.5 •	0.5 *	0.5 •
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 •
3-Carene				
Concentration, ppmvd	0.5 •	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 •
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 •	0.5 •
Emission Rate, lb/hr	0.1 *	0.1 •	0.1 *	0.1 •

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	Combined ClO2 Scrubber Vent		FIN:	PN2138
Source Code: SP-BPSCSV	Date:	6/7/92	EPN: SN81	CIN:	CN2139

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	56.4	81.8	81.3	73.2
Unknowns as Carbon				
Concentration, ppmvd	1.1	1.8	1.6	1.5
Sum M18 as Carbon, lb/hr	0.5	0.7	0.7	0.6
Unknown Compounds % of Total	1.9%	2.1%	2.0%	2.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	59.3	62.6	62.6	61.5
Emission Rate, lb/hr as C	0.5	0.5	0.5	0.5

COMMENTS

M18 run 3 for 6/8/92 was rejected due to double injection.

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Combined ClO2 Scrubber Vent | FIN: PN2138
Source Code: SP-BPSCSV | Date: 6/8/92 | EPN: SN81 | CIN: CN2139

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1656	1756	1856	
Flow Data				
Stack Temperature, °F	125			125
Moisture Content, %	13.3			13.3
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	5.4			5.4
Volumetric Flow Rate, x10^3 DSCFM	4.2			4.2
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8	20.8	20.8	20.8
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	90.9	93.9		92.4
Emission Rate, lb/hr	1.9	2.0		1.9
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *	0.6 *		0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Acetone				
Concentration, ppmvd	0.6 *	0.6 *		0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *		0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Combined ClO2 Scrubber Vent | FIN: PN2138
Source Code: SP-BPSCSV | Date: 6/8/92 | EPN: SN81 | CIN: CN2139

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *		0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Chloroform				
Concentration, ppmvd	14.0	13.7		13.8
Emission Rate, lb/hr	1.1	1.1		1.1
Benzene				
Concentration, ppmvd	0.6 *	0.6 *		0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.2 *	1.2 *		1.2 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *		0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *		0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *		0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *		0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 *		0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6 *		0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 *		0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *		0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 *	0.6 *		0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA		Source:	Combined ClO2 Scrubber Vent		FIN:	PN2138
Source Code:	SP-BPSCSV	Date:	6/8/92	EPN: SN81	CIN:	CN2139

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *		0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Knowns as Carbon				
Concentration, ppmvd	83.3	87.0		85.1
Unknowns as Carbon				
Concentration, ppmvd	0.0	1.2		0.6
Sum M18 as Carbon, lb/hr	0.7	0.7		0.7
Unknown Compounds % of Total	0.0%	1.3%		0.7%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	71.5	77.3	84.2	77.7
Emission Rate, lb/hr as C	0.6	0.6	0.7	0.6

COMMENTS

M18 run 3 for 6/8/92 was rejected due to double injection.

* One or more values were less than the detection limit.

Section 15.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA	Source:	Combined ClO2 Scrubber Vent			FIN:	PN2138
Source Code: SP-BPSCSV	Date:	6/7/92	EPN:	SN81	CIN:	CN2139

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1414			
Flow Data				
Stack Temperature, °F	124			124
Moisture Content, %	9.0			9.0
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	5.6			5.6
Volumetric Flow Rate, x10^3 DSCFM	4.6			4.6
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8			20.8
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	39.9			39.9
Emission Rate, lb/hr	3.4			3.4
Hydrogen chloride				
Concentration, ppmvd	1.3			1.3
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA | Source: Combined ClO2 Scrubber Vent | FIN: PN2138
Source Code: SP-BPSCSV | Date: 6/8/92 | EPN: SN81 | CIN: CN2139

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1800			
Flow Data				
Stack Temperature, °F	125			125
Moisture Content, %	13.3			13.3
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	5.4			5.4
Volumetric Flow Rate, x10^3 DSCFM	4.2			4.2
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8			20.8
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	9.2			9.2
Emission Rate, lb/hr	0.7			0.7
Hydrogen chloride				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

Section 15.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL SP SOURCE SP-BPSCSV

4

1. CALIBRATION

THEOR	DATE	6/7/92	DATE	6/7/92
ppm	ppm	%REC	ppm	%REC
0	-7	-0.7%	-3	-0.3%
90	94	104.4%	86	95.6%
149	155	104.0%	159	106.7%
375	371	98.9%	371	98.9%

2. PROPANE LINE RECOVERY

	DATE	6/7/92		DATE	6/7/92	
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	377	342	91%	372	374	101%
AFTER	356	338	95%	373	355	95%

3. LINE BLANK

	DATE	6/7/92	DATE	6/7/92
	INST	LINE	INST	LINE
BEFORE	1	0	1	0
AFTER	0	0	0	0

QUALITY CONTROL SUMMARY
METHOD 18

MILL SP SOURCE SP-BPSCSV

1. CHECK STANDARD

ANALYTE	THEOR	DATE	6/7/92	THEOR	DATE	6/~~7~~8/92
	ppm	ppm	%REC	ppm	ppm	%REC
ethanol	55.64	43.79	78.70%	55.64	37.53	67.45%
acetone	44.47	37.36	84.00%	44.47	38.09	85.65%
isopropanol	42.65	38.53	90.34%	42.65	37.10	86.99%
dimethyl sulfide	9.78	8.55	87.41%	9.78	8.78	89.81%
benzene	36.54	29.41	80.48%	36.54	34.91	95.55%
bromodichloromethane	20.08	18.09	90.08%	20.08	18.74	93.30%
dimethyl disulfide	36.26	31.84	87.80%	36.26	32.31	89.10%
toluene	30.73	28.29	92.07%	30.73	28.98	94.31%
ethyl benzene	26.67	24.57	92.13%	26.67	25.13	94.25%
m-xylene	53.27	49.60	93.11%	53.27	50.58	94.95%
o-xylene	26.76	24.56	91.80%	26.76	25.06	93.65%
cumene	23.47	21.93	93.41%	23.47	22.40	95.45%
alpha-pinene	20.49	19.59	95.60%	20.49	20.01	97.64%
beta-pinene	20.59	19.70	95.69%	20.59	20.32	98.68%
3-carene	20.61	19.44	94.29%	20.61	19.89	96.47%
p-cymene	20.92	19.33	92.37%	20.92	19.79	94.59%

2. PROPANE RESPONSE

	THEOR			THEOR		
BEFORE RUN	89.7	84.7	94.4%	89.7	87.2	97.3%
AFTER RUN	89.7	88.3	98.4%	89.7	86.8	96.7%

3. METHANOL LINE RECOVERY

	THEOR			THEOR		
BEFORE RUN	85.0	92.4	87.0	108.2	106.6	98.6%
AFTER RUN	103.9	104.4	108.5	105.1	84.6	80.5%

4. LINE BLANK

	[--------------FILE REF--------------	--------------]
BEFORE RUN	F6A4014	F8A4010
AFTER RUN	F7A4007	F8A4017

Section 15.4 Process Operating Data

MILL: SIMPSON PAPER   SOURCE: PINE BLEACH PLANT

DATE		6/07 ->						6/07 ->								
TIME		0900	1000	1100	0900	1000	1100	1334	1434	1534	1334	1434	1534	1841	1941	2041
SOURCE		BPSSHW ->			BPSSHS ->			BPSCCS ->			BPSCSV ->			BPSFHT ->		
FIN		PN2141 ->			PN2142 ->			PN2126-2127-2128 ->			PN2136-2137-2138 ->			PN2133 ->		
EPN		SN63 ->			SN84 ->			SN80 ->			SN81 ->			SN59 ->		
	UNITS															
WOOD		PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE
PRODUCT	T/D	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
KAPPA		31.9	31.8	33.7	31.9	31.8	33.7	33.7	37.2	34.7	33.7	37.2	35.7	36.8	40.8	30.5
CE K		3.1	3.7	3.4	3.1	3.7	3.4	3.4	3.5	3.3	3.4	3.5	3.3	3.7	3.1	3.1
CHEM USAGE																
Cl_2	LB/T	74	70	70	74	70	70	54	66	70	70	66	70	72	76	64
ClO_2	LB/T	66	62	62	66	62	62	48	59	62	62	59	62	64	67	57
NaOH	LB/T	44	44	44	44	44	44	40	40	44	40	40	44	52	52	52
OXYGEN	LB/T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NaOCl	LB/T	13	13	13	13	13	13	13	13	13	12	12	12	12	12	10
NaOH	LB/T	.8	.8	.8	.8	.8	.8	0	0	0	0	0	0	0	0	0
ClO_2	LB/T	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
NaOH	LB/T															
NAOCl	LB/T	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NaOH	LB/T	2.0	2.0	2.0	2.0	2.0	2.0	1.2	1.2	1.4	1.2	1.2	1.4	3.2	3.2	3.2
Dc STOCK	F	124	123	122	124	123	122	131	131	131	131	131	131	131	131	128
Eo MIXER	F	158	154	161	158	154	161	165	164	166	165	164	166	165	160	158
H_1 MIXER	F	146	158	160	146	158	160	154	153	159	154	153	159	161	162	161
D UPFLOW	F	159	152	158	159	152	158	157	172	171	157	172	171	172	170	172
H_2 MIXR	F	100	99	100	100	99	100	116	117	118	116	117	118	123	124	126
pH LEVEL																
Eo		10.0	10.0	10.0	10.0	10.0	10.00	10.5	10.4	10.0	10.5	10.4	10.0	10.2	10.2	10.1
H_1		9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.7	9.8	10.4	9.0	10.3	9.80	9.8
D		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
H_2		9.5	9.6	9.5	9.5	9.6	9.5	9.5	9.8	9.4	9.5	9.8	9.4	9.1	9.7	9.7

SCRUBBER. Cl_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW 4000 SCFM
LIQ FLOW 5 GPM 5% CAUSTIC
DP 3.5 IN H_2O

SCRUBBER. ClO_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW 4000 SCFM
LIQ FLOW 1 GPM WHITE LIQUOR
DP 3.5 IN H_2O

NOTES: 1.0 BLEACHING SEQUENCE -		RETENTION TIMES, MIN @ 550 T/D
	CHLORINE WITH CLORINE DIOXIDE. Dc	30
	CAUSTIC SODA & OXYGEN. Eo	80
	1st SODIUM HYPOCHLORITE. H_1	50
	CHLORINE DIOXIDE. D	220
	2nd SODIUM HYPOCHLORITE. H_2	120

2.0 ClO_2 SUBSITITUTION MAINTAINED AT 70%
3.0 ALL VALUES ONE HOUR READINGS FROM OPERATIONS LOG
4.0 PRODUCTION IS IN OVEN DRY UNBLEACHED SHORT TONS
5.0 ClO_2 AS ClO_2 USAGE

Note: See Appendix D for Unit Process Description

MILL: SIMPSON PAPER SOURCE: PINE BLEACH PLANT

DATE		6/08 ->						6/08	6/08 ->		
TIME		1100	1200	1300	1519	1556	1756	1856	1656	1756	1356
SOURCE		BPSETV ->			BPSSHT	BPSCSV ->			BPSCCS ->		
FIN		PN2130 ->			PN2140	PN2319 ->			PN2128 ->		
EPN		SN56 ->			SN62	SN81->			SN80->		
	UNITS										
WOOD		PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE
PRODUCT	T/D	500	500	500	500	500	500	500	500	500	500
KAPPA		24.8	24.8	36.3	32.1	43.1	43.1	43.1	43.1	43.1	33.9
CE K		3.0	3.1	3.2	3.0	3.1	3.2	3.2	3.2	3.4	3.2
CHEM USAGE											
Cl_2	LB/T	44	36	44	56	64	66	62	64	66	62
ClO_2	LB/T	39	32	39	50	57	59	55	48	59	55
NaOH	LB/T	40	40	48	44	60	60	60	60	60	60
OXYGEN	LB/T	0	0	0	0	0	0	0	0	0	0
NaOCl	LB/T	12	12	12	12	12	12	12	12	12	12
NaOH	LB/T	0	0	0	0	0	0	0	0	0	0
ClO_2	LB/T	19	19	19	19	19	19	19	19	19	19
NaOH	LB/T	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
NAOCl	LB/T	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
NaOH	LB/T	2.0	2.0	2.0	3.6	3.2	2.8	2.8	3.2	2.8	2.8
Dc STOCK	F	132	131	133	132	133	133	134	133	133	134
Eo MIXER	F	179	180	179	167	168	168	169	168	168	169
H_1 MIXER	F	159	157	159	160	158	158	158	158	158	158
D UPFLOW	F	170	170	171	174	170	174	172	170	174	171
H_2 MIXR	F	125	125	125	125	127	126	127	127	126	127
pH LEVEL											
Eo		10.3	10.3	10.4	10.4	9.8	10.1	10.1	9.8	10.1	10.1
H_1		9.5	9.7	9.7	9.5	9.7	9.4	9.7	9.7	9.4	9.7
D		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
H_2		9.1	9.1	9.0	8.5	9.8	9.8	9.6	9.8	9.8	9.6

SCRUBBER, Cl_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW 4000 SCFM
LIQ FLOW 5.0 GPM 5% CAUSTIC
DP 3.5 INCHES H_2O

SCRUBBER, ClO_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW 4000 SCFM
LIQ FLOW 1 GPM WHITE LIQUOR
DP 3.5 INCHES H_2O

NOTES: 1.0 BLEACHING SEQUENCE -	RETENTION TIMES, MIN @ 550 T/D
CHLORINE WITH CLORINE DIOXIDE, Dc	30
CAUSTIC SODA & OXYGEN, Eo	80
1st SODIUM HYPOCHLORITE, H_1	50
CHLORINE DIOXIDE, D	220
2nd SODIUM HYPOCHLORITE, H_2	120

2.0 ClO_2 SUBSITITUTION MAINTAINED AT 70%
3.0 ALL VALUES ONE HOUR READINGS FROM OPERATIONS LOG
4.0 PRODUCTION IS IN OVEN DRY UNBLEACHED SHORT TONS
5.0 ClO_2 IS AS ClO_2 USAGE

Note: See Appendix D for Unit Process Description

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16. SP-BPSSHT

SECTION 16

SECOND NaOCl TOWER VENT

(SP-BPSSHT)

WESTON

SECTION 16
SECOND NaOCl TOWER VENT
(SP-BPSSHT)

The Second NaOCl Tower Vent was tested on one day. The source was sampled for volatile organic compounds using Methods 25A and 18. Chloroform and hydrogen chloride samples were collected.

Total Hydrocarbons (M25A)

Figure 16.1 presents the THC trend for the test period on 6/8/92. Total hydrocarbon concentrations exhibited a downward trend from 47 to 28 ppm.

Volatile Organic Compounds (M18)

Table 16.1 summarizes the results for the Method 18 target compounds, and Section 16.1 is a tabulation of the data. Methanol and chloroform were detected by the Method 18 analyses. The volumetric flow was measured during sampling with a pitot tube.

Miscellaneous Parameters

Table 16.2 summarizes the results of testing for hydrogen chloride and chloroform. Section 16.2 tabulates the results for each compound. Chloroform was detected.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 16.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 16.4 includes the process operating data as recorded and provided by mill personnel.

FIGURE 16.1

THC TREND ANALYSIS (6/8/92)
SECOND NaOCl TOWER VENT (SP-BPSSHT)

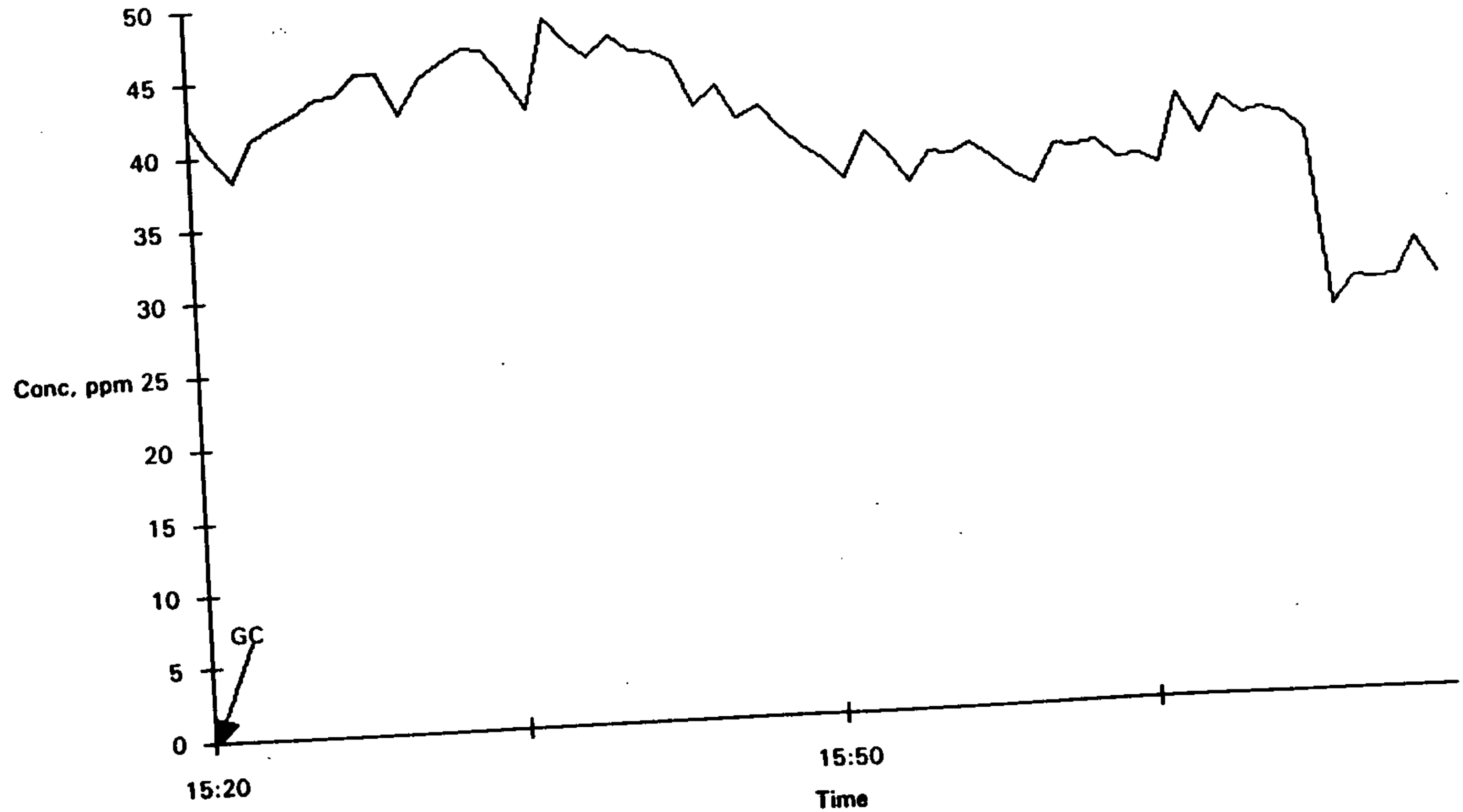


TABLE 16.1 SUMMARY OF VOC RESULTS

Mill: SIMPSON - PASADENA
Source Code: SP-BPSSHT
FIN: PN2140 CIN: NA
Source: Second NaOCl Tower Vent
Test Dates: 6/8/92
EPN: SN62

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	112	112	112	
Volumetric Flow Rate, $x10^3$ DSCFM	0.2	0.2	0.2	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	20.8	20.8	20.8	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	<0.1	<0.1	0.1	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	0.2	0.2	0.2	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	ND	ND	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	ND	ND	ND	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	<0.1	<0.1	0.1	0.1

ND=Not Detected
DL=Detection Limit

TABLE 16.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: SIMPSON-PASADENA
Source Code: SP-BPSSHT
FIN: PN2140 EPN: SN62

Source: Sceond NaOCl Tower Vent
Test Dates: 6/8/92
CIN: NA

	RUN 1	DL
Volumetric Flow Data		
Stack Temperature, °F	112	
Volumetric Flow Rate, x 10^3 DSCFM	0.2	
Process Operating Conditions		
Production Rate, ADT pulp/hr	20.8	
Emission Rate, lb/hr		
Chloroform	<0.1	0.1
Hydrogen chloride	ND	0.1

ND = Not Detected
DL = Detection Limit

WESTON

Section 16.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA		Source:	Second NaOCl Tower Vent	FIN:	PN2140
Source Code:	SP-BPSSHT	Date:	6/8/92 EPN: SN62	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1519			
Flow Data				
Stack Temperature, °F	112			112
Moisture Content, %	9.2			9.2
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.2			0.2
Volumetric Flow Rate, x10^3 DSCFM	0.2			0.2
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8			20.8
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	16.7			16.7
Emission Rate, lb/hr	0.1 *			0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *			0.6 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acetone				
Concentration, ppmvd	0.6 *			0.6 *
Emission Rate, lb/hr	0.1 *			0.1 *
2-Propanol				
Concentration, ppmvd	0.6 *			0.6 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Second NaOCl Tower Vent | FIN: PN2140
Source Code: SP-BPSSHT | Date: 6/8/92 | EPN: SN62 | CIN: NA

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *			0.6 *
Emission Rate, lb/hr	0.1 *			0.1 *
Chloroform				
Concentration, ppmvd	58.4			58.4
Emission Rate, lb/hr	0.2			0.2
Benzene				
Concentration, ppmvd	0.6 *			0.6 *
Emission Rate, lb/hr	0.1 *			0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *			1.1 *
Emission Rate, lb/hr	0.1 *			0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *			0.6 *
Emission Rate, lb/hr	0.1 *			0.1 *
Ethyl benzene				
Concentration, ppmvd	0.6 *			0.6 *
Emission Rate, lb/hr	0.1 *			0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *			0.6 *
Emission Rate, lb/hr	0.1 *			0.1 *
o-Xylene				
Concentration, ppmvd	0.6 *			0.6 *
Emission Rate, lb/hr	0.1 *			0.1 *
Cumene				
Concentration, ppmvd	0.6 *			0.6 *
Emission Rate, lb/hr	0.1 *			0.1 *
alpha-Pinene				
Concentration, ppmvd	0.6 *			0.6 *
Emission Rate, lb/hr	0.1 *			0.1 *
beta-Pinene				
Concentration, ppmvd	0.6 *			0.6 *
Emission Rate, lb/hr	0.1 *			0.1 *
3-Carene				
Concentration, ppmvd	0.6 *			0.6 *
Emission Rate, lb/hr	0.1 *			0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 *			0.6 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	Second NaOCl Tower Vent		FIN:	PN2140
Source Code: SP-BPSSHT	Date:	6/8/92	EPN: SN62	CIN:	NA

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *			0.6 *
Emission Rate, lb/hr	0.1 •			0.1 *
Knowns as Carbon				
Concentration, ppmvd	59.5			59.5
Unknowns as Carbon				
Concentration, ppmvd	0.0			0.0
Sum M18 as Carbon, lb/hr	0.1 •			0.1 •
Unknown Compounds % of Total	0.0%			0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	44.1			44.1
Emission Rate, lb/hr as C	0.1 *			0.1 *

• One or more values were less than the detection limit.

Section 16.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA   Source: Second NaOCl Tower Vent   FIN: PN2140
Source Code: SP-BPSSHT   Date: 6/8/92   EPN: SN62   CIN: NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1525			
Flow Data				
Stack Temperature, °F	112			112
Moisture Content, %	9.2			9.2
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.2			0.2
Volumetric Flow Rate, x10^3 DSCFM	0.2			0.2
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8			20.8
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	24.8			24.8
Emission Rate, lb/hr	0.1 *			0.1 *
Hydrogen chloride				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

Section 16.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL SP SOURCE SP-BPSSHT

1. CALIBRATION

THEOR	DATE	6/8/92	DATE	
ppm	ppm	%REC	ppm	%REC
0	-5	-0.5%		
90	91	101.1%		
149	156	104.7%		
375	371	98.9%		

2. PROPANE LINE RECOVERY

	DATE INST	6/8/92 LINE	%REC	DATE INST	LINE	%REC
BEFORE	372	374	101%			
AFTER	373	355	95%			

3. LINE BLANK

	DATE INST	6/8/92 LINE	DATE INST	LINE
BEFORE	1	0		
AFTER	0	0		

QUALITY CONTROL SUMMARY
METHOD 18

MILL SP SOURCE SP-BPSSHT

1. CHECK STANDARD

ANALYTE	THEOR	DATE	6/8/92	THEOR	DATE	
	ppm	ppm	%REC	ppm	ppm	%REC
ethanol	55.64	38.50	69.20%			
acetone	44.47	36.27	81.55%			
isopropanol	42.65	39.97	93.71%			
dimethyl sulfide	9.78	8.93	91.31%			
benzene	36.54	35.21	96.37%			
bromodichloromethane	20.08	18.55	92.36%			
dimethyl disulfide	36.26	32.87	90.64%			
toluene	30.73	29.23	95.12%			
ethyl benzene	26.67	25.40	95.24%			
m-xylene	53.27	51.10	95.93%			
o-xylene	26.76	25.36	94.77%			
cumene	23.47	22.65	96.50%			
alpha-pinene	20.49	20.25	98.79%			
beta-pinene	20.59	20.40	99.06%			
3-carene	20.61	20.11	97.58%			
p-cymene	20.92	19.99	95.53%			

2. PROPANE RESPONSE

	THEOR			THEOR	
BEFORE RUN	89.7	87.2	97.3%		
AFTER RUN	89.7	86.8	96.7%		

3. METHANOL LINE RECOVERY

	THEOR			THEOR	
BEFORE RUN	108.1614	106.65	98.6%		
AFTER RUN	105.0759	84.571	80.5%		

4. LINE BLANK

	[------------FILE REF------------]	
BEFORE RUN	F8A4010	
AFTER RUN	F8A4017	

Section 16.4 Process Operating Data

MILL: SIMPSON PAPER SOURCE: PINE BLEACH PLANT

DATE		6/08 ->						6/08	6/08 ->		
TIME		1100	1200	1300	1519	1656	1756	1856	1656	1756	1856
SOURCE		BPSETV ->			BPSSHT	BPSCSV ->			BPSCCS ->		
FIN		PN2130 ->			PN2140	PN2319 ->			PN2128 ->		
EPN		SN56 ->			SN62	SN81->			SN80->		
	UNITS										
WOOD		PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE
PRODUCT	T/D	500	500	500	500	500	500	500	500	500	500
KAPPA		24.8	24.8	36.3	32.1	43.1	43.1	43.1	43.1	43.1	33.9
CE K		3.0	3.1	3.2	3.0	3.1	3.2	3.2	3.2	3.4	3.2
CHEM USAGE											
Cl_2	LB/T	44	36	44	56	64	66	62	64	66	62
ClO_2	LB/T	39	32	39	50	57	59	55	48	59	55
NaOH	LB/T	40	40	48	44	60	60	60	60	60	60
OXYGEN	LB/T	0	0	0	0	0	0	0	0	0	0
NaOCl	LB/T	12	12	12	12	12	12	12	12	12	12
NaOH	LB/T	0	0	0	0	0	0	0	0	0	0
ClO_2	LB/T	19	19	19	19	19	19	19	19	19	19
NaOH	LB/T	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
NAOCl	LB/T	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
NaOH	LB/T	2.0	2.0	2.0	3.6	3.2	2.8	2.8	3.2	2.8	2.8
Dc STOCK	F	132	131	133	132	133	133	134	133	133	134
Eo MIXER	F	179	180	179	167	168	168	169	168	168	169
H_1 MIXER	F	159	157	159	160	158	158	158	158	158	158
D UPFLOW	F	170	170	171	174	170	174	172	170	174	171
H_2 MIXR	F	125	125	125	125	127	126	127	127	126	127
pH LEVEL											
Eo		10.3	10.3	10.4	10.4	9.8	10.1	10.1	9.8	10.1	10.1
H_1		9.5	9.7	9.7	9.5	9.7	9.4	9.7	9.7	9.4	9.7
D		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
H_2		9.1	9.1	9.0	8.5	9.8	9.8	9.6	9.8	9.8	9.6

SCRUBBER. Cl_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW 4000 SCFM
LIQ FLOW 5.0 GPM 5% CAUSTIC
DP 3.5 INCHES H_2O

SCRUBBER. ClO_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW 4000 SCFM
LIQ FLOW 1 GPM WHITE LIQUOR
DP 3.5 INCHES H_2O

NOTES:		RETENTION TIMES, MIN @ 550 T/D
1.0 BLEACHING SEQUENCE -	CHLORINE WITH CLORINE DIOXIDE, Dc	30
	CAUSTIC SODA & OXYGEN, Eo	80
	1st SODIUM HYPOCHLORITE, H_1	50
	CHLORINE DIOXIDE, D	220
	2nd SODIUM HYPOCHLORITE, H_2	120

2.0 ClO_2 SUBSITITUTION MAINTAINED AT 70%
3.0 ALL VALUES ONE HOUR READINGS FROM OPERATIONS LOG
4.0 PRODUCTION IS IN OVEN DRY UNBLEACHED SHORT TONS
5.0 ClO_2 IS AS ClO_2 USAGE

Note: See Appendix D for Unit Process Description

WESTON
MANAGERS DESIGNERS/CONSULTANTS

SECTION 17

SECOND NaOCl WASHER VENT

(SP-BPSSHW)

17. SP-BPSSHW

SECTION 17
SECOND NaOCl WASHER VENT
(SP-BPSSHW)

The Second NaOCl Washer Vent was tested on two different days. The source was sampled for volatile organic compounds by Methods 25A and 18. Chloroform and hydrogen chloride samples were collected.

Total Hydrocarbons (M25A)

Figures 17.1 and 17.2 present the THC trends for the test periods on 6/5/92 and 6/7/92, respectively. On the first day, the total hydrocarbon concentration was predominately 0 ppm except at 1048, 1112, 1136, and 1154 where the concentrations were between 3 to 6 ppm. On the second day, the concentration was 0 ppm except between 0904 and 0926 where the concentration was between 1 to 2 ppm.

Volatile Organic Compounds (M18)

Table 17.1 summarizes the results for the Method 18 target compounds, and Section 17.1 is a tabulation of the data. Chloroform was detected by the Method 18 analyses. Unknowns were present following chloroform at ~1 ppm as carbon on day 1. The volumetric flow was measured during sampling with a pitot tube.

Miscellaneous Parameters

Table 17.2 summarizes the results of testing for hydrogen chloride and chloroform. Section 17.2 tabulates the results for each compound. Chloroform results (lb/hr) were comparable to Method 18. Hydrogen chloride was detected on day 2 (<0.1 lb/hr).

VOC Quality Control Results

The VOC quality control data are tabulated in Section 17.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 17.4 includes the process operating data as recorded and provided by mill personnel.

FIGURE 17.1
THC TREND ANALYSIS (6/5/92)
SECOND NaOCl WASHER VENT (SP-BPSSHW)

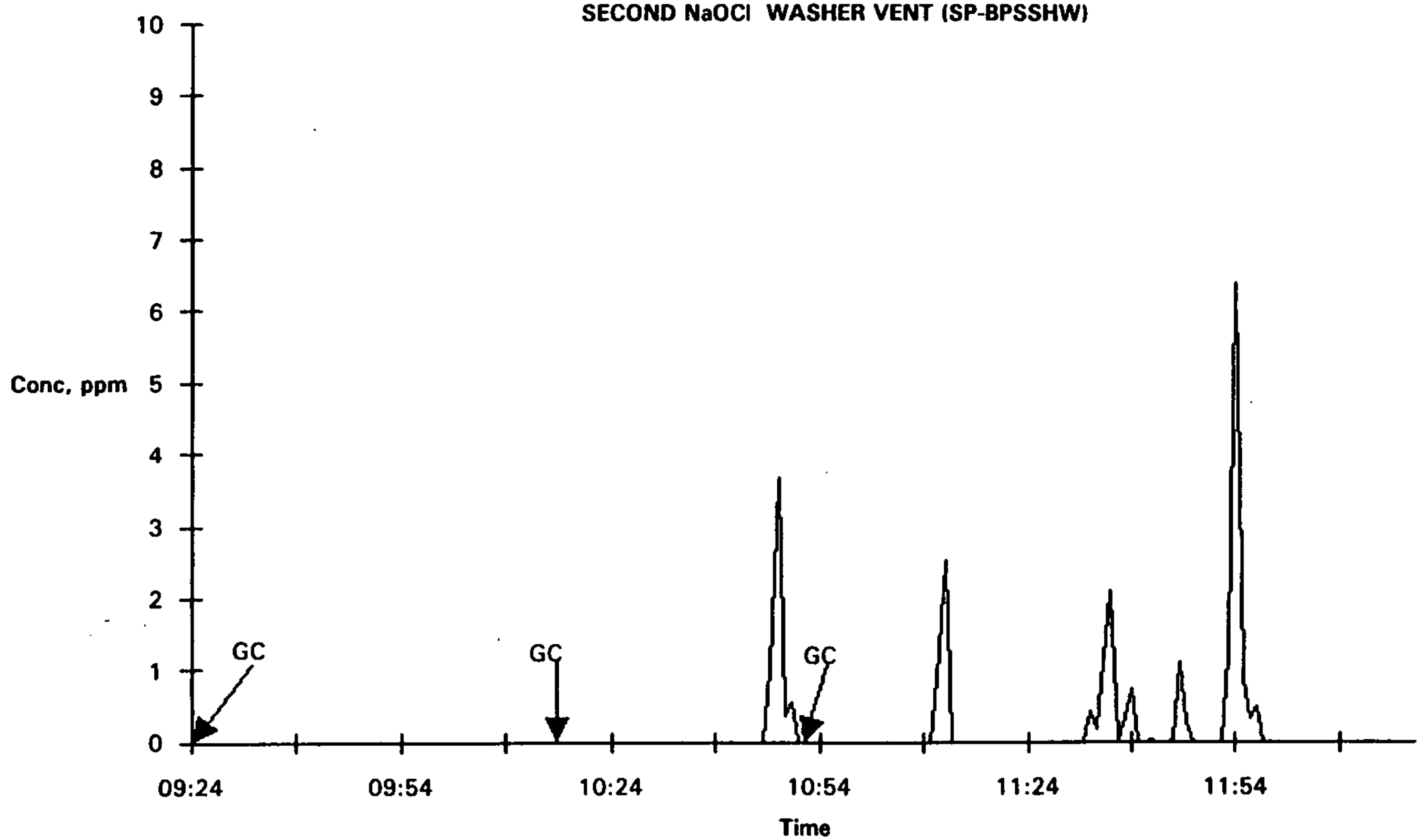
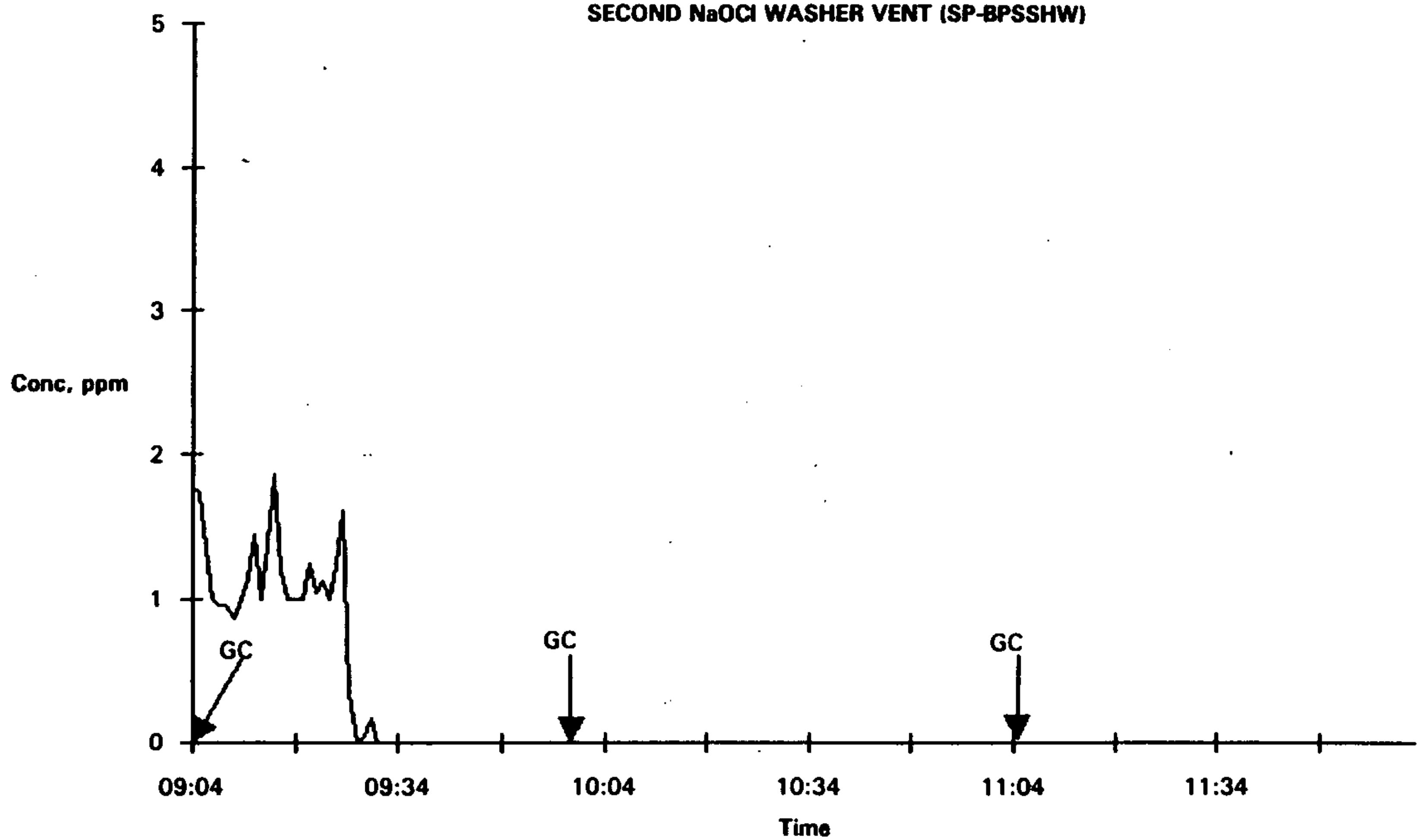


FIGURE 17.2
THC TREND ANALYSIS (6/7/92)
SECOND NaOCl WASHER VENT (SP-BPSSHW)



WESTON

TABLE 17.1 SUMMARY OF VOC RESULTS

Mill: SIMPSON - PASADENA		Source:	Second NaOCl Washer Vent
Source Code: SP-BPSSHW		Test Dates:	6/5/92 6/7/92
FIN: PN2141	CIN: NA	EPN:	SN63

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	91	95	93	
Volumetric Flow Rate, $x10^3$ DSCFM	2.9	2.9	2.9	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	20.8	20.8	20.8	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	ND	ND	ND	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	<0.1	0.2	0.1	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	ND	ND	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	ND	ND	ND	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	<0.1	<0.1	0.1	0.1

ND=Not Detected
DL=Detection Limit

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TABLE 17.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: SIMPSON-PASADENA
Source Code: SP-BPSSHW
FIN: PN2141 EPN: SN63

Source: Second NaOCl Washer Vent
Test Dates: 6/5/92, 6/7/92
CIN: NA

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	91	95	93	
Volumetric Flow Rate, x 10^3 DSCFM	2.9	2.9	2.9	
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8	20.8	20.8	
Emission Rate, lb/hr				
Chloroform	<0.1	0.2	0.1	0.1
Hydrogen chloride	ND	<0.1	0.1	

ND = Not Detected
DL = Detection Limit

Section 17.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Second NaOCl Washer Vent | FIN: PN2141
Source Code: SP-BPSSHW | Date: 6/5/92 | EPN: SN63 | CIN: NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	923	1020	1120	
Flow Data				
Stack Temperature, °F	91			91
Moisture Content, %	5.0			5.0
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	3.2			3.2
Volumetric Flow Rate, x10^3 DSCFM	2.9			2.9
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8	20.8	20.8	20.8
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	2.1 *	2.1 *	2.1 *	2.1 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	Second NaOCl Washer Vent			FIN:	PN2141
Source Code: SP-BPSSHW	Date:	6/5/92	EPN:	SN63	CIN:	NA

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.8	2.0	3.2	2.3
Emission Rate, lb/hr	0.1 *	0.1	0.2	0.1
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

*One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA		Source:	Second NaOCl Washer Vent		FIN:	PN2141
Source Code:	SP-BPSSHW	Date:	6/5/92	EPN: SN63	CIN:	NA

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	1.5	2.6	3.3	2.5
Unknowns as Carbon				
Concentration, ppmvd	0.7	0.7	0.5	0.7
Sum M18 as Carbon, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Unknown Compounds % of Total	33.3%	21.9%	13.9%	23.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr as C	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	Second NaOCl Washer Vent		FIN:	PN2141
Source Code: SP-BPSSHW	Date:	6/7/92	EPN: SN63	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	903	1003	1103	
Flow Data				
Stack Temperature, °F	95			95
Moisture Content, %	5.6			5.6
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	3.2			3.2
Volumetric Flow Rate, x10^3 DSCFM	2.9			2.9
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8	20.8	20.8	20.8
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	2.1 *	2.1 *	2.1 *	2.1 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	Second NaOCl Washer Vent		FIN:	PN2141
Source Code: SP-BPSSHW	Date:	6/7/92	EPN: SN63	CIN:	NA

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.5	1.6	1.4	1.5
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Second NaOCl Washer Vent | FIN: PN2141
Source Code: SP-BPSSHW | Date: 6/7/92 EPN: SN63 | CIN: NA

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	1.6	1.4	1.2	1.4
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr as C	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

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Section 17.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA	Source:	Second NaOCl Washer Vent		FIN:	PN2141
Source Code: SP-BPSSHW	Date:	6/5/92	EPN: SN63	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1133			
Flow Data				
Stack Temperature, °F	91			91
Moisture Content, %	5.0			5.0
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	3.2			3.2
Volumetric Flow Rate, x10^3 DSCFM	2.9			2.9
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8			20.8
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	4.3			4.3
Emission Rate, lb/hr	0.2			0.2
Hydrogen chloride				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA	Source:	Second NaOCl Washer Vent		FIN:	PN2141
Source Code: SP-BPSSHW	Date:	6/7/92	EPN: SN63	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1026			
Flow Data				
Stack Temperature, °F	95			95
Moisture Content, %	5.6			5.6
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	3.2			3.2
Volumetric Flow Rate, x10^3 DSCFM	2.9			2.9
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8			20.8
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	1.6			1.6
Emission Rate, lb/hr	0.1 *			0.1 *
Hydrogen chloride				
Concentration, ppmvd	1.1			1.1
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

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Section 17.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL SP SOURCE SP-BPSSHW

1. CALIBRATION

THEOR	DATE	6/5/92	DATE	6/7/92
ppm	ppm	%REC	ppm	%REC
0	-7	-0.7%	-3	-0.3%
90	94	104.4%	86	95.6%
149	155	104.0%	159	106.7%
375	371	98.9%	371	98.9%

2. PROPANE LINE RECOVERY

	DATE	6/5/92		DATE	6/7/92	
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	347	328	95%	314	310	99%
AFTER	376	363	97%	377	342	91%

3. LINE BLANK

	[----------------- PPM	-----------------]		
BEFORE RUN	0	0	0	0
AFTER RUN	0	0	1	0

QUALITY CONTROL SUMMARY
METHOD 18

MILL SP SOURCE SP-BPSSHW

1. CHECK STANDARD

ANALYTE	THEOR	DATE	6/5/92	THEOR	DATE	6/7/92
	ppm	ppm	%REC	ppm	ppm	%REC
ethanol	55.64	46.69	83.90%	55.64	43.79	78.70%
acetone	44.47	42.04	94.52%	44.47	37.36	84.00%
isopropanol	42.65	39.81	93.34%	42.65	38.53	90.34%
dimethyl sulfide	9.78	9.19	94.00%	9.78	8.55	87.41%
benzene	36.54	36.15	98.92%	36.54	29.41	80.48%
bromodichloromethane	20.08	18.95	94.37%	20.08	18.09	90.08%
dimethyl disulfide	36.26	32.98	90.95%	36.26	31.84	87.80%
toluene	30.73	29.14	94.84%	30.73	28.29	92.07%
ethyl benzene	26.67	25.20	94.48%	26.67	24.57	92.13%
m-xylene	53.27	50.56	94.92%	53.27	49.60	93.11%
o-xylene	26.76	25.11	93.83%	26.76	24.56	91.80%
cumene	23.47	22.35	95.21%	23.47	21.93	93.41%
alpha-pinene	20.49	19.76	96.42%	20.49	19.59	95.60%
beta-pinene	20.59	20.28	98.51%	20.59	19.70	95.69%
3-carene	20.61	19.60	95.06%	20.61	19.44	94.29%
p-cymene	20.92	19.33	92.40%	20.92	19.33	92.37%

2. PROPANE RESPONSE

	THEOR			THEOR		
BEFORE RUN	89.7	87.0	97.0%	89.7	84.7	94.4%
AFTER RUN	89.7	86.1	96.0%	89.7	88.3	98.4%

3. METHANOL LINE RECOVERY

	THEOR			THEOR		
BEFORE RUN	85.0	98.8	116.3%	92.4	87.0	94.1%
AFTER RUN	103.9	102.8	99.0%	104.4	108.5	103.9%

4. LINE BLANK

	[--------------FILE REF--------------]	
BEFORE RUN	F4A4014	F6A4014
AFTER RUN	F5A4008	F7A4007

Section 17.4 Process Operating Data

MILL: SIMPSON PAPER SOURCE: PINE BLEACH PLANT

DATE		6/05 ->						6/05 ->							
TIME		0923	1023	1123	0923	1023	1123	1351	1451	1551	1651	1351	1451	1551	1651
SOURCE		BPSSHS	BPSSHS	BPSSHS	BPSSHW	BPSSHW	BPSSHW	BPSETV	BPSETV	BPSETV	BPSETV	BPSFHW	BPSFHW	BPSFHW	BPSFHW
FIN		PN2142 ->			PN2141 ->			PN1232 ->				PN2134 ->			
EPN		SN64	SN64	SN64	SN63	SN63	SN63	SN58	SN58	SN58	SN58	SN60	SN60	SN60	SN60
	UNITS														
WOOD		PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE
PRODUCT	T/D	500	500	500	500	500	500	500	500	500	500	500	500	500	500
KAPPA		32.4	30.5	30.5	30.5	30.5	30.5	36.7	36.7	36.7	30.8	30.8	36.7	36.7	30.8
CE K		3.2	3.2	3.2	3.2	3.2	3.2	2.8	2.8	3.2	3.2	2.8	2.8	3.3	3.3
CHEM USAGE															
Cl_2	LB/T	50	54	46	50	54	46	58	74	62	54	58	74	62	54
ClO_2	LB/T	44	48	41	44	48	41	51	66	55	48	51	66	55	48
NaOH	LB/T	40	40	40	40	40	40	52	52	52	60	52	52	52	60
OXYGEN	LB/T	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NaOCl	LB/T	14	12	12	14	12	12	12	12	12	12	12	12	12	12
NaOH	LB/T	1.2	1.2	1.2	1.2	1.2	1.2	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0
ClO_2	LB/T	20	20	20	20	20	20	20	20	20	20	20	20	20	20
NaOH	LB/T	6.4	6.4	6.4	6.4	6.4	6.4	6.1	6.1	6.1	6.1	6.1	6.1	8.1	8.1
NAOCl	LB/T	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NaOH	LB/T	4.6	4.2	4.2	4.6	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
TOWER TEMP	F														
Dc STOCK	F	134	134	134	134	134	134	131	131	131	131	131	131	131	131
Eo MIXER	F	165	169	170	165	169	170	160	164	164	162	160	164	164	162
H_1 MIXER	F	154	163	161	154	163	161	161	159	161	163	161	159	161	163
D UPFLOW	F	171	171	174	171	171	174	171	173	170	171	171	173	170	171
H_2 MIXER	F	118	122	123	118	122	123	125	125	124	124	125	125	124	124
pH LEVEL															
Eo		10.7	10.7	10.3	10.7	10.7	10.3	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
H_1		9.5	9.4	9.4	9.5	9.4	9.4	8.6	8.6	8.6	8.6	8.6	8.6	8.5	8.6
D		3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
H_2		9.7	9.7	9.7	9.7	9.7	9.7	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5

SCRUBBER, Cl_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW 4000 SCFM DESIGN
LIQ FLOW 5 GPM 5% CAUSTIC
DP 3.5 IN H_2O

SCRUBBER, ClO_2
TYPE - COLUMN
SCB MED - TELLERETTES
GAS FLOW 4000 SCFM DESIGN
LIQ FLOW 1 GPM WHITE LIQUOR
DP 3.5 INCHES H_2O

NOTES: 1.0 BLEACHING SEQUENCE -

	RETENTION TIMES, MIN @ 550 T/D
CHLORINE WITH CLORINE DIOXIDE, Dc	30
CAUSTIC SODA & OXYGEN, Eo	60
#1 SODIUM HYPOCHLORITE, H_1	50
CHLORINE DIOXIDE, D	220
#2 SODIUM HYPOCHLORITE, H_2	120

2.0 ClO_2 SUBSITITUTION MAINTAINED AT 70%
3.0 ALL VALUES ONE HOUR READINGS FROM OPERATIONS LOG
4.0 PRODUCTION IS IN OVEN DRY UNBLEACHED SHORT TONS/DAY
5.0 ClO_2 IS AS ClO_2

Note: See Apendix D for Unit Process Description

MILL: SIMPSON PAPER SOURCE: PINE BLEACH PLANT

DATE		6/07 ->						6/07 ->								
TIME		0900	1000	1100	0900	1000	1100	1334	1434	1534	1334	1434	1534	1841	1941	2041
SOURCE		BPSSHW ->			BPSSHS ->			BPSCCS ->			BPSCSV ->			BPSFHT ->		
FIN		PN2141 ->			PN2142 ->			PN2126-2127-2128 ->			PN2136-2137-2138 ->			PN2133 ->		
EPN		SN63 ->			SN64 ->			SN80 ->			SN81 ->			SN59 ->		
	UNITS															
WOOD	---	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE
PRODUCT	T/D	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
KAPPA		31.9	31.8	33.7	31.9	31.8	33.7	33.7	37.2	34.7	33.7	37.2	35.7	36.6	40.8	30[illegible]
CE K		3.1	3.7	3.4	3.1	3.7	3.4	3.4	3.5	3.3	3.4	3.5	3.3	3.7	3.1	3.[illegible]
CHEM USAGE																
Cl_2	LB/T	74	70	70	74	70	70	54	66	70	70	66	70	72	76	5[illegible]
ClO_2	LB/T	66	62	62	66	62	62	48	59	62	62	59	62	64	67	57
NaOH	LB/T	44	44	44	44	44	44	40	40	44	40	40	44	52	52	5[illegible]
OXYGEN	LB/T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
NaOCl	LB/T	13	13	13	13	13	13	13	13	13	12	12	12	12	12	10
NaOH	LB/T	.8	.8	.8	.8	.8	.8	0	0	0	0	0	0	0	0	[illegible]
ClO_2	LB/T	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
NaOH	LB/T															
NAOCl	LB/T	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NaOH	LB/T	2.0	2.0	2.0	2.0	2.0	2.0	1.2	1.2	1.4	1.2	1.2	1.4	3.2	3.2	[illegible]
Dc STOCK	F	124	123	122	124	123	122	131	131	131	131	131	131	131	131	[illegible]
Eo MIXER	F	158	154	161	158	154	161	165	164	166	165	164	166	165	160	158
H_1 MIXER	F	146	158	160	146	158	160	154	153	159	154	153	159	161	162	161
D UPFLOW	F	159	152	158	159	152	158	157	172	171	157	172	171	172	170	1[illegible]
H_2 MIXR	F	100	99	100	100	99	100	116	117	118	116	117	118	123	124	1[illegible]
pH LEVEL																
Eo		10.0	10.0	10.0	10.0	10.0	10.00	10.5	10.4	10.0	10.5	10.4	10.0	10.2	10.2	1[illegible]
H_1		9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.7	9.8	10.4	3.0	10.3	9.80	[illegible]
D		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.[illegible]
H_2		9.5	9.6	9.5	9.5	9.6	9.5	9.5	9.8	9.4	9.5	9.8	9.4	9.1	9.7	9.[illegible]

SCRUBBER, Cl_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW 4000 SCFM
LIQ FLOW 5 GPM 5% CAUSTIC
DP 3.5 IN H_2O

SCRUBBER, ClO_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW 4000 SCFM
LIQ FLOW 1 GPM WHITE LIQUOR
DP 3.5 IN H_2O

NOTES: 1.0 BLEACHING SEQUENCE -

	RETENTION TIMES, MIN @ 550 T/D
CHLORINE WITH CLORINE DIOXIDE, Dc	30
CAUSTIC SODA & OXYGEN, Eo	80
1st SODIUM HYPOCHLORITE, H_1	50
CHLORINE DIOXIDE, D	220
2nd SODIUM HYPOCHLORITE, H_2	120

2.0 ClO_2 SUBSITITUTION MAINTAINED AT 70%
3.0 ALL VALUES ONE HOUR READINGS FROM OPERATIONS LOG
4.0 PRODUCTION IS IN OVEN DRY UNBLEACHED SHORT TONS
5.0 ClO_2 AS ClO_2 USAGE

Note: See Appendix D for Unit Process Description

SECTION 18

SECOND NaOCl SEAL BOX VENT

(SP-BPSSHS)

SECTION 18
SECOND NaOCl SEAL BOX VENT
(SP-BPSSHS)

The Second NaOCl Seal Box Vent was tested on two different days. The source was sampled for volatile organic compounds using Methods 25A and 18. Chloroform and hydrogen chloride samples were collected.

Total Hydrocarbons (M25A)

Figures 18.1 and 18.2 present the THC trends for the test periods on 6/5/92 and 6/7/92, respectively. On the first day, total hydrocarbons varied from 188 to 271 ppm except at 1145 where the concentration dropped to 165 ppm. On the second day, a downward trend was exhibited during the first 2 1/2 hours of testing with concentrations ranging from 85 to 37 ppm. During the last 30 minutes, the concentration increased to 88 ppm.

Volatile Organic Compounds (M18)

Table 18.1 summarizes the results for the Method 18 target compounds, and Section 18.1 is a tabulation of the data. Methanol and chloroform were detected by the Method 18 analyses. Methanol and chloroform concentrations were much lower the second day. The volumetric flow was measured during sampling with a pitot tube.

Miscellaneous Parameters

Table 18.2 summarizes the results of testing for hydrogen chloride and chloroform Section 18.2 tabulates the results for each compound. Chloroform results (lb/hr) were consistent with Method 18. Hydrogen chloride was detected on the second day (<0.1 lb/hr).

VOC Quality Control Results

The VOC quality control data are tabulated in Section 18.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 18.4 includes the process operating data as recorded and provided by mill personnel.

FIGURE 18.1

THC TREND ANALYSIS (6/5/92)

SECOND NaOCl SEAL BOX VENT (SP-BPSSHS)

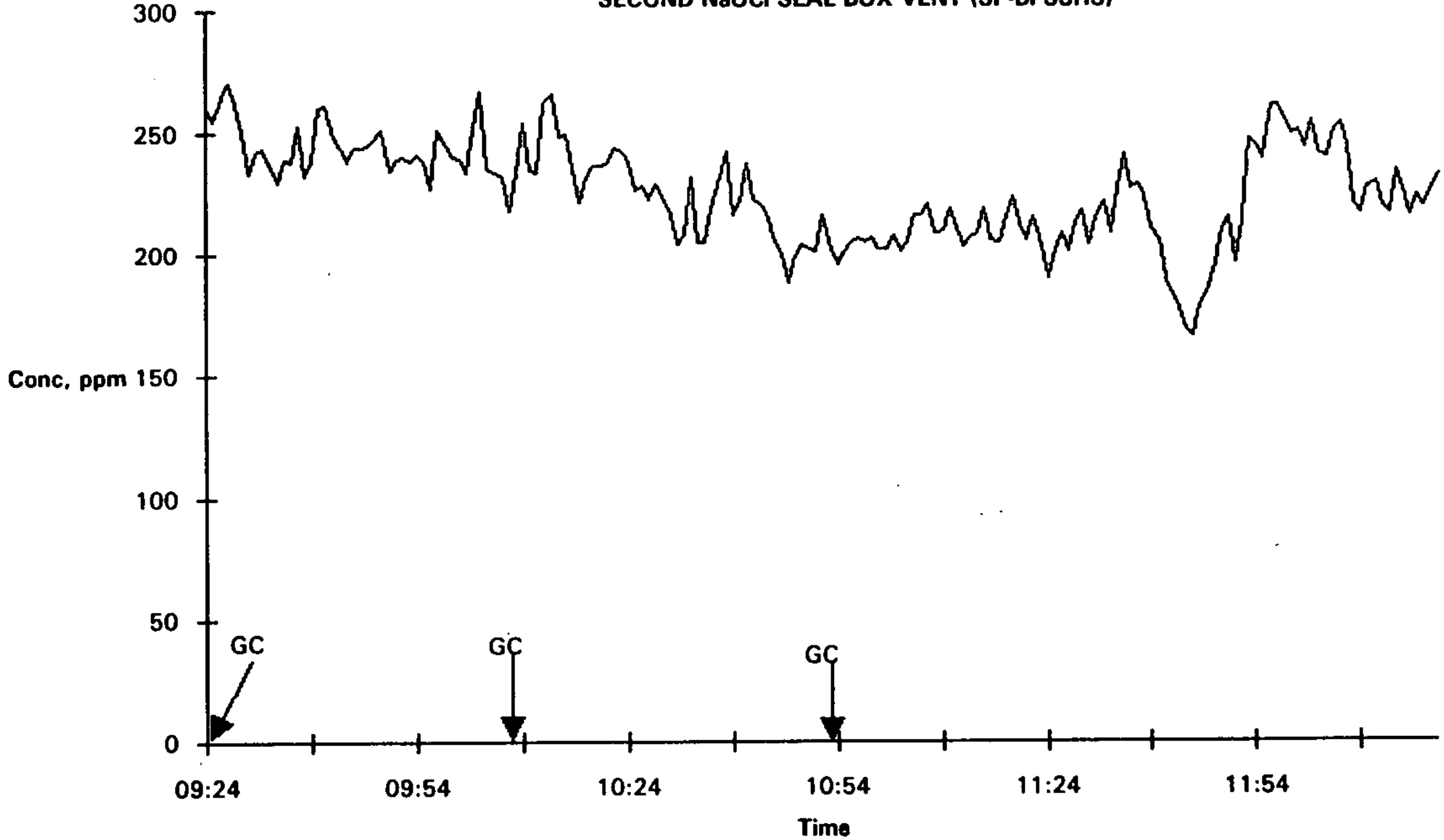

FIGURE 18.2
THC TREND ANALYSIS (6/7/92)
SECOND NaOCl SEAL BOX VENT (SP-BPSSHS)

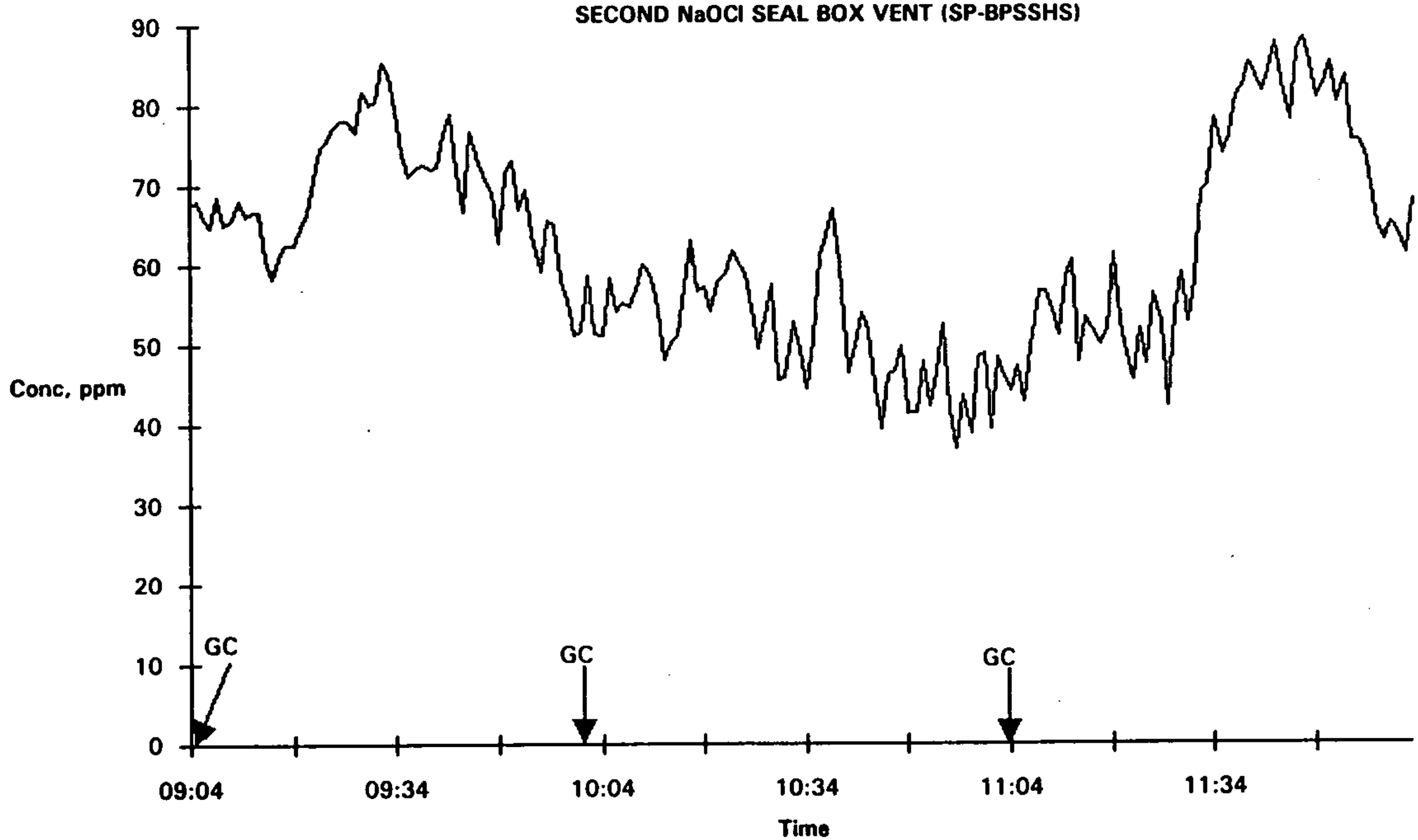

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TABLE 18.1 SUMMARY OF VOC RESULTS

Mill:	SIMPSON - PASADENA	Source:	Second NaOCl Seal Box Vent
Source Code:	SP-BPSSHS	Test Dates:	6/5/92 6/7/92
FIN:	PN2142 CIN: NA	EPN:	SN64

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	95	122	109	
Volumetric Flow Rate, x10³ DSCFM	0.8	1.1	1.0	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	20.8	20.8	20.8	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	<0.1	0.4	0.2	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	<0.1	0.1	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	1.1	5.8	3.1	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	<0.1	0.1	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	<0.1	0.6	0.3	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	<0.1	0.6	0.3	0.1

ND=Not Detected
DL=Detection Limit

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TABLE 18.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: SIMPSON-PASADENA
Source Code: SP-BPSSHS
FIN: PN2124 EPN: SN64

Source: Second NaOCl Seal Box Vent
Test Dates: 6/5/92, 6/7/92
CIN: NA

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	95	122	109	
Volumetric Flow Rate, x 10^3 DSCFM	0.8	1.1	1.0	
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8	20.8	20.8	
Emission Rate, lb/hr				
Chloroform	1.0	6.9	4.0	0.1
Hydrogen chloride	ND	<0.1	0.1	0.1

ND = Not Detected
DL = Detection Limit

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(L) WWC (R) DW 28 December 1992

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Section 18.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Second NaOCl Seal Box Vent | FIN: PN2142
Source Code: SP-BPSSHS | Date: 6/5/92 | EPN: SN64 | CIN: NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	923	1020	1120	
Flow Data				
Stack Temperature, °F	122			122
Moisture Content, %	7.8			7.8
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	1.3			1.3
Volumetric Flow Rate, x10^3 DSCFM	1.1			1.1
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8	20.8	20.8	20.8
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	56.2	79.2	64.5	66.6
Emission Rate, lb/hr	0.3	0.4	0.3	0.4
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.9	1.2	1.1	1.0
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source: Second NaOCl Seal Box Vent		FIN: PN2142
Source Code: SP-BPSSHS	Date: 6/5/92	EPN: SN64	CIN: NA

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	294.4	267.2	218.5	260.1
Emission Rate, lb/hr	5.8	5.3	4.3	5.1
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.7	0.9	0.6
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	Second NaOCl Seal Box Vent		FIN:	PN2142
Source Code: SP-BPSSHS	Date:	6/5/92	EPN: SN64	CIN:	NA

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	299.2	293.0	241.5	277.9
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.5 *	0.2
Sum M18 as Carbon, lb/hr	0.6	0.6	0.5	0.6
Unknown Compounds % of Total	0.0%	0.0%	0.2%	0.1%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	263.6	232.1	238.6	244.8
Emission Rate, lb/hr as C	0.5	0.5	0.5	0.5

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	Second NaOCl Seal Box Vent			FIN:	PN2142
Source Code: SP-BPSSHS	Date:	6/7/92	EPN:	SN64	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	903	1003	1103	
Flow Data				
Stack Temperature, °F	95			95
Moisture Content, %	6.0			6.0
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.9			0.9
Volumetric Flow Rate, x10^3 DSCFM	0.8			0.8
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8	20.8	20.8	20.8
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	6.2	2.7	2.1	3.7
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	Second NaOCl Seal Box Vent		FIN:	PN2142
Source Code: SP-BPSSHS	Date:	6/7/92	EPN: SN64	CIN:	NA

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	74.6	72.6	67.6	71.6
Emission Rate, lb/hr	1.2	1.1	1.1	1.1
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA		Source:	Second NaOCl Seal Box Vent	FIN:	PN2142
Source Code:	SP-BPSSHS	Date:	6/7/92 EPN: SN64	CIN:	NA

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	70.2	65.6	61.0	65.6
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.1	0.1	0.1 *	0.1
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	73.4	54.3	69.1	65.6
Emission Rate, lb/hr as C	0.1	0.1 *	0.1	0.1

* One or more values were less than the detection limit.

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MANAGERS DESIGNERS/CONSULTANTS

Section 18.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA	Source:	Second NaOCl Seal Box Vent		FIN:	PN2142
Source Code: SP-BPSSHS	Date:	6/5/92	EPN: SN64	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	941			
Flow Data				
Stack Temperature, °F	122			122
Moisture Content, %	7.8			7.8
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	1.3			1.3
Volumetric Flow Rate, x10^3 DSCFM	1.1			1.1
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8			20.8
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	349.6			349.6
Emission Rate, lb/hr	6.9			6.9
Hydrogen chloride				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill:	SIMPSON - PASADENA	Source:	Second NaOCl Seal Box Vent	FIN:	PN2142
Source Code:	SP-BPSSHS	Date:	6/7/92 EPN: SN64	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	933			
Flow Data				
Stack Temperature, °F	95			95
Moisture Content, %	6.0			6.0
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.9			0.9
Volumetric Flow Rate, x10^3 DSCFM	0.8			0.8
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.8			20.8
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	63.7			63.7
Emission Rate, lb/hr	1.0			1.0
Hydrogen chloride				
Concentration, ppmvd	0.8			0.8
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

Section 18.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL SP SOURCE SP-BPSSHS

1. CALIBRATION

THEOR	DATE	6/5/92	DATE	6/7/92
ppm	ppm	%REC	ppm	%REC
0	-7	-0.7%	-3	-0.3%
90	94	104.4%	86	95.6%
149	154	103.4%	159	106.7%
375	371	98.9%	371	98.9%

2. PROPANE LINE RECOVERY

	DATE	6/5/92		DATE	6/7/92	
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	342	346	101%	340	329	97%
AFTER	404	373	92%	390	376	96%

3. LINE BLANK

	[---------------- PPM		----------------]	
BEFORE RUN	0	0	0	0
AFTER RUN	0	0	1	0

QUALITY CONTROL SUMMARY
METHOD 18

MILL SP SOURCE SP-BPSSHS

1. CHECK STANDARD

ANALYTE	THEOR	DATE	6/5/92	THEOR	DATE	6/7/92
	ppm	ppm	%REC	ppm	ppm	%REC
ethanol	55.64	49.60	89.14%	55.64	49.80	89.49%
acetone	44.47	48.98	110.13%	44.47	49.46	111.21%
isopropanol	42.65	37.74	88.48%	42.65	40.36	94.62%
dimethyl sulfide	9.78	9.80	100.19%	9.78	10.31	105.47%
benzene	36.54	43.86	120.03%	36.54	32.21	88.16%
bromodichloromethane	20.08	22.65	112.78%	20.08	22.80	113.54%
dimethyl disulfide	36.26	36.25	99.97%	36.26	37.58	103.63%
toluene	30.73	30.28	98.55%	30.73	32.52	105.83%
ethyl benzene	26.67	26.72	100.21%	26.67	28.16	105.60%
m-xylene	53.27	52.30	98.18%	53.27	55.27	103.74%
o-xylene	26.76	27.33	102.12%	26.76	28.68	107.17%
cumene	23.47	23.76	101.23%	23.47	25.11	106.98%
alpha-pinene	20.49	20.52	100.12%	20.49	21.85	106.63%
beta-pinene	20.59	19.95	96.91%	20.59	21.43	104.08%
3-carene	20.61	19.96	96.85%	20.61	21.30	103.32%
p-cymene	20.92	20.36	97.29%	20.92	21.92	104.74%

2. PROPANE RESPONSE

	THEOR		%REC	THEOR		%REC
BEFORE RUN	89.7	*		89.7	81.2	90.6%
AFTER RUN	89.7	82.1	91.5%	89.7	84.3	94.0%

3. METHANOL LINE RECOVERY

	THEOR		%REC	THEOR		%REC
BEFORE RUN	100.0	91.1	91.1%	84.1	81.0	96.3%
AFTER RUN	99.6	100.3	100.8%	103.1	**	

4. LINE BLANK

	[--------------FILE REF	--------------]
BEFORE RUN	F5B4002	F6B4014
AFTER RUN	F5B4008	

* Check standard response was correct. Decided to continue with analysis.

** Methanol recovery an A side was acceptable. The needle valve was found to be plugged with "junk" from the source. Valve was cleaned and proceeded with the analysis.

Section 18.4 Process Operating Data

MILL: SIMPSON PAPER SOURCE: PINE BLEACH PLANT

	UNITS						
DATE		6/05 ->					
TIME		0923	1023	1123	0923	1023	1123
SOURCE		BPSSHS	BPSSHS	BPSSHS	BPSSHW	BPSSHW	BPSSHW
FIN		PN2142 ->			PN2141 ->		
EPN		SN64	SN64	SN64	SN63	SN63	SN63
WOOD		PINE	PINE	PINE	PINE	PINE	PINE
PRODUCT	T/D	500	500	500	500	500	500
KAPPA		32.4	30.5	30.5	30.5	30.5	30.5
CE K		3.2	3.2	3.2	3.2	3.2	3.2
CHEM USAGE							
Cl_2	LB/T	50	54	46	50	54	46
ClO_2	LB/T	44	48	41	44	48	41
NaOH	LB/T	40	40	40	40	40	40
OXYGEN	LB/T	0	0	0	0	0	0
NaOCl	LB/T	14	12	12	14	12	12
NaOH	LB/T	1.2	1.2	1.2	1.2	1.2	1.2
ClO_2	LB/T	20	20	20	20	20	20
NaOH	LB/T	6.4	6.4	6.4	6.4	6.4	6.4
NAOCl	LB/T	3	3	3	3	3	3
NaOH	LB/T	4.6	4.2	4.2	4.6	4.2	4.2
TOWER TEMP	F						
Dc STOCK	F	134	134	134	134	134	134
Eo MIXER	F	165	169	170	165	169	170
H_1 MIXER	F	154	163	161	154	163	161
D UPFLOW	F	171	171	174	171	171	174
H_2 MIXER	F	118	122	123	118	122	123
pH LEVEL							
Eo		10.7	10.7	10.3	10.7	10.7	10.3
H_1		9.5	9.4	9.4	9.5	9.4	9.4
D		3.4	3.4	3.4	3.4	3.4	3.4
H_2		9.7	9.7	9.7	9.7	9.7	9.7

	UNITS								
DATE		6/05 ->							
TIME		1351	1451	1551	1651	1351	1451	1551	1651
SOURCE		BPSETV	BPSETV	BPSETV	BPSETV	BPSFHW	BPSFHW	BPSFHW	BPSFHW
FIN		PN1232 ->				PN2134 ->			
EPN		SN58	SN58	SN58	SN58	SN60	SN60	SN60	SN60
WOOD		PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE
PRODUCT	T/D	500	500	500	500	500	500	500	500
KAPPA		36.7	36.7	36.7	30.8	30.8	36.7	36.7	30.8
CE K		2.8	2.8	3.2	3.2	2.8	2.8	3.3	3.3
CHEM USAGE									
Cl_2	LB/T	58	74	62	54	58	74	62	54
ClO_2	LB/T	51	66	55	48	51	66	55	48
NaOH	LB/T	52	52	52	60	52	52	52	60
OXYGEN	LB/T	0	0	0	0	0	0	0	0
NaOCl	LB/T	12	12	12	12	12	12	12	12
NaOH	LB/T	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0
ClO_2	LB/T	20	20	20	20	20	20	20	20
NaOH	LB/T	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
NAOCl	LB/T	3	3	3	3	3	3	3	3
NaOH	LB/T	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
TOWER TEMP	F								
Dc STOCK	F	131	131	131	131	131	131	131	131
Eo MIXER	F	160	164	164	162	160	164	164	162
H_1 MIXER	F	161	159	161	163	161	159	161	163
D UPFLOW	F	171	173	170	171	171	173	170	171
H_2 MIXER	F	125	125	124	124	125	125	124	124
pH LEVEL									
Eo		10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
H_1		8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
D		3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
H_2		9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5

SCRUBBER, Cl_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW 4000 SCFM DESIGN
LIQ FLOW 5 GPM 5% CAUSTIC
DP 3.5 IN H_2O

SCRUBBER, ClO_2
TYPE - COLUMN
SCB MED - TELLERETTES
GAS FLOW 4000 SCFM DESIGN
LIQ FLOW 1 GPM WHITE LIQUOR
DP 3.5 INCHES H_2O

NOTES: 1.0 BLEACHING SEQUENCE -

	RETENTION TIMES, MIN @ 550 T/D
CHLORINE WITH CLORINE DIOXIDE, Dc	30
CAUSTIC SODA & OXYGEN, Eo	80
#1 SODIUM HYPOCHLORITE, H_1	50
CHLORINE DIOXIDE, D	220
#2 SODIUM HYPOCHLORITE, H_2	120

2.0 ClO_2 SUBSITITUTION MAINTAINED AT 70%
3.0 ALL VALUES ONE HOUR READINGS FROM OPERATIONS LOG
4.0 PRODUCTION IS IN OVEN DRY UNBLEACHED SHORT TONS/DAY
5.0 ClO_2 IS AS ClO_2

Note: See Apendix D for Unit Process Description

MILL: SIMPSON PAPER SOURCE: PINE BLEACH PLANT

DATE		6.07 ->						6.07 ->							
TIME		0900	1000	1100	0900	1000	1100	1334	1434	1534	1334	1434	1534	[illegible]	[illegible]
SOURCE		BPSSHW ->			BPSSHS -			BPSCCS -			BPSCSY -			BPSP[illegible] -	
FIN		PN2141 -			PN2142 -			PN2126-2127-2128 -			PN2136-2137-2138 -			PN2133 -	
EPN		SN53 ->			SN64 -			SN60 ->			SN61 -			SN53 -	
	UNITS														
WOOD		PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE	PINE
PRODUCT	T/D	500	500	500	500	500	500	500	500	500	500	500	500	500	500
KAPPA		31.9	31.8	33.7	31.9	31.8	33.7	33.7	37.2	34.7	33.7	37.2	35.7	35.6	40.3
CE %		3.1	3.7	3.4	3.1	3.7	3.4	3.4	3.5	3.3	3.4	3.5	3.3	3.7	3.1
CHEM USAGE															
Cl_2	LB/T	74	70	70	74	70	70	54	56	70	70	56	70	72	75
ClO_2	LB/T	66	62	62	66	62	62	48	59	62	62	59	62	64	67
NaOH	LB/T	44	44	44	44	44	44	40	40	44	40	40	44	52	52
OXYGEN	LB/T	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NaOCl	LB/T	13	13	13	13	13	13	13	13	13	12	12	12	12	12
NaOH	LB/T	.8	.8	.8	.8	.8	.8	0	0	0	0	0	0	0	0
ClO_2	LB/T	19	19	19	19	13	19	19	19	19	19	13	19	19	13
NaOH	LB/T														
NAOCl	LB/T	3	3	3	3	3	3	3	3	3	3	3	3	3	3
NaOH	LB/T	2.0	2.0	2.0	2.0	2.0	2.0	1.2	1.2	1.4	1.2	1.2	1.4	3.2	3.2
Dc STOCK	F	124	123	122	124	123	122	131	131	131	131	131	131	131	131
Eo MIXER	F	158	154	161	158	154	161	165	164	166	165	164	166	165	160
H_1 MIXER	F	146	158	160	146	158	160	154	153	159	154	153	159	161	152
D UPFLOW	F	159	152	158	159	152	158	157	172	171	157	172	171	172	170
H_2 MIXR	F	100	99	100	100	99	100	116	117	118	116	117	118	123	124
pH LEVEL															
Eo		10.0	10.0	10.0	10.0	10.0	10.00	10.5	10.4	10.0	10.5	10.4	10.0	10.2	10.2
H_1		9.3	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.7	3.8	10.4	3.0	10.3	9.80
D		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
H_2		9.5	9.6	9.5	9.5	9.6	9.5	9.5	9.8	9.4	9.5	9.8	9.4	9.1	9.7

SCRUBBER, Cl_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW 4000 SCFM
LIQ FLOW 5 GPM 5% CAUSTIC
DP 3.5 IN H_2O

SCRUBBER, ClO_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW 4000 SCFM
LIQ FLOW 1 GPM WHITE LIQUOR
DP 3.5 IN H_2O

NOTES:		RETENTION TIMES, MIN @ 550 T/D
1.0 BLEACHING SEQUENCE -	CHLORINE WITH CLORINE DIOXIDE, Dc	30
	CAUSTIC SODA & OXYGEN, Eo	30
	1st SODIUM HYPOCHLORITE, H_1	50
	CHLORINE DIOXIDE, D	220
	2nd SODIUM HYPOCHLORITE, H_2	120

2.0 ClO_2 SUBSITITUTION MAINTAINED AT 70%
3.0 ALL VALUES ONE HOUR READINGS FROM OPERATIONS LOG
4.0 PRODUCTION IS IN OVEN DRY UNBLEACHED SHORT TONS
5.0 ClO_2 AS ClO_2 USAGE

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SECTION 19

CHLORINATION WASHER VENT

(SP-BPHCWV)

19 SP-BPHCWV

SECTION 19
CHLORINATION WASHER VENT
(SP-BPHCWV)

The Chlorination Washer Vent was tested on one day. The source was sampled for volatile organic compounds by Methods 25A and 18. One hydrogen chloride sample was collected. Chloroform was not sampled due to the entire bleach plant going down during runs 2 and 3.

Total Hydrocarbons (M25A)

Figure 19.1 presents the THC trend for the test period on 6/10/92. The total hydrocarbon concentrations varied from 8 to 12 ppm except for a drop to 5 ppm at 1048.

Volatile Organic Compounds (M18)

Table 19.1 summarizes the results for the Method 18 target compounds, and Section 19.1 is a tabulation of the data. Methanol and chloroform were detected by the Method 18 analyses. The volumetric flow was measured during sampling with a pitot tube.

Miscellaneous Parameters

Table 19.2 summarizes the results of testing for hydrogen chloride and chloroform Section 19.2 tabulates the results for each compound. Hydrogen chloride was detected (<0.1 lb/hr).

VOC Quality Control Results

The VOC quality control data are tabulated in Section 19.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 19.4 includes the process operating data as recorded and provided by mill personnel.

FIGURE 19.1
THC TREND ANALYSIS (6/10/92)
CHLORINATION WASHER VENT (SP-BPHCWV)

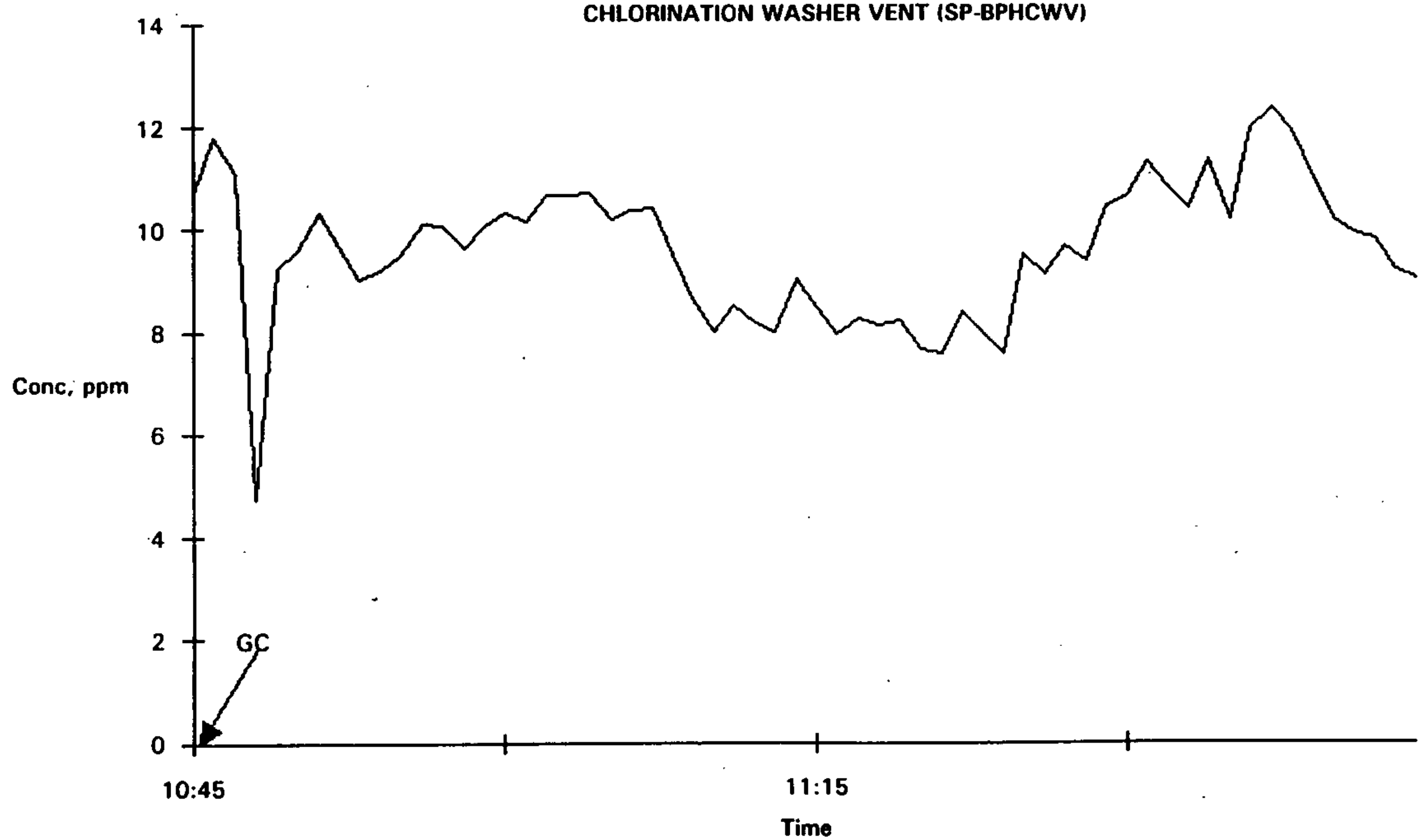

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TABLE 19.1 SUMMARY OF VOC RESULTS

Mill: SIMPSON - PASADENA | Source: Chlorination Washer Vent
Source Code: SP-BPHCWV | Test Dates: 6/10/92
FIN: PN2151 CIN: NA | EPN: SN66

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	99	99	99	
Volumetric Flow Rate, x10^3 DSCFM	8.3	8.3	8.3	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	13.5	13.5	13.5	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	0.4	0.4	0.4	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	0.4	0.4	0.4	0.2
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.2
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	ND	ND	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	0.2	0.2	0.2	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	0.2	0.2	0.2	0.1

ND=Not Detected
DL=Detection Limit

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TABLE 19.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: SIMPSON-PASADENA
Source Code: SP-BPHCWV
FIN: PN2151 EPN: SN66

Source: Chlorination Washer Vent
Test Dates: 6/10/92
CIN: NA

	RUN 1	DL
Volumetric Flow Data		
Stack Temperature, °F	99	
Volumetric Flow Rate, x 10^3 DSCFM	8.3	
Process Operating Conditions		
Production Rate, ADT pulp/hr	13.5	
Emission Rate, lb/hr		
Chloroform		
Hydrogen chloride	<0.1	0.1

ND = Not Detected
DL = Detection Limit

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Section 19.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source: Chlorination Washer Vent		FIN: PN2151
Source Code: SP-BPHCWV	Date: 6/10/92	EPN: SN66	CIN: NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1044			
Flow Data				
Stack Temperature, °F	99			99
Moisture Content, %	6.3			6.3
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	9.4			9.4
Volumetric Flow Rate, x10^3 DSCFM	8.3			8.3
Process Operating Conditions				
Production Rate, ADT pulp/hr	13.5			13.5
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	8.9			8.9
Emission Rate, lb/hr	0.4			0.4
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acetone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Chlorination Washer Vent | FIN: PN2151
Source Code: SP-BPHCWV | Date: 6/10/92 EPN: SN66 | CIN: NA

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Chloroform				
Concentration, ppmvd	2.7			2.7
Emission Rate, lb/hr	0.4			0.4
Benzene				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *			1.1 *
Emission Rate, lb/hr	0.2 *			0.2 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Cumene				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
alpha-Pinene				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
beta-Pinene				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
3-Carene				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA
Source Code: SP-BPHCWV

Source: Chlorination Washer Vent
Date: 6/10/92 EPN: SN66

FIN: PN2151
CIN: NA

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Knowns as Carbon				
Concentration, ppmvd	11.2			11.2
Unknowns as Carbon				
Concentration, ppmvd	0.0			0.0
Sum M18 as Carbon, lb/hr	0.2			0.2
Unknown Compounds % of Total	0.0%			0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	10.7			10.7
Emission Rate, lb/hr as C	0.2			0.2

COMMENTS

Bleach plant down for runs 2 and 3.

* One or more values were less than the detection limit.

Section 19.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill:	SIMPSON - PASADENA	Source:	Chlorination Washer Vent			FIN:	PN2151
Source Code:	SP-BPHCWV	Date:	6/10/92	EPN:	SN66	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1048			
Flow Data				
Stack Temperature, °F	99			99
Moisture Content, %	6.3			6.3
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	9.4			9.4
Volumetric Flow Rate, x10^3 DSCFM	8.3			8.3
Process Operating Conditions				
Production Rate, ADT pulp/hr	13.5			13.5
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd				
Emission Rate, lb/hr				
Hydrogen chloride				
Concentration, ppmvd	1.5			1.5
Emission Rate, lb/hr	0.1 *			0.1 *

COMMENTS

Chloroform was not sampled due to bleach plant going down.

* One or more values were less than the detection limit.

Section 19.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL SP SOURCE SP-BPHCWV

1. CALIBRATION

THEOR	DATE	6/10/92	DATE	1/0/00
ppm	ppm	%REC	ppm	%REC
0	-7	-0.7%		
90	94	104.4%		0.0%
149	156	104.7%		0.0%
375	371	98.9%		0.0%

2. PROPANE LINE RECOVERY

	DATE	6/10/92		DATE		
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	155	140	90%			
AFTER	158	151	96%			

3. LINE BLANK

	DATE	6/10/92		DATE		
	INST	LINE		INST	LINE	
BEFORE	0	0				
AFTER	0	0				

QUALITY CONTROL SUMMARY
METHOD 18

MILL SP SOURCE SP-BPHCWV

1. CHECK STANDARD

ANALYTE	THEOR	DATE	6/10/92	THEOR	DATE	
	ppm	ppm	%REC	ppm	ppm	%REC
ethanol	55.64	35.09	63.07%			
acetone	44.47	39.08	87.87%			
isopropanol	42.65	31.24	73.24%			
dimethyl sulfide	9.78	8.37	85.66%			
benzene	36.54	36.89	100.96%			
bromodichloromethane	20.08	18.48	92.04%			
dimethyl disulfide	36.26	31.81	87.73%			
toluene	30.73	27.76	90.36%			
ethyl benzene	26.67	24.25	90.95%			
m-xylene	53.27	47.62	89.38%			
o-xylene	26.76	24.67	92.18%			
cumene	23.47	21.73	92.57%			
alpha-pinene	20.49	18.94	92.44%			
beta-pinene	20.59	18.51	89.89%			
3-carene	20.61	18.43	89.39%			
p-cymene	20.92	18.82	89.97%			

2. PROPANE RESPONSE

	THEOR			THEOR	
BEFORE RUN	89.7	86.9	96.9%		
AFTER RUN	89.7	86.0	95.9%		

3. METHANOL LINE RECOVERY

	THEOR			THEOR	
BEFORE RUN	109.0	99.4	91.2%		
AFTER RUN	107.7	110.0	102.1%		

4. LINE BLANK

	[------------FILE REF------------]	
BEFORE RUN	FAB4003	
AFTER RUN	FBB4001	

Section 19.4 Process Operating Data

MILL: SIMPSON PAPER SOURCE: HARDWOOD BLEACH PLANT

	UNITS														
DATE		6/10 ->								6/18					
TIME		1044	1044	1523	1623	1723	1523	1623	1723	1110	1210	1310	1520	1620	1720
SOURCE		BPHSHW	BPHCWV	BPHCSS ->			BPHEWV ->			BPHCSS ->			BPHCTS ->		
FIN		PN2166	PN2151	PN2152 ->			PN2151 ->			PN2152 ->			PN2162 ->		
EPN		SN75	SN66	SN88 ->			SN66 ->			SN88 ->			SN74 ->		
WOOD		HARDWOOD ->													
PRODUCT	T/D	325	325	300	300	275	300	300	275	300	275	275	275	275	275
KAPPA		16.9	16.9	17.9	17.9	18.5	17.9	17.9	18.5	19.0	18.2	18.2	18.8	21.5	20.7
CHEM USAGE															
Cl_2	LB/T	112	112	112	112	80	112	112	80	136	128	128	72	108	116
NaOH	LB/T	114	114	106	106	105	106	106	105	132	133	133	133	130	130
NaOCl	LB/T	36	36	32	32	32	32	32	32	34	34	34	34	34	34
ClO_2	LB/T	17	17	17	17	17	17	17	17	17	17	17	17	17	17
NaOCl	LB/T	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NaOH	LB/T	8	8	8	8	8	8	8	8	4	4	4	4	4	4
C STOCK	F	100	100	100	100	100	100	100	100	116	116	116	116	116	116
E MIXER	F	110	110	110	110	110	110	110	110	118	118	118	118	118	118
H_1 MIXER	F	128	128	128	128	128	128	128	128	128	128	128	128	128	128
D UPFLOW	F	154	154	154	154	154	154	154	160	160	160	160	160	160	160
H_2 MIXR	F	110	110	110	110	110	110	110	110	110	110	110	110	110	110
pH LEVEL															
Eo		10.6	10.6	10.8	10.8	10.9	10.8	10.8	10.9	10.8	11.1	11.1	10.9	11.1	10.8
H_1		8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.0	7.8	7.8	8.1	8.3	8.5
D		4.5	4.5	4.5	4.5	4.5	4.5	4.5	3.9	4.0	3.8	3.8	4.1	3.7	4.1
H_2		9.0	9.0	9.0	9.0	9.0	9.0	9.0	8.8	8.8	8.7	8.7	8.6	8.6	8.6

SCRUBBER, Cl_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW SCFM - NO FAN
LIQ FLOW 3 GPM 10% NaOH
DP IN H_2O - NO FAN

(2) SCRUBBERS, ClO_2 TOWER AND SEAL BOX
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW SCFM - NO FAN
LIQ FLOW 10 GPM DILUTE SODIUM BISULFITE
DP IN H_2O - NO FAN

NOTES: 1.0 BLEACHING SEQUENCE -

	RETENTION TIMES, MIN @ 350 T/D
CHLORINE, C	42
CAUSTIC SODA, E	42
1st SODIUM HYPOCHLORITE WITH CAUSTIC, H_1	170
CHLORINE DIOXIDE WITH CAUSTIC, D	220
2nd SODIUM HYPOCHLORITE WITH CAUSTIC, H_2	30

2.0 ALL VALUES ONE HOUR READINGS FROM OPERATIONS LOG
3.0 PRODUCTION IS IN OVEN DRY UNBLEACHED SHORT TONS
4.0 ClO_2 IS AS ClO_2
5.0 H_1 pH REPRESENTS VAT pH WHERE pH IS ADJUSTED BY ADDING CHLORINE FILTRATE TO REDUCE SCALING. ACTUAL pH IN THE HYPO TOWER IS IN THE RANGE OF 9.5.

Note: See Appendix D for Unit Process Description

SECTION 20

EXTRACTION WASHER VENT

(SP-BPHEWV)

20. SP-BPHEWV

SECTION 20
EXTRACTION WASHER VENT
(SP-BPHEWV)

The Extraction Washer Vent was tested on one day. The source was sampled for volatile organic compounds using Methods 25A and 18. Chloroform and hydrogen chloride samples were collected.

Total Hydrocarbons (M25A)

Figures 20.1 presents the THC trends for the test period on 6/10/92. The total hydrocarbon concentrations were predominately 0 ppm. Between 1524 and 1551, the concentration was 1 ppm.

Volatile Organic Compounds (M18)

Table 20.1 summarizes the results for Method 18 target compounds, and Section 20.1 is a tabulation of the data. Methanol and chloroform were identified by the Method 18 analyses. The volumetric flow was measured during sampling with a pitot tube.

Miscellaneous Parameters

Table 20.2 summarizes the results of testing for hydrogen chloride and chloroform. *Section 20.2 tabulates the results for each compound.* The chloroform result was slightly higher than Method 18. Hydrogen chloride was detected (<0.1 lb/hr).

VOC Quality Control Results

The VOC quality control data are tabulated in Section 20.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 20.4 includes the process operating data as recorded and provided by mill personnel.

FIGURE 20.1

THC TREND ANALYSIS (6/10/92)
EXTRACTION WASHER VENT (SP-BPHEWV)

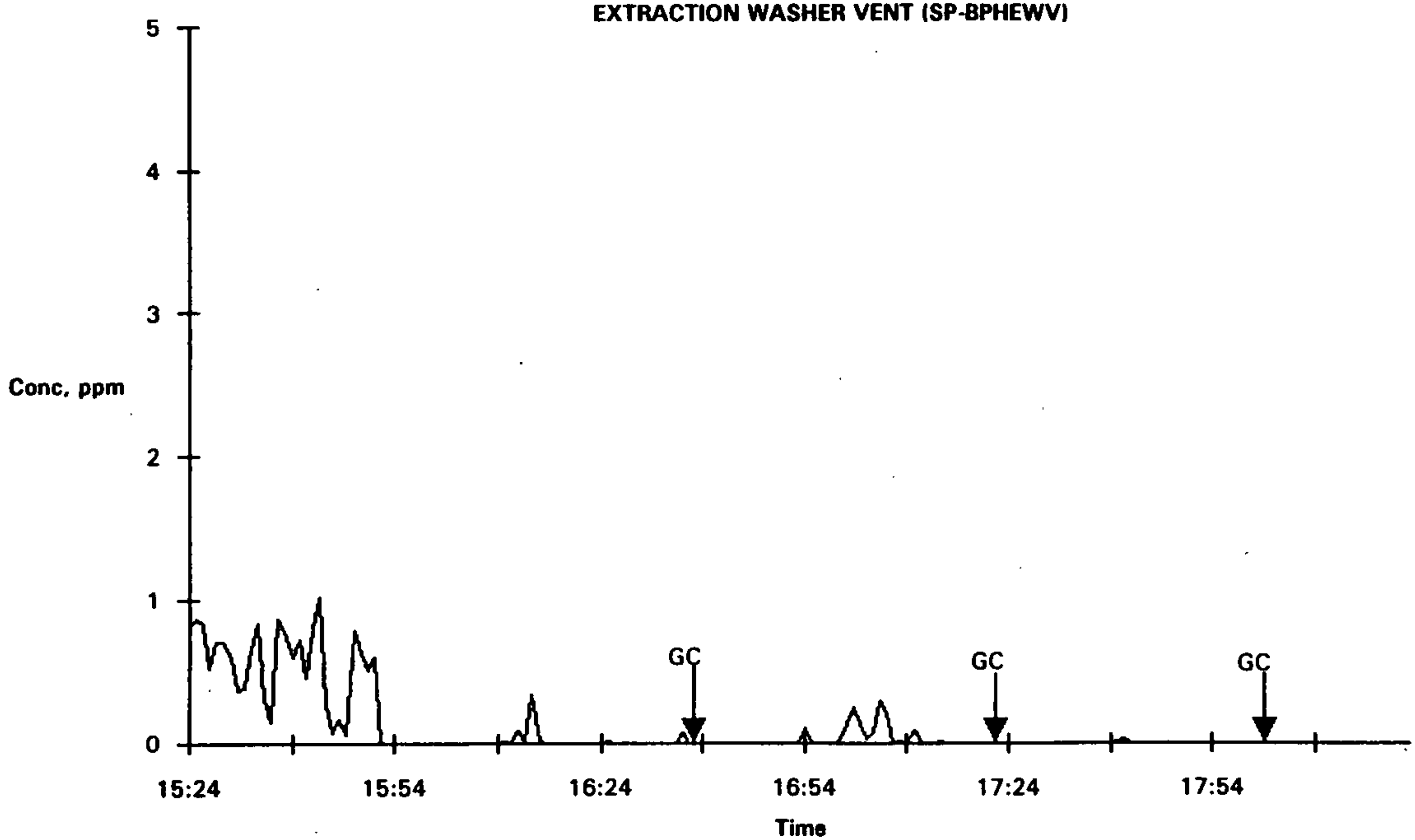

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TABLE 20.1 SUMMARY OF VOC RESULTS

Mill: SIMPSON - PASADENA | Source: Extraction Washer Vent
Source Code: SP-BPHEWV | Test Dates: 6/10/92
FIN: PN2155 CIN: NA | EPN: SN68

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	101	101	101	
Volumetric Flow Rate, $x10^3$ DSCFM	14.2	14.2	14.2	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	12.5	12.5	12.5	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	0.7	1.6	1.1	0.2
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	<0.1	0.1	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	ND	0.4	0.2	0.3
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.4
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.2
beta-Pinene	ND	ND	ND	0.2
3-Carene	ND	ND	ND	0.2
Terpenes (Unspecified)	ND	ND	ND	0.2
p-Cymene	ND	ND	ND	0.2
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	0.2	0.4	0.3	0.1
Unknowns as C, lb/hr	ND	<0.1	0.1	0.1
Sum of Compounds as C, lb/hr	0.3	0.4	0.3	0.1

ND=Not Detected
DL=Detection Limit

TEXAS EMISSIONS SPECIATION STUDY
EMISSION TEST RESULTS
TEMPLE-INLAND
SILSBEE, TEXAS

VOLUME 6 OF 6

Prepared For:

TEXAS PAPER INDUSTRY ENVIRONMENTAL COMMITTEE

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JANUARY 1993

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WWC (R) DW 18 December 1992

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MANAGERS DESIGNERS/CONSULTANTS

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This volume of the report presents the results of the sources tested at the Temple-Inland mill in Silsbee, Texas. Volume 1 describes the objectives of the study, methodology used to collect the data, and the quality control results which are applicable to the entire study at the five mills. A copy of the project work plan is also included as an Appendix to Volume 1.

The table on the following page summarizes the sources tested for the various parameters. The testing was conducted during the time period of 09 July through 21 July by a WESTON test team led by Mr. Bobby Betts. Mr. J. P. Hawkins of Temple-Inland was responsible for collection of process operating data and coordination of testing activities with mill operations.

The data are presented in separate sections for each source. A brief narrative is used to highlight data for the source and the data collected for each source is summarized in tabular form. A trend plot is included for the total hydrocarbon concentration. Subsections are used to present specific source results, quality control results and process operating conditions. The preliminary data collected during the screening phase is included as an appendix. Supporting data (chromatograms, calibration data, field data sheets, etc.) will remain on file for a period of three years.

SOURCES TESTED AT TEMPLE - INLAND

SOURCE TESTED	SOURCE CODE	Phase 2									
		M16 TRS	M18 M25A	VOST	MM5	CH2O	Metals	Cr+6	HCl	Acid Mist	Chloro-form
TEMPLE - INLAND (Evadale)											
TPIEC-POOLED SOURCES											
Gas-Fired Power Boiler	TI-PBGF		Y			Y					
Recovery Furnace (Non-Contact)	TI-RF2	Y	Y	Y		Y					
Brown Stock Washer SW Line (3 vents)											
BSW Vent No 4	TI-BSWV4	Y	Y	Y							
BSW Vent No 5	TI-BSWV5	Y	Y								
BSW Vent No 6	TI-BSWV6	Y	Y								
Brown Stock Washer HW Line (2 vents)											
BSW Vent No 1	TI-BSWV1	Y	Y	Y							
BSW Vent No 2	TI-BSWV2	Y	Y								
MILL-SPECIFIC SOURCES											
No. 6 Power Boiler	TI-PB6		Y			Y	Y				
NCG Incinerator Stack	TI-INCNCG	Y	Y								
Bleach Plant 1 Scrubber Outlet	TI-BPSO1		Y								Y
Bleach Plant 2 Scrubber Outlet	TI-BPSO2		Y								Y
Bleach Plant 3 Scrubber Outlet	TI-BPSO3		Y								Y
Lime Kiln Mud Washer Vent No 3	TI-LKMW	Y	Y								
Sewer Manhole Area	TI-SMA	Y	Y								

1. TI-PBGF

SECTION 1
GAS-FIRED POWER BOILER
(TI-PBGF)

SECTION 1
GAS-FIRED POWER BOILER
(TI-PBGF)

The Gas-Fired Power Boiler was tested on two different days for volatile organic compounds and aldehydes.

Total Hydrocarbons (M25A)

Figures 1.1 and 1.2 present the THC trends for the test periods on 7/18/92 and 7/19/92. Total hydrocarbon values were very low on both days (2-3 ppm). No explanation is available for the THC spikes on 7/18/92.

Volatile Organic Compounds (M18)

Table 1.1 summarizes the results for the Method 18 target compounds, and Section 1.1 is a tabulation of the data. TRS was not analyzed. The volumetric flow was measured during sampling using a pitot tube. Methanol was present on 7/18/92 at concentrations approximately one-half the detection limit of 1.2 lb/hr. No target compounds were identified on 7/19/92.

Miscellaneous Parameters

Table 1.2 summarizes the results of testing for aldehydes. Section 1.2 tabulates the results for each compound. Acetone was detected at 2 lb/hr on 7/19/92. No other aldehydes were detected. It is unknown whether or not the trace amount of acetone is an anomaly of the method or the source. Acetone was not identified in any of the M18 analyses.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 1.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 1.4 includes the process operating data as recorded and provided by mill personnel. It should be noted that process data for this source was provided for 7/16/92 and 7/17/92 instead of 7/18/92 and 7/19/92.

FIGURE 1.1
THC TREND ANALYSIS (7/18/92)
GAS-FIRED POWER BOILER (TI-PBGF)

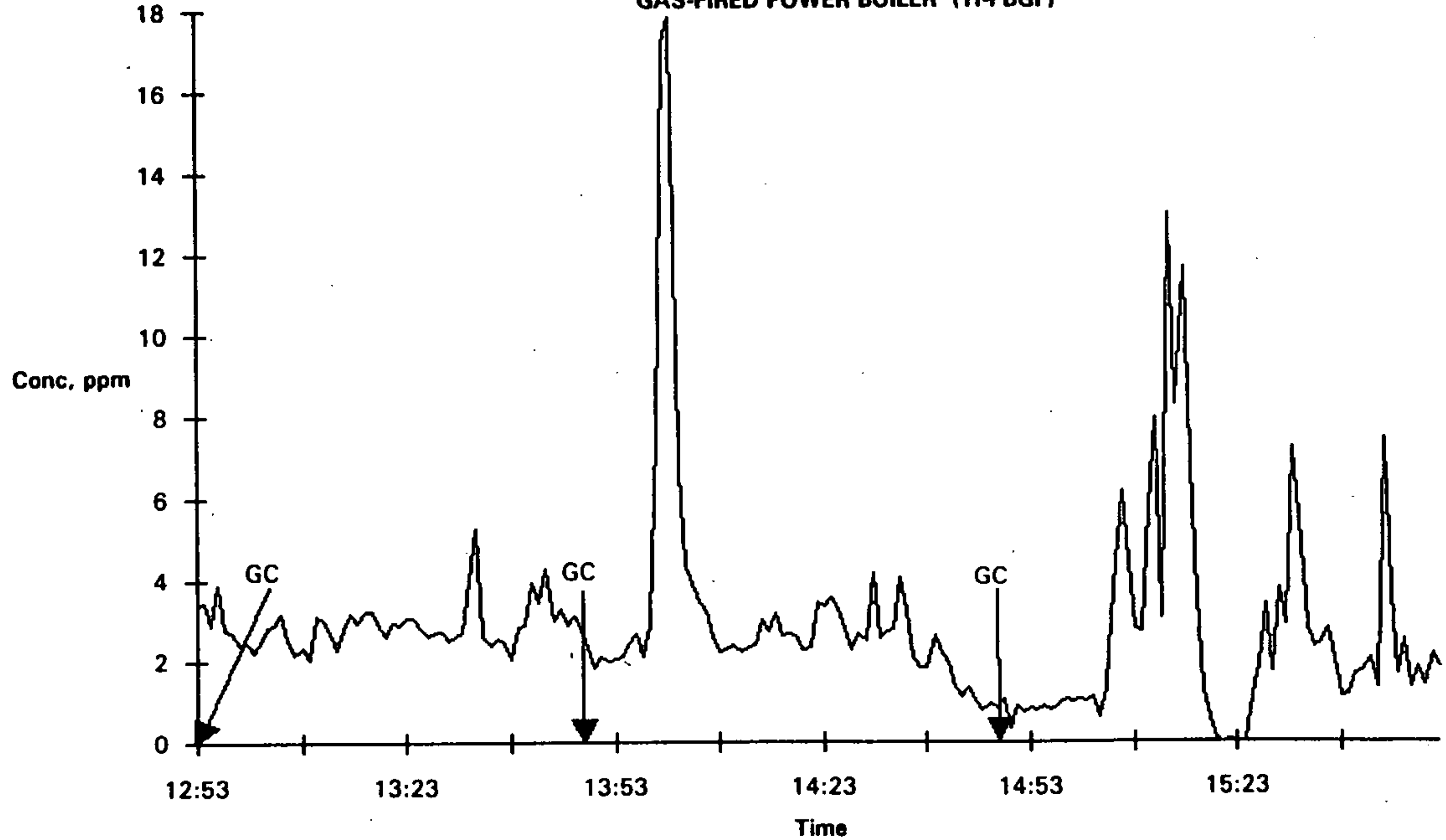

FIGURE 1.2
THC TREND ANALYSIS (7/19/92)
GAS-FIRED POWER BOILER (TI-PBGF)

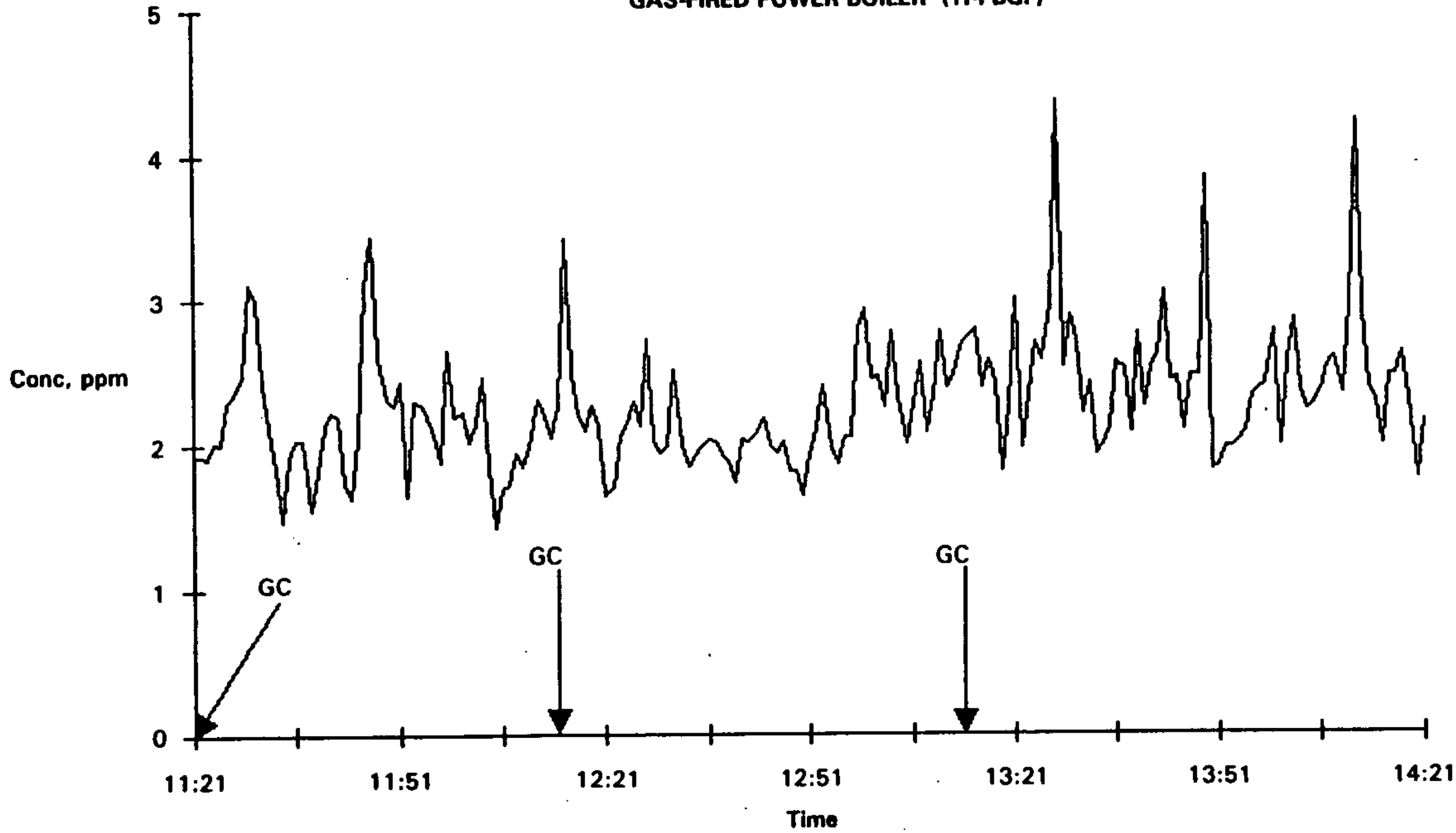

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TABLE 1.1 SUMMARY OF VOC RESULTS

Mill: TEMPLE-INLAND (Evadale) Source: Gas-Fired Power Boiler
Source Code: TI-PBGF Test Dates: 7/18/92 7/19/92
FIN: P-6 CIN: 511 EPN: 1

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	342	349	346	
Volumetric Flow Rate, $x10^3$ DSCFM	107.9	108.7	108.3	
Process Operating Conditions				
Production Rate, $x10^6$ BTU/hr	251.7	299.7	270.0	
Method 16 Data, lb/hr				
Hydrogen sulfide				
Methyl mercaptan				
Dimethyl sulfide				
Carbon disulfide				
Dimethyl disulfide				
Method 18 Data, lb/hr				
Methanol	ND	ND	ND	1.2
Ethanol	ND	ND	ND	0.4
Acetone	ND	ND	ND	0.5
2-Propanol	ND	ND	ND	0.6
2-Butanone	ND	ND	ND	0.7
Chloroform	ND	ND	ND	2.2
Benzene	ND	ND	ND	0.7
Bromodichloromethane	ND	ND	ND	3
Toluene	ND	ND	ND	0.8
Ethyl benzene	ND	ND	ND	1
m-, p-Xylene	ND	ND	ND	1
o-Xylene	ND	ND	ND	1
Cumene	ND	ND	ND	1.1
alpha-Pinene	ND	ND	ND	1.3
beta-Pinene	ND	ND	ND	1.3
3-Carene	ND	ND	ND	1.3
Terpenes (Unspecified)	ND	ND	ND	1.3
p-Cymene	ND	ND	ND	1.2
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	ND	0.2	0.1	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	ND	0.2	0.1	0.1

ND=Not Detected
DL=Detection Limit

WESTON
MANAGERS DESIGNERS CONSULTANTS

TABLE 1.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: TEMPLE-INLAND
Source Code: TI-PBGF
FIN: P-6 EPN: 1

Source: Gas-Fired Power Boiler
Test Dates: 7/18/92, 7/19/92
CIN: 511

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	342	349	346	
Volumetric Flow Rate, x 10^3 DSCFM	107.9	108.7	108.3	
Process Operating Conditions				
Production Rate, x 10^6 BTU/hr	273.9	278.5	276.2	
Emission Rate, lb/hr				
Formaldehyde	ND	ND	ND	0.3
Acetaldehyde	ND	ND	ND	0.4
Acetone (Impinger)	ND	2.0	1.1	0.5
Acetophenone	ND	ND	ND	1.0
2-Butanone (Impinger)	ND	ND	ND	0.6
Methyl isobutyl ketone	ND	ND	ND	0.8
Acrolein	ND	ND	ND	0.5
Benzaldehyde	ND	ND	ND	0.9

ND = Not Detected
DL = Detection Limit

Section 1.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale)	Source:	Gas-fired Power Boiler		FIN:	P-6
Source Code: TI-PBGF	Date:	7/18/92	EPN: 1	CIN:	511

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1252	1352	1452	
Flow Data				
Stack Temperature, °F		349		349
Moisture Content, %		8.4		8.4
Oxygen Concentration, %		14.5		14.5
Carbon Dioxide Concentration, %		4.0		4.0
Volumetric Flow Rate, x10^3 ACFM		180.5		180.5
Volumetric Flow Rate, x10^3 DSCFM		107.9		107.9
Process Operating Conditions				
Production Rate, x10^6 BTU/hr	278.5	299.7	263.0	280.4
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	2.2 *	2.2 *	2.2 *	2.2 *
Emission Rate, lb/hr	1.2 *	1.2 *	1.2 *	1.2 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.6 *	0.6 *	0.6 *	0.6 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale)	Source: Gas-fired Power Boiler		FIN: P-6
Source Code: TI-PBGF	Date: 7/18/92	EPN: 1	CIN: 511

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
Chloroform				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	2.2 *	2.2 *	2.2 *	2.2 *
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	3.0 *	3.0 *	3.0 *	3.0 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.8 *	0.8 *	0.8 *	0.8 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	1.0 *	1.0 *	1.0 *	1.0 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	1.0 *	1.0 *	1.0 *	1.0 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	1.0 *	1.0 *	1.0 *	1.0 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	1.1 *	1.1 *	1.1 *	1.1 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	1.2 *	1.2 *	1.2 *	1.2 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	1.2 *	1.2 *	1.2 *	1.2 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	1.2 *	1.2 *	1.2 *	1.2 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	1.2 *	1.2 *	1.2 *	1.2 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: Gas-fired Power Boiler FIN: P-6

Source Code: TI-PBGF Date: 7/18/92 EPN: 1 CIN: 511

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	1.2 *	1.2 *	1.2 *	1.2 *
Knowns as Carbon				
Concentration, ppmvd	0.8	0.9	0.8	0.8
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.2	0.2	0.2	0.2
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	3.3	3.3	3.3	3.3
Emission Rate, lb/hr as C	0.7	0.7	0.7	0.7

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale)	Source: Gas-fired Power Boiler		FIN:	P-6
Source Code: TI-PBGF	Date: 7/19/92	EPN: 1	CIN:	511

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1120	1220	1320	
Flow Data				
Stack Temperature, °F			342	342
Moisture Content, %			8.4	8.4
Oxygen Concentration, %			14.5	14.5
Carbon Dioxide Concentration, %			4.0	4.0
Volumetric Flow Rate, x10^3 ACFM			180.2	180.2
Volumetric Flow Rate, x10^3 DSCFM			108.7	108.7
Process Operating Conditions				
Production Rate, x10^6 BTU/hr	251.7	253.4	273.9	259.7
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	2.2 *	2.2 *	2.2 *	2.2 *
Emission Rate, lb/hr	1.2 *	1.2 *	1.2 *	1.2 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.6 *	0.6 *	0.6 *	0.6 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale)	Source:	Gas-fired Power Boiler		FIN:	P-6
Source Code: TI-PBGF	Date:	7/19/92	EPN: 1	CIN:	511

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
Chloroform				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	2.2 *	2.2 *	2.2 *	2.2 *
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	3.0 *	3.0 *	3.0 *	3.0 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.9 *	0.9 *	0.9 *	0.9 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	1.0 *	1.0 *	1.0 *	1.0 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	1.0 *	1.0 *	1.0 *	1.0 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	1.0 *	1.0 *	1.0 *	1.0 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	1.1 *	1.1 *	1.1 *	1.1 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	1.3 *	1.3 *	1.3 *	1.3 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	1.3 *	1.3 *	1.3 *	1.3 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	1.3 *	1.3 *	1.3 *	1.3 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	1.3 *	1.3 *	1.3 *	1.3 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: Gas-fired Power Boiler FIN: P-6
Source Code: TI-PBGF Date: 7/19/92 EPN: 1 CIN: 51'

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	1.2 *	1.2 *	1.2 *	1.2 *
Knowns as Carbon				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.1 *	0.1 *	0.1 •	0.1 *
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	2.2	2.2	2.2	2.2
Emission Rate, lb/hr as C	0.4	0.4	0.4	0.4

* One or more values were less than the detection limit.

WESTON

Section 1.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: TEMPLE-INLAND (Evadale)	Source:	Gas-fired Power Boiler		FIN:	P-6
Source Code: TI-PBGF	Date:	7/18/92	EPN: 1	CIN:	511

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1339			
Flow Data				
Stack Temperature, °F	349			349
Moisture Content, %	8.4			8.4
Oxygen Concentration, %	14.5			14.5
Carbon Dioxide Concentration, %	4.0			4.0
Volumetric Flow Rate, x10^3 ACFM	180.5			180.5
Volumetric Flow Rate, x10^3 DSCFM	107.9			107.9
Process Operating Conditions				
Production Rate, x10^6 BTU/hr	278.5			278.5
Miscellaneous Parameters				
Formaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.3 *			0.3 *
Acetaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.4 *			0.4 *
Acetone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.5 *			0.5 *
Acetophenone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.0 *			1.0 *
Methyl ethyl ketone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.6 *			0.6 *
Methyl isobutyl ketone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.8 *			0.8 *
Acrolein				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.5 *			0.5 *
Benzaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.9 *			0.9 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill:	TEMPLE-INLAND (Evadale)	Source:	Gas-fired Power Boiler	FIN:	P-6
Source Code:	TI-PBGF	Date:	7/19/92 EPN: 1	CIN:	511

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1359			
Flow Data				
Stack Temperature, °F	342			342
Moisture Content, %	8.4			8.4
Oxygen Concentration, %	14.5			14.5
Carbon Dioxide Concentration, %	4.0			4.0
Volumetric Flow Rate, x10^3 ACFM	180.2			180.2
Volumetric Flow Rate, x10^3 DSCFM	108.7			108.7
Process Operating Conditions				
Production Rate, x10^6 BTU/hr	273.9			273.9
Miscellaneous Parameters				
Formaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.3 *			0.3 *
Acetaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.4 *			0.4 *
Acetone (Impinger)				
Concentration, ppmvd	2.0			2.0
Emission Rate, lb/hr	2.0			2.0
Acetophenone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.0 *			1.0 *
Methyl ethyl ketone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.6 *			0.6 *
Methyl isobutyl ketone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.8 *			0.8 *
Acrolein				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.5 *			0.5 *
Benzaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.9 *			0.9 *

* One or more values were less than the detection limit.

Section 1.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source.. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL TEMPLE-INLAND SOURCE TI-PBGF

1. CALIBRATION

THEOR	DATE 7/18/92		DATE		7/19/92
ppm	ppm	%REC	ppm	%REC	%REC
0	2		0		
90	85	94%	87		97%
360	361	100%	364		101%
747	746	100%	744		100%

2. PROPANE LINE RECOVERY

	DATE INST	7/18/92 LINE	%REC	DATE INST	7/19/92 LINE	%REC
BEFORE	90	91	101%	92	87	95%
AFTER	92	87	95%	16	18	113%

3. LINE BLANK

	[---------------- ppm	----------------]		
BEFORE RUN	0	0	0	0
AFTER RUN	0	0	0	0

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QUALITY CONTROL SUMMARY
METHOD 18

MILL TEMPLE-INLAND SOURCE TI-PBGF

1. CHECK STANDARD

ANALYTE	THEOR ppm	DATE 7/18/92 ppm	%REC	THEOR ppm	DATE 7/19/92 ppm	%REC
ethanol	55.64	26.98	48%	55.64	13.27	24%
acetone	44.47	29.93	67%	44.47	23.54	53%
isopropanol	42.65	35.46	83%	42.65	32.58	76%
benzene	36.54	71.26	195%	36.54	66.95	183%
bromodichloromethane	40.17	37.06	92%	40.17	35.55	89%
toluene	30.73	31.78	103%	30.73	31.25	102%
ethyl benzene	26.67	26.08	98%	26.67	25.83	97%
m-xylene	26.64	26.04	98%	26.64	26.07	98%
o-xylene	26.76	25.72	96%	26.76	25.40	95%
cumene	23.47	23.06	98%	23.47	22.23	95%
alpha-pinene	20.49	20.26	99%	20.49	20.09	98%
beta-pinene	20.59	21.62	105%	20.59	17.11	83%
3-carene	20.61	19.98	97%	20.61	19.63	95%
p-cymene	20.92	20.58	98%	20.92	20.09	96%

2. PROPANE RESPONSE

	THEOR					
BEFORE RUN	125.00	116.30	93%	125.00	111.87	89%
AFTER RUN	125.00	111.87	89%	125.00	115.04	92%

3. METHANOL LINE RECOVERY

	THEOR					
BEFORE RUN	98.92	112.24	113%	85.70	81.03	95%
AFTER RUN	85.70	81.03	95%	99.48	102.53	103%

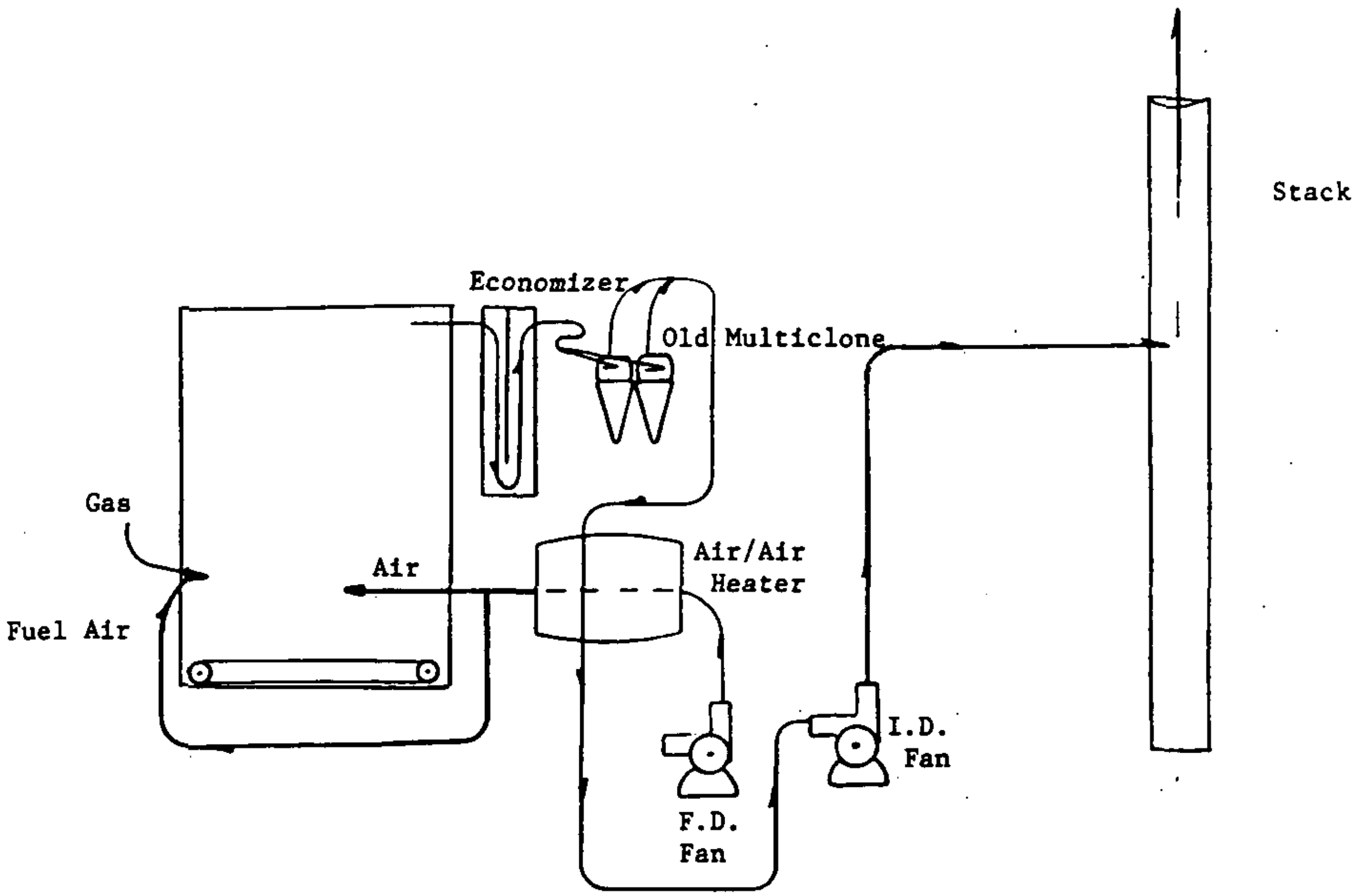
4. LINE BLANK

	[------------FILE REF------------]	
BEFORE RUN	GIB4004	GIB4010
AFTER RUN	GIB4010	GJA4008

Section 1.4 Process Operating Data

GAS FIRED POWER BOILER

The No.1 gas fired power boiler (EPN 1) is a converted 1958 vintage B & W wood fueled boiler with a present production capacity of 225,000 lbs/hr steam at 700# pressure. The boiler is fired with pipeline quality natural gas and was recently modified (1991) to include "low NOx" burners. (See Figure GB-1)



No.1 Gas Fired
Power Boiler
(Converted Bark Burner)

SECTION 2
RECOVERY FURNACE
(TI-RF2)

WESTON
MANAGERS DESIGNERS/CONSULTANTS

SECTION 2
RECOVERY FURNACE
(TI-RF2)

The No. 2 Recovery Furnace was tested on two different days for volatile organic compounds by Methods 25A, 16, 18 and VOST. Miscellaneous parameters tested included aldehydes.

Total Hydrocarbons (M25A)

Figures 2.1 and 2.2 present the THC trends for the test periods on 7/18/92 and 7/19/92. Total hydrocarbon values were low, ranging from 3 to 9 ppm on 7/18/92. On 7/19/92, very low total hydrocarbons were present except for a spike at approximately 1200 ppm in the second hour.

Volatile Organic Compounds (M16 and M18)

Table 2.1 summarizes the results for the Method 16 and Method 18 target compounds, and Section 2.1 is a tabulation of the data. Methanol was present on 7/18/92, but not on 7/19/92. Concentrations were just above the detection limit of 1.3 to 1.4 lb/hr. No other target compounds were identified at levels greater than the listed detection limits. Methyl mercaptan was the sole reduced sulfur compound present with an emission rate of 1.7 to 2.8 lb/hr each day.

Volatile Organic Sampling Train (VOST)

Table 2.2 summarizes the result of the VOST sample collected on 7/18/92. Section 2.2 tabulates the results for target compounds and tentatively identified compounds (TIC). Benzene, acetone, toluene and 2-butanone were detected at unexpectedly high concentrations. These results were not supported by the THC nor the M18 results. The high-level VOST analysis was performed.

Miscellaneous Parameters

Table 2.3 summarizes the results of testing for aldehydes. Section 2.3 tabulates the results for each compound. Acetone was detected by the DNPH method but the result was unsupported by the M18 data. Acetone was the only compound detected at levels above the detection limit.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 2.4. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 2.5 includes the process operating data as recorded and provided by mill personnel.

FIGURE 2.1
THC TREND ANALYSIS (7/18/92)
RECOVERY FURNACE (NON-CONTACT) (TI-RF2)

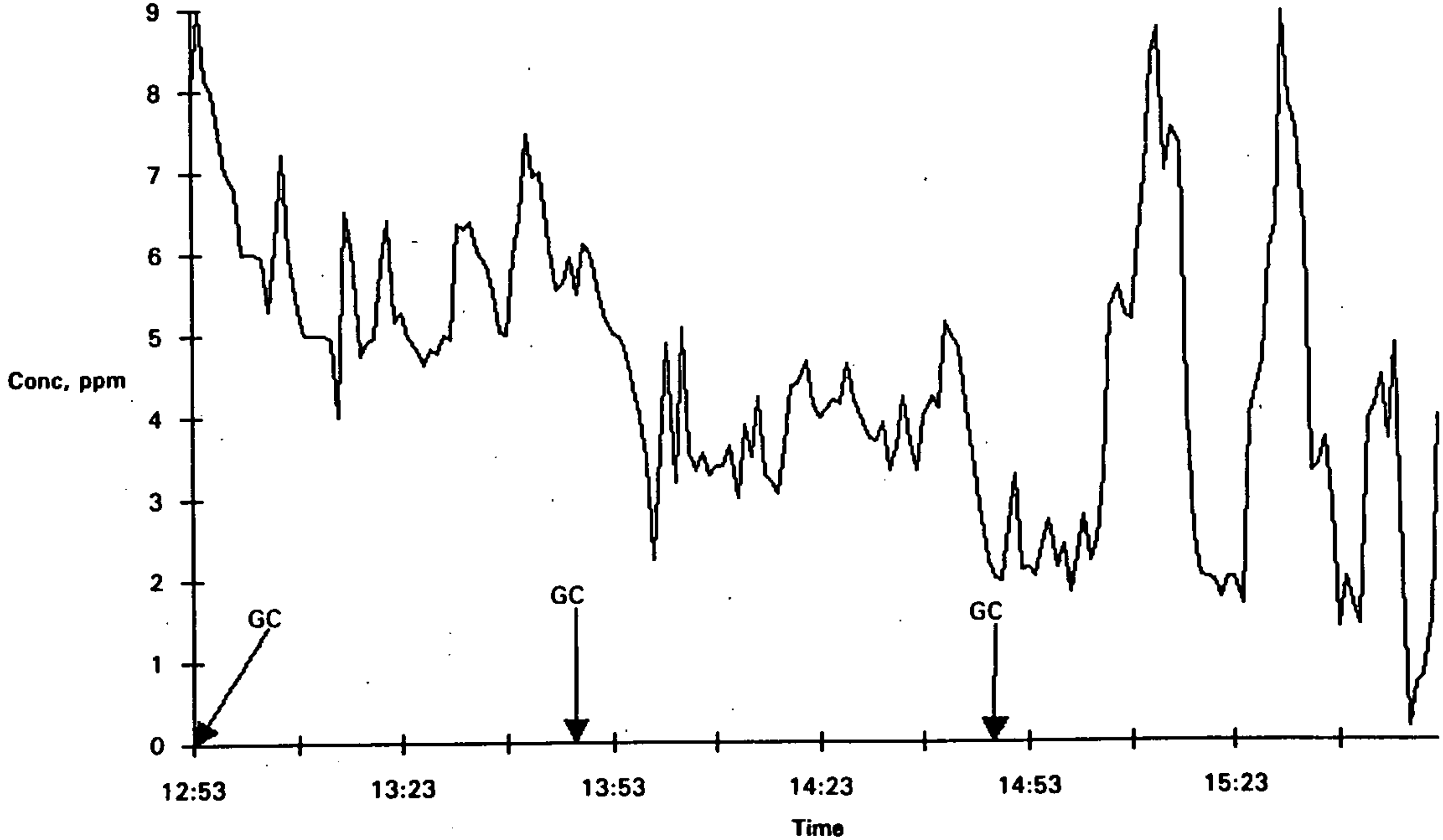


FIGURE 2.2
THC TREND ANALYSIS (7/19/92)
RECOVERY FURNACE (NON-CONTACT) (TI-RF2)

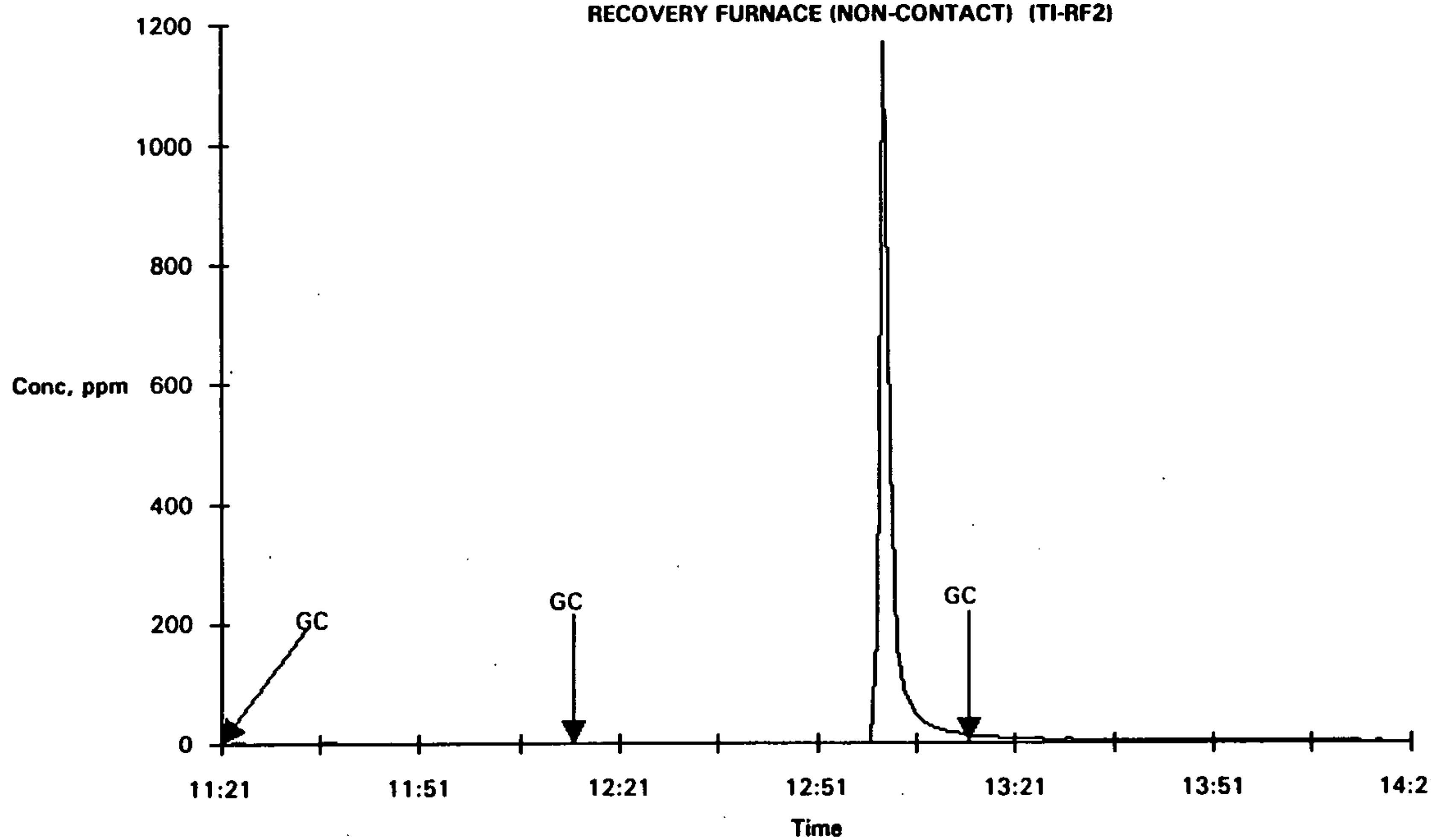


TABLE 2.1 SUMMARY OF VOC RESULTS

Mill: TEMPLE-INLAND (Evadale) | Source: Recovery Furnace (Non-Contact)
Source Code: TI-RF2 | Test Dates: 7/18/92 7/19/92
FIN: P-7 CIN: 617&9 | EPN: 2

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	348	358	353	
Volumetric Flow Rate, x10^3 DSCFM	106.1	112.0	109.0	
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	79.9	81.9	80.9	
Method 16 Data, lb/hr				
Hydrogen sulfide	3.2	7.7	5.3	0.3
Methyl mercaptan	1.7	2.8	2.2	0.4
Dimethyl sulfide	ND	ND	ND	0.5
Carbon disulfide	ND	ND	ND	0.6
Dimethyl disulfide	ND	ND	ND	0.8
Method 18 Data, lb/hr				
Methanol	ND	1.5	0.9	1.4
Ethanol	ND	ND	ND	0.5
Acetone	ND	ND	ND	0.6
2-Propanol	ND	ND	ND	0.6
2-Butanone	ND	ND	ND	0.8
Chloroform	ND	ND	ND	2.5
Benzene	ND	ND	ND	0.8
Bromodichloromethane	ND	ND	ND	3.5
Toluene	ND	ND	ND	1
Ethyl benzene	ND	ND	ND	1.1
m-, p-Xylene	ND	ND	ND	1.1
o-Xylene	ND	ND	ND	1.1
Cumene	ND	ND	ND	1.3
alpha-Pinene	ND	ND	ND	1.4
beta-Pinene	ND	ND	ND	1.4
3-Carene	ND	ND	ND	1.4
Terpenes (Unspecified)	ND	ND	ND	1.4
p-Cymene	ND	ND	ND	1.4
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	0.8	1.1	0.9	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	0.8	1.1	0.9	0.1

ND=Not Detected
DL=Detection Limit

WESTON

TABLE 2.2 SUMMARY OF VOST RESULTS

Mill: TEMPLE-INLAND
Source Code: TI-RF2
FIN: P-7 EPN: 2

Source: Recovery Furnace (Non-Contact)
Test Dates: 7/18/92
CIN: 617 & 9

TIME	1410
Volumetric Flow Data	
Stack Temperature, °F	348
Volumetric Flow Rate, x 10^3 DSCFM	106.1
Process Operating Conditions	
Production Rate, 1000 lb BLS/hr	79.9
Target Compounds, ppm	
Methylene Chloride	0.116
Acetone	3.732
n-Hexane	0.107
2-Butanone (MEK)	0.297
Benzene	10.589
Dibromomethane	0.000
Toluene	0.316
Styrene	0.014
o-Xylene	0.030
m-,p-Xylene	0.042
a-Pinene	0.045
p-Cymene	0.030

WESTON

TABLE 2.3 SUMMARY OF MISCELLANEOUS RESULTS

Mill: TEMPLE-INLAND
Source Code: TI-RF2
FIN: P-7 EPN: 2

Source: Recovery Furance (Non-Contact)
Test Dates: 7/18/92, 7/19/92
CIN: 617&9

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	348	358	353	
Volumetric Flow Rate, x 10^3 DSCFM	106.1	112.0	109.1	
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	79.9	89.1	84.5	
Emission Rate, lb/hr				
Formaldehyde	ND	ND	ND	0.3
Acetaldehyde	ND	ND	ND	0.4
Acetone (Impinger)	ND	2.1	1.2	0.5
Acetophenone	ND	ND	ND	1.0
2-Butanone (Impinger)	ND	ND	ND	0.6
Methyl isobutyl ketone	ND	ND	ND	0.9
Acrolein	ND	ND	ND	0.5
Benzaldehyde	ND	ND	ND	0.9

ND = Not Detected
DL = Detection Limit

Section 2.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill:	TEMPLE-INLAND (Evadale)	Source:	Recovery Furnace (Non-Contact)	FIN:	P-7
Source Code:	TI-RF2	Date:	7/18/92 EPN: 2	CIN:	617 & 9

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1252	1352	1452	
Flow Data				
Stack Temperature, °F			348	348
Moisture Content, %			19.4	19.4
Oxygen Concentration, %			11.5	11.5
Carbon Dioxide Concentration, %			12.0	12.0
Volumetric Flow Rate, x10^3 ACFM			204.1	204.1
Volumetric Flow Rate, x10^3 DSCFM			106.1	106.1
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	79.9	79.9	79.9	79.9
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	5.6	6.0	7.6	6.4
Emission Rate, lb/hr	3.2	3.4	4.3	3.6
Methyl mercaptan				
Concentration, ppmvd	2.1	2.3	2.6	2.3
Emission Rate, lb/hr	1.7	1.8	2.1	1.9
Dimethyl sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.6 *	0.6 *	0.6 *	0.6 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.8 *	0.8 *	0.8 *	0.8 *
Method 18 Data				
Methanol				
Concentration, ppmvd	2.9	2.6	2.5 *	2.2
Emission Rate, lb/hr	1.5	1.4	1.3 *	1.2
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Acetone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.6 *	0.6 *	0.6 *	0.6 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.6 *	0.6 *	0.6 *	0.6 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: Recovery Furnace (Non-Contact) FIN: P-7
Source Code: TI-RF2 Date: 7/18/92 EPN: 2 CIN: 617 & 9

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
Chloroform				
Concentration, ppmvd	1.2 •	1.2 •	1.2 *	1.2 *
Emission Rate, lb/hr	2.4 *	2.4 *	2.4 *	2.4 *
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 •	0.6 *
Emission Rate, lb/hr	0.8 *	0.8 *	0.8 •	0.8 •
Bromodichloromethane				
Concentration, ppmvd	1.2 •	1.2 *	1.2 •	1.2 *
Emission Rate, lb/hr	3.4 *	3.4 *	3.4 *	3.4 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 •	0.6 *	0.6 *	0.6 •
Emission Rate, lb/hr	0.9 *	0.9 *	0.9 *	0.9 •
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.1 *	1.1 *	1.1 *	1.1 •
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.1 •	1.1 *	1.1 •	1.1 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.1 *	1.1 *	1.1 *	1.1 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.2 •	1.2 *	1.2 •	1.2 •
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 •	0.6 •
Emission Rate, lb/hr	1.4 *	1.4 *	1.4 •	1.4 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.4 *	1.4 *	1.4 •	1.4 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 •	0.6 *
Emission Rate, lb/hr	1.4 *	1.4 *	1.4 •	1.4 •
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 •	0.6 *	0.6 •	0.6 *
Emission Rate, lb/hr	1.4 *	1.4 *	1.4 *	1.4 •

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale)	Source:	Recovery Furnace (Non-Contact)		FIN:	P-7
Source Code: TI-RF2	Date:	7/18/92	EPN: 2	CIN:	617 & 9

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.4 *	1.4 *	1.4 *	1.4 *
Knowns as Carbon				
Concentration, ppmvd	5.6	5.0	5.2	5.3
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	1.1	1.0	1.0	1.0
Unknown Compounds % of Total	0.0%	0.0%	0.0%	.0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	7.4	5.0	5.0	5.8
Emission Rate, lb/hr as C	1.5	1.0	1.0	1.1

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale)	Source: Recovery Furnace (Non-Contact)	FIN:	P-7
Source Code: TI-RF2	Date: 7/19/92 EPN: 2	CIN:	617 & 9

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1120	1220	1320	
Flow Data				
Stack Temperature, °F			358	358
Moisture Content, %			19.4	19.4
Oxygen Concentration, %			11.5	11.5
Carbon Dioxide Concentration, %			12.0	12.0
Volumetric Flow Rate, x10^3 ACFM			217.7	217.7
Volumetric Flow Rate, x10^3 DSCFM			112.0	112.0
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	81.9	81.9	81.9	81.9
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	12.9	10.9	12.0	11.9
Emission Rate, lb/hr	7.7	6.5	7.1	7.1
Methyl mercaptan				
Concentration, ppmvd	3.1	3.0	3.3	3.1
Emission Rate, lb/hr	2.6	2.5	2.8	2.6
Dimethyl sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.8 *	0.8 *	0.8 *	0.8 *
Method 18 Data				
Methanol				
Concentration, ppmvd	2.5 *	2.5 *	2.5 *	2.5 *
Emission Rate, lb/hr	1.4 *	1.4 *	1.4 *	1.4 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Acetone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.6 *	0.6 *	0.6 *	0.6 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: Recovery Furnace (Non-Contact) FIN: P-7
Source Code: TI-RF2 Date: 7/19/92 EPN: 2 CIN: 617 & 9

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 •	0.6 *
Emission Rate, lb/hr	0.8 *	0.8 *	0.8 •	0.8 •
Chloroform				
Concentration, ppmvd	1.2 *	1.2 *	1.2 •	1.2 *
Emission Rate, lb/hr	2.6 *	2.6 *	2.6 *	2.6 *
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 •	0.6 *
Emission Rate, lb/hr	0.8 *	0.8 •	0.8 •	0.8 *
Bromodichloromethane				
Concentration, ppmvd	1.2 *	1.2 *	1.2 •	1.2 *
Emission Rate, lb/hr	3.6 •	3.6 *	3.6 •	3.6 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 •	0.6 •
Emission Rate, lb/hr	1.0 *	1.0 *	1.0 *	1.0 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 •	0.6 •	0.6 •
Emission Rate, lb/hr	1.1 •	1.1 *	1.1 *	1.1 *
m-, p-Xylene				
Concentration, ppmvd	0.6 •	0.6 •	0.6 *	0.6 *
Emission Rate, lb/hr	1.1 *	1.1 *	1.1 *	1.1 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.1 *	1.1 *	1.1 •	1.1 •
Cumene				
Concentration, ppmvd	0.6 •	0.6 *	0.6 *	0.6 •
Emission Rate, lb/hr	1.3 *	1.3 *	1.3 *	1.3 *
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6 •	0.6 •	0.6 •
Emission Rate, lb/hr	1.5 *	1.5 •	1.5 *	1.5 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.5 *	1.5 *	1.5 *	1.5 *
3-Carene				
Concentration, ppmvd	0.6 •	0.6 *	0.6 *	0.6 •
Emission Rate, lb/hr	1.5 *	1.5 *	1.5 *	1.5 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 •
Emission Rate, lb/hr	1.5 *	1.5 •	1.5 •	1.5 •

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale)	Source: Recovery Furnace (Non-Contact)		FIN: P-7
Source Code: TI-RF2	Date: 7/19/92	EPN: 2	CIN: 617 & 9

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.5 *	1.5 *	1.5 *	1.5 *
Knowns as Carbon				
Concentration, ppmvd	3.6	3.7	3.7	3.7
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.8	0.8	0.8	0.8
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	0.0	49.6	2.5	17.4
Emission Rate, lb/hr as C	0.1 *	10.4	0.5	3.7

* One or more values were less than the detection limit.

Section 2.2 Emission Test Results - VOST

EMISSION TEST RESULTS - VOST

Mill TEMPLE-INLAND (Evadale) Source: Recovery Furnace (Non-Contact)
Source Code: TI-RF2 EPN: 2 FIN: P-7 CIN: 617 & 9
[HIGH-LEVEL VOST]

Date: 7/18/92

Compound	RF2-T (µg)	RF2-T/C (µg)	RF2-C (µg/L)	Total µg	TI-RF2 (µg/m3)	Conc. (ppm)
TARGET COMPOUNDS						
Methylene Chloride		1.467	48.81	3.57	411.28	0.116
Acetone	63.564	11.987	61.37	78.19	9018.44	3.732
n-Hexane	3.316		0.27	3.33	383.81	0.107
2-Butanone (MEK)	7.555		4.04	7.73	891.43	0.297
Benzene	298.246			298.25	34399.77	10.589
Dibromomethane			0.60	0.03	2.98	0.000
Toluene	10.344		3.56	10.50	1210.74	0.316
Styrene	0.503		0.88	0.54	62.38	0.014
o-Xylene	1.157			1.16	133.45	0.030
m-/p-Xylene	1.624			1.62	187.31	0.042
A-Pinene		2.218		2.22	255.82	0.045
p-Cymene		1.474		1.47	170.01	0.030
TENTATIVELY IDENTIFIED CMPDS.						
Siloxane	2191.284	1040.485	475.30	3252.21	375110.37	
Silane	16.771	40.627	81.43	60.90	7024.16	
Silanol	29.553		30.88	30.88	3561.80	
subst'd HC		4.685	4.71	4.89	563.73	
SURROGATE STDS (% Recovery)						
Toluene-d8	132.2	205.0	110.0			
1,2-Dichloroethane-d4	67.2	99.4	98.3			
Benzene-d6	122.5	130.6	127.7			

NOTES:
- -T = Tenax
- -TC = Tenax/Charcoal
- -C = Condensate

Air Volume = 0.00867 cu.m.

Condensate Vol. 43.0 mL

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: BC200
RF FILE: BC196
DATE: 08/13/92
TLI PROJ #: 21515

SAMPLE ID: TI-RF2-1VOST-0718-3A T
TLI ID: 58.116.5
ANALYSIS DATE: 07/31/92

METHOD 8240--HIGH LEVEL VOST QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1 Bromochloromethane	513		852	1		IS	
2 Chloromethane	0	.495	0	1	.984	ND	5
3 Bromomethane	0	.927	0	1	.525	ND	5
4 Vinyl Chloride	0	.508	0	1	.959	ND	5
5 Chloroethane	0	.737	0	1	.661	ND	5
6 Methylene Chloride	0	2.670	0	1	.182	ND	5
7 Acetone	1200	.460	595	1	63.564	D	5
8 Carbon Disulfide	0	4.939	0	1	.099	ND	5
9 1,1-Dichloroethene	0	1.727	0	1	.282	ND	5
10 1,1-Dichloroethane	0	5.348	0	1	.091	ND	5
11 trans-1,2-Dichloroethene	0	2.590	0	1	.188	ND	5
12 Chloroform	0	6.093	0	1	.080	ND	5
13 1,2-Dichloroethane	0	2.676	0	1	.182	ND	5
43 Trichlorofluoromethane	0	1.099	0	1	.443	ND	5
47 cis-1,2-Dichloroethene	0	3.264	0	1	.149	ND	5
57 Allyl chloride	0	1.362	0	1	.358	ND	5
62 Dimethyl disulfide	0	5.245	0	1	.093	ND	5
63 Dimethyl sulfide	0	1.814	0	1	.269	ND	5
65 Iodomethane	0	3.230	0	1	.151	ND	5
66 Isooctane	0	10.516	0	1	.046	ND	5
68 Tert-Butyl methyl ether	0	4.492	0	1	.108	ND	5
69 Vinyl Bromide	0	1.157	0	1	.421	ND	5
70 n-Hexane	353	2.594	730	1	3.316	E	5
14 1,4-Difluorobenzene	2593		994	14		IS LOW	
15 2-Butanone	34	.022	841	14	7.555	D	5
16 1,1,1-Trichloroethane	0	.551	0	14	.175	ND	5
17 Carbon Tetrachloride	0	.493	0	14	.196	ND	5
18 Vinyl Acetate	0	.543	0	14	.178	ND	5
19 Bromodichloromethane	0	.631	0	14	.153	ND	5
20 1,2-Dichloropropane	0	.569	0	14	.170	ND	5
21 cis-1,3-Dichloropropene	0	.616	0	14	.157	ND	5
22 Trichloroethene	0	.488	0	14	.198	ND	5
23 Dibromochloromethane	0	.456	0	14	.212	ND	5
24 1,1,2-Trichloroethane	0	.300	0	14	.322	ND	5
25 Benzene	64628	1.045	930	14	298.246	E	5
26 trans-1,3-Dichloropropene	0	.559	0	14	.172	ND	5
27 Bromoform	0	.225	0	14	.428	ND	5
54 1,4-Dichloro-2-butene	0	.087	0	14	1.112	ND	5
60 Dibromomethane	0	.221	0	14	.436	ND	5
28 Chlorobenzene-d5	3125		1465	28		IS LOW	
29 4-Methyl-2-Pentanone	0	.200	0	28	.399	ND	5
30 2-Hexanone	0	.162	0	28	.494	ND	5
31 Tetrachloroethene	0	.292	0	28	.274	ND	5
33 Toluene	1481	.573	1222	28	10.344	D	5
34 Chlorobenzene	0	.696	0	28	.115	ND	5
35 Ethylbenzene	0	.425	0	28	.188	ND	5
36 Styrene	83	.660	1605	28	.503	E	5
37 o-Xylene	131	.454	1600	28	1.157	E	5

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

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801 Capitola Drive
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FILE NAME: BC200
RF FILE: BC196
DATE: 08/13/92
TLI PROJ #: 21515

SAMPLE ID: TI-RF2-1VOST-0718-3A T
TLI ID: 58.116.5
ANALYSIS DATE: 07/31/92

METHOD 8240--HIGH LEVEL VOST QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
38 m-/p-Xylene	163	.402	1523	28	1.624	E	5
49 1,2 Dichlorobenzene	0	.334	0	28	.240	ND	5
50 1,2,3-Trichloropropane	0	.154	0	28	.518	ND	5
51 1,3 Dichlorobenzene	0	.520	0	28	.154	ND	5
53 1,4 Dichlorobenzene	0	.415	0	28	.193	ND	5
56 A-Pinene	0	.695	0	28	.115	ND	5
58 B-Pinene	0	.746	0	28	.107	ND	5
59 Cumene (isopropylbenzene)	0	.894	0	28	.089	ND	5
64 Ethyl methacrylate	0	.296	0	28	.270	ND	5
67 P-Cymene	0	.935	0	28	.086	ND	5

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	766	2.223	928	1	8.40	D	67.2
48 Benzene-d6	3599	1.133	925	14	15.32	D	122.5
39 Toluene-d8	3599	.871	1210	28	16.52	D	132.2

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

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FILE NAME: BC200
DATE: 08/13/92
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SAMPLE ID: TI-RF2-1VOST-0718-3A T
TLI ID: 58.116.5
ANALYSIS DATE: 07/31/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

	NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
1	SILOXANE	1216	254967	994	12.5	475.945
2	SILOXANE	1903	398229	1465	12.5	427.083
3	SILOXANE	948	222180	994	12.5	414.741
4	SILOXANE	2161	228133	1465	12.5	244.862
5	SILOXANE	1496	201899	1465	12.5	216.528
6	SILOXANE	1805	159552	1465	12.5	171.113
7	SILOXANE	1432	157358	1465	12.5	168.759
8	SILOXANE	1328	67558	1465	12.5	72.453
9	SILANOL	867	9917	851	12.5	29.553
10	SILANE	682	5628	851	12.5	16.771

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	851	4195	1
1,4-Difluorobenzene	994	6696	14
Chlorobenzene-d5	1465	11656	28

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FILE NAME: BC210
RF FILE: BC206
DATE: 08/13/92
TLI PROJ #: 21515

SAMPLE ID: TI-RF2-1VOST-0718-3B TC
TLI ID: 58.116.6
ANALYSIS DATE: 08/03/92

METHOD 8240--HIGH LEVEL VOST QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	605		862	1		IS	
2	Chloromethane	0	.495	0	1	.834	ND	5
3	Bromomethane	0	.927	0	1	.445	ND	5
4	Vinyl Chloride	0	.508	0	1	.813	ND	5
5	Chloroethane	0	.737	0	1	.560	ND	5
6	Methylene Chloride	190	2.670	661	1	1.467	E	5
7	Acetone	267	.460	609	1	11.987	D	5
8	Carbon Disulfide	0	4.939	0	1	.084	ND	5
9	1,1-Dichloroethene	0	1.727	0	1	.239	ND	5
10	1,1-Dichloroethane	0	5.348	0	1	.077	ND	5
11	trans-1,2-Dichloroethene	0	2.590	0	1	.159	ND	5
12	Chloroform	0	6.093	0	1	.068	ND	5
13	1,2-Dichloroethane	0	2.676	0	1	.154	ND	5
43	Trichlorofluoromethane	0	1.099	0	1	.376	ND	5
47	cis-1,2-Dichloroethene	0	3.264	0	1	.126	ND	5
57	Allyl chloride	0	1.362	0	1	.303	ND	5
62	Dimethyl disulfide	0	5.245	0	1	.079	ND	5
63	Dimethyl sulfide	0	1.814	0	1	.228	ND	5
65	Iodomethane	0	3.230	0	1	.128	ND	5
66	Isooctane	0	10.516	0	1	.039	ND	5
68	Tert-Butyl methyl ether	0	4.492	0	1	.092	ND	5
69	Vinyl Bromide	0	1.157	0	1	.357	ND	5
70	n-Hexane	0	2.594	0	1	.159	ND	5
14	1,4-Difluorobenzene	3564		1006	14		IS	
15	2-Butanone	0	.022	0	14	3.210	ND	5
16	1,1,1-Trichloroethane	0	.551	0	14	.127	ND	5
17	Carbon Tetrachloride	0	.493	0	14	.142	ND	5
18	Vinyl Acetate	0	.543	0	14	.129	ND	5
19	Bromodichloromethane	0	.631	0	14	.111	ND	5
20	1,2-Dichloropropane	0	.569	0	14	.123	ND	5
21	cis-1,3-Dichloropropene	0	.616	0	14	.114	ND	5
22	Trichloroethene	0	.488	0	14	.144	ND	5
23	Dibromochloromethane	0	.456	0	14	.154	ND	5
24	1,1,2-Trichloroethane	0	.300	0	14	.234	ND	5
25	Benzene	0	1.045	0	14	.067	ND	5
26	trans-1,3-Dichloropropene	0	.559	0	14	.125	ND	5
27	Bromoform	0	.225	0	14	.311	ND	5
54	1,4-Dichloro-2-butene	0	.087	0	14	.809	ND	5
60	Dibromomethane	0	.221	0	14	.317	ND	5
28	Chlorobenzene-d5	3138		1481	28		IS	
29	4-Methyl-2-Pentanone	0	.200	0	28	.398	ND	5
30	2-Hexanone	0	.162	0	28	.492	ND	5
31	Tetrachloroethene	0	.292	0	28	.273	ND	5
33	Toluene	0	.573	0	28	.139	ND	5
34	Chlorobenzene	0	.696	0	28	.115	ND	5
35	Ethylbenzene	0	.425	0	28	.188	ND	5
36	Styrene	0	.660	0	28	.121	ND	5
37	o-Xylene	0	.454	0	28	.176	ND	5

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

.riangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: BC210
RF FILE: BC206
DATE: 08/13/92
TLI PROJ #: 21515

SAMPLE ID: TI-RF2-1VOST-0718-3B TC
TLI ID: 58.116.6
ANALYSIS DATE: 08/03/92

METHOD 8240--HIGH LEVEL VOST QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
38 m-/p-Xylene	0	.402	0	28	.198	ND	5
49 1,2 Dichlorobenzene	0	.334	0	28	.239	ND	5
50 1,2,3-Trichloropropane	0	.154	0	28	.516	ND	5
51 1,3 Dichlorobenzene	0	.520	0	28	.153	ND	5
53 1,4 Dichlorobenzene	0	.415	0	28	.192	ND	5
56 A-Pinene	387	.695	1699	28	2.218	E	5
58 B-Pinene	0	.746	0	28	.107	ND	5
59 Cumene (isopropylbenzene)	0	.894	0	28	.089	ND	5
64 Etnyl methacrylate	0	.296	0	28	.269	ND	5
67 P-Cymene	346	.935	2124	28	1.474	E	5

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	1338	2.223	939	1	12.43	D	99.4
48 Benzene-d6	5272	1.133	936	14	16.32	D	• 130.6
39 Toluene-d8	5604	.871	1225	28	25.63	D	205.0

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

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801 Capitola Drive
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Telephone: (919) 544-5729

FILE NAME: BC210
DATE: 08/13/92
TLI PROJ #: 21515

SAMPLE ID: TI-RF2-1VOST-0718-38 TC
TLI ID: 58.116.6
ANALYSIS DATE: 08/03/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

	NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
1	SILOXANE	1345	388731	1481	12.5	398.967
2	SILOXANE	960	189802	1006	12.5	282.938
3	SILOXANE	1446	131859	1481	12.5	135.331
4	SILOXANE	1229	85589	1006	12.5	127.586
5	SILOXANE	1512	75846	1481	12.5	77.844
6	SILANE	692	8951	863	12.5	25.720
7	SILOXANE	1921	15722	1481	12.5	16.136
8	SILANE	877	14525	1481	12.5	14.907
9	SUBSTITUTED HYDROCARBON	255	2909	863	12.5	8.358
10	SILOXANE	2174	4565	1481	12.5	4.685

1003.055
40.627

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	863	4350	1
1,4-Difluorobenzene	1006	8385	14
Chlorobenzene-d5	1481	12179	28

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Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: AC9453
RF FILE: AC940
DATE: 08/13/92
TLI PROJ #: 21515

SAMPLE ID: TI-RF2-1VOST-0718-3C
TLI ID: 58.116.21
SAMPLE VOL. .005 L
ANALYSIS DATE: 07/28/92
DILUTION FACTOR: 1

METHOD 8240 QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	CONC, ug/L	CODE	QUAN LIMIT
1	Bromochloromethane	2351		783	1		IS	
2	Chloromethane	0	2.136	0	1	.20	ND	10
3	Bromomethane	0	1.702	0	1	.25	ND	10
4	Vinyl Chloride	0	2.393	0	1	.18	ND	10
5	Chloroethane	0	1.579	0	1	.27	ND	10
6	Methylene Chloride	5229	2.278	587	1	48.81	D	10
7	Acetone	4806	1.665	530	1	61.37	D	10
8	Carbon Disulfide	0	6.283	0	1	.07	ND	10
9	1,1-Dichloroethene	0	2.001	0	1	.21	ND	10
10	1,1-Dichloroethane	0	4.708	0	1	.09	ND	10
11	trans-1,2-Dichloroethene	0	2.432	0	1	.17	ND	10
12	Chloroform	0	4.473	0	1	.10	ND	10
13	1,2-Dichloroethane	0	3.804	0	1	.11	ND	10
43	Trichlorofluoromethane	0	1.673	0	1	.25	ND	10
45	Acrolein	0	.541	0	1	.79	ND	10
46	Acrylonitrile	0	.942	0	1	.45	ND	10
47	cis-1,2-Dichloroethene	0	2.619	0	1	.16	ND	10
52	1,3-butadiene	0	2.896	0	1	.15	ND	10
57	Allyl chloride	0	1.144	0	1	.37	ND	10
62	Dimethyl disulfide	0	5.464	0	1	.08	ND	10
63	Dimethyl sulfide	0	2.716	0	1	.16	ND	10
65	Iodomethane	0	2.346	0	1	.18	ND	10
66	Isooctane	0	15.486	0	1	.03	ND	10
68	Tert-Butyl methyl ether	0	6.646	0	1	.06	ND	10
69	Vinyl Bromide	0	1.902	0	1	.22	ND	10
70	n-Hexane	65	5.071	668	1	.27	E	10
14	1,4-Difluorobenzene	10704		918	14		IS	
15	2-Butanone	79	.091	768	14	4.04	E	10
16	1,1,1-Trichloroethane	0	.695	0	14	.13	ND	10
17	Carbon Tetrachloride	0	.656	0	14	.14	ND	10
18	Vinyl Acetate	0	1.232	0	14	.08	ND	10
19	Bromodichloromethane	0	.805	0	14	.12	ND	10
20	1,2-Dichloropropane	0	.772	0	14	.12	ND	10
21	cis-1,3-Dichloropropene	0	.856	0	14	.11	ND	10
22	Trichloroethene	0	.475	0	14	.20	ND	10
23	Dibromochloromethane	0	.642	0	14	.15	ND	10
24	1,1,2-Trichloroethane	0	.592	0	14	.16	ND	10
25	Benzene	0	1.589	0	14	.06	ND	10
26	trans-1,3-Dichloropropene	0	1.076	0	14	.09	ND	10
27	Bromoform	0	.566	0	14	.16	ND	10
54	1,4-Dichloro-2-butene	0	.382	0	14	.24	ND	10
60	Dibromomethane	59	.462	989	14	.60	E	10
28	Chlorobenzene-d5	13349		1366	28		IS	
29	4-Methyl-2-Pentanone	0	.690	0	28	.11	ND	10
30	2-Hexanone	0	.692	0	28	.11	ND	10
31	Tetrachloroethene	0	.437	0	28	.17	ND	10
32	1,1,2,2-Tetrachloroethane	0	.949	0	28	.08	ND	10
33	Toluene	902	.949	1133	28	3.56	E	10

CODES: ND = Not Detected; D = Detected; E = Est4mated; IS = Internal Standard

..e Laboratories of RTP, Inc.	FILE NAME: AC9453	SAMPLE ID: TI-RF2-1VOST-0718-3C
801 Capitola Drive	RF FILE: AC940	TLI ID: 58.116.21
Durham, NC 27713	DATE: 08/13/92	SAMPLE VOL: .005 L
Telephone: (919) 544-5729	TLI PROJ #: 21515	ANALYSIS DATE: 07/28/92
		DILUTION FACTOR: 1

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	CONC, ug/L	CODE	QUAN LIMIT
34 Chlorobenzene	0	1.073	0	28	.07	ND	10
35 Ethylbenzene	0	.716	0	28	.10	ND	10
36 Styrene	287	1.220	1503	28	.88	E	10
37 o-Xylene	0	.806	0	28	.09	ND	10
38 m-/p-Xylene	0	.728	0	28	.10	ND	10
49 1,2 Dichlorobenzene	0	1.082	0	28	.07	ND	10
50 1,2,3-Trichloropropane	0	.686	0	28	.11	ND	10
51 1,3 Dichlorobenzene	0	1.116	0	28	.07	ND	10
53 1,4 Dichlorobenzene	0	1.098	0	28	.07	ND	10
56 A-Pinene	0	1.487	0	28	.05	ND	10
58 B-Pinene	0	1.550	0	28	.05	ND	10
59 Cumene (isopropylbenzene)	0	2.029	0	28	.04	ND	10
64 Ethyl methacrylate	0	.804	0	28	.09	ND	10
67 P-Cymene	0	2.052	0	28	.04	ND	10

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT,ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	6498	2.812	853	1	.25	D	98.3
48 Benzene-d6	20723	1.516	852	14	.32	D	127.7
39 Toluene-d8	19238	1.310	1124	28	.27	D	110.0

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: AC9453
DATE: 08/13/92
TLI PROJ #: 21515

SAMPLE ID: TI-RF2-1VOST-0718-3C
TLI ID: 58.116.21
SAMPLE VOL: .005 L
ANALYSIS DATE: 07/28/92
DILUTION FACTOR: 1

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	SCAN	AREA	IS SCAN #	IS AMT	CONC, ug/L
1 SILOXANE	883	158675	918	.25	232.69
2 SILOXANE	1139	65167	918	.25	95.56
3 SILANE	623	36598	783	.25	81.43
4 SILOXANE	1347	100279	1366	.25	147.05
5 SULFUR DIOXIDE	260	52343	783	.25	116.46
6 SILANOL	799	13878	783	.25	30.88
7 BRANCHED HYDROCARBON	2157	3210	1366	.25	4.71

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	783	22472	1
1,4-Difluorobenzene	918	34096	14

Section 2.3 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: TEMPLE-INLAND (Evadale) Source: Recovery Furnace (Non-Contact) FIN: P-7
Source Code: TI-RF2 Date: 7/18/92 EPN: 2 CIN: 617 & 9

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1505			
Flow Data				
Stack Temperature, °F	348			348
Moisture Content, %	19.4			19.4
Oxygen Concentration, %	11.5			11.5
Carbon Dioxide Concentration, %	12.0			12.0
Volumetric Flow Rate, x10^3 ACFM	204.1			204.1
Volumetric Flow Rate, x10^3 DSCFM	106.1			106.1
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	79.9			79.9
Miscellaneous Parameters				
Formaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.2 *			0.2 *
Acetaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.4 *			0.4 *
Acetone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.5 *			0.5 *
Acetophenone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.0 *			1.0 *
Methyl ethyl ketone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.6 *			0.6 *
Methyl isobutyl ketone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.8 *			0.8 *
Acrolein				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.5 *			0.5 *
Benzaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.9 *			0.9 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: TEMPLE-INLAND (Evadale) | Source: Recovery Furnace (Non-Contact) | FIN: P-7
Source Code: TI-RF2 | Date: 7/19/92 | EPN: 2 | CIN: 617 & 9

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1227			
Flow Data				
Stack Temperature, °F	358			358
Moisture Content, %	19.4			19.4
Oxygen Concentration, %	11.5			11.5
Carbon Dioxide Concentration, %	12.0			12.0
Volumetric Flow Rate, x10^3 ACFM	217.7			217.7
Volumetric Flow Rate, x10^3 DSCFM	112.0			112.0
Process Operating Conditions				
Production Rate, 1000 lb BLS/hr	89.1			89.1
Miscellaneous Parameters				
Formaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.3 *			0.3 *
Acetaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.4 *			0.4 *
Acetone (Impinger)				
Concentration, ppmvd	2.1			2.1
Emission Rate, lb/hr	2.1			2.1
Acetophenone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.0 *			1.0 *
Methyl ethyl ketone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.6 *			0.6 *
Methyl isobutyl ketone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.9 *			0.9 *
Acrolein				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.5 *			0.5 *
Benzaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.9 *			0.9 *

* One or more values were less than the detection limit.

Section 2.4 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL TEMPLE-INLAND SOURCE TI-RF2

1. CALIBRATION

THEOR	DATE	7/18/92	DATE		7/19/92
ppm	ppm	%REC	ppm	%REC	%REC
0	-3		-3		
90	88	98%	88		98%
360	368	102%	368		102%
747	743	99%	743		99%

2. PROPANE LINE RECOVERY

	DATE	7/18/92		DATE	7/19/92	
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	91	94	103%	95	96	101%
AFTER	95	96	101%	83	84	101%

3. LINE BLANK

	[-------------- PPM	--------------]		
BEFORE RUN	0	0	0	0
AFTER RUN	0	0	0	0

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QUALITY CONTROL SUMMARY
METHOD 18

MILL TEMPLE-INLAND SOURCE TI-RF2

1. CHECK STANDARD

ANALYTE	THEOR	DATE	7/18/92	THEOR	DATE	7/19/92
	ppm	ppm	%REC	ppm	ppm	%REC
ethanol	55.64	21.99	40%	55.64	59.45	107%
acetone	44.47	35.22	79%	44.47	41.03	92%
isopropanol	42.65	35.97	84%	42.65	43.61	102%
benzene	36.54	74.43	204%	36.54	84.61	232%
bromodichloromethane	40.17	37.67	94%	40.17	40.17	100%
toluene	30.73	28.15	92%	30.73	31.29	102%
ethyl benzene	26.67	24.35	91%	26.67	26.85	101%
m-xylene	26.64	24.68	93%	26.64	26.84	101%
o-xylene	26.76	24.30	91%	26.76	26.76	100%
cumene	23.47	21.33	91%	23.47	23.26	99%
alpha-pinene	20.49	17.71	86%	20.49	20.18	98%
beta-pinene	20.59	14.71	71%	20.59	20.20	98%
3-carene	20.61	17.77	86%	20.61	20.45	99%
p-cymene	20.92	21.21	101%	20.92	20.14	96%

2. PROPANE RESPONSE

	THEOR					
BEFORE RUN	125	117.38	94%	125	115.52	92%
AFTER RUN	125	115.52	92%	125.00	119.91	96%

3. METHANOL LINE RECOVERY

	THEOR					
BEFORE RUN	111.73	109.46	98%	122.78	126.94	103%
AFTER RUN	122.78	126.94	103%	103.89	102.15	98%

4. LINE BLANK

	[-------------FILE REF-------------]	
BEFORE RUN	GIB4004	GIB4010
AFTER RUN	GIB4010	GJB4008

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QUALITY CONTROL SUMMARY
METHOD 16

MILL TEMPLE-INLAND SOURCE TI-RF2

1. CALIBRATION

ANALYTE	LO	MED	HI	CORR COEFF
	ppm	ppm	ppm	
7/18/92				
hydrogen sulfide	5.35	15.20	29.50	
methyl mercaptan	5.22	14.90	28.80	
dimethyl sulfide	7.06	20.10	39.00	
carbon disulfide	2.03	5.78	11.20	
dimethyl disulfide	3.28	9.35	18.10	
7/19/92				
hydrogen sulfide	2.57	7.74	29.70	
methyl mercaptan	2.51	7.56	29.00	
dimethyl sulfide	3.40	10.20	39.20	
carbon disulfide	0.98	2.94	11.30	
dimethyl disulfide	1.58	4.75	1.58	

2. HYDROGEN SULFIDE LINE RECOVERY

	DATE 7/18/92 INST	LINE	%REC	DATE 7/19/92 INST	LINE	%REC
BEFORE						
AFTER						

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WESTON
MANAGERS DESIGNERS/CONSULTANTS

Section 2.5 Process Operating Data

RECOVERY FURNACES

Recovery boiler No. 2 is a Combustion Engineering unit, initially built in 1962, modified to a non-contact configuration in 1979-1980. This unit fires nearly 1.5 million lbs. of black liquor solids/day annual average, corresponding to a wood pulping rate of 500 ton/day. The primary, secondary and tertiary air is supplied at elevations of 3'8", 7'5", and 26'5" above the hearth floor.

Liquor is fed through four to eight guns located 22 feet above the hearth floor, approximately half-way between the high primary and secondary air ports. NOTE: On C.E. boilers, the air ports are known as high and low primary air levels with the highest level called secondary air. The sulfidity of black liquor ranges from 28 to 30 percent and is fired at 68-70% solids. No makeup sulfur is necessary at this facility, in fact, sulfidity on occasion tends to be higher than is desirable. Spent acid from the ClO_2 generation and tall oil is burned in the boilers. The Btu content of our black liquor is 5400 to 5800 Btu/lb B.L. Solids. Recovery Boiler temperatures are generally above 1800°F. ESP exhasut gases contain partiuculate at about 0.047 gr/SDCF concentration. ESP's are wet-bottom units.

Representative Process Conditions

Liquor firing rate	120 gpm
Sulfidity (green liquor)	4.30
Primary, secondary	66% Primary; 34% Secondary
Excess air or O_2 in furnace	7%

Makeup chemicals and addition rates None

CO, NO_x, SO_2, TRS in the furnace at 8% O_2 CO not measured.

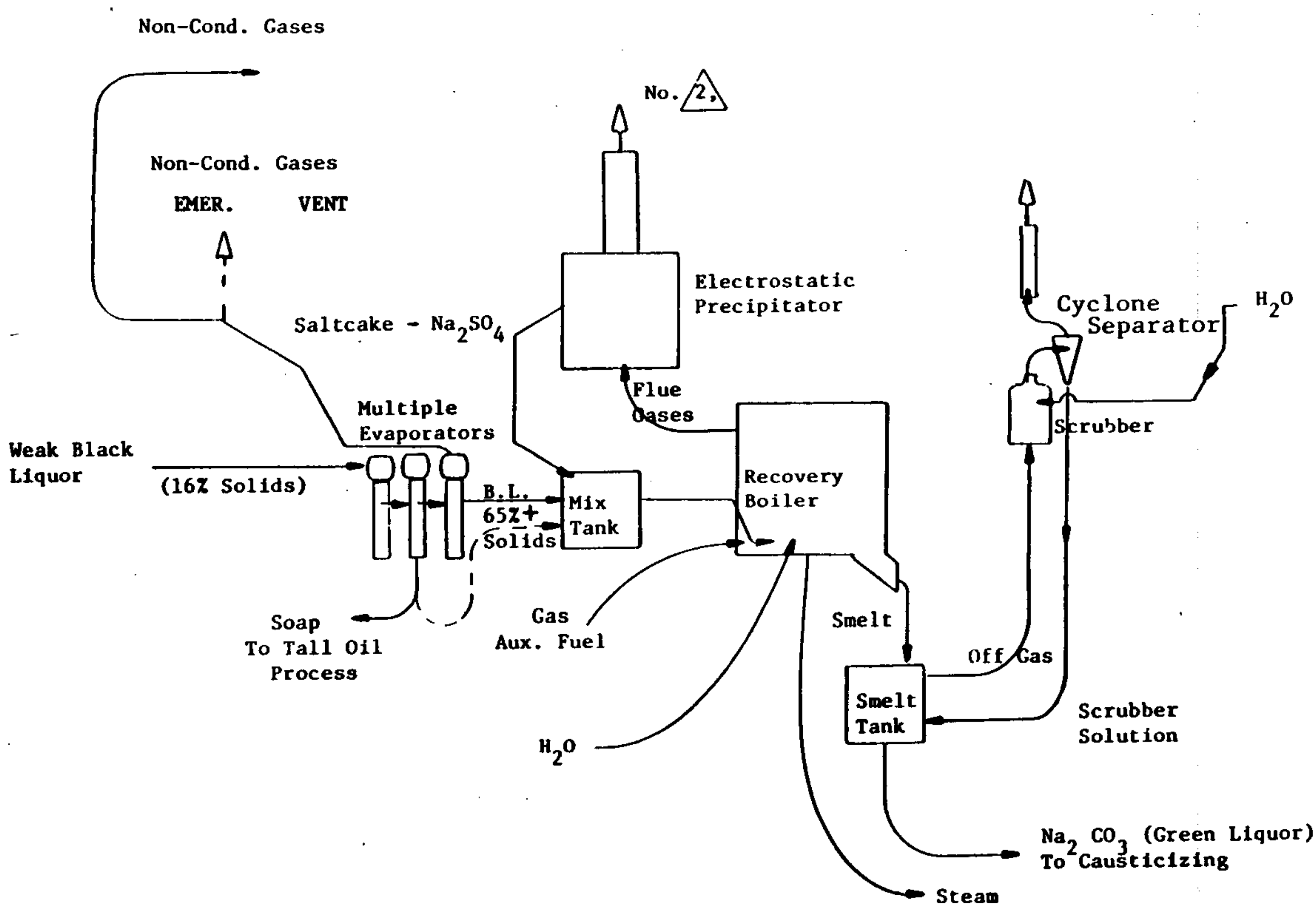
Liquor chloride content - not measured

Liquor Btu content 5600 BTU/lb

NOx 0.10 lb/MMBTU @ 39 ppm

TRS 10 ppm average

SO_2 64 ppm



CHEMICAL RECOVERY

NO.2 RECOVERY BOILER

DIAGRAM REC-2

SECTION 3
BROWN STOCK WASHER SOFTWOOD
(TI-BSWV4, TI-BSWV5, TI-BSWV6)

SECTION 3
BROWN STOCK WASHER SOFTWOOD
(TI-BSWV4, TI-BSWV5, TI-BSWV6)

The Brown Stock Washer Softwood Line was tested on two different days for volatile organic compounds by Methods 25A, 16, and 18. A high level VOST sample was also collected from Vent No. 4 on 7/13/92.

Total Hydrocarbons (M25A)

Figures 3.1 through 3.6 present the THC trends for the test periods on 7/13/92 and 7/14/92. Total hydrocarbon concentrations were generally in the range of 40 ppm for Vents No. 4 and No. 5. Vent No. 6 showed less than 5 ppm total hydrocarbons with the exception of an unexplained spike of 10 ppm on 7/14/92.

Volatile Organic Compounds (M16 and M18)

Table 3.1 summarizes the mean mass emission rates for the Method 16 and Method 18 target compounds for all three vents. Sections 3.1 is a tabulation of the data. The volumetric flow was measured during sampling using a pitot tube. Methyl mercaptan was the only reduced sulfur compound detected and was only present above the detection limit in Vent No. 4 on the first day of testing. Methanol was detected in all runs with the exception of Run 3 on 7/14/92 of Vent No. 6. In some cases, the concentration was below the listed detection limit. Varying amounts of unspecified terpenes were present in all runs of the three vents. Other components present included p-cymene in Vent No. 6.

Volatile Organic Sampling Train (VOST)

Table 3.2 summarizes the result of the VOST sample collected on 7/13/92 on Vent No. 4. Section 3.2 tabulates the results for target compounds and tentatively identified compounds (TIC). Low levels of several compounds were detected including alpha- and beta- pinene, dimethyl sulfide and dimethyl disulfide. Concentrations were at or below Method 18 detection limits.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 3.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 3.4 includes the process operating data as recorded and provided by mill personnel.

FIGURE 3.1
THC TREND ANALYSIS (7/13/92)
BSW VENT NO.4 (TI-BSWV4)

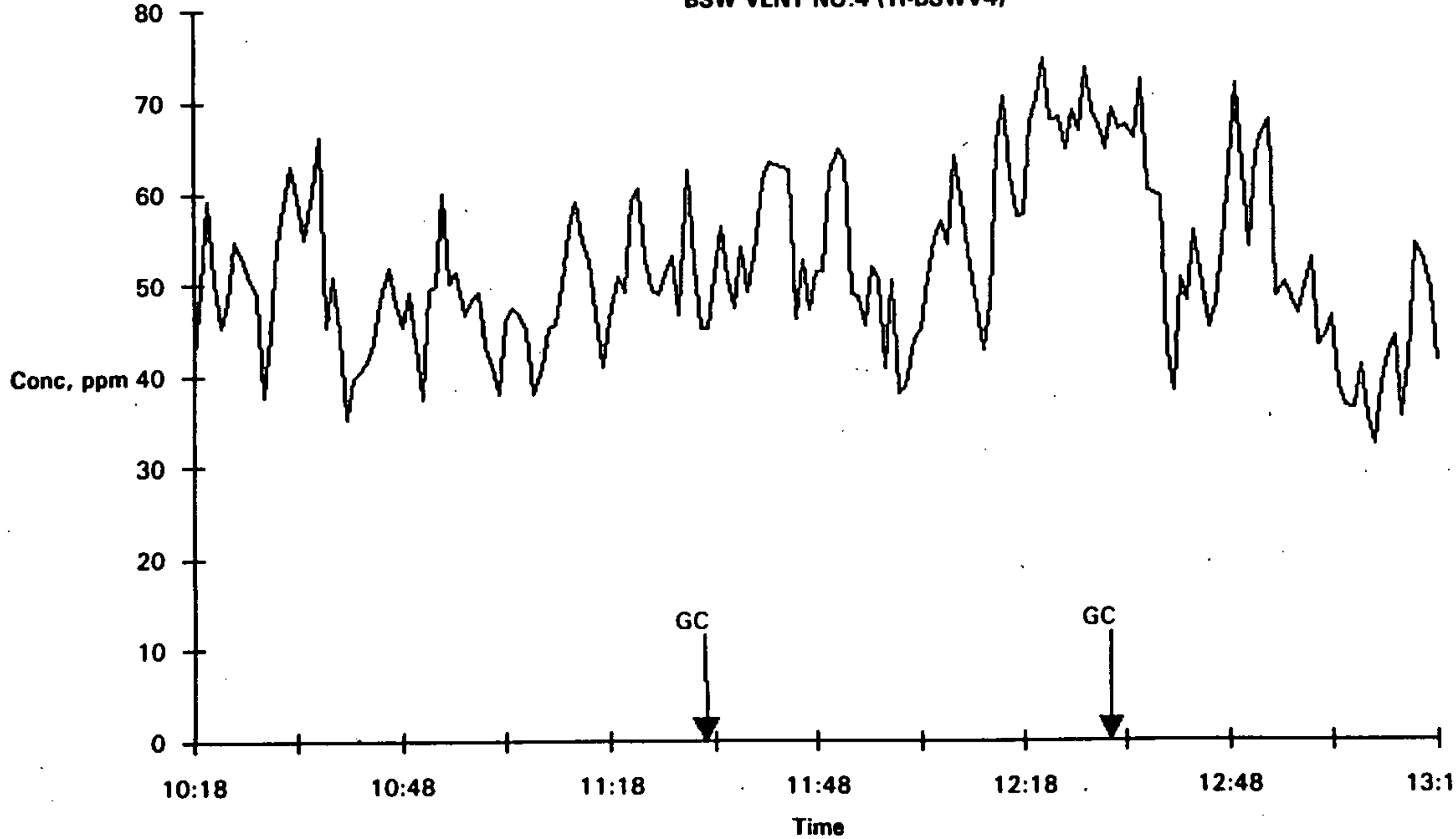


FIGURE 3.2
THC TREND ANALYSIS (7/14/92)
BSW VENT NO.4 (TI-BSWV4)

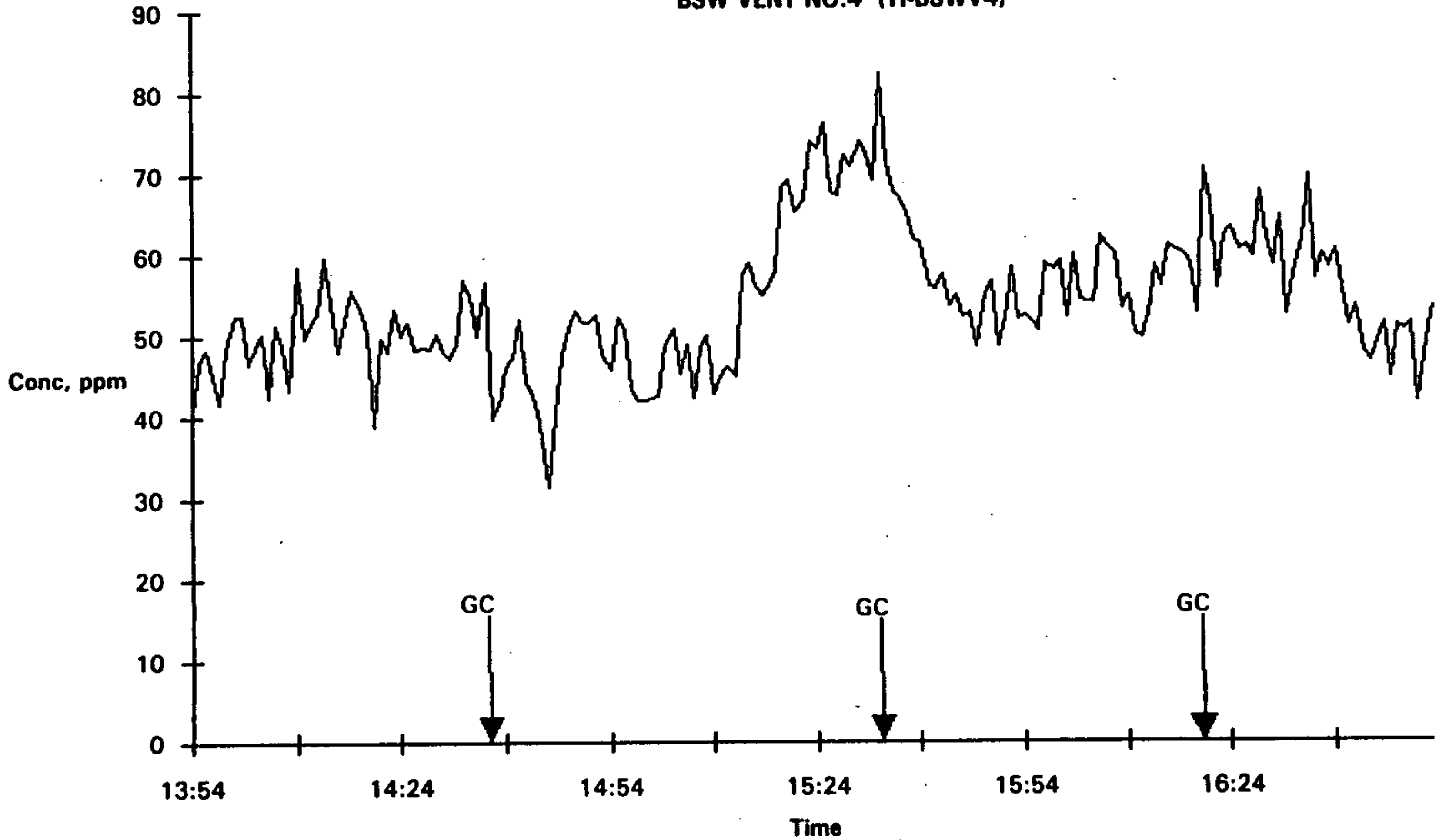


FIGURE 3.3
THC TREND ANALYSIS (7/13/92)
BSW VENT NO.5 (TI-BSWV5)

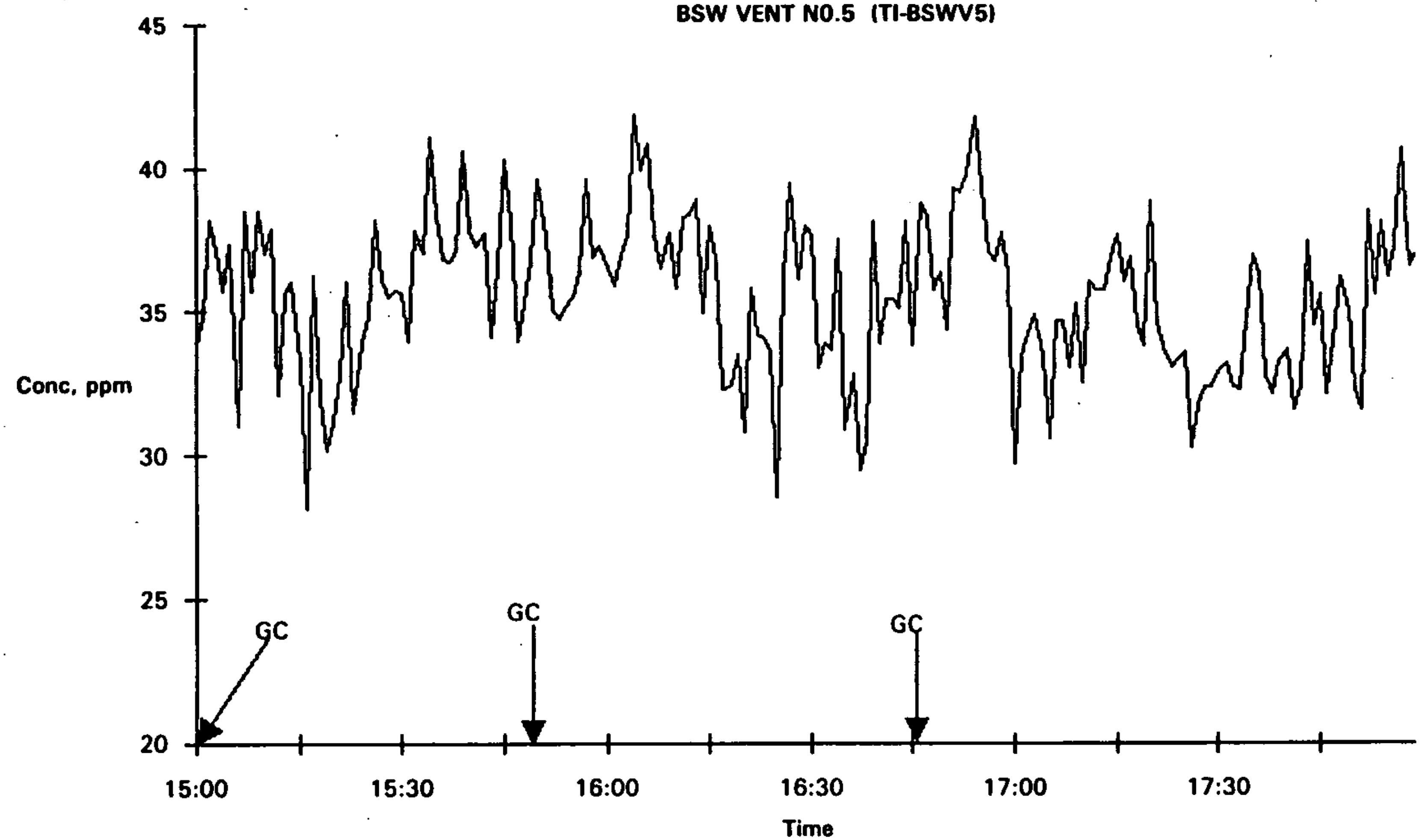


FIGURE 3.4

THC TREND ANALYSIS (7/14/92)
BSW VENT NO.5 (TI-BSWV5)

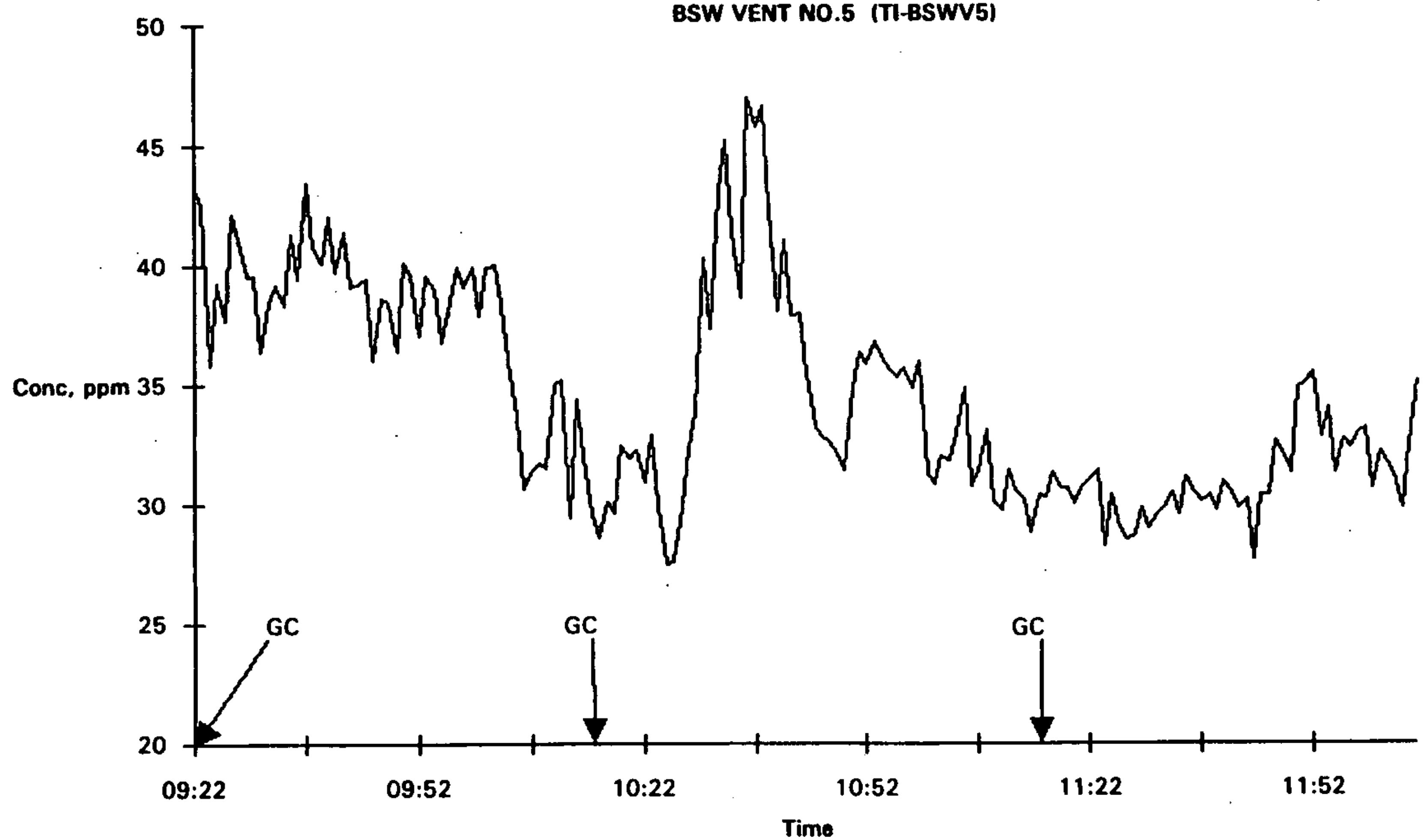


FIGURE 3.5
THC TREND ANALYSIS (7/13/92)
BSW VENT NO.6 (TI-BSWV6)

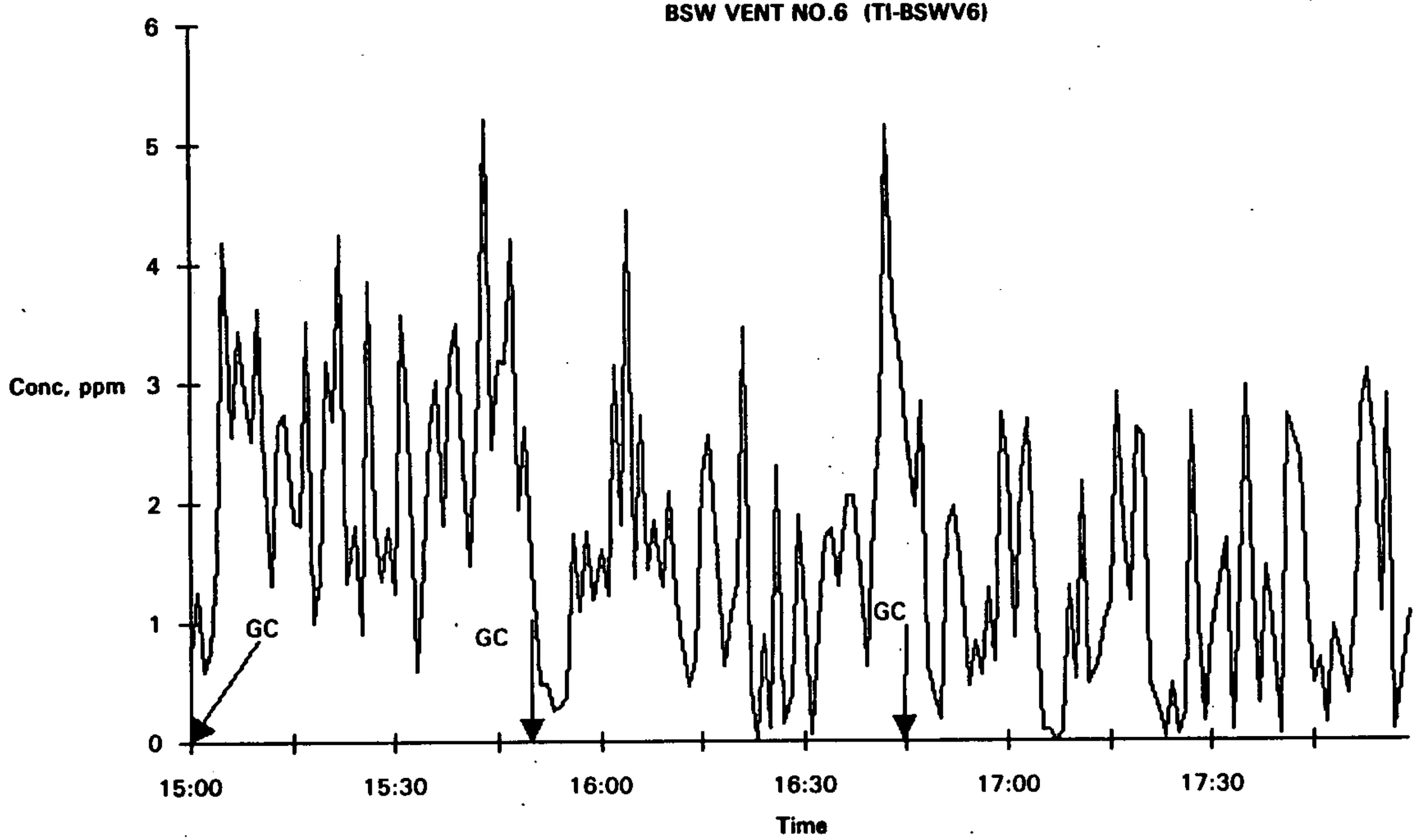


FIGURE 3.6
THC TREND ANALYSIS (7/14/92)
BSW VENT NO.6 (TI-BSWV6)

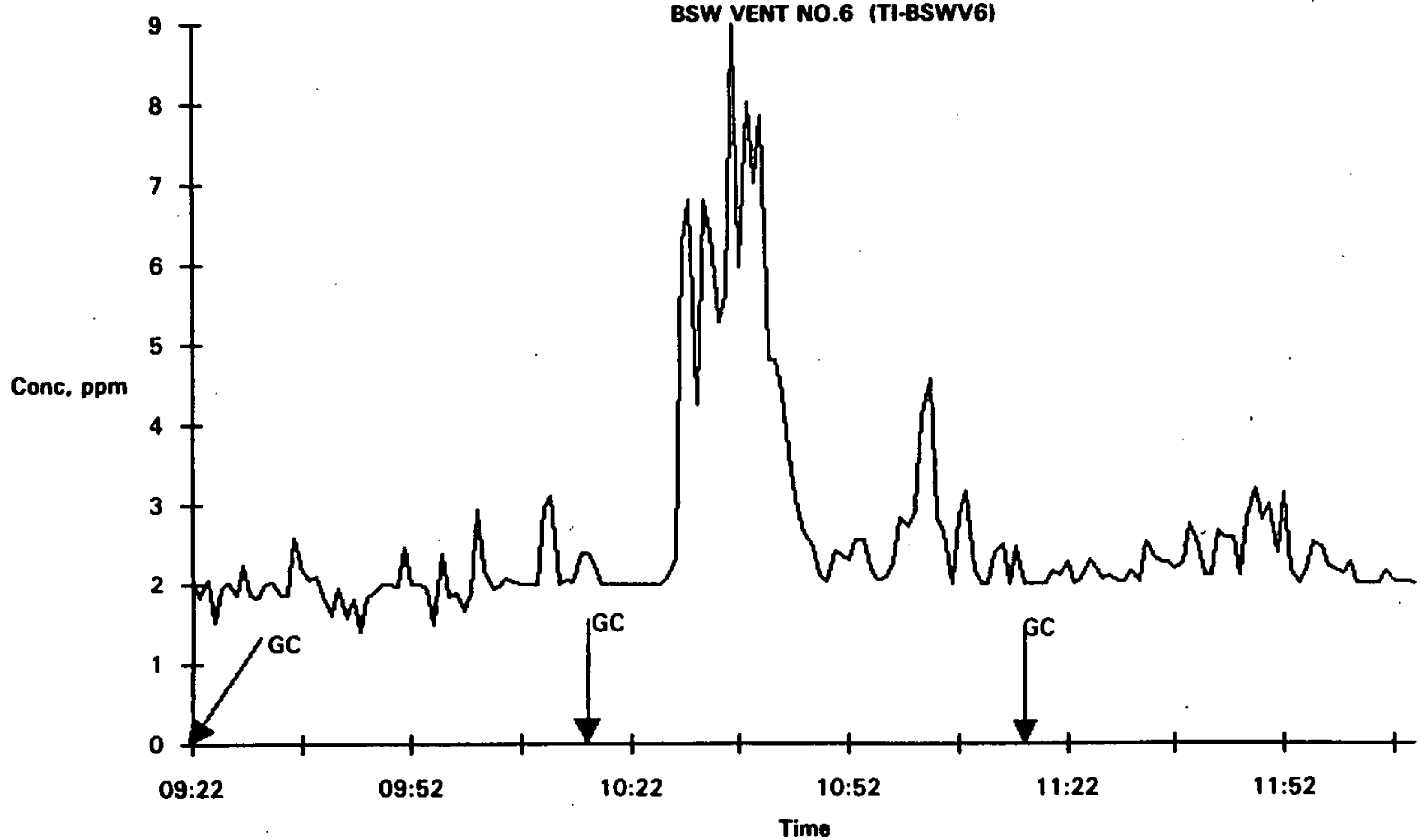


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TABLE 3.1 SUMMARY OF VOC RESULTS
SOFTWOOD BROWN STOCK WASHER VENTS

Mill: TEMPLE-INLAND (Evadale)   Source: Softwood Brown Stock Washer Vents

Source Code: TI-BSWV 4,5,6   Test Dates: 7/13/92 7/14/92

	BSWV4	BSWV5	BSWV6	SUM
Volumetric Flow Data				
Stack Temperature, °F	100	99	100	
Volumetric Flow Rate, x10³ DSCFM	15.2	15.5	16.2	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	26.2	25.7	26.0	
Method 16 Data, lb/hr				
Hydrogen sulfide	ND	ND	ND	ND
Methyl mercaptan	0.1	ND	ND	0.2
Dimethyl sulfide	ND	ND	ND	ND
Carbon disulfide	ND	ND	ND	ND
Dimethyl disulfide	ND	ND	ND	ND
Method 18 Data, lb/hr				
Methanol	3.4	1.2	0.1	4.7
Ethanol	ND	ND	ND	ND
Acetone	ND	ND	0.1	0.2
2-Propanol	ND	ND	ND	ND
2-Butanone	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND
Benzene	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND
Toluene	ND	ND	ND	ND
Ethyl benzene	ND	ND	ND	ND
m-, p-Xylene	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND
Cumene	ND	ND	ND	ND
alpha-Pinene	0.2	ND	ND	0.4
beta-Pinene	ND	ND	ND	ND
3-Carene	ND	ND	ND	ND
Terpenes (Unspecified)	0.3	0.3	ND	0.7
p-Cymene	0.2	0.1	ND	0.4
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	1.6	0.8	0.1	2.5
Unknowns as C, lb/hr	ND	ND	ND	ND
Sum of Compounds as C, lb/hr	1.6	0.8	0.1	2.5

ND=Not Detected

DL=Detection Limit

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TABLE 3.2 SUMMARY OF VOST RESULTS

Mill: TEMPLE-INLAND
Source Code: TI-BSWV4
FIN: P-2 SW EPN: 4

Source: BSW Vent No. 4
Test Dates: 7/13/92
CIN: NONE

TIME	1240
Volumetric Flow Data	
Stack Temperature, °F	102
Volumetric Flow Rate, x 10^3 DSCFM	14.8
Process Operating Conditions	
Production Rate, ADT pulp/hr	29.0
Target Compounds, ppm	
Chloromethane	0.014
Methylene Chloride	0.062
Acetone	0.111
Carbon Disulfide	0.005
Chloroform	0.023
Trichlorofluoromethane	0.055
Dimethyl disulfide	0.315
Dimethyl sulfide	0.523
Isooctane	0.023
tert-Butyl Methyl Ether	0.002
n-Hexane	0.038
2-Butanone (MEK)	0.052
1,1,1-Trichloroethane	0.002
Toluene	0.013
Ethylbenzene	0.000
Styrene	0.004
o-Xylene	0.000
m-,p-Xylene	0.001
a-Pinene	0.234
b-Pinene	0.199

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Section 3.1 BSWS4 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: BSW Vent No 4 FIN: P-2 SW
Source Code: TI-BSWV4 Date: 7/13/92 EPN: 4 CIN: NONE

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1017	1117	1217	
Flow Data				
Stack Temperature, °F			102	102
Moisture Content, %			6.9	6.9
Oxygen Concentration, %			20.8	20.8
Carbon Dioxide Concentration, %			0.0	0.0
Volumetric Flow Rate, x10^3 ACFM			17.0	17.0
Volumetric Flow Rate, x10^3 DSCFM			14.8	14.8
Process Operating Conditions				
Production Rate, ADT pulp/hr	29.0	29.0	29.0	29.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd	1.1	1.8	1.4	1.4
Emission Rate, lb/hr	0.1	0.2	0.2	0.2
Dimethyl sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Method 18 Data				
Methanol				
Concentration, ppmvd	32.3	35.6	56.4	41.4
Emission Rate, lb/hr	2.4	2.6	4.2	3.1
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) | Source: BSW Vent No 4 | FIN: P-2 SW
Source Code: TI-BSWV4 | Date: 7/13/92 | EPN: 4 | CIN: NONE

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 •	0.1 •	0.1 •
Chloroform				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 •
Emission Rate, lb/hr	0.3 •	0.3 *	0.3 *	0.3 *
Benzene				
Concentration, ppmvd	0.5 *	0.5 •	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 •	0.1 *	0.1 •
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 •
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 •
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 •	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 •	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 •	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.5 •	0.5 •	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 •	0.2 *	0.2 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 •	0.2 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 •	0.2 *	0.2 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.6	1.3	0.7
Emission Rate, lb/hr	0.2 *	0.2	0.4	0.2

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale)	Source:	BSW Vent No 4		FIN:	P-2 SW
Source Code: TI-BSWV4	Date:	7/13/92	EPN: 4	CIN:	NONE

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.8	1.1	0.7
Emission Rate, lb/hr	0.2 *	0.3	0.3	0.2
Knowns as Carbon				
Concentration, ppmvd	31.3	46.3	73.4	50.3
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.9	1.3	2.0	1.4
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	51.6	56.9	59.1	55.9
Emission Rate, lb/hr as C	1.4	1.6	1.6	1.5

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: BSW Vent No 4 FIN: P-2 SW
Source Code: TI-BSWV4 Date: 7/14/92 EPN: 4 CIN: NONE

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1353	1453	1553	
Flow Data				
Stack Temperature, °F		98		98
Moisture Content, %		6.1		6.1
Oxygen Concentration, %		20.8		20.8
Carbon Dioxide Concentration, %		0.0		0.0
Volumetric Flow Rate, x10^3 ACFM		17.7		17.7
Volumetric Flow Rate, x10^3 DSCFM		15.6		15.6
Process Operating Conditions				
Production Rate, ADT pulp/hr	22.0	24.0	24.0	23.3
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd	0.8	0.9	1.0	0.9
Emission Rate, lb/hr	0.1 *	0.1	0.1	0.1
Dimethyl sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Method 18 Data				
Methanol				
Concentration, ppmvd		46.5	52.4	49.5
Emission Rate, lb/hr		3.6	4.1	3.8
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: BSW Vent No 4 FIN: P-2 SW
Source Code: TI-BSWV4 Date: 7/14/92 EPN: 4 CIN: NONE

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd		1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr		0.3 *	0.3 *	0.3 *
Benzene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd		1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr		0.4 *	0.4 *	0.4 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
alpha-Pinene				
Concentration, ppmvd		0.6	0.8	0.7
Emission Rate, lb/hr		0.2	0.3	0.2
beta-Pinene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
3-Carene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
Terpenes (Unspecified)				
Concentration, ppmvd		1.3	1.2	1.2
Emission Rate, lb/hr		0.4	0.4	0.4

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: BSW Vent No 4 FIN: P-2 SW
Source Code: TI-BSWV4 Date: 7/14/92 EPN: 4 CIN: NONE

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
Knowns as Carbon				
Concentration, ppmvd		61.6	68.8	65.2
Unknowns as Carbon				
Concentration, ppmvd		0.0	0.0	0.0
Sum M18 as Carbon, lb/hr		1.8	2.0	1.9
Unknown Compounds % of Total		0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	52.2	60.7	59.6	57.5
Emission Rate, lb/hr as C	1.5	1.8	1.7	1.7

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale)	Source:	BSW Vent No 5			FIN:	P-2 SW
Source Code: TI-BSWV5	Date:	7/13/92	EPN:	5	CIN:	NONE

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1459	1559	1659	
Flow Data				
Stack Temperature, °F			100	100
Moisture Content, %			6.5	6.5
Oxygen Concentration, %			20.8	20.8
Carbon Dioxide Concentration, %			0.0	0.0
Volumetric Flow Rate, x10^3 ACFM			17.6	17.6
Volumetric Flow Rate, x10^3 DSCFM			15.4	15.4
Process Operating Conditions				
Production Rate, ADT pulp/hr	23.0	23.0	23.0	23.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 •	0.1 *	0.1 *	0.1 *
Dimethyl sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 •	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Method 18 Data				
Methanol				
Concentration, ppmvd	13.4	21.3	13.0	15.9
Emission Rate, lb/hr	1.0	1.6	1.0	1.2
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 •	0.5 •
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 •
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 •
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 •
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 •
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 •

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: BSW Vent No 5 FIN: P-2 SW
Source Code: TI-BSWV5 Date: 7/13/92 EPN: 5 CIN: NONE

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6	1.0	0.7	0.8
Emission Rate, lb/hr	0.2	0.3	0.2	0.3

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale)	Source:	BSW Vent No 5		FIN:	P-2 SW
Source Code: TI-BSWV5	Date:	7/13/92	EPN: 5	CIN:	NONE

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5	0.5 *	0.5 *	0.4
Emission Rate, lb/hr	0.2	0.2 *	0.2 *	0.1
Knowns as Carbon				
Concentration, ppmvd	24.1	33.9	24.3	27.4
Unknowns as Carbon				
Concentration, ppmvd	0.5	0.6	0.7	0.6
Sum M18 as Carbon, lb/hr	0.7	1.0	0.7	0.8
Unknown Compounds % of Total	2.2%	1.9%	3.0%	2.3%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	38.5	38.5	36.4	37.8
Emission Rate, lb/hr as C	1.1	1.1	1.1	1.1

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: BSW Vent No 5 FIN: P-2 SW
Source Code: TI-BSWVV5 Date: 7/14/92 EPN: 5 CIN: NONE

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	921	1021	1121	
Flow Data				
Stack Temperature, °F			98	98
Moisture Content, %			6.1	6.1
Oxygen Concentration, %			20.8	20.8
Carbon Dioxide Concentration, %			0.0	0.0
Volumetric Flow Rate, x10^3 ACFM			17.6	17.6
Volumetric Flow Rate, x10^3 DSCFM			15.5	15.5
Process Operating Conditions				
Production Rate, ADT pulp/hr	29.0	28.0	28.0	28.3
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Method 18 Data				
Methanol				
Concentration, ppmvd	21.6	14.2	11.8	15.9
Emission Rate, lb/hr	1.7	1.1	0.9	1.2
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) | Source: BSW Vent No 5 | FIN: P-2 SW
Source Code: TI-BSWV5 | Date: 7/14/92 | EPN: 5 | CIN: NONE

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 •	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.3 *	0.3 •	0.3 *	0.3 *
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 •	0.5 *
Emission Rate, lb/hr	0.1 •	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 •	0.4 •
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 •	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 •	0.5 *	0.5 *	0.5 •
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 •
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 •	0.2 •
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 •	0.5 •
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 •
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 •	0.2 *	0.2 •
Terpenes (Unspecified)				
Concentration, ppmvd	1.6	1.3	1.1	1.3
Emission Rate, lb/hr	0.5	0.4	0.4	0.4

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: BSW Vent No 5 FIN: P-2 SW
Source Code: TI-BSWV5 Date: 7/14/92 EPN: 5 CIN: NONE

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5	0.5 *	0.5 *	0.4
Emission Rate, lb/hr	0.2	0.2 *	0.2 *	0.1
Knowns as Carbon				
Concentration, ppmvd	38.6	28.0	23.1	29.9
Unknowns as Carbon				
Concentration, ppmvd	0.5	0.0	0.0	0.2
Sum M18 as Carbon, lb/hr	1.1	0.8	0.7	0.9
Unknown Compounds % of Total	1.4%	0.0%	0.0%	0.5%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	39.4	36.2	33.0	36.2
Emission Rate, lb/hr as C	1.1	1.1	1.0	1.1

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: BSW Vent No 6 FIN: P-2 SW
Source Code: TI-BSWV6 Date: 7/13/92 EPN: 6 CIN: NONE

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1459	1559	1659	
Flow Data				
Stack Temperature, °F			101	101
Moisture Content, %			6.7	6.7
Oxygen Concentration, %			20.8	20.8
Carbon Dioxide Concentration, %			0.0	0.0
Volumetric Flow Rate, x10^3 ACFM			18.5	18.5
Volumetric Flow Rate, x10^3 DSCFM			16.1	16.1
Process Operating Conditions				
Production Rate, ADT pulp/hr	25.0	23.0	23.0	23.7
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl sulfide				
Concentration, ppmvd	0.5 *	0.5 •	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Method 18 Data				
Methanol				
Concentration, ppmvd	2.1 *	2.7	2.1 •	1.6
Emission Rate, lb/hr	0.2 *	0.2	0.2 •	0.1
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 •	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.9	0.9	0.9	0.9
Emission Rate, lb/hr	0.1	0.1	0.1	0.1
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) | Source: BSW Vent No 6 | FIN: P-2 SW
Source Code: TI-BSWV6 | Date: 7/13/92 | EPN: 6 | CIN: NONE

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 •	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 •
Chloroform				
Concentration, ppmvd	1.1 *	1.1 *	1.1 •	1.1 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 •	0.3 •
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 •	1.1 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 •	0.1 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 •	0.2 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 •	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 •	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 •	0.2 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale)	Source:	BSW Vent No 6			FIN:	P-2 SW
Source Code: TI-BSWV6	Date:	7/13/92	EPN:	6	CIN:	NONE

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Knowns as Carbon				
Concentration, ppmvd	3.0	4.4	3.3	3.6
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.1 *	0.1	0.1	0.1
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	2.1	2.1	1.1	1.8
Emission Rate, lb/hr as C	0.1 *	0.1 *	0.1 *	0.1 *

*One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: BSW Vent No 6 FIN: P-2 SW
Source Code: TI-BSWV6 Date: 7/14/92 EPN: 6 CIN: NONE

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	921	1021	1121	
Flow Data				
Stack Temperature, °F			98	98
Moisture Content, %			6.1	6.1
Oxygen Concentration, %			20.8	20.8
Carbon Dioxide Concentration, %			0.0	0.0
Volumetric Flow Rate, x10^3 ACFM			18.5	18.5
Volumetric Flow Rate, x10^3 DSCFM			16.3	16.3
Process Operating Conditions				
Production Rate, ADT pulp/hr	29.0	28.0	28.0	28.3
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 •	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Method 18 Data				
Methanol				
Concentration, ppmvd	2.1 *	2.1 *	2.1 *	2.1 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 •
Acetone				
Concentration, ppmvd	0.5	1.2	0.5 *	0.7
Emission Rate, lb/hr	0.1 *	0.2	0.1 *	0.1
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 •

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: BSW Vent No 6 FIN: P-2 SW
Source Code: TI-BSWV6 Date: 7/14/92 EPN: 6 CIN: NONE

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.3 •	0.3 *	0.3 *	0.3 *
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 •	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 •	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 •	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 •
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 •
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 •
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale)	Source:	BSW Vent No 6		FIN:	P-2 SW
Source Code: TI-BSWV6	Date:	7/14/92	EPN: 6	CIN:	NON⁻

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Knowns as Carbon				
Concentration, ppmvd	2.3	1.9	0.7	1.7
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	2.1	3.2	2.1	2.5
Emission Rate, lb/hr as C	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

Section 3.2 BSWV4 Emission Test Results - VOST

EMISSION TEST RESULTS - VOST

Mill TEMPLE-INLAND (Evadale) Source: BSW Vent No 4

Source Code: TI-BSWV4 EPN: 4 FIN: P-2 SW CIN: NONE

Date: 7/13/92

Compound	BSWV4-T (μg)	BSWV4-TC (μg)	BSWV4-C (μg/L)	Total μg	TI-BSWV4 (μg/m3)	Conc. (ppm)
TARGET COMPOUNDS						
Chloromethane		0.162		0.16	28.72	0.014
Methylene Chloride	0.083	0.086	24.98	1.24	220.41	0.062
Acetone	1.432	0.079		1.51	267.91	0.111
Carbon Disulfide	0.092	0.005		0.10	17.20	0.005
Chloroform	0.398	0.024	5.33	0.65	115.46	0.023
Trichlorofluoromethane	0.984	0.790		1.77	314.54	0.055
Acrolein						
Allyl Chloride						
Dimethyl disulfide	6.730	0.179	0.97	6.95	1232.40	0.315
Dimethyl sulfide	7.619			7.62	1350.89	0.523
Isooctane	0.615			0.62	109.04	0.023
tert-Butyl Methyl Ether		0.041		0.04	7.27	0.002
n-Hexane	0.501	0.275		0.78	137.59	0.038
2-Butanone (MEK)	0.873			0.87	154.79	0.052
1,1,1-Trichloroethane	0.039	0.008	0.47	0.07	11.92	0.002
Bromodichloromethane						
Dibromomethane						
Toluene	0.251	0.006	0.71	0.29	50.98	0.013
Ethylbenzene	0.005			0.01	0.89	0.000
Styrene	0.010		2.18	0.10	18.39	0.004
o-Xylene	0.006			0.01	1.06	0.000
m-/p-Xylene	0.014			0.01	2.48	0.001
A-Pinene	7.478	0.010		7.49	1327.66	0.234
B-Pinene	6.365			6.37	1128.55	0.199
TENTATIVELY IDENTIFIED CMPDS.						
Pinene-related Compounds	9.092			9.09	1612.06	
Dimethyl Trisulfide	1.810			1.81	320.92	
Methanethiol	0.148			0.15	26.24	
Cyclohexane	0.156			0.16	27.66	
Branched HC						
Subst'd HC	0.927			0.93	164.36	
2-Butene						
Pentadiene						
Siloxane	0.243			0.24	43.09	
SURROGATE STDS (% Recovery)						
Toluene-d8	98.0	94.1	101.3			
1,2-Dichloroethane-d4	78.6	76.0	80.9			
Benzene-d6	90.5	62.4	96.8			

NOTES:

-T=Tenax

Air Volume = 0.00564 cu.m.

EMISSION TEST RESULTS - VOST

Mill TEMPLE-INLAND (Evadale) Source: BSW Vent No 4
Source Code: TI-BSWV4 EPN: 4 FIN: P-2 SW CIN: NON

Compound	BSWV4-T (µg)	BSWV4-TC (µg)	BSWV4-C (µg/L)	Date: 7/13/92 Total µg	TI-BSWV4 (µg/m3)	Conc. (ppm)
-TC = Tenax/Charcoal						
-C = Condensate			Condensate Vol.	43.0 mL		

Triangle Laboratories of RTP, Inc.
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Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HI478
RF FILE: HI469
DATE: 07/31/92
TLI PROJ #: 21436

SAMPLE ID: TI-BSWV4/1VOST/0713/18 T
TLI ID: 58.57.5A
ANALYSIS DATE: 07/24/92

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1 Bromochloromethane	4820		770	1		IS	
2 Chloromethane	0	.924	0	1	.001	ND	.05
3 Bromomethane	0	.924	0	1	.001	ND	.05
4 Vinyl Chloride	0	1.096	0	1	.001	ND	.05
5 Chloroethane	0	.938	0	1	.001	ND	.05
6 Methylene Chloride	3255	2.025	578	1	.083	D	.05
7 Acetone	15229	.552	523	1	1.432	E	.05
8 Carbon Disulfide	10229	5.799	494	1	.092	D	.05
9 1,1-Dichloroethene	0	1.818	0	1	.001	ND	.05
10 1,1-Dichloroethane	0	4.648	0	1	.001	ND	.05
11 trans-1,2-Dichloroethene	0	2.075	0	1	.001	ND	.05
12 Chloroform	41837	5.456	789	1	.398	D	.05
13 1,2-Dichloroethane	0	3.052	0	1	.001	ND	.05
43 Trichlorofluoromethane	49768	2.623	394	1	.984	D	.05
45 Acrolein	0	.036	0	1	.029	ND	.05
46 Acrylonitrile	0	.531	0	1	.002	ND	.05
47 cis-1,2-Dichloroethene	0	2.411	0	1	.001	ND	.05
52 1,3-butadiene	0	1.282	0	1	.001	ND	.05
57 Allyl chloride	0	1.166	0	1	.001	ND	.05
62 Dimethyl disulfide	587208	4.526	1071	1	6.730	E	.05
63 Dimethyl sulfide	273429	1.861	507	1	7.619	E	.05
65 Iodomethane	0	2.117	0	1	.001	ND	.05
66 Isooctane	189332	15.975	860	1	.615	D	.05
68 Tert-Butyl methyl ether	0	4.526	0	1	.001	ND	.05
69 Vinyl Bromide	0	1.369	0	1	.001	ND	.05
70 n-Hexane	44106	4.571	658	1	.501	D	.05
14 1,4-Difluorobenzene	21744		901	14		IS	
15 2-Butanone	2760	.036	757	14	.873	D	.05
16 1,1,1-Trichloroethane	3141	.915	797	14	.039	E	.05
17 Carbon Tetrachloride	0	.671	0	14	.001	ND	.05
18 Vinyl Acetate	0	.806	0	14	.001	ND	.05
19 Bromodichloromethane	0	.876	0	14	.001	ND	.05
20 1,2-Dichloropropane	0	.689	0	14	.001	ND	.05
21 cis-1,3-Dichloropropene	0	1.104	0	14	.001	ND	.05
22 Trichloroethene	0	.557	0	14	.001	ND	.05
23 Dibromochloromethane	0	.493	0	14	.001	ND	.05
24 1,1,2-Trichloroethane	0	.409	0	14	.001	ND	.05
25 Benzene	0	2.375	0	14	.001	ND	.05
26 trans-1,3-Dichloropropene	0	.745	0	14	.001	ND	.05
27 Bromoform	0	.255	0	14	.001	ND	.05
54 1,4-Dichloro-2-butene	0	.123	0	14	.002	ND	.05
60 Dibromomethane	0	.303	0	14	.001	ND	.05
28 Chlorobenzene-d5	25243		1339	28		IS	
29 4-Methyl-2-Pentanone	0	.240	0	28	.001	ND	.05
30 2-Hexanone	0	.111	0	28	.002	ND	.05
31 Tetrachloroethene	0	.375	0	28	.001	ND	.05
32 1,1,2,2-Tetrachloroethane	0	.339	0	28	.001	ND	.05
33 Toluene	25117	.989	1111	28	.251	D	.05

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

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FILE NAME: HI478
RF FILE: HI469
DATE: 07/31/92
TLI PROJ #: 21436

SAMPLE ID: TI-BSWV4/1VOST/0713/18 T
TLI ID: 58.57.5A
ANALYSIS DATE: 07/24/92

M E T H O D 8 2 4 0 Q U A N T I T A T I O N R E P O R T

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
34 Chlorobenzene	0	1.073	0	28	.001	ND	.05
35 Ethylbenzene	318	.582	1374	28	.005	E	.05
36 Styrene	1263	1.295	1476	28	.010	E	.05
37 o-Xylene	477	.784	1471	28	.006	E	.05
38 m-/p-Xylene	1191	.834	1398	28	.014	E	.05
49 1,2 Dichlorobenzene	0	.586	0	28	.001	ND	.05
50 1,2,3-Trichloropropane	0	.236	0	28	.001	ND	.05
51 1,3 Dichlorobenzene	0	.800	0	28	.001	ND	.05
53 1,4 Dichlorobenzene	0	.674	0	28	.001	ND	.05
56 A-Pinene	905313	1.199	1550	28	7.478	E	.05
58 B-Pinene	860210	1.339	1693	28	6.365	E	.05
59 Cumene (isopropylbenzene)	0	1.613	0	28	.001	ND	.05
64 Ethyl methacrylate	0	.402	0	28	.001	ND	.05
67 P-Cymene	0	1.797	0	28	.001	ND	.05

S U R R O G A T E S U M M A R Y	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	11511	3.037	838	1	.20	D	78.6
48 Benzene-d6	50122	2.548	836	14	.23	D	90.
39 Toluene-d8	40441	1.635	1102	28	.25	D	98.

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

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FILE NAME: HI478
DATE: 07/31/92
TLI PROJ #: 21436

SAMPLE ID: TI-BSWV4/1VOST/0713/18 T
TLI ID: 58.57.5A
ANALYSIS DATE: 07/24/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
PINENE RELATED COMPOUND	1894	2063441	1339	.25	5.899 9.042
DIMETHYL TRISULFIDE	1727	633269	1339	.25	1.810
SUBSTITUTED HYDROCARBON	627	155065	770	.25	.927
PINENE RELATED COMPOUND	1592	265817	1339	.25	.760
PINENE RELATED COMPOUND	1802	138523	1339	.25	.396
SILOXANE	1228	84950	1339	.25	.243
CYCLOHEXANE	724	26057	770	.25	.156
METHANETHIOL	272	24719	770	.25	.148
PINENE RELATED COMPOUND	1507	45724	1339	.25	.131
PINENE RELATED COMPOUND	2030	33483	1339	.25	.098

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	770	41835	1
1,4-Difluorobenzene	901	60333	14
Chlorobenzene-d5	1339	87454	28

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FILE NAME: HI473
RF FILE: HI489
DATE: 07/31/92
TLI PROJ #: 21438

SAMPLE ID: TI-BSWV4/1VOST/0713/18 TC
TLI ID: 58.57.58
ANALYSIS DATE: 07/24/92

M E T H O D 8 2 4 0 Q U A N T I T A T I O N R E P O R T

	NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	5057		771	1		IS	
2	Chloromethane	3021	.924	164	1	.162	D	.05
3	Bromomethane	0	.924	0	1	.001	ND	.05
4	Vinyl Chloride	0	1.098	0	1	.001	ND	.05
5	Chloroethane	0	.938	0	1	.001	ND	.05
6	Methylene Chloride	3533	2.025	578	1	.086	D	.05
7	Acetone	881	.552	523	1	.079	D	.05
8	Carbon Disulfide	540	5.799	495	1	.005	E	.05
9	1,1-Dichloroethene	0	1.618	0	1	.001	ND	.05
10	1,1-Dichloroethane	0	4.648	0	1	.001	ND	.05
11	trans-1,2-Dichloroethene	0	2.075	0	1	.001	ND	.05
12	Chloroform	2598	5.456	789	1	.024	E	.05
13	1,2-Dichloroethane	0	3.052	0	1	.001	ND	.05
43	Trichlorofluoromethane	41931	2.623	393	1	.790	D	.05
45	Acrolein	0	.038	0	1	.027	ND	.05
46	Acrylonitrile	0	.531	0	1	.002	ND	.05
47	cis-1,2-Dichloroethene	0	2.411	0	1	.001	ND	.05
52	1,3-butadiene	0	1.282	0	1	.001	ND	.05
57	Allyl chloride	0	1.166	0	1	.001	ND	.(
62	Dimethyl disulfide	16359	4.526	1063	1	.179	D	.0
63	Dimethyl sulfide	0	1.861	0	1	.001	ND	.05
65	Iodomethane	0	2.117	0	1	.001	ND	.05
66	Isooctane	0	15.975	0	1	.001	ND	.05
68	Tert-Butyl methyl ether	3738	4.526	628	1	.041	E	.05
69	Vinyl Bromide	0	1.369	0	1	.001	ND	.05
70	n-Hexane	25449	4.571	659	1	.275	D	.05
14	1,4-Difluorobenzene	32142		901	14		IS	
15	2-Butanone	0	.038	0	14	.004	ND	.05
16	1,1,1-Trichloroethane	930	.915	798	14	.008	E	.05
17	Carbon Tetrachloride	0	.671	0	14	.001	ND	.05
18	Vinyl Acetate	0	.808	0	14	.001	ND	.05
19	Bromodichloromethane	0	.876	0	14	.001	ND	.05
20	1,2-Dichloropropane	0	.689	0	14	.001	ND	.05
21	cis-1,3-Dichloropropene	0	1.104	0	14	.001	ND	.05
22	Trichloroethene	0	.557	0	14	.001	ND	.05
23	Dibromochloromethane	0	.493	0	14	.001	ND	.05
24	1,1,2-Trichloroethane	0	.409	0	14	.001	ND	.05
25	Benzene	0	2.375	0	14	.001	ND	.05
26	trans-1,3-Dichloropropene	0	.745	0	14	.001	ND	.05
27	Bromoform	0	.255	0	14	.001	ND	.05
54	1,4-Dichloro-2-butene	0	.123	0	14	.001	ND	.05
60	Dibromomethane	0	.303	0	14	.001	ND	.05
28	Chlorobenzene-d5	26200		1340	28		IS	
29	4-Methyl-2-Pentanone	0	.240	0	28	.001	ND	.05
30	2-Hexanone	0	.111	0	28	.002	ND	.05
31	Tetrachloroethene	0	.375	0	28	.001	ND	.05
32	1,1,2,2-Tetrachloroethane	0	.339	0	28	.001	ND	.05
33	Toluene	631	.989	1109	28	.006	E	.05

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Durham, NC 27713
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FILE NAME: HI473
RF FILE: HI469
DATE: 07/31/92
TLI PROJ #: 21436

SAMPLE ID: TI-BSWV4/1VOST/0713/1B TC
TLI ID: 58.57.58
ANALYSIS DATE: 07/24/92

M E T H O D 8 2 4 0 Q U A N T I T A T I O N R E P O R T

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
34 Chlorobenzene	0	1.073	0	28	.001	ND	.05
35 Ethylbenzene	0	.582	0	28	.001	ND	.05
36 Styrene	0	1.295	0	28	.001	ND	.05
37 o-Xylene	0	.784	0	28	.001	ND	.05
38 m-/p-Xylene	0	.834	0	28	.001	ND	.05
49 1,2 Dichlorobenzene	0	.586	0	28	.001	ND	.05
50 1,2,3-Trichloropropane	0	.236	0	28	.001	ND	.05
51 1,3 Dichlorobenzene	0	.800	0	28	.001	ND	.05
53 1,4 Dichlorobenzene	0	.674	0	28	.001	ND	.05
56 A-Pinene	1294	1.199	1543	28	.010	E	.05
58 B-Pinene	0	1.339	0	28	.001	ND	.05
59 Cumene (isopropylbenzene)	0	1.613	0	28	.001	ND	.05
64 Ethyl methacrylate	0	.402	0	28	.001	ND	.05
67 P-Cymene	0	1.797	0	28	.001	ND	.05

S U R R O G A T E S U M M A R Y	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	11674	3.037	838	1	.19	D	76.0
48 Benzene-d6	51094	2.548	837	14	.16	D	62.4
39 Toluene-d8	40320	1.635	1099	28	.24	D	94.1

Triangle Laboratories of RTP, Inc.	FILE NAME: AC8952	SAMPLE ID:	TI-BSWV4/1VOST/0713/1B
801 Capitola Drive	RF FILE: AC893	TLI ID:	58.57.10
Durham, NC 27713	DATE: 07/31/92	SAMPLE VOL:	.005 L
Telephone: (919) 544-5729	TLI PROJ #: 21436	ANALYSIS DATE:	07/21/92
		DILUTION FACTOR:	1

METHOD 8240 QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	CONC,ug/L	CODE	QUAN LIMIT
1	Bromochloromethane	2182		776	1		IS	
2	Chloromethane	0	1.500	0	1	.31	ND	10
3	Bromomethane	0	1.450	0	1	.32	ND	10
4	Vinyl Chloride	0	1.856	0	1	.25	ND	10
5	Chloroethane	0	1.225	0	1	.37	ND	10
6	Methylene Chloride	1294	1.187	580	1	24.98	D	10
7	Acetone	0	1.112	0	1	.41	ND	10
8	Carbon Disulfide	0	2.922	0	1	.16	ND	10
9	1,1-Dichloroethene	0	1.486	0	1	.31	ND	10
10	1,1-Dichloroethane	0	4.168	0	1	.11	ND	10
11	trans-1,2-Dichloroethene	0	1.676	0	1	.27	ND	10
12	Chloroform	673	2.892	795	1	5.33	E	10
13	1,2-Dichloroethane	0	2.959	0	1	.15	ND	10
43	Trichlorofluoromethane	0	1.815	0	1	.25	ND	10
45	Acrolein	0	.471	0	1	.97	ND	10
46	Acrylonitrile	0	.882	0	1	.52	ND	10
47	cis-1,2-Dichloroethene	0	1.856	0	1	.25	ND	10
52	1,3-butadiene	0	2.246	0	1	.20	ND	10
57	Allyl chloride	0	.649	0	1	.71	ND	10
62	Dimethyl disulfide	184	4.349	1083	1	.97	E	10
63	Dimethyl sulfide	0	2.154	0	1	.21	ND	10
65	Iodomethane	0	1.579	0	1	.29	ND	10
66	Isooctane	0	13.240	0	1	.03	ND	10
68	Tert-Butyl methyl ether	0	3.578	0	1	.13	ND	10
69	Vinyl Bromide	0	1.747	0	1	.26	ND	10
70	n-Hexane	0	4.066	0	1	.11	ND	10
14	1,4-Difluorobenzene	9454		912	14		IS	
15	2-Butanone	0	.057	0	14	1.85	ND	10
16	1,1,1-Trichloroethane	59	.667	805	14	.47	E	10
17	Carbon Tetrachloride	0	.536	0	14	.20	ND	10
18	Vinyl Acetate	0	1.187	0	14	.09	ND	10
19	Bromodichloromethane	0	.597	0	14	.18	ND	10
20	1,2-Dichloropropane	0	.730	0	14	.14	ND	10
21	cis-1,3-Dichloropropene	0	.646	0	14	.16	ND	10
22	Trichloroethene	0	.462	0	14	.23	ND	10
23	Dibromochloromethane	0	.618	0	14	.17	ND	10
24	1,1,2-Trichloroethane	0	.529	0	14	.20	ND	10
25	Benzene	0	.962	0	14	.11	ND	10
26	trans-1,3-Dichloropropene	0	.646	0	14	.16	ND	10
27	Bromoform	0	.389	0	14	.27	ND	10
54	1,4-Dichloro-2-butene	0	.263	0	14	.40	ND	10
60	Dibromomethane	0	.362	0	14	.29	ND	10
28	Chlorobenzene-d5	10655		1365	28		IS	
29	4-Methyl-2-Pentanone	0	.608	0	28	.15	ND	10
30	2-Hexanone	0	.636	0	28	.15	ND	10
31	Tetrachloroethene	0	.275	0	28	.34	ND	10
32	1,1,2,2-Tetrachloroethane	0	.759	0	28	.12	ND	10
33	Toluene	120	.797	1130	28	.71	E	10

CODES: ND = Not Detected; D = Detected; ...

Triangle Laboratories of RTP, Inc. FILE NAME: AC8952 SAMPLE ID: TI-BSWV4/1VOST/0713/1B
801 Capitola Drive RF FILE: AC893 TLI ID: 58.57.10
Durham, NC 27713 DATE: 07/31/92 SAMPLE VOL: .005 L
Telephone: (919) 544-5729 TLI PROJ #: 21436 ANALYSIS DATE: 07/21/92
DILUTION FACTOR: 1

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	CONC,ug/L	CODE	QUAN LIMIT
34 Chlorobenzene	0	1.085	0	28	.09	ND	10
35 Ethylbenzene	0	.579	0	28	.16	ND	10
36 Styrene	565	1.215	1502	28	2.18	E	10
37 o-Xylene	0	.770	0	28	.12	ND	10
38 m-/p-Xylene	0	.728	0	28	.13	ND	10
49 1,2 Dichlorobenzene	0	.849	0	28	.11	ND	10
50 1,2,3-Trichloropropane	0	.453	0	28	.21	ND	10
51 1,3 Dichlorobenzene	0	.947	0	28	.10	ND	10
53 1,4 Dichlorobenzene	0	.848	0	28	.11	ND	10
56 A-Pinene	0	1.243	0	28	.08	ND	10
58 B-Pinene	0	1.385	0	28	.07	ND	10
59 Cumene (isopropylbenzene)	0	1.849	0	28	.05	ND	10
64 Ethyl methacrylate	0	.604	0	28	.16	ND	10
67 P-Cymene	0	2.113	0	28	.04	ND	10

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT,ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	4551	2.577	846	1	.20	D	80.9
48 Benzene-d6	10542	1.151	845	14	.24	D	96.8
39 Toluene-d8	14070	1.304	1120	28	.25	D	101.3

Section 3.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source.. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL TEMPLE-INLAND SOURCE TI-BSWV4

1. CALIBRATION

THEOR	DATE	7/13/92	DATE		7/14/92
ppm	ppm	%REC	ppm	%REC	%REC
0	0		-2		
90	87	97%	88		98%
360	364	101%	367		102%
747	744	100%	743		99%

2. PROPANE LINE RECOVERY

	DATE	7/13/92		DATE	7/14/92	
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	16	17	106%	14	14	100%
AFTER	16	17	106%	10	12	120%

3. LINE BLANK

	[------------------- ppm		-------------------	]
BEFORE RUN	0	0	0	0
AFTER RUN	0	0	0	0

QUALITY CONTROL SUMMARY
METHOD 18

MILL TEMPLE-INLAND SOURCE TI-BSWV4

1. CHECK STANDARD

ANALYTE	THEOR	DATE	7/13/92	THEOR	DATE	7/14/92
	ppm	ppm	%REC	ppm	ppm	%REC
ethanol	3.15	0.00	0%	10.50	0.93	9%
acetone	2.52	0.26	10%	8.40	4.22	50%
isopropanol	2.42	0.28	12%	8.05	5.36	67%
benzene	2.07	37.20	1798%	6.90	44.08	639%
bromodichloromethane	2.27	0.00	0%	7.58	3.94	52%
toluene	1.74	1.69	97%	5.80	5.81	100%
ethyl benzene	1.51	1.46	97%	5.03	5.56	110%
m-xylene	1.51	1.51	100%	5.03	5.60	111%
o-xylene	1.52	1.42	94%	5.05	5.44	108%
cumene	1.33	1.35	101%	4.43	4.97	112%
alpha-pinene	1.16	1.13	97%	3.87	4.31	111%
beta-pinene	1.17	1.11	95%	3.89	4.08	105%
3-carene	1.17	1.14	97%	3.89	4.30	110%
p-cymene	1.19	1.12	95%	3.95	4.30	109%

2. PROPANE RESPONSE

	THEOR					
BEFORE RUN	125	122.99	98%	29.9	31.15	104%
AFTER RUN	29.9	31.40	105%	29.9	33.99	114%

3. METHANOL LINE RECOVERY

	THEOR					
BEFORE RUN	104.75	107.27	102%	101.34	97.23	96%
AFTER RUN	109.21	104.55	96%	127.81	128.53	101%

4. LINE BLANK

	[-------------FILE REF-------------	]
BEFORE RUN	GCA4008	GEA4007
AFTER RUN	GDA4010	GEA4014

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QUALITY CONTROL SUMMARY
METHOD 16

MILL TEMPLE-INLAND SOURCE TI-BSWV4

1. CALIBRATION

ANALYTE	LO ppm	MED ppm	HI ppm	CORR COEFF
7/13/92 *				
hydrogen sulfide	3.52	8.31	11.10	
methyl mercaptan	3.43	8.11	10.80	
dimethyl sulfide	4.64	11.00	14.70	
carbon disulfide	1.33	3.15	4.21	
dimethyl disulfide	2.16	5.10	6.82	
7/14/92				
hydrogen sulfide	3.52	8.31	11.10	
methyl mercaptan	3.43	8.11	10.80	
dimethyl sulfide	4.64	11.00	14.70	
carbon disulfide	1.33	3.15	4.21	
dimethyl disulfide	2.16	5.10	6.82	

* Post calibration on 7/14/92 was used

2. HYDROGEN SULFIDE LINE RECOVERY

	DATE 7/13/92 INST	LINE	%REC	DATE 7/14/92 INST	LINE	%REC
BEFORE						
AFTER						

QUALITY CONTROL SUMMARY
METHOD 25A

MILL TEMPLE-INLAND SOURCE TI-BSWV5

1. CALIBRATION

THEOR	DATE 7/13/92		DATE 7/14/92		
ppm	ppm	%REC	ppm	%REC	%REC
0	0		-2		
90	87	97%	88		98%
360	364	101%	367		102%
747	744	100%	743		99%

2. PROPANE LINE RECOVERY

	DATE INST	7/13/92 LINE	%REC	DATE INST	7/14/92 LINE	%REC
BEFORE	16	17	106%	15	18	120%
AFTER	15	18	120%	14	14	100%

3. LINE BLANK

	[--------------FILE REF---------------]	
BEFORE RUN		
AFTER RUN		

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QUALITY CONTROL SUMMARY
METHOD 18

MILL TEMPLE-INLAND SOURCE TI-BSWV5

1. CHECK STANDARD

ANALYTE	THEOR ppm	DATE 7/13/92 ppm	%REC	THEOR ppm	DATE 7/14/92 ppm	%REC
ethanol	3.15	0.00	0%	10.50	0.93	9%
acetone	2.52	0.26	10%	8.40	4.22	50%
isopropanol	2.42	0.28	12%	8.05	5.36	67%
benzene	2.07	37.20	1798%	6.90	44.08	639%
bromodichloromethane	2.27	0.00	0%	7.58	3.94	52%
toluene	1.74	1.69	97%	5.80	5.81	100%
ethyl benzene	1.51	1.46	97%	5.03	5.56	110%
m-xylene	1.51	1.51	100%	5.03	5.60	111%
o-xylene	1.52	1.42	94%	5.05	5.44	108%
cumene	1.33	1.35	101%	4.43	4.97	112%
alpha-pinene	1.16	1.13	97%	3.87	4.31	111%
beta-pinene	1.17	1.11	95%	3.89	4.08	105%
3-carene	1.17	1.14	97%	3.89	4.30	110%
p-cymene	1.19	1.12	95%	3.95	4.30	109%

2. PROPANE RESPONSE

	THEOR					
BEFORE RUN	29.9	31.40	105%	5.03	5.30	105%
AFTER RUN	5.03	5.30	105%	29.9	31.15	104%

3. METHANOL LINE RECOVERY

	THEOR					
BEFORE RUN	109.21	104.55	96%	108.68	108.96	100%
AFTER RUN	108.68	108.96	100%	101.34	97.23	96%

4. LINE BLANK

	[--------------FILE REF	--------------]
BEFORE RUN	GDA4010	GDA4016
AFTER RUN	GDA4016	GEA4007

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QUALITY CONTROL SUMMARY
METHOD 16

MILL TEMPLE-INLAND SOURCE TI-BSWV5

1. CALIBRATION

ANALYTE	LO	MED	HI	CORR COEFF
	ppm	ppm	ppm	
7/13/92				
hydrogen sulfide				
methyl mercaptan				
dimethyl sulfide				
carbon disulfide				
dimethyl disulfide				
7/14/92				
hydrogen sulfide	3.52	8.31	11.10	
methyl mercaptan	3.43	8.11	10.80	
dimethyl sulfide	4.64	11.00	14.70	
carbon disulfide	1.33	3.15	4.21	
dimethyl disulfide	2.16	5.10	6.82	

2. HYDROGEN SULFIDE LINE RECOVERY

	DATE 7/13/92			DATE 7/14/92		
	INST	LINE	%REC	INST	LINE	%REC
BEFORE						
AFTER						

Printed July 27,1992 16:28

QUALITY CONTROL SUMMARY
METHOD 25A

MILL TEMPLE-INLAND SOURCE TI-BSWV6

1. CALIBRATION

THEOR	DATE	7/13/92	DATE		7/14/92
ppm	ppm	%REC	ppm	%REC	%REC
0	0		-2		
90	87	97%	87		97%
360	364	101%	370		103%
747	744	100%	742		99%

2. PROPANE LINE RECOVERY

	DATE INST	7/13/92 LINE	%REC	DATE INST	7/14/92 LINE	%REC
BEFORE	14	14	100%	12	14	117%
AFTER	12	14	117%	17	15	88%

3. LINE BLANK

[--------------ppm as C--------------]

	DATE INST	7/13/92 LINE		DATE INST	7/14/92 LINE	
BEFORE	0	0		0	0	
AFTER	0	0		0	0	

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QUALITY CONTROL SUMMARY
METHOD 18

MILL TEMPLE-INLAND SOURCE TI-BSWV6

1. CHECK STANDARD

ANALYTE	THEOR	DATE	7/13/92	THEOR	DATE	7/14/92
	ppm	ppm	%REC	ppm	ppm	%REC
ethanol	3.15	0.00	0%	10.50	0.93	9%
acetone	2.52	2.78	110%	8.40	4.22	50%
isopropanol	2.42	0.00	0%	8.05	5.36	67%
benzene	2.07	42.05	2032%	6.90	44.08	639%
bromodichloromethane	2.27	5.97	263%	7.58	3.94	52%
toluene	1.74	1.76	101%	5.80	5.81	100%
ethyl benzene	1.51	1.57	104%	5.03	5.56	110%
m-xylene	1.51	1.60	106%	5.03	5.60	111%
o-xylene	1.52	1.54	102%	5.05	5.44	108%
cumene	1.33	1.44	108%	4.43	4.97	112%
alpha-pinene	1.16	1.21	104%	3.87	4.31	111%
beta-pinene	1.17	1.20	103%	3.89	4.08	105%
3-carene	1.17	1.24	106%	3.89	4.30	110%
p-cymene	1.19	1.31	110%	3.95	4.30	109%

2. PROPANE RESPONSE

	THEOR					
BEFORE RUN	29.9	32.31	108%	5.03	5.30	105%
AFTER RUN	5.03	5.25	104%	29.9	31.23	104%

3. METHANOL LINE RECOVERY

	THEOR					
BEFORE RUN	110.44	109.94	100%	108.68	108.96	100%
AFTER RUN	116.44	111.68	96%	114.54	117.92	103%

4. LINE BLANK

	[-------------FILE REF-------------]	
BEFORE RUN	GDB4010	GDB4016
AFTER RUN	GDB4018	GEB4007

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QUALITY CONTROL SUMMARY
METHOD 16

MILL TEMPLE-INLAND SOURCE TI-BSWV6

1. CALIBRATION

ANALYTE	LO ppm	MED ppm	HI ppm	CORR COEFF
7/13/92				
hydrogen sulfide				
methyl mercaptan				
dimethyl sulfide				
carbon disulfide				
dimethyl disulfide				
7/14/92				
hydrogen sulfide	3.52	8.31	11.10	
methyl mercaptan	3.43	8.11	10.80	
dimethyl sulfide	4.64	11.00	14.70	
carbon disulfide	1.33	3.15	4.21	
dimethyl disulfide	2.16	5.10	6.82	

2. HYDROGEN SULFIDE LINE RECOVERY

	DATE 7/13/92 INST	LINE	%REC	DATE 7/14/92 INST	LINE	%REC
BEFORE						
AFTER						

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Section 3.4 Process Operating Data

BROWNSTOCK WASHER

The mill utilizes two three-stage countercurrent vacuum drum system for brownstock washing. Each drum washer line is covered with a common hood. The softwood side has three fans which are vented to the atmosphere. This hood is equipped with fans rated at 14,800 ACFM at 102°F, 17,600 ACFM at 98°F, and 18,500 ACFM at 101°F respectively. The hardwood side has two fans vented to the atmosphere rated at 24,100 at 111°F and 38,600 at 104°F. (See Diagram BSW-1 and Diagram BSW-2)

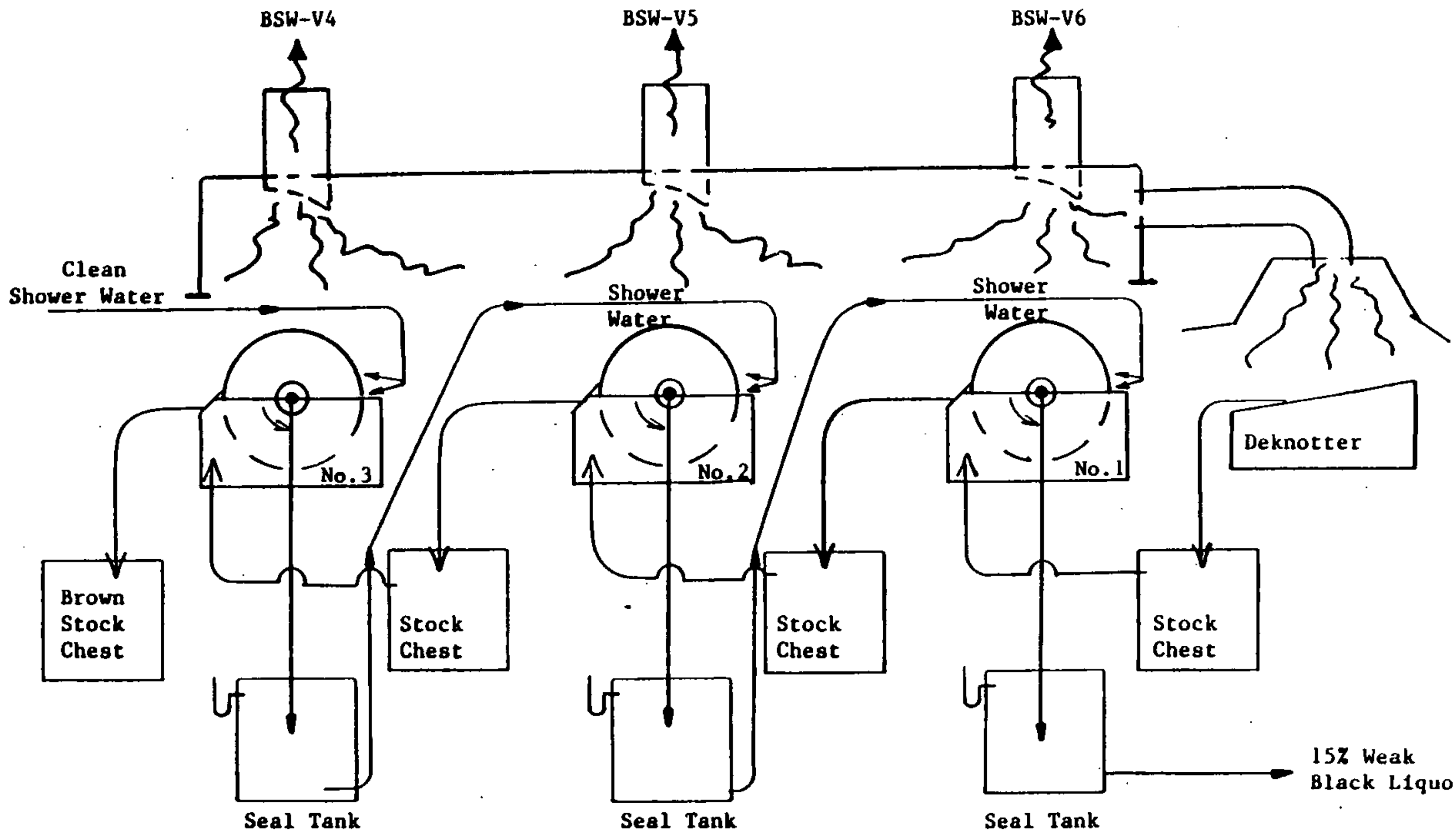
Clean condensates from the blow heat recovery system and fresh water are used as shower water on the last washer on both lines. Average process parameters during the test were as follows:

SOFTWOOD LINE - BROWN STOCK WASHER

Pulp kappa No.	19.6	
Pulp flow rate	675 ADT/day	
Shower water temperature		111°F
Shower water flow rate (first stage)		1137 gpm
Vat temperatures	118°F	

HARDWOOD LINE - BROWN STOCK WASHER

Pulp kappa no.	11.7	
Pulp flow rate	795 ADT/day	
Shower water temp.	135°F	
Shower water flow rate (first stage)		1745 gpm
Vat temperatures		140°F



EVADALE
TEMPLE-INLAND
BSW - SOFTWOOD

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SECTION 4

BROWN STOCK WASHER HARDWOOD

(TI-BSWV1, TI-BSWV2)

4 TI-BSWV1, TI-BSWV2

SECTION 4
BROWN STOCK WASHER HARDWOOD
(TI-BSWV1, TI-BSWV2)

The Brown Stock Washer Hardwood Side was tested on two different days for volatile organic compounds by Methods 25A, 16 and 18. In addition, a VOST sample was collected on 7/12/92 on Vent No. 1.

Total Hydrocarbons (M25A)

Figures 4.1 through 4.4 present the THC trends for the test periods on 7/10/92 through 7/12/92. Total hydrocarbon concentrations were consistent from day to day for both sources. Vent No. 1 showed 45 to 50 ppm. Vent No. 2 gave concentrations around 15 ppm with a spike of 40 ppm in the third hour of testing.

Volatile Organic Compounds (M16 and M18)

Table 4.1 summarizes the results for the Method 16 and Method 18 target compounds, and Section 4.1 is a tabulation of the data. The volumetric flow was measured during sampling using a pitot tube. Hydrogen sulfide, methyl mercaptan, and dimethyl disulfide were identified in Vent No. 1. No reduced sulfur compounds were identified in Vent No. 2 at concentrations above the detection limits. Methanol was present at 4-5 lb/hr in Vent No. 1. Also identified in one or more runs were acetone, alpha- and beta- pinene. Vent No. 2 showed only high molecular weight compounds such as alpha- and beta- pinene, p-cymene. These compounds did not appear above the detection limits in all runs. Run 1 of Vent No. 2 on 7/10/92 was eliminated due to interference.

Volatile Organic Sampling Train (VOST)

Table 4.2 summarizes the result of the VOST sample collected on 7/12/92. Section 4.2 tabulates the results for target compounds and tentatively identified compounds (TIC). VOST data confirmed the presence of alpha- and beta- pinene as well as the reduced sulfur compounds.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 4.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 4.4 includes the process operating data as recorded and provided by mill personnel.

FIGURE 4.1
THC TREND ANALYSIS (7/11/92)
BSW VENT NO.1 (TI-BSWV1)

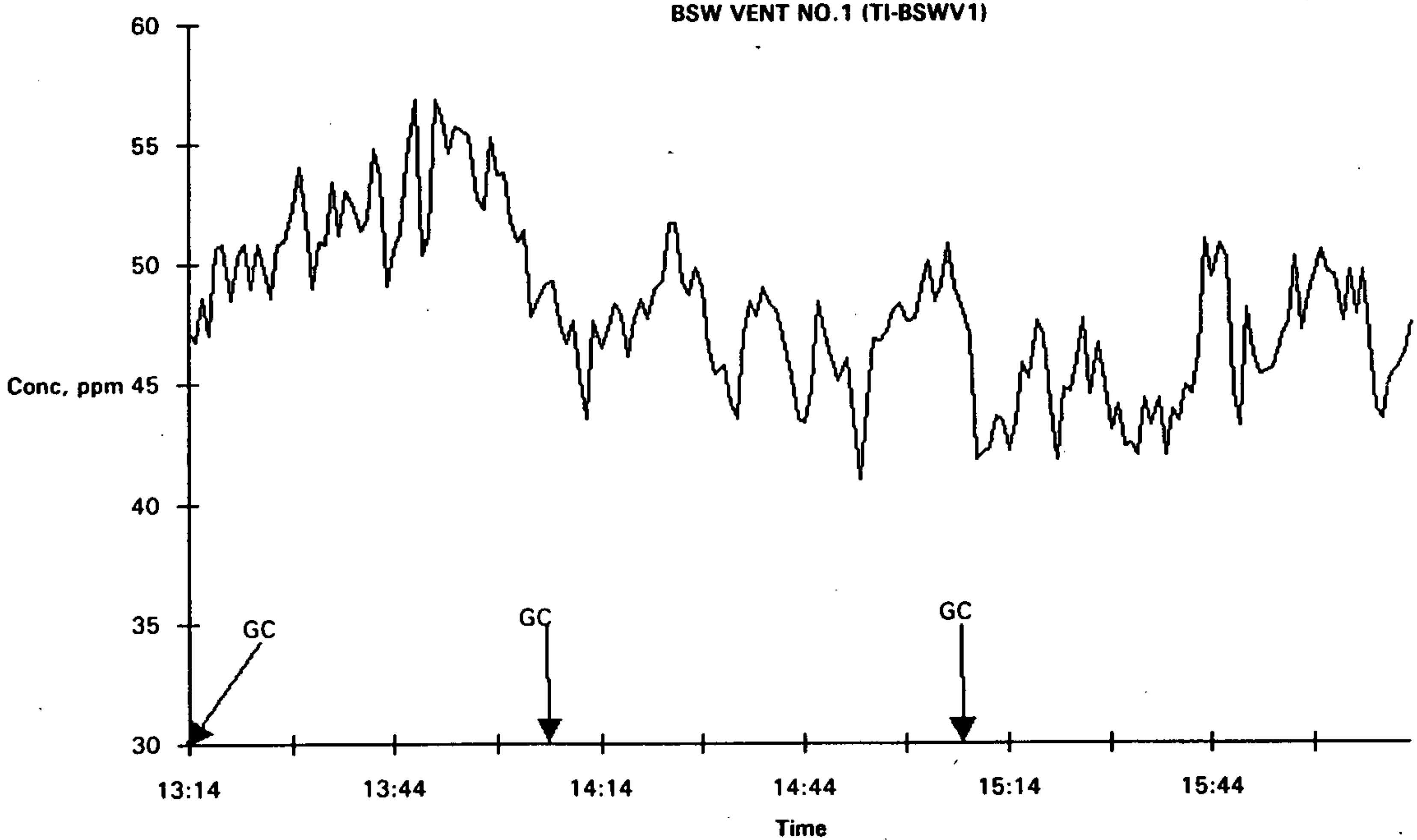

FIGURE 4.2
THC TREND ANALYSIS (7/12/92)
BSW VENT NO.1 (TI-BSWV1)

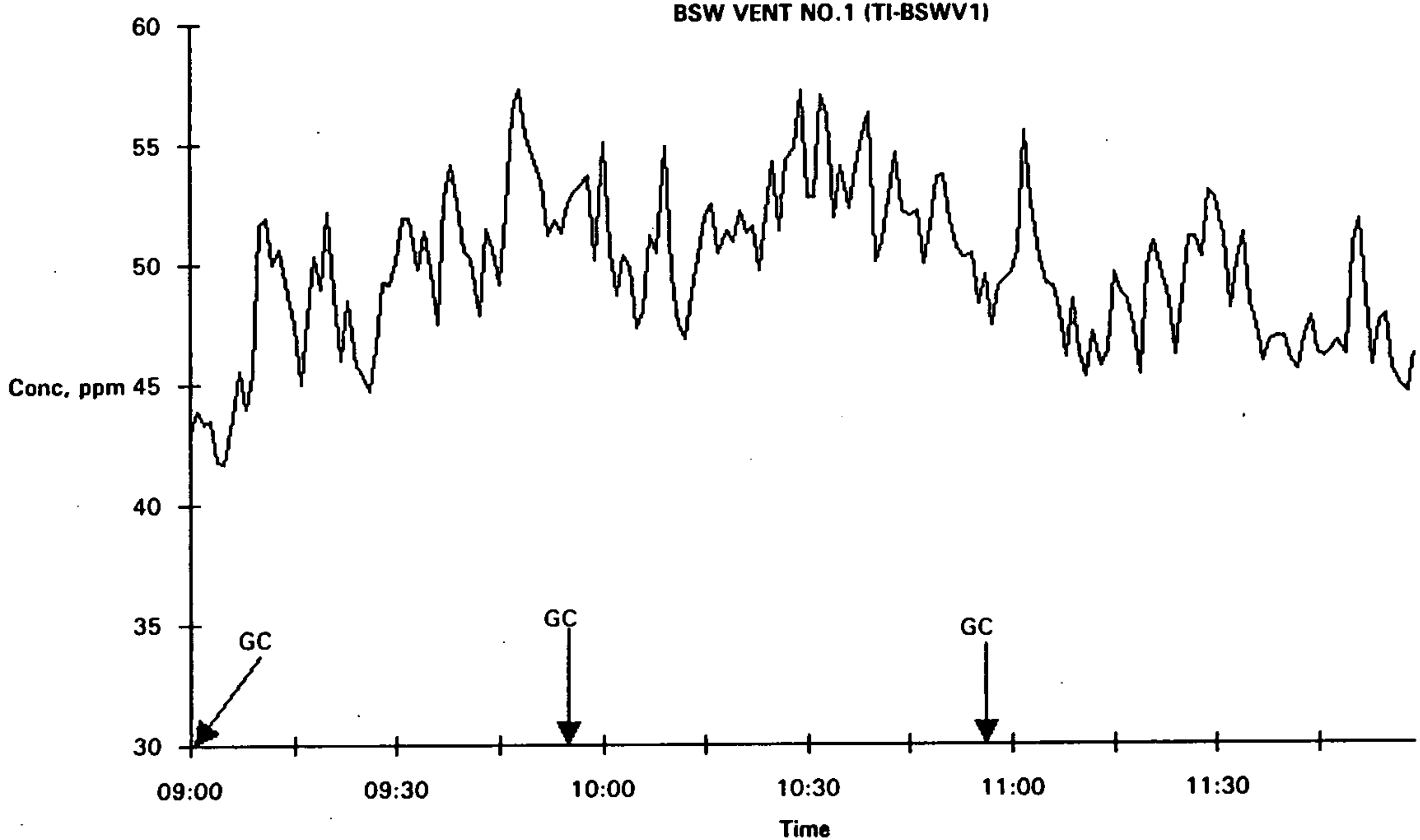

FIGURE 4.3
THC TREND ANALYSIS (7/10/92)
BSW VENT NO.2 (TI-BSWV2)

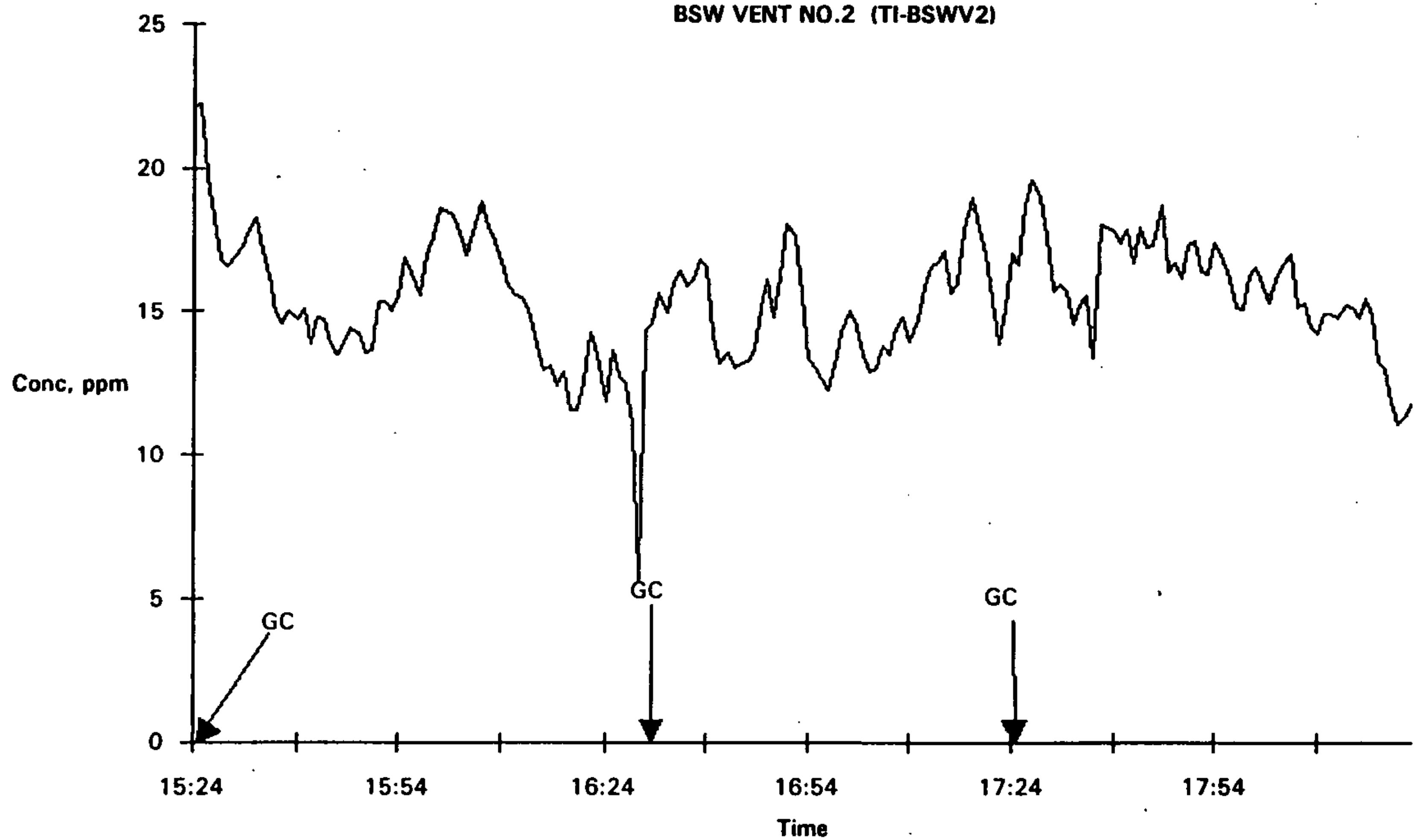

FIGURE 4.4
THC TREND ANALYSIS (7/11/92)
BSW VENT NO.2 (TI-BSWV2)

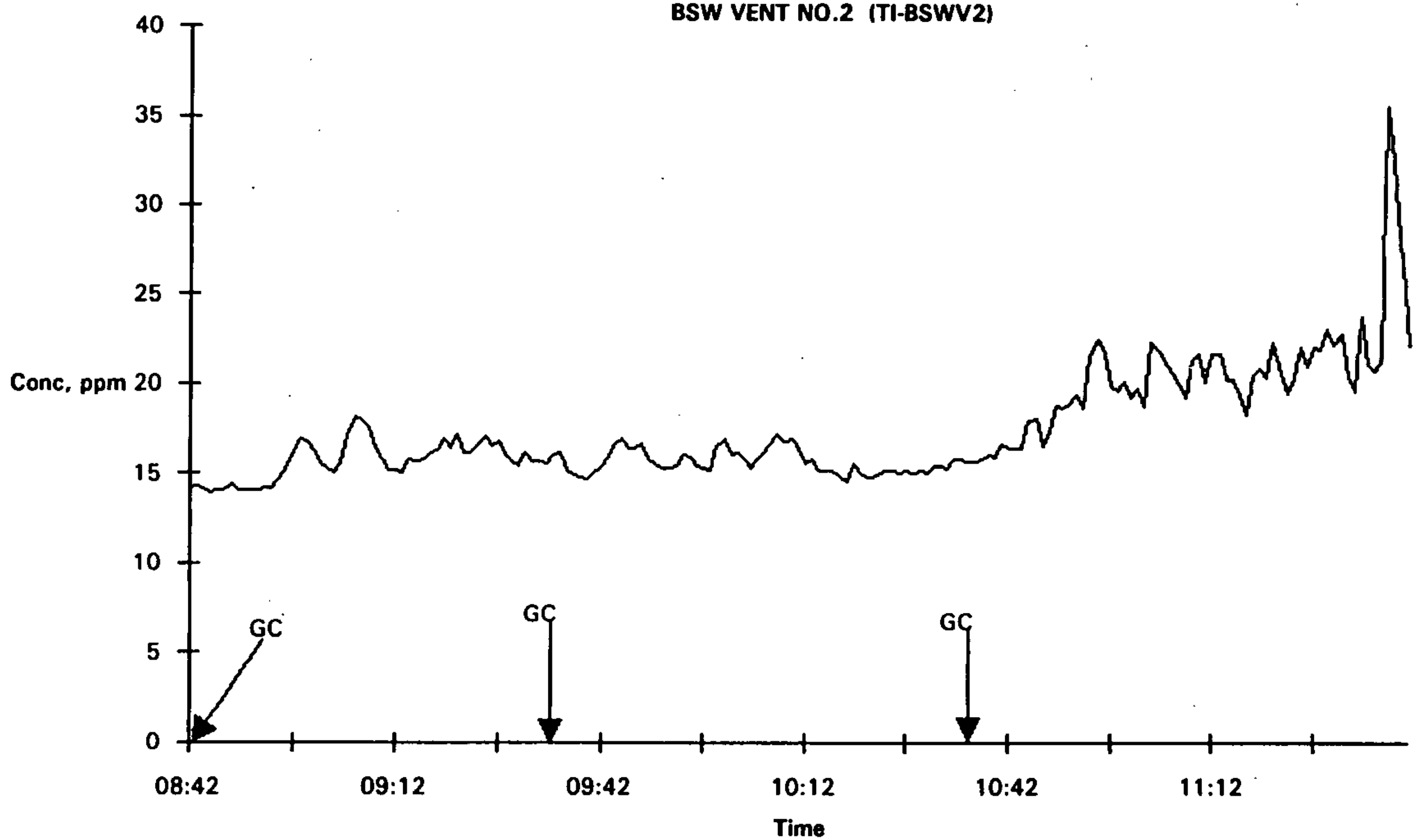

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TABLE 4.1 SUMMARY OF VOC RESULTS
HARDWOOD BROWN STOCK WASHER VENTS

Mill: TEMPLE-INLAND (Evadale)

Source Code: TI-BSWV1,2

Source: Hardwood Brown Stock Washer Vents

Test Dates: 7/10/92 7/11/92 7/12/92

EPN: 1

	BSWV1	BSWV2	SUM
Volumetric Flow Data			
Stack Temperature, °F	111	102	
Volumetric Flow Rate, x10³ DSCFM	20.4	32.1	
Process Operating Conditions			
Production Rate, ADT Pulp/hr	33.0	32.7	
Method 16 Data, lb/hr			
Hydrogen sulfide	0.1	ND	0.1
Methyl mercaptan	0.5	ND	0.6
Dimethyl sulfide	0.4	ND	0.5
Carbon disulfide	ND	ND	ND
Dimethyl disulfide	ND	ND	ND
Method 18 Data, lb/hr			
Methanol	4.5	ND	4.6
Ethanol	ND	ND	ND
Acetone	0.3	ND	0.4
2-Propanol	ND	ND	ND
2-Butanone	ND	ND	ND
Chloroform	ND	ND	ND
Benzene	ND	ND	ND
Bromodichloromethane	ND	ND	ND
Toluene	ND	ND	ND
Ethyl benzene	ND	ND	ND
m-, p-Xylene	ND	ND	ND
o-Xylene	ND	ND	ND
Cumene	ND	ND	ND
alpha-Pinene	0.3	0.4	0.7
beta-Pinene	0.1	ND	0.3
3-Carene	ND	ND	ND
Terpenes (Unspecified)	ND	ND	ND
p-Cymene	ND	0.2	0.3
Method 16 Plus Method 18 Data			
Knowns as C, lb/hr	2.0	0.6	2.6
Unknowns as C, lb/hr	ND	ND	ND
Sum of Compounds as C, lb/hr	2.0	0.6	2.6

ND=Not Detected
DL=Detection Limit

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(L) WWC (R) DW 29 December 1992

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TABLE 4.2 SUMMARY OF VOST RESULTS

Mill: TEMPLE-INLAND
Source Code: TI-BSWV1
FIN: P-2 HW EPN: 1

Source: BSW Vent No. 1
Test Dates: 7/12/92
CIN: NONE

TIME	1021
Volumetric Flow Data	
Stack Temperature, °F	111
Volumetric Flow Rate, x 10^3 DSCFM	20.2
Process Operating Conditions	
Production Rate, ADT pulp/hr	32.0
Target Compounds, ppm	
Chloromethane	0.004
Methylene Chloride	0.041
Acetone	0.003
Carbon Disulfide	0.008
Chloroform	0.049
Trichlorofluoromethane	0.001
Acrolein	0.002
Allyl Chloride	0.001
Dimethyl disulfide	0.289
Dimethyl sulfide	0.899
Isooctane	0.003
n-Hexane	0.126
2-Butanone (MEK)	0.059
Bromodichloromethane	0.000
Dibromomethane	0.000
Toluene	0.056
Ethylbenzene	0.000
Styrene	0.000
m-,p-Xylene	0.000
a-Pinene	0.127
B-Pinene	0.114

Section 4.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: BSW Vent No 1 FIN: P-2 HW
Source Code: TI-BSWV1 Date: 7/11/92 EPN: 1 CIN: NONE

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1313	1413	1513	
Flow Data				
Stack Temperature, °F			111	111
Moisture Content, %			9.0	9.0
Oxygen Concentration, %			20.8	20.8
Carbon Dioxide Concentration, %			0.0	0.0
Volumetric Flow Rate, x10^3 ACFM			24.6	24.6
Volumetric Flow Rate, x10^3 DSCFM			20.7	20.7
Process Operating Conditions				
Production Rate, ADT pulp/hr	34.0	34.0	34.0	34.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd	2.8	2.8	2.3	2.6
Emission Rate, lb/hr	0.4	0.4	0.4	0.4
Dimethyl sulfide				
Concentration, ppmvd	1.9	1.5	1.1	1.5
Emission Rate, lb/hr	0.4	0.3	0.2	0.3
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Method 18 Data				
Methanol				
Concentration, ppmvd	44.2	43.3	36.9	41.5
Emission Rate, lb/hr	4.6	4.5	3.8	4.3
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	2.1	2.1	2.1	2.1
Emission Rate, lb/hr	0.4	0.4	0.4	0.4
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill:	TEMPLE-INLAND (Evadale)	Source:	BSW Vent No 1	FIN:	P-2 HW
Source Code:	TI-BSWV1	Date:	7/11/92 EPN: 1	CIN:	NONE

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.6 *	0.6 *	0.6 *	0.6 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
alpha-Pinene				
Concentration, ppmvd	0.5	0.5 *	0.7	0.5
Emission Rate, lb/hr	0.2	0.2 *	0.3	0.2
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill:	TEMPLE-INLAND (Evadale)	Source:	BSW Vent No 1	FIN:	P-2 HW
Source Code:	TI-BSWV1	Date:	7/11/92 EPN: 1	CIN:	NONE

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Knowns as Carbon				
Concentration, ppmvd	52.0	50.3	47.3	49.9
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	2.0	1.9	1.8	1.9
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	56.0	51.6	50.5	52.7
Emission Rate, lb/hr as C	2.2	2.0	2.0	2.0

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale)	Source:	BSW Vent No 1		FIN:	P-2 HW
Source Code: TI-BSWV1	Date:	7/12/92	EPN: 1	CIN:	NONE

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	859	959	1059	
Flow Data				
Stack Temperature, °F			111	111
Moisture Content, %			9.0	9.0
Oxygen Concentration, %			20.8	20.8
Carbon Dioxide Concentration, %			0.0	0.0
Volumetric Flow Rate, x10^3 ACFM			24.1	24.1
Volumetric Flow Rate, x10^3 DSCFM			20.2	20.2
Process Operating Conditions				
Production Rate, ADT pulp/hr	31.0	32.0	33.0	32.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	0.5 *	1.1	1.0	0.8
Emission Rate, lb/hr	0.1 *	0.1	0.1	0.1
Methyl mercaptan				
Concentration, ppmvd	3.2	3.4	3.2	3.3
Emission Rate, lb/hr	0.5	0.5	0.5	0.5
Dimethyl sulfide				
Concentration, ppmvd	2.3	2.3	1.8	2.1
Emission Rate, lb/hr	0.4	0.4	0.4	0.4
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Method 18 Data				
Methanol				
Concentration, ppmvd	39.0	48.8	55.6	47.8
Emission Rate, lb/hr	3.9	4.9	5.6	4.8
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5	0.7	0.5	0.6
Emission Rate, lb/hr	0.1	0.1	0.1	0.1
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale)	Source: BSW Vent No 1		FIN: P-2 HW
Source Code: TI-BSWV1	Date: 7/12/92	EPN: 1	CIN: NONE

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.6 *	0.6 *	0.6 *	0.6 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
alpha-Pinene				
Concentration, ppmvd	0.7	0.7	0.8	0.7
Emission Rate, lb/hr	0.3	0.3	0.3	0.3
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5	0.4
Emission Rate, lb/hr	0.2 *	0.2 *	0.2	0.2
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: BSW Vent No 1 FIN: P-2 HW
Source Code: TI-BSWV1 Date: 7/12/92 EPN: 1 CIN: NON[illegible]

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Knowns as Carbon				
Concentration, ppmvd	46.6	56.4	63.4	55.5
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	1.8	2.1	2.4	2.1
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	53.8	57.1	52.7	54.6
Emission Rate, lb/hr as C	2.0	2.2	2.0	2.1

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale)	Source:	BSW Vent No 2		FIN:	P-2 HW
Source Code: TI-BSWV2	Date:	7/10/92	EPN: 2	CIN:	NONE

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1523	1623	1723	
Flow Data				
Stack Temperature, °F		104		104
Moisture Content, %		7.3		7.3
Oxygen Concentration, %		20.8		20.8
Carbon Dioxide Concentration, %		0.0		0.0
Volumetric Flow Rate, x10^3 ACFM		38.6		38.6
Volumetric Flow Rate, x10^3 DSCFM		33.2		33.2
Process Operating Conditions				
Production Rate, ADT pulp/hr	32.0	32.0	32.0	32.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Method 18 Data				
Methanol				
Concentration, ppmvd		2.2 *	2.2 *	2.2 *
Emission Rate, lb/hr		0.4 *	0.4 *	0.4 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
2-Propanol				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) | Source: BSW Vent No 2 | FIN: P-2 HW
Source Code: TI-BSWV2 | Date: 7/10/92 | EPN: 2 | CIN: NONE

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
Chloroform				
Concentration, ppmvd		1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr		0.7 *	0.7 *	0.7 *
Benzene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
Bromodichloromethane				
Concentration, ppmvd		1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr		0.9 *	0.9 *	0.9 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.3 *	0.3 *	0.3 *
Ethyl benzene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.3 *	0.3 *	0.3 *
m-, p-Xylene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.3 *	0.3 *	0.3 *
o-Xylene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.3 *	0.3 *	0.3 *
Cumene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.3 *	0.3 *	0.3 *
alpha-Pinene				
Concentration, ppmvd		0.9	0.8	0.8
Emission Rate, lb/hr		0.6	0.5	0.6
beta-Pinene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.4 *	0.4 *	0.4 *
3-Carene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.4 *	0.4 *	0.4 *
Terpenes (Unspecified)				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.4 *	0.4 *	0.4 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) | Source: BSW Vent No 2 | FIN: P-2 HW
Source Code: TI-BSWV2 | Date: 7/10/92 | EPN: 2 | CIN: NONE

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.4 *	0.4 *	0.4 *
Knowns as Carbon				
Concentration, ppmvd		14.0	13.7	13.9
Unknowns as Carbon				
Concentration, ppmvd		0.0	0.0	0.0
Sum M18 as Carbon, lb/hr		0.9	0.9	0.9
Unknown Compounds % of Total		0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	17.3	16.2	17.3	16.9
Emission Rate, lb/hr as C	1.1	1.0	1.1	1.1

*One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: BSW Vent No 2 FIN: P-2 HW
Source Code: TI-BSWV2 Date: 7/11/92 EPN: 2 CIN: NONE

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	841	941	1041	
Flow Data				
Stack Temperature, °F			99	99
Moisture Content, %			6.3	6.3
Oxygen Concentration, %			20.8	20.8
Carbon Dioxide Concentration, %			0.0	0.0
Volumetric Flow Rate, x10^3 ACFM			35.3	35.3
Volumetric Flow Rate, x10^3 DSCFM			31.0	31.0
Process Operating Conditions				
Production Rate, ADT pulp/hr	32.0	34.0	34.0	33.3
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Method 18 Data				
Methanol				
Concentration, ppmvd	2.1 *	2.1 *	2.1 *	2.1 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale)	Source: BSW Vent No 2		FIN: P-2 HW
Source Code: TI-BSWV2	Date: 7/11/92	EPN: 2	CIN: NONE

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Chloroform				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.6 *	0.6 *	0.6 *	0.6 *
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.8 *	0.8 *	0.8 *	0.8 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale)	Source: BSW Vent No 2		FIN: P-2 HW
Source Code: TI-BSWV2	Date: 7/11/92	EPN: 2	CIN: NONE

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5	0.5 *	0.4
Emission Rate, lb/hr	0.3 *	0.4	0.3 *	0.2
Knowns as Carbon				
Concentration, ppmvd	6.0	8.3	7.2	7.2
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.3	0.5	0.4	0.4
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	17.1	17.1	22.4	18.9
Emission Rate, lb/hr as C	1.0	1.0	1.3	1.1

* One or more values were less than the detection limit.

Section 4.2 BSWV1 Emission Test Results - VOST

EMISSION TEST RESULTS - VOST

Mill TEMPLE-INLAND (Evadale) Source: BSW Vent No 1
Source Code: TI-BSWV1 EPN: 1 FIN: P-2 HW CIN: NONE

Date: 7/12/92

Compound	BSWV1-T (µg)	BSWV1-TC (µg)	BSWV1-C (µg/L)	Total µg	TI-BSWV1 (µg/m3)	Conc. (ppm)
TARGET COMPOUNDS						
Chloromethane		0.088		0.09	8.21	0.004
Methylene Chloride	0.078	0.041	32.96	1.54	143.31	0.041
Acetone			1.73	0.07	6.94	0.003
Carbon Disulfide	0.106	0.175		0.28	26.21	0.008
Chloroform	2.453	0.041	3.05	2.63	244.88	0.049
Trichlorofluoromethane	0.020	0.015		0.04	3.26	0.001
Acrolein			1.41	0.06	5.66	0.002
Allyl Chloride			1.13	0.05	4.53	0.001
Dimethyl disulfide	11.203	0.893	0.91	12.14	1132.01	0.289
Dimethyl sulfide	18.403	6.418	1.93	24.90	2323.13	0.899
Isooctane	0.133	0.007		0.14	13.06	0.003
tert-Butyl Methyl Ether						
n-Hexane	4.053	0.783	0.11	4.84	451.56	0.126
2-Butanone (MEK)	1.449		10.49	1.90	177.25	0.059
1,1,1-Trichloroethane						
Bromodichloromethane	0.027			0.03	2.52	0.000
Dibromomethane			0.72	0.03	2.89	0.000
Toluene	2.259	0.008	0.56	2.29	213.72	0.056
Ethylbenzene	0.017			0.02	1.59	0.000
Styrene	0.019			0.02	1.77	0.000
o-Xylene						
m-/p-Xylene	0.012			0.01	1.12	0.000
A-Pinene	7.657	0.032		7.69	717.26	0.127
B-Pinene	6.935			6.94	646.92	0.114
TENTATIVELY IDENTIFIED CMPDS.						
Pinene-related Compounds	28.531			28.53	2661.47	
Dimethyl Trisulfide	4.932	0.016		4.95	461.57	
Methanethiol	0.773	0.015		0.79	73.51	
Cyclohexane	0.561	0.099		0.66	61.57	
Branched HC		0.057		0.06	5.32	
Subst'd HC		0.018		0.02	1.68	
2-Butene		0.017		0.02	1.59	
Pentadiene		0.009		0.01	0.84	
Siloxane		0.008		0.01	0.75	
SURROGATE STDS (% Recovery)						
Toluene-d8	104.1	98.3	84.9			
1,2-Dichloroethane-d4	87.2	73.5	95.0			
Benzene-d6	76.0	86.8	124.4			

NOTES:
-T=Tenax

Air Volume = 0.01072 cu.m.

EMISSION TEST RESULTS - VOST

Mill TEMPLE-INLAND (Evadale) Source: BSW Vent No 1
Source Code: TI-BSWV1 EPN: 1 FIN: P-2 HW CIN: NONE

Compound	BSWV1-T (μg)	BSWV1-TC (μg)	BSWV1-C ($\mu g/L$)	Date:	7/12/92 Total μg	TI-BSWV1 ($\mu g/m3$)	Conc. (ppm)

-TC=Tenax/Charcoal
-C = Condensate

Condensate Vol. 43.0 mL

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HI477
RF FILE: HI469
DATE: 07/31/92
TLI PROJ #: 21436

SAMPLE ID: TI-BSWV1/1VOST/0712/1C T
TLI ID: 58.57.3A
ANALYSIS DATE: 07/24/92

METHOD 8240 QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	4072		772	1		IS	
2	Chloromethane	0	.924	0	1	.001	ND	.05
3	Bromomethane	0	.924	0	1	.001	ND	.05
4	Vinyl Chloride	0	1.096	0	1	.001	ND	.05
5	Chloroethane	0	.938	0	1	.001	ND	.05
6	Methylene Chloride	2584	2.025	579	1	.078	D	.05
7	Acetone	0	.552	0	1	.002	ND	.05
8	Carbon Disulfide	10042	5.799	497	1	.106	D	.05
9	1,1-Dichloroethene	0	1.618	0	1	.001	ND	.05
10	1,1-Dichloroethane	0	4.648	0	1	.001	ND	.05
11	trans-1,2-Dichloroethene	0	2.075	0	1	.001	ND	.05
12	Chloroform	217956	5.456	791	1	2.453	E	.05
13	1,2-Dichloroethane	0	3.052	0	1	.001	ND	.05
43	Trichlorofluoromethane	855	2.623	395	1	.020	E	.05
45	Acrolein	0	.036	0	1	.034	ND	.05
46	Acrylonitrile	0	.531	0	1	.002	ND	.05
47	cis-1,2-Dichloroethene	0	2.411	0	1	.001	ND	.05
52	1,3-butadiene	0	1.282	0	1	.001	ND	.05
57	Allyl chloride	0	1.166	0	1	.001	ND	.05
62	Dimethyl disulfide	825799	4.526	1081	1	11.203	E	.05
63	Dimethyl sulfide	557893	1.861	511	1	18.403	E	.05
65	Iodomethane	0	2.117	0	1	.001	ND	.05
66	Isooctane	34687	15.975	863	1	.133	D	.05
68	Tert-Butyl methyl ether	0	4.526	0	1	.001	ND	.05
69	Vinyl Bromide	0	1.369	0	1	.001	ND	.05
70	n-Hexane	301673	4.571	661	1	4.053	E	.05
14	1,4-Difluorobenzene	22613		904	14		IS	
15	2-Butanone	4762	.036	757	14	1.449	E	.05
16	1,1,1-Trichloroethane	0	.915	0	14	.001	ND	.05
17	Carbon Tetrachloride	0	.671	0	14	.001	ND	.05
18	Vinyl Acetate	0	.806	0	14	.001	ND	.05
19	Bromodichloromethane	2109	.876	1003	14	.027	E	.05
20	1,2-Dichloropropane	0	.689	0	14	.001	ND	.05
21	cis-1,3-Dichloropropene	0	1.104	0	14	.001	ND	.05
22	Trichloroethene	0	.557	0	14	.001	ND	.05
23	Dibromochloromethane	0	.493	0	14	.001	ND	.05
24	1,1,2-Trichloroethane	0	.409	0	14	.001	ND	.05
25	Benzene	0	2.375	0	14	.001	ND	.05
26	trans-1,3-Dichloropropene	0	.745	0	14	.001	ND	.05
27	Bromoform	0	.255	0	14	.001	ND	.05
54	1,4-Dichloro-2-butene	0	.123	0	14	.002	ND	.05
60	Dibromomethane	0	.303	0	14	.001	ND	.05
28	Chlorobenzene-d5	25832		1343	28		IS	
29	4-Methyl-2-Pentanone	0	.240	0	28	.001	ND	.05
30	2-Hexanone	0	.111	0	28	.002	ND	.05
31	Tetrachloroethene	0	.375	0	28	.001	ND	.05
32	1,1,2,2-Tetrachloroethane	0	.339	0	28	.001	ND	.05
33	Toluene	230875	.989	1116	28	2.259	E	.05

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FILE NAME: HI477
RF FILE: HI469
DATE: 07/31/92
TLI PROJ #: 21436

SAMPLE ID: TI-BSWV1/1VOST/0712/1C T
TLI ID: 58.57.3A
ANALYSIS DATE: 07/24/92

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
34 Chlorobenzene	0	1.073	0	28	.001	ND	.05
35 Ethylbenzene	999	.582	1401	28	.017	E	.05
36 Styrene	2569	1.295	1479	28	.019	E	.05
37 o-Xylene	0	.784	0	28	.001	ND	.05
38 m-/p-Xylene	999	.834	1401	28	.012	E	.05
49 1,2 Dichlorobenzene	0	.586	0	28	.001	ND	.05
50 1,2,3-Trichloropropane	0	.236	0	28	.001	ND	.05
51 1,3 Dichlorobenzene	0	.800	0	28	.001	ND	.05
53 1,4 Dichlorobenzene	0	.674	0	28	.001	ND	.05
56 A-Pinene	948635	1.199	1555	28	7.657	E	.05
58 B-Pinene	959210	1.339	1701	28	6.935	E	.05
59 Cumene (isopropylbenzene)	0	1.613	0	28	.001	ND	.05
64 Ethyl methacrylate	0	.402	0	28	.001	ND	.05
67 P-Cymene	0	1.797	0	28	.001	ND	.05

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	10788	3.037	841	1	.22	D	87.2
48 Benzene-d6	43815	2.548	840	14	.19	D	76.0
39 Toluene-d8	43974	1.635	1107	28	.26	D	104.1

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FILE NAME: HI477
DATE: 07/31/92
TLI PROJ #: 21436

SAMPLE ID: TI-BSWV1/1VOST/0712/1C T
TLI ID: 58.57.3A
ANALYSIS DATE: 07/24/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
PINENE RELATED COMPOUND (SAT)	1699	5855175	1343	.25	17.476 — 25.531
PINENE RELATED COMPOUND	1903	2415424	1343	.25	7.209
DIMETHYL TRISULFIDE	1736	1652355	1343	.25	4.932
PINENE RELATED COMPOUND	1921	799285	1343	.25	2.386
PINENE RELATED COMPOUND	1596	354230	1343	.25	1.057
METHANETHIOL	273	111539	773	.25	.773
CYCLOHEXANE	727	80955	773	.25	.561
PINENE RELATED COMPOUND	1808	76673	1343	.25	.229
PINENE RELATED COMPOUND	1510	58226	1343	.25	.174

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	773	36084	1
1,4-Difluorobenzene	905	68554	14
Chlorobenzene-d5	1343	83762	28

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FILE NAME: HI474
RF FILE: HI469
DATE: 07/31/92
TLI PROJ #: 21436

SAMPLE ID: TI-BSWV1/1VOST/0712/1C TC
TLI ID: 58.57.38
ANALYSIS DATE: 07/24/92

M E T H O D 8 2 4 0 Q U A N T I T A T I O N R E P O R T

	NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	4060		774	1		IS	
2	Chloromethane	1317	.924	166	1	.088	D	.05
3	Bromomethane	0	.924	0	1	.001	ND	.05
4	Vinyl Chloride	0	1.096	0	1	.001	ND	.05
5	Chloroethane	0	.938	0	1	.001	ND	.05
6	Methylene Chloride	1356	2.025	580	1	.041	E	.05
7	Acetone	0	.552	0	1	.002	ND	.05
8	Carbon Disulfide	16489	5.799	498	1	.175	D	.05
9	1,1-Dichloroethene	0	1.618	0	1	.001	ND	.05
10	1,1-Dichloroethane	0	4.648	0	1	.001	ND	.05
11	trans-1,2-Dichloroethene	0	2.075	0	1	.001	ND	.05
12	Chloroform	3652	5.456	792	1	.041	E	.05
13	1,2-Dichloroethane	0	3.052	0	1	.001	ND	.05
43	Trichlorofluoromethane	641	2.623	396	1	.015	E	.05
45	Acrolein	0	.036	0	1	.034	ND	.05
46	Acrylonitrile	0	.531	0	1	.002	ND	.05
47	cis-1,2-Dichloroethene	0	2.411	0	1	.001	ND	.05
52	1,3-butadiene	0	1.282	0	1	.001	ND	.05
57	Allyl chloride	0	1.166	0	1	.001	ND	.05
62	Dimethyl disulfide	65634	4.526	1072	1	.893	D	.05
63	Dimethyl sulfide	193993	1.881	509	1	6.418	E	.
65	Iodomethane	0	2.117	0	1	.001	ND	.05
66	Isooctane	1816	15.975	865	1	.007	E	.05
68	Tert-Butyl methyl ether	0	4.526	0	1	.001	ND	.05
69	Vinyl Bromide	0	1.369	0	1	.001	ND	.05
70	n-Hexane	58111	4.571	662	1	.783	D	.05
14	1,4-Difluorobenzene	20912		907	14		IS	
15	2-Butanone	0	.036	0	14	.007	ND	.05
16	1,1,1-Trichloroethane	0	.915	0	14	.001	ND	.05
17	Carbon Tetrachloride	0	.671	0	14	.001	ND	.05
18	Vinyl Acetate	0	.806	0	14	.001	ND	.05
19	Bromodichloromethane	0	.876	0	14	.001	ND	.05
20	1,2-Dichloropropane	0	.689	0	14	.001	ND	.05
21	cis-1,3-Dichloropropene	0	1.104	0	14	.001	ND	.05
22	Trichloroethene	0	.557	0	14	.001	ND	.05
23	Dibromochloromethane	0	.493	0	14	.001	ND	.05
24	1,1,2-Trichloroethane	0	.409	0	14	.001	ND	.05
25	Benzene	0	2.375	0	14	.001	ND	.05
26	trans-1,3-Dichloropropene	0	.745	0	14	.001	ND	.05
27	Bromoform	0	.255	0	14	.001	ND	.05
54	1,4-Dichloro-2-butene	0	.123	0	14	.002	ND	.05
60	Dibromomethane	0	.303	0	14	.001	ND	.05
28	Chlorobenzene-d5	24274		1349	28		IS	
29	4-Methyl-2-Pentanone	0	.240	0	28	.001	ND	.
30	2-Hexanone	0	.111	0	28	.002	ND	.
31	Tetrachloroethene	0	.375	0	28	.001	ND	.05
32	1,1,2,2-Tetrachloroethane	0	.339	0	28	.001	ND	.05
33	Toluene	808	.989	1118	28	.008	E	.05

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

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FILE NAME: HI474
RF FILE: HI489
DATE: 07/31/92
TLI PROJ #: 21436

SAMPLE ID: TI-BSWV1/1VOBT/0712/1C TC
TLI ID: 58.57.38
ANALYSIS DATE: 07/24/92

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
34 Chlorobenzene	0	1.073	0	28	.001	ND	.05
35 Ethylbenzene	0	.582	0	28	.001	ND	.05
36 Styrene	0	1.295	0	28	.001	ND	.05
37 o-Xylene	0	.784	0	28	.001	ND	.05
38 m-/p-Xylene	0	.834	0	28	.001	ND	.05
49 1,2 Dichlorobenzene	0	.588	0	28	.001	ND	.05
50 1,2,3-Trichloropropane	0	.238	0	28	.001	ND	.05
51 1,3 Dichlorobenzene	0	.800	0	28	.001	ND	.05
53 1,4 Dichlorobenzene	0	.674	0	28	.001	ND	.05
56 A-Pinene	3734	1.199	1550	28	.032	E	.05
58 B-Pinene	0	1.339	0	28	.001	ND	.05
59 Cumene (isopropylbenzene)	0	1.613	0	28	.001	ND	.05
64 Ethyl methacrylate	0	.402	0	28	.001	ND	.05
67 P-Cymene	0	1.797	0	28	.001	ND	.05

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT, ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	9085	3.037	843	1	.18	D	73.5
48 Benzene-d6	48241	2.548	841	14	.22	D	88.8
39 Toluene-d8	39002	1.835	1108	28	.25	D	98.3

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FILE NAME: HI474
DATE: 07/31/92
TLI PROJ #: 21436

SAMPLE ID: TI-BSWV1/1VOST/0712/1C T
TLI ID: 58.57.3B
ANALYSIS DATE: 07/24/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
CYCLOHEXANE	728	14449	774	.25	.099
BRANCHED HYDROCARBON	621	8282	774	.25	.057
SUBSTITUTED HYDROCARBON	358	2668	774	.25	.018
2-BUTENE	205	2412	774	.25	.017
DIMETHYL TRISULFIDE	1738	5884	1349	.25	.016
METHANETHIOL	275	2117	774	.25	.015
PENTADIENE	463	1300	774	.25	.009
SILOXANE	1233	2723	1349	.25	.008

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	774	36369	1
1,4-Difluorobenzene	907	56824	14
Chlorobenzene-d5	1349	90487	28

Triangle Laboratories of RTP, Inc.	FILE NAME: AC918	SAMPLE ID:	TI-8SWV1/1VOST/0712/1C
801 Capitola Drive	RF FILE: AC916	TLI ID:	58.057.8
Durham, NC 27713	DATE: 07/31/92	SAMPLE VOL:	.005 L
Telephone: (919) 544-5729	TLI PROJ #: 21436	ANALYSIS DATE:	07/24/92
		DILUTION FACTOR:	1

METHOD 8240 QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	CONC,ug/L	CODE	QUAN LIMIT
1	Bromochloromethane	1493		777	1		IS	
2	Chloromethane	0	.995	0	1	.67	ND	10
3	Bromomethane	0	1.516	0	1	.44	ND	10
4	Vinyl Chloride	0	1.715	0	1	.39	ND	10
5	Chloroethane	0	1.342	0	1	.50	ND	10
6	Methylene Chloride	1402	1.424	579	1	32.96	D	10
7	Acetone	65	1.254	529	1	1.73	E	10
8	Carbon Disulfide	0	3.826	0	1	.18	ND	10
9	1,1-Dichloroethene	0	1.558	0	1	.43	ND	10
10	1,1-Dichloroethane	0	4.189	0	1	.16	ND	10
11	trans-1,2-Dichloroethene	0	1.867	0	1	.36	ND	10
12	Chloroform	292	3.201	795	1	3.05	E	10
13	1,2-Dichloroethane	0	3.284	0	1	.20	ND	10
43	Trichlorofluoromethane	0	1.768	0	1	.38	ND	10
45	Acrolein	0	.475	0	1	1.41	ND	10
46	Acrylonitrile	0	.806	0	1	.83	ND	10
47	cis-1,2-Dichloroethene	0	2.314	0	1	.29	ND	10
52	1,3-butadiene	0	2.003	0	1	.33	ND	10
57	Allyl chloride	0	.594	0	1	1.13	ND	10
62	Dimethyl disulfide	115	4.240	1083	1	.91	E	10
63	Dimethyl sulfide	129	2.242	511	1	1.93	E	10
65	Iodomethane	0	2.015	0	1	.33	ND	10
66	Isooctane	0	15.143	0	1	.04	ND	10
68	Tert-Butyl methyl ether	0	4.506	0	1	.15	ND	10
69	Vinyl Bromide	0	1.751	0	1	.38	ND	10
70	n-Hexane	13	3.893	660	1	.11	E	10
14	1,4-Difluorobenzene	5619		913	14		IS	
15	2-Butanone	75	.064	763	14	10.49	D	10
16	1,1,1-Trichloroethane	0	.606	0	14	.29	ND	10
17	Carbon Tetrachloride	0	.430	0	14	.41	ND	10
18	Vinyl Acetate	0	1.087	0	14	.16	ND	10
19	Bromodichloromethane	0	.684	0	14	.26	ND	10
20	1,2-Dichloropropane	0	.698	0	14	.25	ND	10
21	cis-1,3-Dichloropropene	0	.635	0	14	.28	ND	10
22	Trichloroethene	0	.489	0	14	.36	ND	10
23	Dibromochloromethane	0	.522	0	14	.34	ND	10
24	1,1,2-Trichloroethane	0	.449	0	14	.40	ND	10
25	Benzene	0	1.053	0	14	.17	ND	10
26	trans-1,3-Dichloropropene	0	.789	0	14	.23	ND	10
27	Bromoform	0	.435	0	14	.41	ND	10
54	1,4-Dichloro-2-butene	0	.330	0	14	.54	ND	10
60	Dibromomethane	31	.379	983	14	.72	E	10
28	Chlorobenzene-d5	7732		1365	28		IS	
29	4-Methyl-2-Pentanone	0	.732	0	28	.18	ND	10
30	2-Hexanone	0	.621	0	28	.21	ND	10
31	Tetrachloroethene	0	.319	0	28	.40	ND	10
32	1,1,2,2-Tetrachloroethane	0	.974	0	28	.13	ND	10
33	Toluene	87	.999	1131	28	.56	E	10

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

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FILE NAME: AC918
RF FILE: AC916
DATE: 07/31/92
TLI PROJ #: 21436

SAMPLE ID: TI-BSWV1/1VOST/0712/1C
TLI ID: 58.057.8
SAMPLE VOL: .005 L
ANALYSIS DATE: 07/24/92
DILUTION FACTOR: 1

METHOD 8240 QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	CONC,ug/L	CODE	QUAN LIMIT
34 Chlorobenzene	0	1.011	0	28	.13	ND	10
35 Ethylbenzene	0	.667	0	28	.19	ND	10
36 Styrene	0	1.319	0	28	.10	ND	10
37 o-Xylene	0	.673	0	28	.19	ND	10
38 m-/p-Xylene	0	.655	0	28	.20	ND	10
49 1,2 Dichlorobenzene	0	1.076	0	28	.12	ND	10
50 1,2,3-Trichloropropane	0	.573	0	28	.23	ND	10
51 1,3 Dichlorobenzene	0	1.135	0	28	.11	ND	10
53 1,4 Dichlorobenzene	0	1.017	0	28	.13	ND	10
56 A-Pinene	0	1.346	0	28	.10	ND	10
58 B-Pinene	0	1.528	0	28	.08	ND	10
59 Cumene (isopropylbenzene)	0	1.842	0	28	.07	ND	10
64 Ethyl methacrylate	0	.644	0	28	.20	ND	10
67 P-Cymene	0	1.995	0	28	.06	ND	10

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT,ug	CODE	% RECOVERY
41 1,2-Dichloroethane-d4	3353	2.363	847	1	.24	D	95.0
48 Benzene-d6	7653	1.095	848	14	.31	D	124.4
39 Toluene-d8	9257	1.410	1120	28	.21	D	84.9

Section 4.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL TEMPLE-INLAND SOURCE TI-BSWV1

1. CALIBRATION

THEOR	DATE 7/11/92		DATE 7/12/92		
ppm	ppm	%REC	ppm	%REC	%REC
0	2		0		
90	85	94%	87		97%
360	361	100%	364		101%
747	746	100%	744		100%

2. PROPANE LINE RECOVERY

	DATE 7/11/92			DATE 7/12/92		
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	16	18	113%	15	16	107%
AFTER	15	16	107%	15	17	113%

3. LINE BLANK

	[--------------FILE REF--------------]			
BEFORE RUN	0	0	0	0
AFTER RUN	0	0	0	0

QUALITY CONTROL SUMMARY
METHOD 18

MILL TEMPLE-INLAND SOURCE TI-BSWV1

1. CHECK STANDARD

ANALYTE	THEOR	DATE	7/11/92	THEOR	DATE	7/12/92
	ppm	ppm	%REC	ppm	ppm	%REC
ethanol	10.50	2.59	25%	10.50	5.23	50%
acetone	8.40	6.95	83%	8.40	8.88	106%
isopropanol	8.05	6.54	81%	8.05	8.34	104%
benzene	6.90	49.65	720%	6.90	55.69	807%
bromodichloromethane	7.58	7.11	94%	7.58	8.05	106%
toluene	5.80	5.99	103%	5.80	6.52	112%
ethyl benzene	5.03	5.33	106%	5.03	5.42	108%
m-xylene	5.03	5.38	107%	5.03	5.33	106%
o-xylene	5.05	5.34	106%	5.05	5.72	113%
cumene	4.43	4.75	107%	4.43	4.62	104%
alpha-pinene	3.87	4.09	106%	3.87	3.89	101%
beta-pinene	3.89	4.04	104%	3.89	4.08	105%
3-carene	3.89	4.15	107%	3.89	3.45	89%
p-cymene	3.95	4.13	105%	3.95	3.78	96%

2. PROPANE RESPONSE

	THEOR					
BEFORE RUN	5.03	5.35	106%	5.03	5.31	106%
AFTER RUN	5.03	5.31	106%	125	129.70	104%

3. METHANOL LINE RECOVERY

	THEOR					
BEFORE RUN	113.02	113.49	100%	122.85	116.40	95%
AFTER RUN	122.85	116.40	95%	110.21	113.65	103%

4. LINE BLANK

	[-------------FILE REF-------------]	
BEFORE RUN	GBB4007	GBB4013
AFTER RUN	GBB4013	GBB4008

QUALITY CONTROL SUMMARY
METHOD 16

MILL TEMPLE-INLAND SOURCE TI-BSW/1

1. CALIBRATION

ANALYTE	LO ppm	MED ppm	HI ppm	CORR COEFF
7/11/92				
hydrogen sulfide	6.19	9.08	32.00	
methyl mercaptan	6.04	8.86	31.20	
dimethyl sulfide	8.17	11.98	42.20	
carbon disulfide	2.35	3.44	12.10	
dimethyl disulfide	3.80	5.57	19.60	
7/12/92 *				
hydrogen sulfide	6.19	9.08	32.00	
methyl mercaptan	6.04	8.86	31.20	
dimethyl sulfide	8.17	11.98	42.20	
carbon disulfide	2.35	3.44	12.10	
dimethyl disulfide	3.80	5.57	19.60	

* Calibration from 7/11/92 checked and used

2. HYDROGEN SULFIDE LINE RECOVERY

	DATE 7/11/92 INST	LINE	%REC	DATE 7/12/92 INST	LINE	%REC
BEFORE						
AFTER						

QUALITY CONTROL SUMMARY
METHOD 25A

MILL TEMPLE-INLAND SOURCE TI-BSWV2

1. CALIBRATION

THEOR	DATE 7/10/92		DATE 7/11/92		
ppm	ppm	%REC	ppm	%REC	%REC
0	2		0		
90	85	94%	87		97%
360	361	100%	364		101%
747	746	100%	744		100%

2. PROPANE LINE RECOVERY

	DATE 7/10/92			DATE 7/11/92		
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	10	12	120%	12	13	108%
AFTER	12	13	108%	18	18	100%

3. LINE BLANK

	[------------- ppm -------------]			
BEFORE RUN	0	0	0	0
AFTER RUN	0	0	0	2

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QUALITY CONTROL SUMMARY
METHOD 18

MILL TEMPLE-INLAND SOURCE TI-BSWV2

1. CHECK STANDARD

ANALYTE	THEOR	DATE	7/10/92	THEOR	DATE	7/11/92
	ppm	ppm	%REC	ppm	ppm	%REC
ethanol	10.50	0.47	4%	10.50	0.00	0%
acetone	8.40	3.72	44%	8.40	2.81	33%
isopropanol	8.05	4.80	60%	8.05	1.51	19%
benzene	6.90	41.89	607%	6.90	43.88	636%
bromodichloromethane	7.58	8.52	112%	7.58	4.05	53%
toluene	5.80	6.00	103%	5.80	6.49	112%
ethyl benzene	5.03	5.09	101%	5.03	5.51	110%
m-xylene	5.03	5.12	102%	5.03	5.56	110%
o-xylene	5.05	4.95	98%	5.05	5.41	107%
cumene	4.43	4.51	102%	4.43	4.97	112%
alpha-pinene	3.87	4.00	103%	3.87	4.26	110%
beta-pinene	3.89	3.71	95%	3.89	2.18	56%
3-carene	3.89	3.96	102%	3.89	3.96	10[illegible]
p-cymene	3.95	3.43	87%	3.95	4.37	11[illegible]

2. PROPANE RESPONSE

	THEOR					
BEFORE RUN	29.9	31.05	104%	29.9	30.32	101%
AFTER RUN	29.9	30.32	101%	5.03	5.36	106%

3. METHANOL LINE RECOVERY

	THEOR					
BEFORE RUN	100.11	91.25	91%	102.96	100.73	98%
AFTER RUN	102.96	100.73	98%	106.09	94.97	90%

4. LINE BLANK

	[-------------FILE REF-------------]	
BEFORE RUN	GAA4008	GBA4001
AFTER RUN	GBA4001	GBB4008

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QUALITY CONTROL SUMMARY
METHOD 16

MILL TEMPLE-INLAND SOURCE TI-BSWV2

1. CALIBRATION

ANALYTE	LO	MED	HI	CORR COEFF
	ppm	ppm	ppm	
7/10/92				
hydrogen sulfide	6.19	9.08	32.00	
methyl mercaptan	6.04	8.86	31.20	
dimethyl sulfide	8.17	11.98	42.20	
carbon disulfide	2.35	3.44	12.10	
dimethyl disulfide	3.80	5.57	19.60	
7/11/92				
hydrogen sulfide				
methyl mercaptan				
dimethyl sulfide				
carbon disulfide				
dimethyl disulfide				

2. HYDROGEN SULFIDE LINE RECOVERY

	DATE INST	7/10/92 LINE	%REC	DATE INST	7/11/92 LINE	%REC
BEFORE						
AFTER						

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Section 4.4 Process Operating Data

BROWNSTOCK WASHER

The mill utilizes two three-stage countercurrent vacuum drum system for brownstock washing. Each drum washer line is covered with a common hood. The softwood side has three fans which are vented to the atmosphere. This hood is equipped with fans rated at 14,800 ACFM at 102°F, 17,600 ACFM at 98°F, and 18,500 ACFM at 101°F respectively. The hardwood side has two fans vented to the atmosphere rated at 24,100 at 111°F and 38,600 at 104°F. (See Diagram BSW-1 and Diagram BSW-2)

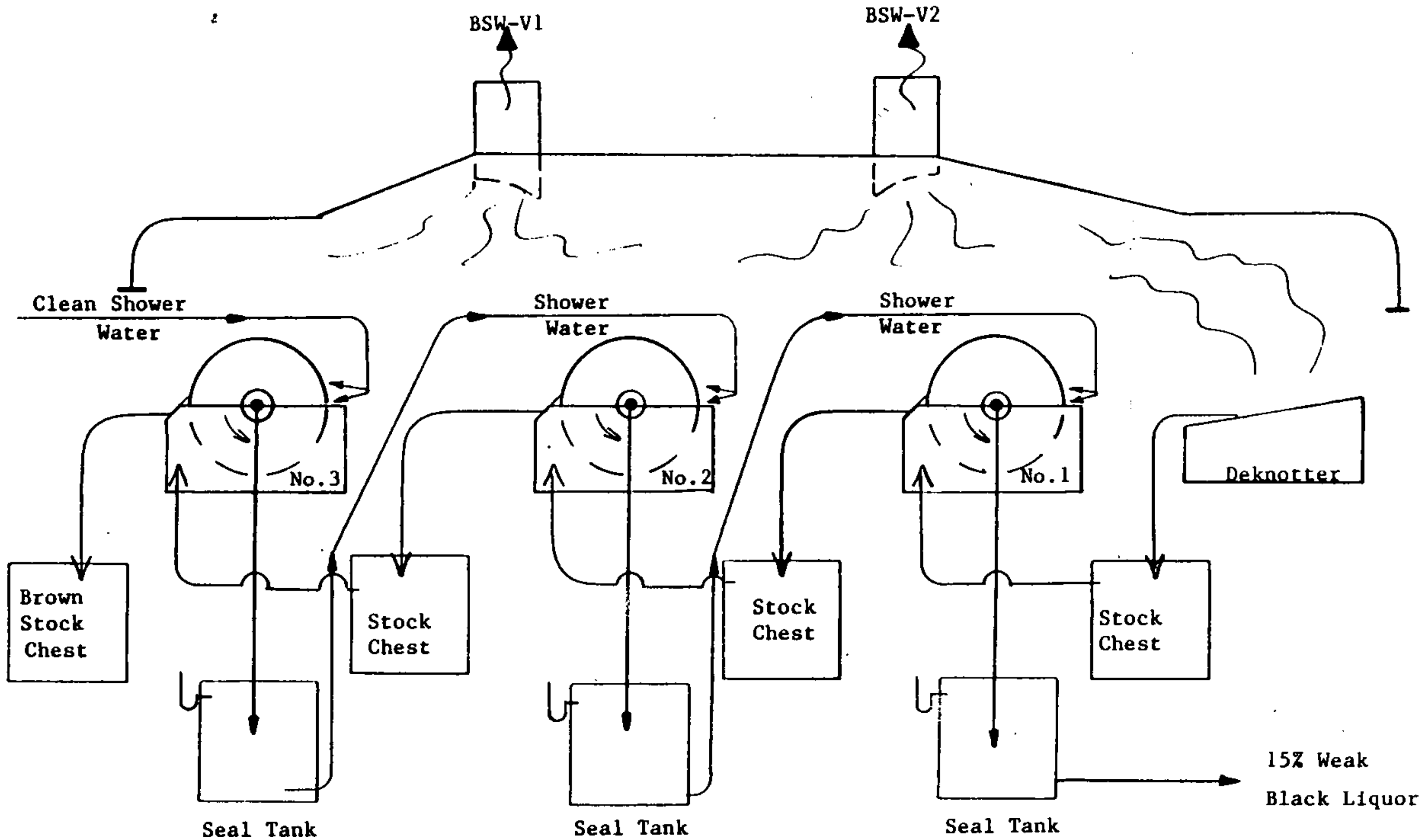
Clean condensates from the blow heat recovery system and fresh water are used as shower water on the last washer on both lines. Average process parameters during the test were as follows:

SOFTWOOD LINE - BROWN STOCK WASHER

Pulp kappa No.	19.6	
Pulp flow rate	675 ADT/day	
Shower water temperature		111°F
Shower water flow rate (first stage)		1137 gpm
Vat temperatures	118°F	

HARDWOOD LINE - BROWN STOCK WASHER

Pulp kappa no.	11.7	
Pulp flow rate	795 ADT/day	
Shower water temp.	135°F	
Shower water flow rate (first stage)		1745 gpm
Vat temperatures		140°F



EVADALE
TEMPLE-INLAND
BSW-HARDWOOD

DIAGRAM BSW-'

SECTION 5

NO. 6 POWER BOILER

(TI-PB6)

SECTION 5
NO. 6 POWER BOILER
(TI-PB6)

The No. 6 Power Boiler was tested on two different days for volatile organic compounds by Methods 25A and 18. Samples were also collected and analyzed for aldehydes and metals.

Total Hydrocarbons (M25A)

Figures 5.1 and 5.2 present the THC trends for the test periods on 7/16/92 and 7/17/92. Total hydrocarbon concentrations fluctuated over a broad range during both test periods. On 7/16/92, concentrations ranged from 0 to 1200 ppm, while on 7/17/92, the range was 0 to 200 ppm.

Volatile Organic Compounds (M18)

Table 5.1 summarizes the results for the Method 18 target compounds, and Section 5.1 is a tabulation of the data. The volumetric flow was measured during sampling using a pitot tube. The only compounds identified were alpha- and beta- pinene; p-cymene. Alpha-pinene concentrations were below the listed detection limit. Results were not consistent with respect to percent unknowns, but follow Method 25A trends. Run 3 on 7/17/92 contains 70 percent unknowns as carbon which is composed of one peak at 19.3 minutes with a concentration of 20 ppm as carbon. This peak is also present in Run 1 on 7/16/92 with a concentration of 2 ppm as carbon.

Miscellaneous Parameters

Table 5.2 summarizes the results of testing for aldehydes. Section 5.2 tabulates the results for each compound. Formaldehyde was identified on 7/16/92 but not on 7/17/92.

Metals

Table 5.3 summarizes the result of the samples collected for metals analyses. Section 5.3 tabulates the results for each compound. Manganese was the largest metal component identified during both test periods. Emission rates were consistent (3.2 and 3.3 lb/hr). Chromium, copper, nickel, and phosphorus were also present on both days. Lead and silver were identified on 7/16/92 but not on 7/17/92.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 5.4. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 5.5 includes the process operating data as recorded and provided by mill personnel.

FIGURE 5.1
THC TREND ANALYSIS (7/16/92)
NO.6 POWER BOILER (TI-PB6)

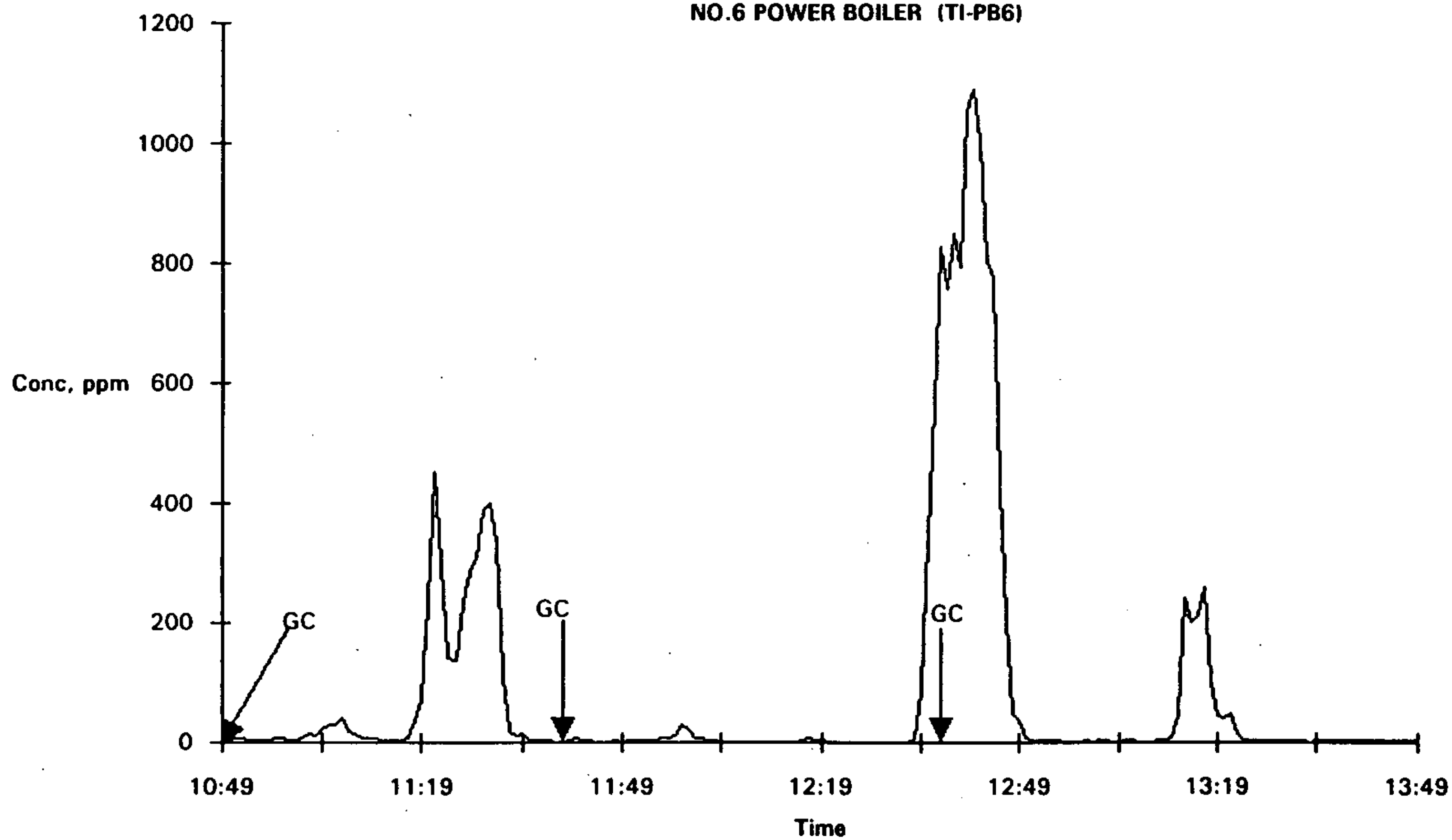


FIGURE 5.2
THC TREND ANALYSIS (7/17/92)
NO.6 POWER BOILER (TI-PB6)

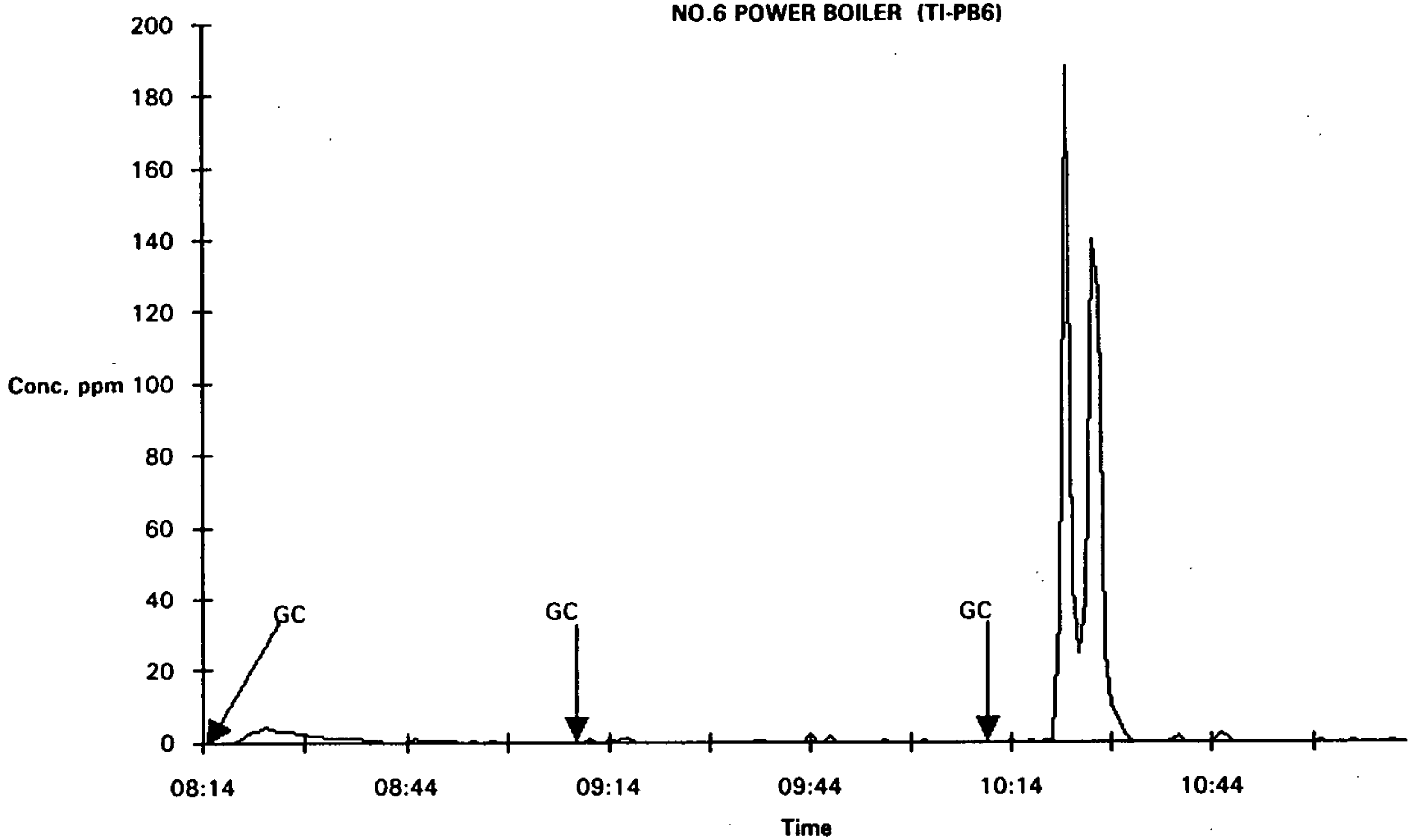


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TABLE 5.1 SUMMARY OF VOC RESULTS

Mill: TEMPLE-INLAND (Evadale) Source: No. 6 Power Boiler
Source Code: TI-PB6 Test Dates: 7/16/92 7/17/92
FIN: P-6 CIN: 261001 EPN: 50

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	137	138	138	
Volumetric Flow Rate, x 10^3 DSCFM	119.0	124.5	121.8	
Process Operating Conditions				
Production Rate, x 10^6 BTU/hr	734.3	762.2	752.6	
Method 16 Data, lb/hr				
Hydrogen sulfide				
Methyl mercaptan				
Dimethyl sulfide				
Carbon disulfide				
Dimethyl disulfide				
Method 18 Data, lb/hr				
Methanol	ND	ND	ND	1.5
Ethanol	ND	ND	ND	0.5
Acetone	ND	ND	ND	0.7
2-Propanol	ND	ND	ND	0.7
2-Butanone	ND	ND	ND	0.8
Chloroform	ND	ND	ND	2.7
Benzene	ND	ND	ND	0.9
Bromodichloromethane	ND	ND	ND	3.8
Toluene	ND	ND	ND	1.1
Ethyl benzene	ND	ND	ND	1.2
m-, p-Xylene	ND	ND	ND	1.2
o-Xylene	ND	ND	ND	1.2
Cumene	ND	ND	ND	1.4
alpha-Pinene	ND	ND	ND	1.6
beta-Pinene	ND	2.8	1.1	1.6
3-Carene	ND	ND	ND	1.6
Terpenes (Unspecified)	ND	ND	ND	1.6
p-Cymene	ND	1.9	1.3	1.5
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	1.1	6.9	2.8	0.1
Unknowns as C, lb/hr	ND	5.4	1.1	0.1
Sum of Compounds as C, lb/hr	1.7	7.8	3.9	0.1

ND=Not Detected
DL=Detection Limit

TABLE 5.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: TEMPLE-INLAND
Source Code: TI-PB6
FIN: P-6 EPN: 50

Source: No. 6 Power Boiler
Test Dates: 7/16/92, 7/17/92
CIN: 261001

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	137	138	138	
Volumetric Flow Rate, x 10^3 DSCFM	119.0	123.2	121.3	
Process Operating Conditions				
Production Rate, x 10^6 BTU/hr	734.3	761.1	747.7	
Emission Rate, lb/hr				
Formaldehyde	ND	0.6	0.4	0.3
Acetaldehyde	ND	ND	ND	0.4
Acetone (Impinger)	ND	ND	ND	0.5
Acetophenone	ND	ND	ND	1.1
2-Butanone (Impinger)	ND	ND	ND	0.7
Methyl isobutyl ketone	ND	ND	ND	0.9
Acrolein	ND	ND	ND	0.5
Benzaldehyde	ND	ND	ND	1.0

ND = Not Detected
DL = Detection Limit

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TABLE 5.3 SUMMARY OF METALS EMISSIONS

Mill: TEMPLE-INLAND
Source Code: TI-PB6
FIN: P-6   EPN: 50

Source: No. 6 Power Boiler
Test Dates: 7/16/92
CIN: 261001

	RUN 1	RUN 2	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	137	138	138	
Volumetric Flow Rate, x 10^3 DSCFM	119	124	122	
Process Operating Conditions				
Production Rate, x 10^6 BTU/hr	761.1	734.3	747.7	
Metals Emission Rate, x10^{-3}lb/hr				
Antimony (Sb)	ND	ND	ND	2.5
Arsenic (As)	ND	ND	ND	2.5
Barium (Ba)	ND	ND	ND	2000
Beryllium (Be)	ND	ND	ND	2.5
Cadmium (Cd)	ND	ND	ND	2.5
Chromium (Cr)	5.6	6.1	5.9	5.1
Copper (Cu)	2.5	7.1	4.8	2.5
Lead (Pb)	12.0	ND	7.3	5.1
Manganese (Mn)	3200.0	3300.0	3250.0	5.1
Mercury (Hg)	ND	ND	ND	2.5
Nickel (Ni)	5.6	6.6	6.1	2.5
Phosphorus (P)	88.0	98.0	93.0	51
Silver (Ag)	7.6	ND	4.4	2.5
Selenium (Se)	ND	ND	ND	2.5
Thallium (Tl)	ND	ND	ND	2.5

ND = Not Detected
DL = Detection Limit

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(L) WWC 06 January 1993

Section 5.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale)	Source:	No. 6 Power Boiler		FIN:	P-6
Source Code: TI-PB6	Date:	7/16/92	EPN: 50	CIN:	261001

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1048	1148	1248	
Flow Data				
Stack Temperature, °F	137	138		137
Moisture Content, %	18.2	17.2		17.7
Oxygen Concentration, %	12.0	13.0		12.5
Carbon Dioxide Concentration, %	5.5	5.5		5.5
Volumetric Flow Rate, x10^3 ACFM	164.8	170.6		167.7
Volumetric Flow Rate, x10^3 DSCFM	119.0	124.5		121.8
Process Operating Conditions				
Production Rate, x10^6 BTU/hr	761.1	782.2	745.6	763.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	2.4 *	2.4 *	2.4 *	2.4 *
Emission Rate, lb/hr	1.5 *	1.5 *	1.5 *	1.5 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Acetone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) | Source: No. 6 Power Boiler | FIN: P-6
Source Code: TI-PB6 | Date: 7/16/92 | EPN: 50 | CIN: 261001

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.8 *	0.8 *	0.8 *	0.8 *
Chloroform				
Concentration, ppmvd	1.2 *	1.2 *	1.2 *	1.2 *
Emission Rate, lb/hr	2.7 *	2.7 *	2.7 *	2.7 *
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.9 *	0.9 *	0.9 *	0.9 *
Bromodichloromethane				
Concentration, ppmvd	1.2 *	1.2 *	1.2 *	1.2 *
Emission Rate, lb/hr	3.8 *	3.8 *	3.8 *	3.8 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.1 *	1.1 *	1.1 *	1.1 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.2 *	1.2 *	1.2 *	1.2 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.2 *	1.2 *	1.2 *	1.2 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.2 *	1.2 *	1.2 *	1.2 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.4 *	1.4 *	1.4 *	1.4 *
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.6 *	1.6 *	1.6 *	1.6 *
beta-Pinene				
Concentration, ppmvd	1.1	0.6 *	0.6 *	0.6
Emission Rate, lb/hr	2.8	1.6 *	1.6 *	1.5
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.6 *	1.6 *	1.6 *	1.6 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.6 *	1.6 *	1.6 *	1.6 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale)	Source:	No. 6 Power Boiler		FIN:	P-6
Source Code: TI-PB6	Date:	7/16/92	EPN: 50	CIN:	261001

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6	0.7	0.6	0.6
Emission Rate, lb/hr	1.5	1.9	1.5	1.6
Knowns as Carbon				
Concentration, ppmvd	30.1	12.8	10.3	17.7
Unknowns as Carbon				
Concentration, ppmvd	0.6	0.6	23.8	8.3
Sum M18 as Carbon, lb/hr	7.0	3.0	7.8	5.9
Unknown Compounds % of Total	2.0%	4.5%	69.8%	25.4%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	75.3	196.8	25.5	99.2
Emission Rate, lb/hr as C	17.2	44.9	5.8	22.6

COMMENTS :

Velocity data for day 2 was the average of runs 1 and 2 for day 1.

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale)	Source:	No. 6 Power Boiler		FIN:	P-6
Source Code: TI-PB6	Date:	7/17/92	EPN: 50	CIN:	261001

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	813	913	1013	
Flow Data				
Stack Temperature, °F	137			137
Moisture Content, %	17.7			17.7
Oxygen Concentration, %	12.5			12.5
Carbon Dioxide Concentration, %	5.5			5.5
Volumetric Flow Rate, x10^3 ACFM	167.6			167.6
Volumetric Flow Rate, x10^3 DSCFM	121.8			121.8
Process Operating Conditions				
Production Rate, x10^6 BTU/hr	734.3	735.9	756.5	742.2
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	2.4 *	2.4 *	2.4 *	2.4 *
Emission Rate, lb/hr	1.5 *	1.5 *	1.5 *	1.5 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Acetone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale)		Source:	No. 6 Power Boiler		FIN:	P-6
Source Code:	TI-PB6	Date:	7/17/92	EPN: 50	CIN:	261001

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.8 *	0.8 *	0.8 *	0.8 *
Chloroform				
Concentration, ppmvd	1.2 *	1.2 *	1.2 *	1.2 *
Emission Rate, lb/hr	2.7 *	2.7 *	2.7 *	2.7 *
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.9 *	0.9 *	0.9 *	0.9 *
Bromodichloromethane				
Concentration, ppmvd	1.2 *	1.2 *	1.2 *	1.2 *
Emission Rate, lb/hr	3.8 *	3.8 *	3.8 *	3.8 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.1 *	1.1 *	1.1 *	1.1 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.2 *	1.2 *	1.2 *	1.2 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.2 *	1.2 *	1.2 *	1.2 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.2 *	1.2 *	1.2 *	1.2 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.4 *	1.4 *	1.4 *	1.4 *
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.6 *	1.6 *	1.6 *	1.6 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.6 *	1.6 *	1.6 *	1.6 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.6 *	1.6 *	1.6 *	1.6 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	1.6 *	1.6 *	1.6 *	1.6 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: No. 6 Power Boiler FIN: P-6
Source Code: TI-PB6 Date: 7/17/92 EPN: 50 CIN: 261001

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6	0.4
Emission Rate, lb/hr	1.5 *	1.5 *	1.5	1.0
Knowns as Carbon				
Concentration, ppmvd	4.7	8.6	8.3	7.2
Unknowns as Carbon				
Concentration, ppmvd	2.8	0.0	0.0	0.9
Sum M18 as Carbon, lb/hr	1.7	2.0	1.9	1.9
Unknown Compounds % of Total	37.1%	0.0%	0.0%	12.4%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	1.2	0.0	13.4	4.9
Emission Rate, lb/hr as C	0.3	0.1 *	3.0	1.1

COMMENTS :

Velocity data for day 2 was the average of runs 1 and 2 for day 1.

* One or more values were less than the detection limit.

Section 5.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: TEMPLE-INLAND (Evadale)		Source:	No. 6 Power Boiler	FIN:	P-6
Source Code:	TI-PB6	Date:	7/16/92 EPN: 50	CIN:	261001

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1116			
Flow Data				
Stack Temperature, °F	137	138		137
Moisture Content, %	18.2	18.2		18.2
Oxygen Concentration, %	12.0	13.0		12.5
Carbon Dioxide Concentration, %	5.5	5.5		5.5
Volumetric Flow Rate, x10^3 ACFM	164.8	170.8		167.8
Volumetric Flow Rate, x10^3 DSCFM	119.0	123.2		121.1
Process Operating Conditions				
Production Rate, x10^6 BTU/hr	761.1			761.1
Miscellaneous Parameters				
Formaldehyde				
Concentration, ppmvd	1.1			1.1
Emission Rate, lb/hr	0.6			0.6
Acetaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.4 *			0.4 *
Acetone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.5 *			0.5 *
Acetophenone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.1 *			1.1 *
Methyl ethyl ketone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.7 *			0.7 *
Methyl isobutyl ketone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.9 *			0.9 *
Acrolein				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.5 *			0.5 *
Benzaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.0 *			1.0 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: TEMPLE-INLAND (Evadale) Source: No. 6 Power Boiler FIN: P-6
Source Code: TI-PB6 Date: 7/17/92 EPN: 50 CIN: 261001

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	842			
Flow Data				
Stack Temperature, °F	138			138
Moisture Content, %	17.7			17.7
Oxygen Concentration, %	12.5			12.5
Carbon Dioxide Concentration, %	5.5			5.5
Volumetric Flow Rate, x10^3 ACFM	167.7			.167.7
Volumetric Flow Rate, x10^3 DSCFM	121.7			121.7
Process Operating Conditions				
Production Rate, x10^6 BTU/hr	734.3			734.3
Miscellaneous Parameters				
Formaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.3 *			0.3 *
Acetaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.4 *			0.4 *
Acetone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.6 *			0.6 *
Acetophenone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.1 *			1.1 *
Methyl ethyl ketone (Impinger)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.7 *			0.7 *
Methyl isobutyl ketone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.9 *			0.9 *
Acrolein				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.5 *			0.5 *
Benzaldehyde				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	1.0 *			1.0 *

* One or more values were less than the detection limit.

Section 5.3 Emission Test Results - Metals

Mill: Temple Inland
Source: TI-PB6

Run 1
Sample volume (DSCF)--------- 31.13
Source Vol Flow (DSCFM)------ 119000

		FH+BH Amt (ug)	Conc (lb/DSCF)	Mass Rt. (lb/hr)	Detection Limit(ug)	Det Limit (lb/DSCF)	Det Limit (lb/hr)
Antimony	Sb	*	0.0E+00	0.0E+00	5	3.5E-10	2.5E-03
Arsenic	As	*	0.0E+00	0.0E+00	5	3.5E-10	2.5E-03
Barium	Ba	*	0.0E+00	0.0E+00	4000	2.8E-07	2.0E+00
Beryllium	Be	*	0.0E+00	0.0E+00	5	3.5E-10	2.5E-03
Cadmium	Cd	*	0.0E+00	0.0E+00	5	3.5E-10	2.5E-03
Chromium	Cr	11	7.8E-10	5.6E-03	10	7.1E-10	5.1E-03
Copper	Cu	5	3.5E-10	2.5E-03	5	3.5E-10	2.5E-03
Lead	Pb	24	1.7E-09	1.2E-02	10	7.1E-10	5.1E-03
Manganese	Mn	6335	4.5E-07	3.2E+00	10	7.1E-10	5.1E-03
Mercury	Hg	*	0.0E+00	0.0E+00	5	3.5E-10	2.5E-03
Nickel	Ni	11	7.8E-10	5.6E-03	5	3.5E-10	2.5E-03
Phosphorus	P	175	1.2E-08	8.8E-02	100	7.1E-09	5.1E-02
Silver	Ag	15	1.1E-09	7.6E-03	5	3.5E-10	2.5E-03
Selenium	Se	*	0.0E+00	0.0E+00	5	3.5E-10	2.5E-03
Thallium	Tl	*	0.0E+00	0.0E+00	5	3.5E-10	2.5E-03

Run 2
Sample volume (DSCF)--------- 32.24
Source Vol Flow (DSCFM)------ 124000

		FH+BH Amt (ug)	Conc (lb/DSCF)	Mass Rt. (lb/hr)	Detection Limit(ug)	Det Limit (lb/DSCF)	Det Limit (lb/hr)
Antimony	Sb	*	0.0E+00	0.0E+00	5	3.4E-10	2.5E-03
Arsenic	As	*	0.0E+00	0.0E+00	5	3.4E-10	2.5E-03
Barium	Ba	*	0.0E+00	0.0E+00	4000	2.7E-07	2.0E+00
Beryllium	Be	*	0.0E+00	0.0E+00	5	3.4E-10	2.5E-03
Cadmium	Cd	*	0.0E+00	0.0E+00	5	3.4E-10	2.5E-03
Chromium	Cr	12	8.2E-10	6.1E-03	10	6.8E-10	5.1E-03
Copper	Cu	14	9.6E-10	7.1E-03	5	3.4E-10	2.5E-03
Lead	Pb	*	0.0E+00	0.0E+00	10	6.8E-10	5.1E-03
Manganese	Mn	6408	4.4E-07	3.3E+00	10	6.8E-10	5.1E-03
Mercury	Hg	*	0.0E+00	0.0E+00	5	3.4E-10	2.5E-03
Nickel	Ni	13	8.9E-10	6.6E-03	5	3.4E-10	2.5E-03
Phosphorus	P	193	1.3E-08	9.8E-02	100	6.8E-09	5.1E-02
Silver	Ag	*	0.0E+00	0.0E+00	5	3.4E-10	2.5E-03
Selenium	Se	*	0.0E+00	0.0E+00	5	3.4E-10	2.5E-03
Thallium	Tl	*	0.0E+00	0.0E+00	5	3.4E-10	2.5E-03

M E T A L S   C A L C U L A T I O N S

Client: TPIEC
Location: Temple Inland
WESTON Project No.: 6848-01-01-527
Source: TI-PB6

INPUT DATA

Run Number		1	2	3	Mean
Date		7/16/92	7/16/92		---
Time Began		819	950		---
Time Ended		923	1100		---
Sampling Time, min	(Theta)	64	64		64
Stack Diameter, in.	(Dia)	116	116	116	116
Barometric Pressure, in. Hg	(Pb)	29.90	29.90		29.90
Static Pressure, in. H2O	(Pg)	-0.43	-0.45		-0.44
Pitot Tube Coefficient	(Cp)	0.84	0.84		0.84
Meter Correction Factor	(Y)	1.010	1.010		1.010
Nozzle Diameter, in.	(Dn)	0.246	0.246		0.246
Meter Volume, ft^3	(Vm)	31.725	33.155		32.440
Meter Temperature, |F	(tm)	84	89		87
Meter Orifice Pressure, in. H2O	(Delta H)	0.853	0.908		0.881
Volume H2O Collected, mL	(Vlc)	151.4	142.6		147.0
CO2 Concentration, %	(CO2)	5.5	5.5		5.5
O2 Concentration, %	(O2)	12.0	13.0		12.5
Average Sq Rt Velo Head, (in. H2O)^*	((Delta P)^*)avg	0.6089	0.6314		0.6202
Stack Temperature, |F	(ts)	137	138		138
Total Metals Collected, ug					0.0
Moisture Fraction (at Saturation)	(Bws)	0.182	0.187	NA	

CALCULATED DATA

Stack Area, ft^2	(As)	73.39	73.39	73.39	73.39
Stack Pressure, in. Hg	(Ps)	29.87	29.87	0.00	19.91
Standard Meter Volume, ft^3	(Vmstd)	31.132	32.243	0.000	21.125
Standard Water Volume, ft^3	(Vwstd)	7.126	6.712	0.000	4.613
Moisture Fraction (Measured)	(Bws)	0.186	0.172	ERR	ERR
Moisture Fraction (lower sat/meas)	(Bws)	0.182	0.172	ERR	ERR
Mol. Wt. of Stack Gas, lb/lb-mole	(Ms)	27.3	27.4	ERR	ERR
Average Stack Gas Velocity, ft/sec	(Vs)	37.4	38.7	ERR	ERR
Stack Gas Flow @ Stack Cond, ft^3/min	(Qa)	1.65E+05	1.71E+05	ERR	ERR
Stack Gas Flow @ Std Cond, ft^3/min	(Qs)	1.19E+05	1.24E+05	ERR	ERR
Isokinetic Sampling Rate, %	(%I)	91	90	ERR	ERR
Metals Concentration, lb/ft^3		0.00E+00	0.00E+00	ERR	ERR

j:\a503\standard\metals.wk1

Blanks for the Multimetals Train. Three blanks were collected during the study. One was collected at Champion-Lufkin and two at Champion-Sheldon. These blanks were used to correct all samples.

		CL Blank Front(ug)	CS Blk 1 Front(ug)	CS Blk 2 Front(ug)	Front Blk(ug)
Antimony	Sb	0.7	0.5 *	0.5 *	0 *
Arsenic	As	3.9	0.8	0.8	1
Barium	Ba	2476	2 *	3742	2073
Beryllium	Be	0.2	0.2 *	0.3	0 *
Cadmium	Cd	0.5	0.4 *	1.4	0 *
Chromium	Cr	9.4	1.2 *	9.3	6.4
Copper	Cu	1.6	1.5 *	1.5 *	0 *
Lead	Pb	10.8	0.3	5.2	5.4
Manganese	Mn	4.4	1 *	4.5	3.1
Mercury	Hg	0.4 *	0.4 *	0.4 *	0 *
Nickel	Ni	2 *	2 *	2 *	0 *
Phosphorus	P	22.6	50 *	53.4	34.7
Silver	Ag	8.3	0.7 *	0.7 *	0 *
Selenium	Se	0.5	0.4 *	0.4 *	0 *
Thallium	Tl	1	0.5	0.7	0 *

The * beside a value means that the analytical value was less than the detection limit for the analysis. The front and the back blank (right column) was developed from the average for most metals. The 8.3 ug from the CL blank was not used because it was unexplainably high.

		CL Blank Back(ug)	CS Blk 1 Back(ug)	CS Blk 2 Back(ug)	Back Blk(ug)
Antimony	Sb	1 *	1 *	0.7 *	0 *
Arsenic	As	1 *	0.5	0.3 *	0 *
Barium	Ba	3.8 *	0.4 *	2.6 *	0 *
Beryllium	Be	0.4 *	0.4 *	0.3 *	0 *
Cadmium	Cd	0.8	1.4	1	1
Chromium	Cr	2.3 *	2.4 *	1.6 *	0 *
Copper	Cu	2.9 *	3 *	2 *	0 *
Lead	Pb	1.5	0.4 *	0.6	0.8
Manganese	Mn	1.9 *	2 *	1.3 *	0 *
Mercury	Hg	0.8 *	0.8 *	1.1	0 *
Nickel	Ni	3.8 *	4 *	2.6 *	0 *
Phosphorus	P	188	100 *	26 *	100 *
Silver	Ag	1.3 *	1.4 *	0.9 *	0 *
Selenium	Se	1 *	0.8 *	0.5 *	0 *
Thallium	Tl	1.9 *	0.4 *	0.3 *	0 *

BAF 9/7/92

TRIANGLE LABORATORIES of RTP, INC.

PO BOX 13485
RTP, NC 27709

Project: 21473 Date in: 21-Jul-92
Weston Date out: 12-Aug-92

CASE NARRATIVE

Overview

This project involves the analysis of 2 Multi-Metals Trains for Ag, As, Ba, Be, Cd, Cr, Cu, Hg, Mn, Na, Ni, P, Pb, Sb, Se, and Tl. The Multi-Metal analysis was conducted according to the protocol described in sections 5-7 of the EPA Draft Document *"Methodology for the Determination of Metals Emissions in Exhaust Gases from Hazardous Waste Incineration and Similar Combustion Processes."*

Preparation

MMTL samples were prepared by microwave and hotplate digestion, as required by the contract. Detailed flow charts of the sample preparation are included with this report.

Analysis

Ag, Ba, Be, Cd, Cr, Cu, Mn, Ni, and P concentrations were determined by Inductively Coupled Plasma (ICP) Emission Spectroscopy. As, Pb, Sb, Se, and Tl concentrations were determined by Graphite Furnace AA (GFAA). Those analytes which failed the postdigestion spike requirement during GFAA analysis were redetermined by MSA. Hg concentrations were determined by Cold Vapor AA (CVAA). Na concentrations were determined by Flame AA.

Results

There was one result that was unobtainable for this project due to sample matrix interference, Sb for sample 1METL-1 BH. The sample was analyzed by MSA twice (per protocol) for Sb. A dilution of the samples would not help due to the fact that the sample absorption was already at zero.

ICP Results:

All of the samples for each analyte were analyzed in triplicate and the average of the triplicate readings were reported.

%REC:

Any postdigestion spike results that were less than 75%REC resulted in all samples related to that spike being reanalyzed by Method of Standard Addition (MSA).

Hg:

All of the Hg %RPD and %REC were within control limits of 25%. The spike %REC was within control limits of 75-125%.

TRIANGLE LABORATORIES of RTP, INC.
PO BOX 13485
RTP, NC 27709

INORGANICS ANALYSIS REPORT

TLI PROJECT #: 21473
CLIENT: WESTON
DATE RECIEVED: 07/21/92
DATE REPORTED: 08/12/92

RESULTS REPORTED IN TOTAL ug

CLIENT SAMPLE ID	Ag	As	Ba	Be	Cd	Cr	Cu	Mn
1METL-1 FH	1.51	2.30	3,160	< .200	1.03	1.25	< 7.50	42.2
1METL-1 BH	13.4	< .262	3.85	< .262	.523	7.47	< 1.96	6,296
1METL-2 FH	1.73	2.21	3,780	.271	3.65	15.1	12.9	75.1
1METL-2 BH	< .906	.324	< 2.59	< .259	.518	3.09	< 1.94	6,408

CLIENT SAMPLE ID	Na	Ni	P	Pb	Sb	Se	Tl
1METL-1 FH	91,700	< 10.0	160	8.04	1.87	< .400	< .200
1METL-1 BH	71.2	5.48	45.3	21.7	**	< .523	< .262
1METL-2 FH	66,100	11.3	178	9.60	3.21	< .400	.410
1METL-2 BH	75.6	< 2.59	< 25.9	< .259	< .647	< .518	< .259

QC SUMMARY

CLIENT SAMPLE ID	Ag	As	Ba	Be	Cd	Cr	Cu	Mn
1METL-1FH(D) %RPD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1METL-1BH(D) %RPD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1METL-1FH(S) %REC	N/A	119%	N/A	N/A	N/A	N/A	N/A	N/A
1METL-1BH(S) %REC	N/A	61.5%	N/A	N/A	N/A	N/A	N/A	N/A

CLIENT SAMPLE ID	Na	Ni	P	Pb	Sb	Se	Tl
1METL-1FH(D) %RPD	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1METL-1BH(D) %RPD	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1METL-1FH(S) %REC	N/A	N/A	N/A	92.8%	*	*	63.8%
1METL-1BH(S) %REC	N/A	N/A	N/A	N/A	*	*	83.6%
1METL-1FH(S) %REC				80.2%			

*BOTH POST DIGESTION SPIKES WERE OUT OF CONTROL LIMITS; ALL SAMPLES WERE ANALYZED BY MSA

**THE SLOPE ON BOTH OF THE MSA ANALYSES WAS TO LOW TO CALIBRATE; THE SAMPLE ABSORBTION WAS ALMOST AT ZERO

INORGANICS ANALYSIS REPORT
PAGE 2 OF 2
Hg RESULTS

	1METL-1 FH	1METL-1 BH	1METL-1 5A	1METL-1 5B	1METL-1 5C
AVG TOTAL ug	.770	2.68	.718	2.55	1.25
%RPD	2.60%	3.17%	20.3%	9.52%	.00%

	1METL-2 FH	1METL-2 BH	1METL-2 5A	1METL-2 5B	1METL-2 5C
AVG TOTAL ug	.960	2.90	.660	2.67	1.46
%RPD	8.33%	.00%	6.06%	9.23%	9.52

	%REC
1METL-1 BH(S)	109%

DESCRIPTION OF ABBREVIATIONS

ICV=Initial Calibration Verification
ICB=Initial Calibration Blank
CCV=Continuing Calibration Verification
CCB=Continuing Calibration Blank
PBW=Preparation Blank Water
PBS=Preparation Blank Soil
LCS=Laboratory Control Spike
ICSA=Interference Check Sample(Solution A) I=Initial F=Final
ICSAB=Interference Check Sample(Solution AB) I=Initial F=Final
Solution A contains common interferents, while Solution AB contains the interferents plus the analyte in question.
CRDL=Contract Required Detection Limit (for CLP)
IDL=Instrument Detection Limit
CRI=CRDL Standard for ICP I=Initial F=Final
CRA=CRDL Standard for AA I=Initial F=Final
%RPD=Relative Percent Difference
%REC=% Recovery
SPK=Spike
AMT=Amount
BLK=Blank
MSA=Method of Standard Additions

CALCULATIONS

MMTL TRAINS:

ICP & GFAA

$$\text{FH \& BH TOTAL ug} = \frac{[\text{ug/L}] * (\text{mL TV/mL USED}) * (\text{mL FV} * \text{DF})}{1000}$$

FLAA

FH & BH TOTAL ug = [ug/L] * (mL TV/mL USED) * (mL FV * DF)

FV=FINAL VOLUME DF=DILUTION FACTOR
WT=WEIGHT TV=TOTAL VOLUME
BV=BEGINNING VOLUME

Hg

MMTL Trains:

FH TOTAL ug = [ug/L] * (ml FV/ml aliquot) * MPV * (DF)

BH TOTAL ug = [ug/L] * (ml TV/ml aliquot) * MPV * (DF)

MMTL Impingers:

TOTAL ug = [ug/L] * (ml TV/ml aliquot) * MPV * (DF)

MPV = Mercury Preparation Volume, which is always 0.1L

$$\%RPD = \frac{|SR - DR|}{(SR + DR)/2} * 100$$

$$\%REC = \frac{SSR - SR}{SA} * 100$$

SR=SAMPLE RESULT DR=DUPLICATE RESULT
SSR=SPIKE SAMPLE RESULT SA=SPIKE ADDED

Metals Data

Mill Temple Inland Run no 1 Sample Volume (DSCF) 31.132

Source TI - PBG Run Date 7/16/92 Source Vol Flow (DSCFM) 1.19 E5

		MEAS FH (ug)	FH Blk Corr (ug)	FH Corr Amt (ug)		Meas BH (ug)	BH Blk corr (ug)	BH Corr Amt (ug)		FH + BH Amt (ug)	Detect Limit
Antimony	Sb	1.9	0	1.9		—	0	—		2	5
Arsenic	As	2.3	1.0	1.3		<0.3	0	<0.3		1	5
Barium	Ba	3160	2073	1087		3.9	0	3.9		1091	400
Beryllium	Be	<0.2	0	<0.2		<0.3	0	<0.3		<1	5
Cadmium	Cd	1.0	1.4	<1.4		0.5	1.0	<1.0		1	5
Chromium	Cr	1.3	6.4	<6.4		7.5	0	7.5	✓	10.7	10
	+6										
Copper	Cu	<7.5	0	<7.5		<2.0	0	<2.0	✓	5	5
Lead	Pb	8.0	5.4	2.6		21.7	0.8	20.9	✓	24	10
Manganese	Mn	42.2	3.1	39.1		6296	0	6296	✓	6335	10
Mercury	Hg	0.8	0	0.8		2.7	0	2.7		4	5
Nickel	Ni	<10.0	0	<10.0		5.5	0	5.5	✓	10.5	5
Phosphorus	P	160	34.7	125.3		45.3	100	<100	✓	175	100
Silver	Ag	1.5	0	1.5		13.4	0	13.4	✓	15	5
Selenium	Se	<0.4	0	<0.4		<0.5	0	<0.5		<1	5
Thallium	Tl	<0.2	0	<0.2		<0.3	0	<0.3		<1	5

Blank is ~ mean of 3 blanks for project
See notes by Bruce dated 9/?/92.

Metals Data

Mill Temple Inland — Run no 2 — Sample Volume (DSCF) 32.243

Source TI - PBG — Run Date 7/16/92 — Source Vol Flow (DSCFM) 1.24 E5

		MEAS FH (ug)	FH Blk Corr (ug)	FH Corr Amt (ug)		Meas BH (ug)	BH Blk Corr (ug)	BH Corr Amt (ug)		FH + BH Amt (ug)	Detect Limit
Antimony	Sb	3.2	0	3.2		<0.6	0	<0.6		4	5
Arsenic	As	2.2	1.0	1.2		0.3	0	0.3		2	5
Barium	Ba	3780	2073	1607		<2.6	0	<2.6		1608	400
Beryllium	Be	0.3	0	0.3		<2.6	0	<2.6		2	5
Cadmium	Cd	3.7	1.4	2.3		0.5	1.0	<1.0		3	5
Chromium	Cr	15.1	6.4	8.7		3.1	0	3.1	✓	12	10
,	+6										
Copper	Cu	12.9	0	12.9		<1.9	0	<1.9	✓	14	5
Lead	Pb	9.6	5.4	4.2		<0.3	0.8	<0.8		5	10
Manganese	Mn	75.1	3.1	72.0		6408	0	6408	✓	6480	10
Mercury	Hg	1.0	0	1.0		2.9	0	2.9		4	5
Nickel	Ni	11.3	0	11.3		<2.6	0	<2.6	✓	13	5
Phosphorus	P	178	34.7	143.3		<25.9	100	<100	✓	193	100
Silver	Ag	1.7	0	1.7		<0.9	0	<0.9		2	5
Selenium	Se	<0.4	0	<0.4		<0.5	0	<0.5		<1	5
Thallium	Tl	0.4	0	0.4		<0.3	0	<0.3		<1	5

Blank is a mean of 3 blanks for project
see notes by Bruce dated 9/13/92.

Section 5.4 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL TEMPLE-INLAND SOURCE TI-PB6

1. CALIBRATION

THEOR	DATE 7/16/92		DATE 7/17/92	
ppm	ppm	%REC	ppm	%REC
0	-2		0	
90	89	99%	87	97%
360	366	102%	364	101%
747	744	100%	744	100%

2. PROPANE LINE RECOVERY

	DATE 7/16/92 INST	LINE	%REC	DATE 7/17/92 INST	LINE	%REC
BEFORE	83	92	111%	90	86	96%
AFTER	90	86	96%	88	88	100%

3. LINE BLANK

	DATE 7/16/92 INST	LINE	DATE 7/17/92 INST	LINE
BEFORE	0	0	0	0
AFTER	0	0	0	0

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QUALITY CONTROL SUMMARY
METHOD 18

MILL TEMPLE-INLAND SOURCE TI-PB6

1. CHECK STANDARD

ANALYTE	THEOR	DATE	7/16/92	THEOR	DATE	7/17/92
	ppm	ppm	%REC	ppm	ppm	%REC
ethanol	11.13	4.99	45%	55.64	27.43	49%
acetone	8.89	8.57	96%	44.47	38.66	87%
isopropanol	8.53	8.33	98%	42.65	40.36	95%
benzene	7.31	44.70	612%	36.54	72.82	199%
bromodichloromethane	8.03	6.37	79%	40.17	37.79	94%
toluene	6.15	6.00	98%	30.73	27.84	91%
ethyl benzene	5.33	5.40	101%	26.67	24.22	91%
m-xylene	5.33	5.69	107%	26.64	24.12	91%
o-xylene	5.35	5.27	99%	26.76	24.16	90%
cumene	4.69	4.87	104%	23.47	21.30	91%
alpha-pinene	4.10	4.18	102%	20.49	18.78	92%
beta-pinene	4.12	4.21	102%	20.59	18.89	92%
3-carene	4.12	4.12	100%	20.61	19.07	93%
p-cymene	4.18	3.98	95%	20.92	19.32	92%

2. PROPANE RESPONSE

	THEOR					
BEFORE RUN	29.90	29.74	99%	29.90	28.01	94%
AFTER RUN	29.90	28.01	94%	29.90	28.28	95%

3. METHANOL LINE RECOVERY

	THEOR					
BEFORE RUN	100.47	94.59	94%	102.53		0%
AFTER RUN	102.53		0%	110.38	119.38	108%

4. LINE BLANK

	[-------------FILE REF-------------]	
BEFORE RUN	GGB4004	
AFTER RUN		GHB4007

* Line blank for Method 18 was not performed. Method 25A line blank was used for end of first run and beginning of second run.

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Section 5.5 Process Operating Data

NO.6 POWER BOILER

The No.6 power boiler is a 400,000 lb/hr steam generator at 700# pressure spreader stoker, traveling grate unit manufactured by Combustion Engineering. This 1986 vintage unit is capable of consuming 720 MMBTU/hr maximum heat input on biomass fuel only, but is normally operated on a 65% biomass, 35% natural gas basis. The boiler pollution control devices include a multiclone separator and low pressure drop wet venturi scrubber. No flyash reinjection is used. (See Diagram PB-6)

Power Boiler
<u>Gas</u> @ 1040 BTU SCF x 500900 SCFH = 520,936,000 BTU hour maximum.

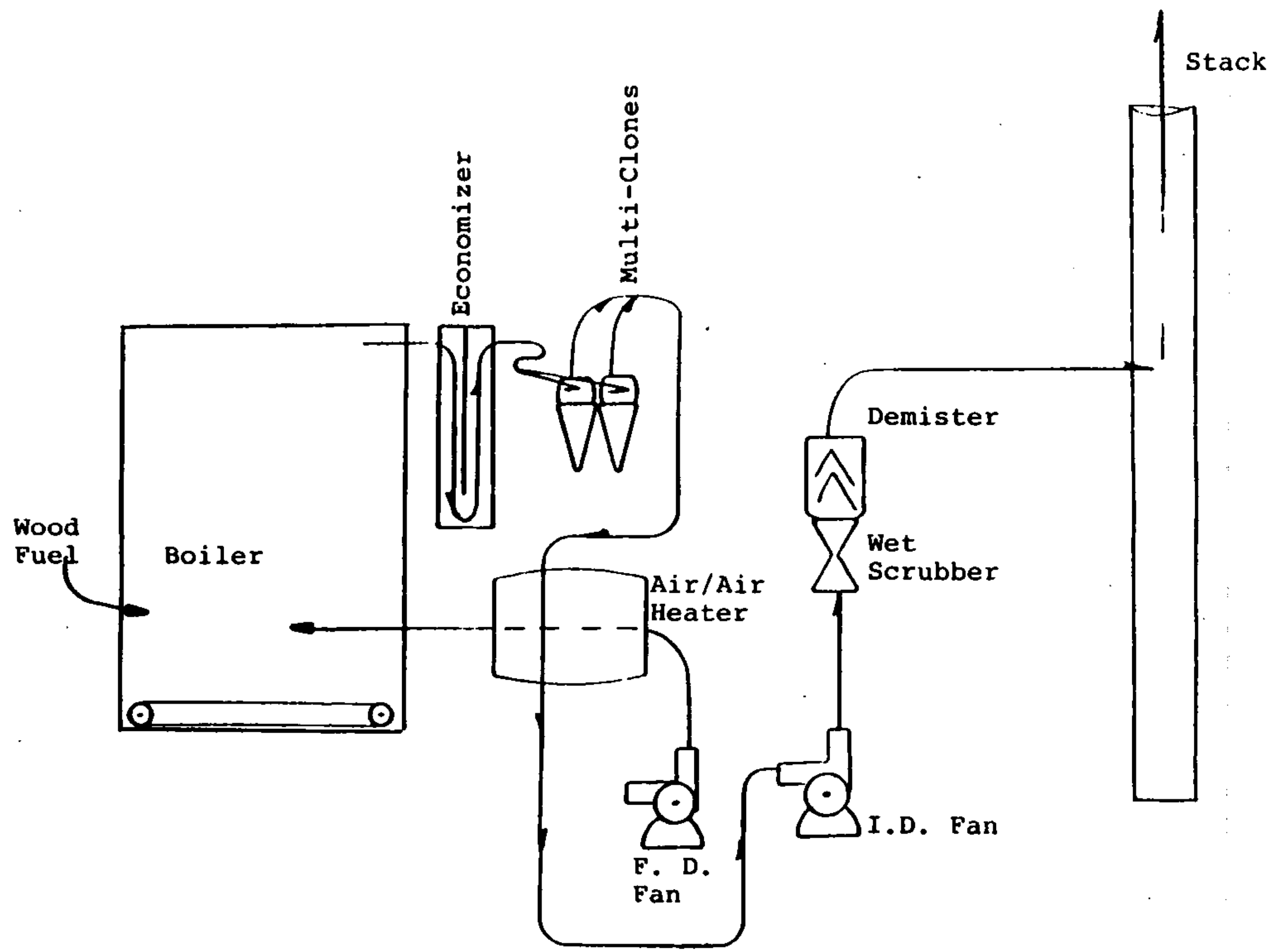
7/16 Run 1 - 278.502 MMBTU/hr.
Run 2 - 299.666 MMBTU/hr.
Run 3 - 263.037 MMBTU/hr.

7/17 Run 1 - 251.742 MMBTU/hr.
Run 2 - 253.354 MMBTU/hr.
Run 3 - 273.926 MMBTU/hr.

<u>Woodwaste</u> - Average feed rate by use - not direct
7/16 Run 1 - 141,390 x 3413 BTU/lb = 482.564 MMBTU/hr.
Run 2 - 482.564 MMBTU/hr.
Run 3 - 482.564 MMBTU/hr.

TOTALS: 7/16
> Run 1 - 761.062 MMBTU/hr
% gas = 36.6%
% wood = 63.4%
> Run 2 - 782.23 MMBTU/hr
% gas = 38.3%
% wood = 61.7%
> Run 3 - 745.601 MMBTU/hr
% Gas = 35.3%
% wood = 64.7%

TOTALS: 7/17 - Wood + Gas
> Run 1 - 734.306 MMBTU/hr.
% Gas = 34.3%
% Wood = 65.7%
> Run 2 - 735.919 MMBTU/hr
% Gas = 34.4%
% Wood = 65.6%
> Run 3 - 756.490 MMBTU/hr
% Gas = 36.2%
% Wood = 63.8%



TEMPLE-INLAND
EVADALE
Wood Fuel Boiler
No.6 Power Boiler

DIAGRAM P

SECTION 6

NCG INCINERATOR STACK

(TI-INCNCG)

6. TI-INCNCG

SECTION 6
NCG INCINERATOR STACK
(TI-INCNCG)

The NCG Incinerator Stack was tested on two different days for volatile organic compounds by Methods 25A, 16 and 18.

Total Hydrocarbons (M25A)

Figures 6.1 and 6.2 present the THC trends for the test periods on 7/11/92 and 7/12/92. Total hydrocarbon concentrations were in the range of 2 ppm to 100 ppm. Results varied widely and showed no consistent pattern.

Volatile Organic Compounds (M16 and M18)

Table 6.1 summarizes the results for the Method 16 and Method 18 target compounds, and Section 6.1 is a tabulation of the data. The volumetric flow was measured during sampling using a pitot tube. Methyl mercaptan and dimethyl sulfide were the only reduced sulfur compounds identified. Concentrations on 7/11/92 were higher than those on 7/12/92 but emission rates were less than 0.1 lb/hr. Methanol and acetone were the only Method 18 compounds present with emission rates again falling below 0.1 lb/hr. An unusually high percentage of unknowns as carbon consisted mainly of three peaks at 19.2, 24.0, and 26.0 minutes on 7/11/92 and in Run 2 on 7/12/92. Run 3 on 7/12/92 was eliminated due to interference.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 6.2. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 6.3 includes the process operating data as recorded and provided by mill personnel.

FIGURE 6.1
THC TREND ANALYSIS (7/11/92)
NCG INCINERATOR STACK (TI-INCNCG)

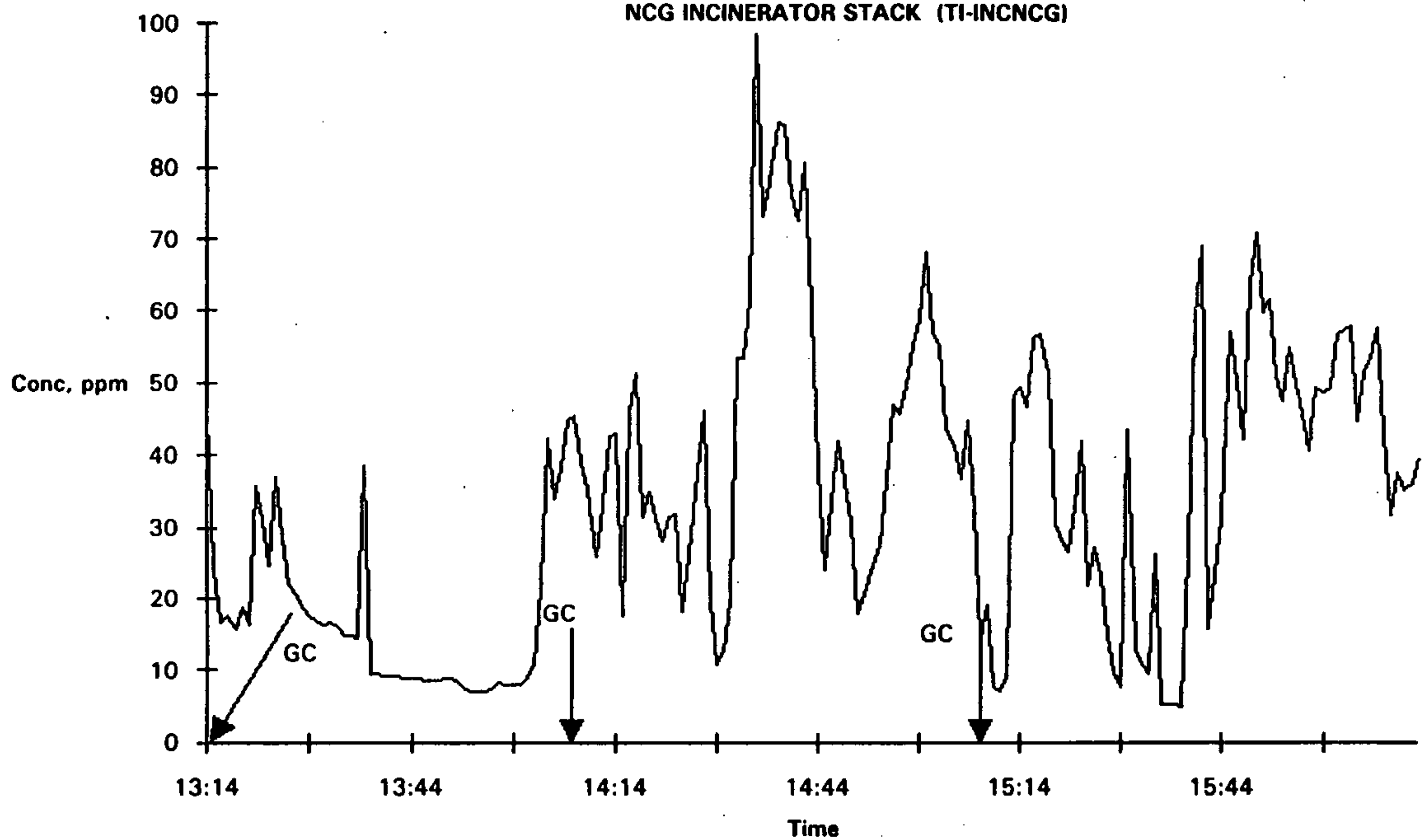


FIGURE 6.2
THC TREND ANALYSIS (7/12/92)
NCG INCINERATOR STACK (TI-INCNCG)

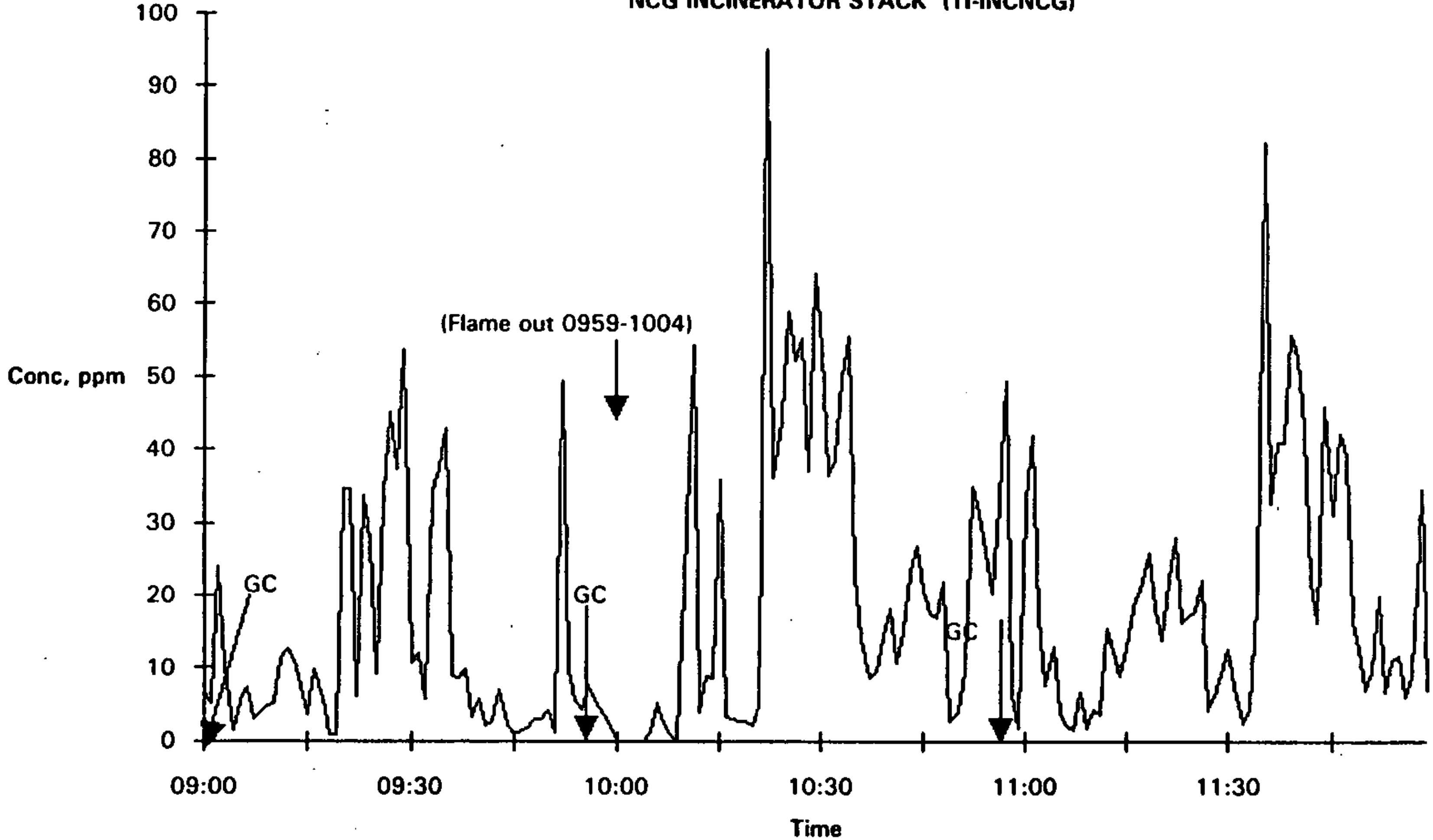


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TABLE 6.1 SUMMARY OF VOC RESULTS

Mill: TEMPLE-INLAND (Evadale)	Source: NCG Incinerator Stack
Source Code: TI-INCNCG	Test Dates: 7/11/92 7/12/92
FIN: P-12 CIN: 012 & 013	EPN: 60

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	171	174	173	
Volumetric Flow Rate, x10^3 DSCFM	2.8	3.0	2.9	
Process Operating Conditions				
Production Rate, ACFM	1450.0	1475.0	1462.5	
Method 16 Data, lb/hr				
Hydrogen sulfide	ND	ND	ND	0.1
Methyl mercaptan	ND	<0.1	0.1	0.1
Dimethyl sulfide	ND	<0.1	0.1	0.1
Carbon disulfide	ND	ND	ND	0.1
Dimethyl disulfide	ND	ND	ND	0.1
Method 18 Data, lb/hr				
Methanol	ND	<0.1	0.1	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	<0.1	0.1	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	ND	ND	ND	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	ND	ND	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	<0.1	0.1	0.1	0.1
Unknowns as C, lb/hr	<0.1	<0.1	0.1	0.1
Sum of Compounds as C, lb/hr	<0.1	<0.1	0.1	0.1

ND=Not Detected
DL=Detection Limit

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Section 6.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: NCG Incinerator Stack FIN: P-12
Source Code: TI-INCNCG Date: 7/11/92 EPN: 60 CIN: 012 & 013

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1313	1413	1513	
Flow Data				
Stack Temperature, °F			174	174
Moisture Content, %			44.7	44.7
Oxygen Concentration, %			16.0	16.0
Carbon Dioxide Concentration, %			1.0	1.0
Volumetric Flow Rate, x10^3 ACFM			6.1	6.1
Volumetric Flow Rate, x10^3 DSCFM			2.8	2.8
Process Operating Conditions				
Production Rate, ACFM	1475.0	1475.0	1475.0	1475.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd	0.5 *	0.8	1.7	0.9
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl sulfide				
Concentration, ppmvd	0.5 *	1.0	3.1	1.5
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Method 18 Data				
Methanol				
Concentration, ppmvd	6.7	5.4	5.4	5.8
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.9 *	0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.9 *	0.9 *	1.1	0.7
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.9 *	0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: NCG Incinerator Stack FIN: P-12
Source Code: TI-INCNCG Date: 7/11/92 EPN: 60 CIN: 012 & 013

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.9 *	0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.8 *	1.8 *	1.8 *	1.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Benzene				
Concentration, ppmvd	0.9 *	0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.8 *	1.8 *	1.8 *	1.8 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.9 *	0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.9 *	0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.9 *	0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.9 *	0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.9 *	0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.9 *	0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.9 *	0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.9 *	0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.9 *	0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: NCG Incinerator Stack FIN: P-12
Source Code: TI-INCNCG Date: 7/11/92 EPN: 60 CIN: 012 & 013

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.9 *	0.9 *	0.9 *	0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	6.5	8.1	9.8	8.1
Unknowns as Carbon				
Concentration, ppmvd	3.3	8.1	4.9	5.4
Sum M18 as Carbon, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Unknown Compounds % of Total	33.3%	50.0%	33.3%	38.9%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	34.4	74.1	70.5	59.7
Emission Rate, lb/hr as C	0.2	0.4	0.4	0.3

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) | Source: NCG Incinerator Stack | FIN: P-12

Source Code: TI-INCNCG | Date: 7/12/92 | EPN: 60 | CIN: 012 & 013

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	859	1005	1059	
Flow Data				
Stack Temperature, °F			171	171
Moisture Content, %			41.8	41.8
Oxygen Concentration, %			17.0	17.0
Carbon Dioxide Concentration, %			1.5	1.5
Volumetric Flow Rate, x10^3 ACFM			6.2	6.2
Volumetric Flow Rate, x10^3 DSCFM			3.0	3.0
Process Operating Conditions				
Production Rate, ACFM	1450.0	1450.0	1450.0	1450.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd	0.5 *	0.9	0.5 *	0.5
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl sulfide				
Concentration, ppmvd	0.5 *	1.2	0.5 *	0.6
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Method 18 Data				
Methanol				
Concentration, ppmvd	6.0	3.4 *		3.9
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Acetone				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
2-Propanol				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: NCG Incinerator Stack FIN: P-12
Source Code: TI-INCNCG Date: 7/12/92 EPN: 60 CIN: 012 & 013

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Chloroform				
Concentration, ppmvd	1.7 *	1.7 *		1.7 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Benzene				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.7 *	1.7 *		1.7 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Ethyl benzene				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
o-Xylene				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Cumene				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
alpha-Pinene				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
beta-Pinene				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
3-Carene				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale)	Source: NCG Incinerator Stack		FIN: P-12
Source Code: TI-INCNCG	Date: 7/12/92	EPN: 60	CIN: 012 & 013

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.9 *	0.9 *		0.9 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Knowns as Carbon				
Concentration, ppmvd	9.3	4.6		7.0
Unknowns as Carbon				
Concentration, ppmvd	5.7	3.6		4.6
Sum M18 as Carbon, lb/hr	0.1 *	0.1 *		0.1 *
Unknown Compounds % of Total	37.9%	43.8%		40.8%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	22.3	41.2	32.6	32.1
Emission Rate, lb/hr as C	0.1	0.2	0.2	0.2

* One or more values were less than the detection limit.

Section 6.2 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL TEMPLE-INLAND SOURCE TI-INCNCG

1. CALIBRATION

THEOR	DATE	7/10/92	DATE		7/11/92
ppm	ppm	%REC	ppm	%REC	%REC
0	0		-2		
90	87	97%	88		98%
360	364	101%	367		102%
747	744	100%	743		99%

2. PROPANE LINE RECOVERY

	DATE	7/10/92		DATE	7/11/92	
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	18	18	100%	16	15	94%
AFTER	16	15	94%	16	17	106%

3. LINE BLANK

	[--------------FILE REF--------------]	
BEFORE RUN	0	0
AFTER RUN	0	0

QUALITY CONTROL SUMMARY
METHOD 18

MILL TEMPLE-INLAND SOURCE TI-INCNCG

1. CHECK STANDARD

ANALYTE	THEOR	DATE	7/10/92	THEOR	DATE	7/11/92
	ppm	ppm	%REC	ppm	ppm	%REC
ethanol	10.50	0.00	0%	10.50	0.93	9%
acetone	8.40	0.67	8%	8.40	4.22	50%
isopropanol	8.05	2.65	33%	8.05	5.36	67%
benzene	6.90	43.88	636%	6.90	44.08	639%
bromodichloromethane	7.58	4.05	53%	7.58	3.94	52%
toluene	5.80	6.49	112%	5.80	5.81	100%
ethyl benzene	5.03	5.51	110%	5.03	5.56	110%
m-xylene	5.03	5.56	110%	5.03	5.60	111%
o-xylene	5.05	5.41	107%	5.05	5.44	108%
cumene	4.43	4.97	112%	4.43	4.97	112%
alpha-pinene	3.87	4.26	110%	3.87	4.31	111%
beta-pinene	3.89	2.18	56%	3.89	4.08	105%
3-carene	3.89	3.96	102%	3.89	4.30	110%
p-cymene	3.95	4.36	110%	3.95	4.30	109%

2. PROPANE RESPONSE

	THEOR					
BEFORE RUN	5.03	5.36	106%	5.03	5.19	103%
AFTER RUN	5.03	5.19	103%	125	122.99	98%

3. METHANOL LINE RECOVERY

	THEOR					
BEFORE RUN	110.45	98.87	90%	115.73	123.71	107%
AFTER RUN	115.73	123.71	107%	104.75	107.27	102%

4. LINE BLANK

	[-------------FILE REF-------------]	
BEFORE RUN	GBA4007	GBA4013
AFTER RUN	GBA4013	GBA4008

QUALITY CONTROL SUMMARY
METHOD 16

MILL TEMPLE-INLAND SOURCE TI-INCNCG

1. CALIBRATION

ANALYTE	LO ppm	MED ppm	HI ppm	CORR COEFF
7/10/92				
hydrogen sulfide	6.19	9.08	32.00	
methyl mercaptan	6.04	8.88	31.20	
dimethyl sulfide	8.17	11.98	42.20	
carbon disulfide	2.35	3.44	12.10	
dimethyl disulfide	3.80	5.57	19.60	
7/11/92				
hydrogen sulfide				
methyl mercaptan				
dimethyl sulfide				
carbon disulfide				
dimethyl disulfide				

2. HYDROGEN SULFIDE LINE RECOVERY

	DATE 7/10/92 INST	LINE	%REC	DATE 7/11/92 INST	LINE	%REC
BEFORE						
AFTER						

Section 6.3 Process Operating Data

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(L) WWC (R) DW 29 December 1992

TRS INCINERATOR AT T-I EVADALE

The unit is a concentratd NCG type system with dilution taking place inside the incinerator. The unit is designed for a minimum residence time of 0.6 seconds at 1400°F minimum temperature in the incinerator.

The unit receives gases from :

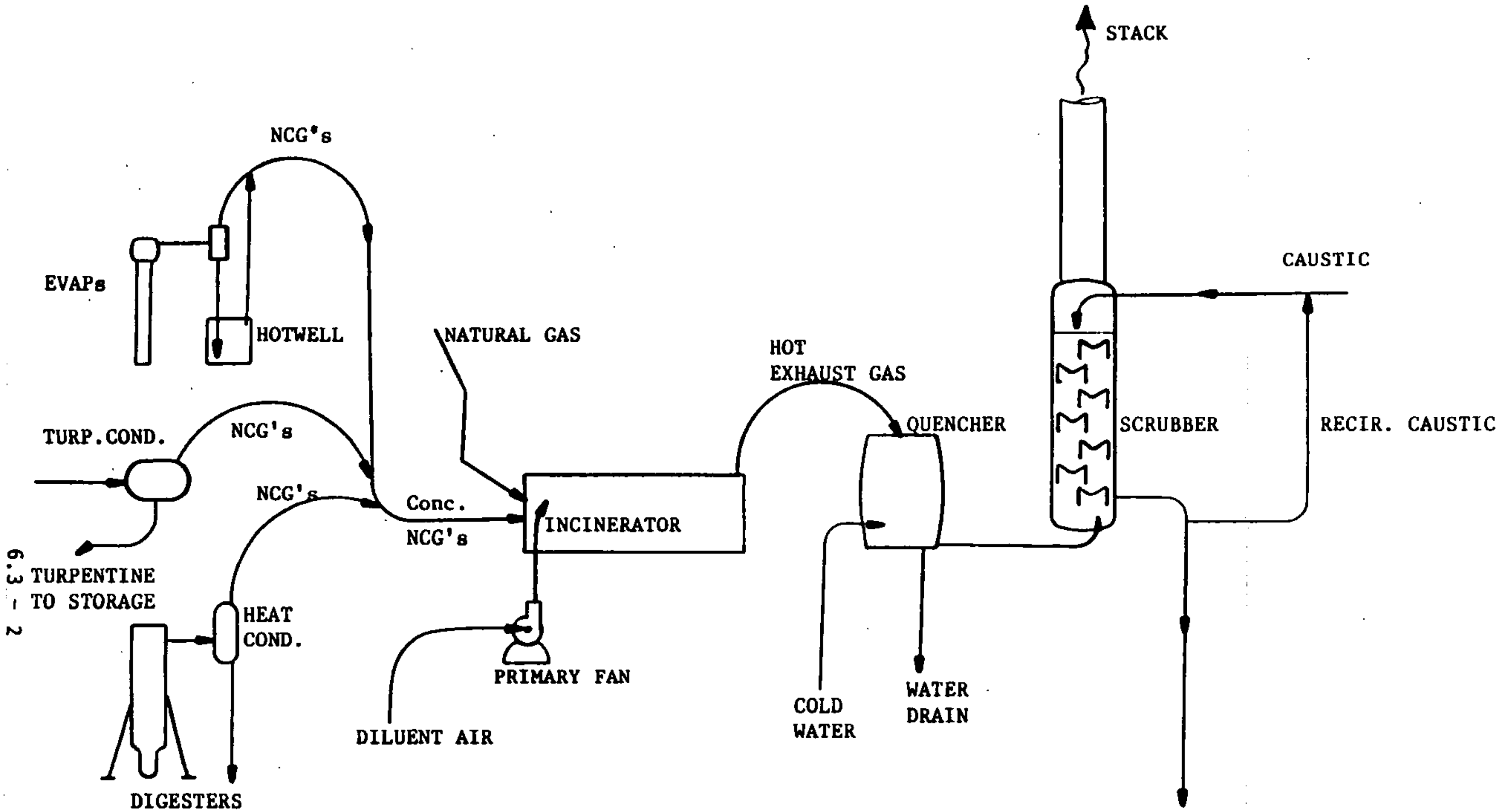
1. Four sets of bl. liquor evaporators, three sets of concentrator evaps., and four sets of evaporator seal tanks.

2. The turpentine condensors (2)

3. One Kamyr continuous type and 12 conventional batch-type digesters blow and vent heat condensor systems.

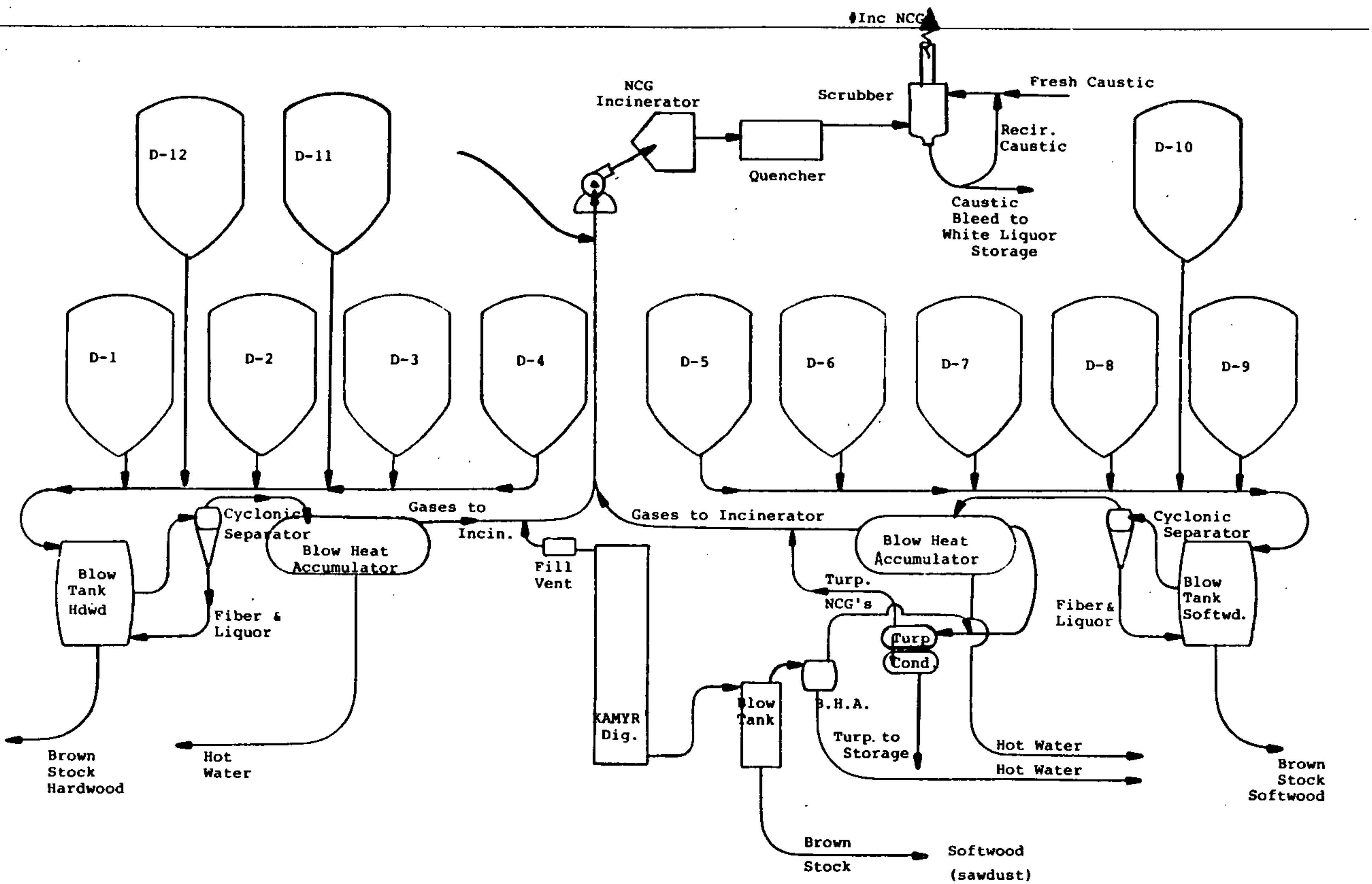
There is no pre-scrubbing of the NCG's prior to incineration. The exhausted gases are cooled in a quencher prior to entering and SO_2 scrubber which utilizes up to 330 gpm of Caustic (NaOH) at 10.5 minimum pH as scrubbing liquid. The TRS scrubber is 30 ft tall, has a diameter of 6.0 ft, and contains 25 ft of plastic saddle-type packing.

The spent scrubber solution bleed is returned to the caustic storage tank or sewered. (See Figure INC-1 and Figure INC-2)



TEMPLE-INLAND NCG INCINERATOR

Figure INC-1



INCINERATOR

Figure INC-2

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SECTION 7
BLEACH PLANT 1 SCRUBBER OUTLET
(TI-BPSO1)

WESTON MANAGERS DESIGNERS CONSULTANTS

SECTION 7
BLEACH PLANT 1 SCRUBBER OUTLET
(TI-BPSO1)

The No. 1 Scrubber Outlet was tested on two different days for volatile organic compounds by Methods 25A and 18. Chloroform was also analyzed using adsorption tubes.

Total Hydrocarbons (M25A)

Figures 7.1 and 7.2 present the THC trends for the test periods on 7/9/92 and 7/10/92. Results were consistent over the two days at 40 to 45 ppm. On 7/10/92, total hydrocarbon concentrations began to decrease at the end of testing.

Volatile Organic Compounds (M18)

Table 7.1 summarizes the results for the Method 18 target compounds, and Section 7.1 is a tabulation of the data. The volumetric flow was measured during sampling using a pitot tube. Three runs were performed on each day of testing. However, Run 1 on 7/9/92 was performed before total hydrocarbon analysis began and is not shown on the trend plot. Methanol and chloroform were the only components present of any significance.

Miscellaneous Parameters

Table 7.2 summarizes the results of testing for chloroform. Section 7.2 tabulates the results for each compound. Chloroform analyses were performed on both days of testing. Results in the 7 lb/hr range are comparable to Method 18 chloroform determination.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 7.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Process description and operating data are included in Appendix C for all three bleach plants.

FIGURE 7.1
THC TREND ANALYSIS (7/9/92)
BLEACH PLANT 1 SCRUBBER OUTLET
(TI-BPSO1)

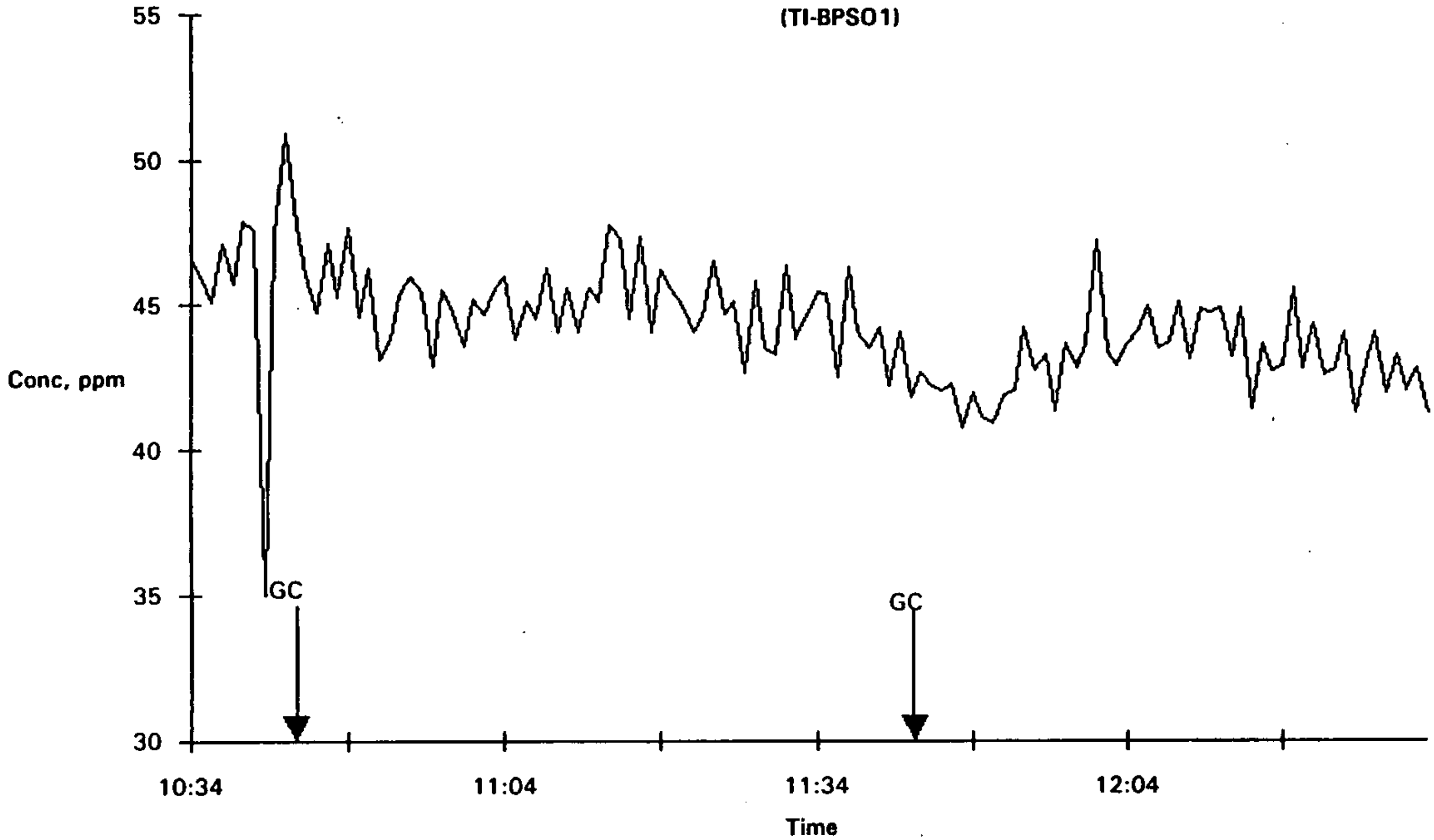

FIGURE 7.2
THC TREND ANALYSIS (7/10/92)
BLEACH PLANT 1 SCRUBBER OUTLET
(TI-BPSO1)

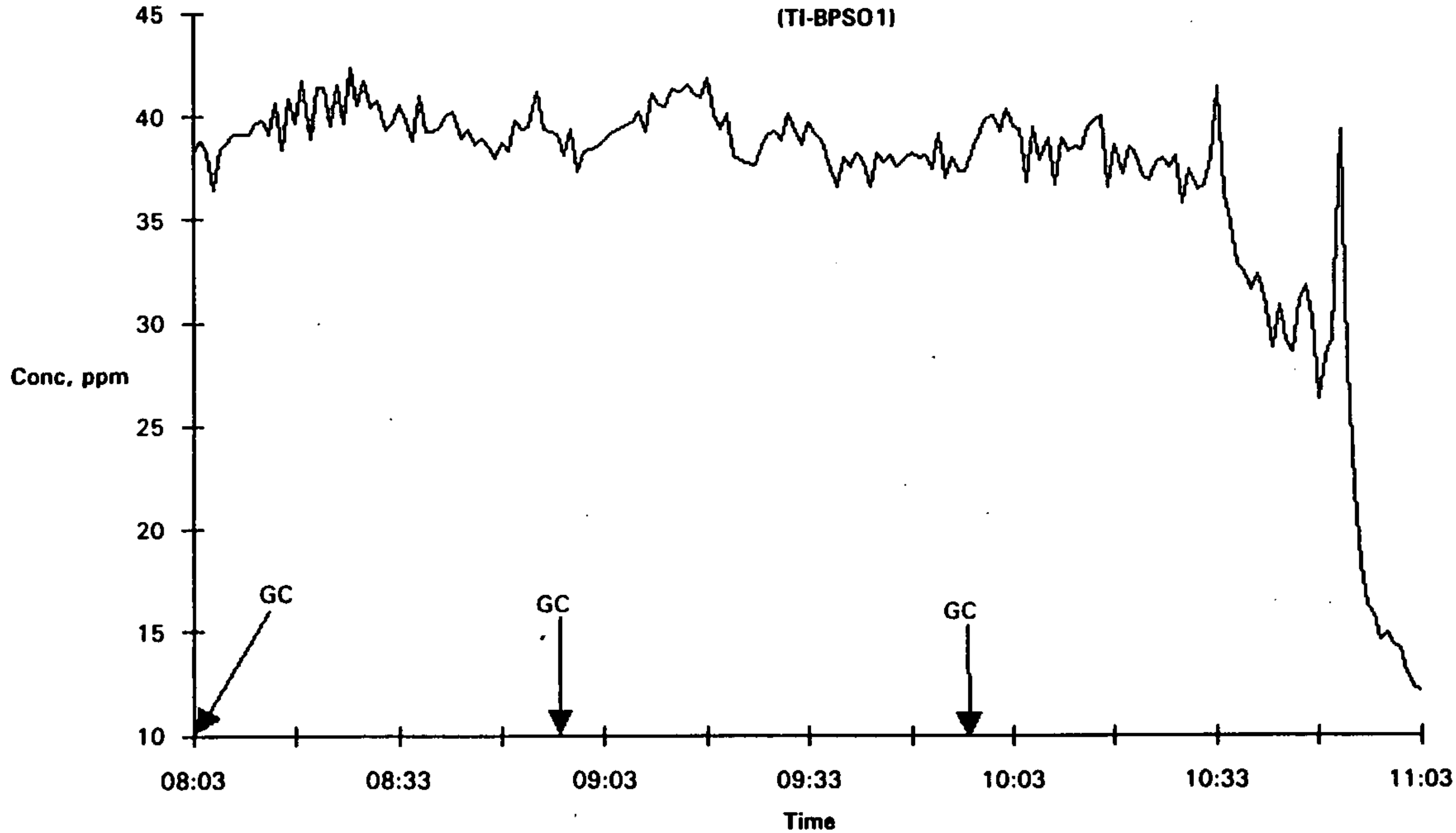

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TABLE 7.1 SUMMARY OF VOC RESULTS

Mill:	TEMPLE-INLAND (Evadale)	Source:	Bleach Plant 1 Scrubber Outlet
Source Code:	TI-BPSO1	Test Dates:	7/9/92 7/10/92
FIN: P-3	CIN: 134a & 135a	EPN:	11-1

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	123	123	123	
Volumetric Flow Rate, x10^3 DSCFM	9.4	10.3	9.9	
Process Operating Conditions				
Production Rate, ADT Pulp/hr				
Method 16 Data, lb/hr				
Hydrogen sulfide				
Methyl mercaptan				
Dimethyl sulfide				
Carbon disulfide				
Dimethyl disulfide				
Method 18 Data, lb/hr				
Methanol	0.6	0.7	0.7	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	6.1	8.7	7.1	0.2
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.3
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	ND	ND	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	0.8	1.0	0.9	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	0.8	1.0	0.9	0.1

ND=Not Detected
DL=Detection Limit

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TABLE 7.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: TEMPLE-INLAND
Source Code: TI-BPSO1
FIN: P-3 EPN: 11-1

Source: Bleach Plant 1 Scrubber Outlet
Test Dates: 7/9/92, 7/10/92
CIN: 134a & 135a

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	123	123	123	
Volumetric Flow Rate, x 10^3 DSCFM	9.4	10.3	9.9	
Process Operating Conditions				
Production Rate, ADT pulp/hr				
Emission Rate, lb/hr				
Chloroform	6.8	6.8	6.8	0.1

ND = Not Detected
DL = Detection Limit

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Section 7.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale)	Source:	Bleach Plant 1 Scrubber Outlet		FIN:	P-3
Source Code: TI-BPSO1	Date:	7/9/92	EPN: 11-1	CIN:	134a&135a

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time		1033	1133	
Flow Data				
Stack Temperature, °F		123		123
Moisture Content, %		12.5		12.5
Oxygen Concentration, %		20.8		20.8
Carbon Dioxide Concentration, %		0.0		0.0
Volumetric Flow Rate, x10^3 ACFM		11.8		11.8
Volumetric Flow Rate, x10^3 DSCFM		9.4		9.4
Process Operating Conditions				
Production Rate, ADT pulp/hr				
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	15.9	14.6	14.4	15.0
Emission Rate, lb/hr	0.7	0.7	0.7	0.7
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: Bleach Plant 1 Scrubber Outlet FIN: P-3
Source Code: TI-BPSO1 Date: 7/9/92 EPN: 11-1 CIN: 134a&135a

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	41.3	49.9	36.0	42.4
Emission Rate, lb/hr	7.2	8.7	6.3	7.4
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale)	Source:	Bleach Plant 1 Scrubber Outlet		FIN:	P-3
Source Code: TI-BPSO1	Date:	7/9/92	EPN: 11-1	CIN:	134a&135a

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	51.2	59.0	45.0	51.7
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.9	1.0	0.8	0.9
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C		51.4	49.1	50.3
Emission Rate, lb/hr as C		0.9	0.9	0.9

COMMENTS :

Total hydrocarbons for day 1, run1, was not obtained due to computer failure.

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) | Source: Bleach Plant 1 Scrubber Outlet | FIN: P-3
Source Code: TI-BPSO1 | Date: 7/10/92 | EPN: 11-1 | CIN: 134a&135a

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	802	902	1002	
Flow Data				
Stack Temperature, °F		123		123
Moisture Content, %		12.5		12.5
Oxygen Concentration, %		20.8		20.8
Carbon Dioxide Concentration, %		0.0		0.0
Volumetric Flow Rate, x10^3 ACFM		13.0		13.0
Volumetric Flow Rate, x10^3 DSCFM		10.3		10.3
Process Operating Conditions				
Production Rate, ADT pulp/hr				
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	12.0	11.7	10.7	11.5
Emission Rate, lb/hr	0.6	0.6	0.6	0.6
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill:	TEMPLE-INLAND (Evadale)	Source:	Bleach Plant 1 Scrubber Outlet	FIN:	P-3
Source Code:	TI-BPSO1	Date:	7/10/92 EPN: 11-1	CIN:	134a&135a

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	36.5	31.9	38.1	35.5
Emission Rate, lb/hr	7.0	6.1	7.3	6.8
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill:	TEMPLE-INLAND (Evadale)	Source:	Bleach Plant 1 Scrubber Outlet	FIN:	P-3
Source Code:	TI-BPSO1	Date:	7/10/92 EPN: 11-1	CIN:	134a&135a

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	48.7	44.5	49.7	47.6
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.9	0.9	1.0	0.9
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	45.7	44.6	36.6	42.3
Emission Rate, lb/hr as C	0.9	0.9	0.7	0.8

COMMENTS :

Total hydrocarbons for day 1, run1, was not obtained due to computer failure.

* One or more values were less than the detection limit.

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Section 7.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - MISCELLANEOUS

Mill: TEMPLE-INLAND (Evadale)		Source:	Bleach Plant 1 Scrubber Outlet	FIN:	P-3
Source Code:	TI-BPSO1	Date:	7/9/92 EPN: 11-1	CIN:	134a&135a

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1122			
Flow Data				
Stack Temperature, °F	123			123
Moisture Content, %	12.5			12.5
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	11.8			11.8
Volumetric Flow Rate, x10^3 DSCFM	9.4			9.4
Process Operating Conditions				
Production Rate, ADT pulp/hr				
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	39.0			39.0
Emission Rate, lb/hr	6.8			6.8

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - MISCELLANEOUS

Mill: TEMPLE-INLAND (Evadale) Source: Bleach Plant 1 Scrubber Outlet FIN: P-3
Source Code: TI-BPSO1 Date: 7/10/92 EPN: 11-1 CIN: 134a&135a

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	821			
Flow Data				
Stack Temperature, °F	123			123
Moisture Content, %	12.5			12.5
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	13.0			13.0
Volumetric Flow Rate, x10^3 DSCFM	10.3			10.3
Process Operating Conditions				
Production Rate, ADT pulp/hr				
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	35.7			35.7
Emission Rate, lb/hr	6.8			6.8

*One or more values were less than the detection limit.

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Section 7.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL TEMPLE-INLAND SOURCE TI-BPSO1

1. CALIBRATION

THEOR	DATE	7/9/92	DATE	7/10/92
ppm	ppm	%REC	ppm	%REC
0	-3		-3	
90	88	98%	89	99%
360	366	102%	367	102%
747	743	99%	743	99%

2. PROPANE LINE RECOVERY

	DATE 7/9/92 INST	LINE	%REC	DATE 7/10/92 INST	LINE	%REC
BEFORE	17	17	100%	97	96	99%
AFTER	16	17	106%	10	12	120%

3. LINE BLANK

	[--------------FILE REF----------------]	
BEFORE RUN	0	0
AFTER RUN	0	0

QUALITY CONTROL SUMMARY

METHOD 13

MILL TEMPLE-INLAND SOURCE 11-BPS01

1. CHECK STANDARD

ANALYTE	THEOR	DATE	7/3/92	THEOR	DATE	7/10/92
	ppm	ppm	%REC	ppm	ppm	%REC
ethanol	52.52	30.88	59%	10.50	0.00	0%
acetone	41.93	45.50	108%	8.40	3.72	44%
isopropanol	40.26	44.13	110%	8.05	4.80	60%
benzene	34.49	83.82	243%	6.90	41.89	607%
bromodichloromethane	37.91	39.23	103%	7.58	8.55	113%
toluene	28.91	30.93	107%	5.80	6.00	103%
ethyl benzene	25.17	27.05	107%	5.03	5.09	101%
m-xylene	25.14	26.89	107%	5.03	5.12	102%
o-xylene	25.25	26.99	107%	5.05	4.95	98%
cumene	22.16	24.23	109%	4.43	4.51	102%
alpha-pinene	19.35	20.58	106%	3.87	4.00	103%
beta-pinene	19.44	20.57	106%	3.89	3.71	95%
3-carene	19.46	20.71	106%	3.89	3.96	102%
p-cymene	19.75	21.45	109%	3.95	6.09	154%

2. PROPANE RESPONSE

	THEOR				
BEFORE RUN	29.9	32.41	108%	30.80	103%
AFTER RUN	29.9	30.71	103%	30.71	103%

3. METHANOL LINE RECOVERY

	THEOR					
BEFORE RUN	116.04	116.02	100%	105.588	64.77	61%
AFTER RUN	116.73	113.93	98%	104.223	95.00	91%

4. LINE BLANK

	[-------------FILE REF-------------]	
BEFORE RUN	G9B4004	G9B4022
AFTER RUN	G9B4010	GAB4007

SECTION 8

BLEACH PLANT 2 SCRUBBER OUTLET

(TI-BPSO2)

SECTION 8
BLEACH PLANT 2 SCRUBBER OUTLET
(TI-BPSO2)

The No. 2 Scrubber Outlet was tested on two different days for volatile organic compounds by Methods 25A and 18. Chloroform was also analyzed using adsorption tubes.

Total Hydrocarbons (M25A)

Figures 8.1 and 8.2 present the THC trends for the test periods on 7/10/92 and 7/11/92. Results in the 30 ppm range were consistent over both testing periods.

Volatile Organic Compounds (M18)

Table 8.1 summarizes the results for the Method 18 target compounds, and Section 8.1 is a tabulation of the data. The volumetric flow was measured during sampling using a pitot tube. Methanol, acetone and chloroform were the only compounds of any significance present in the source. Run 1 of 7/10/92 contained interference and was not included.

Miscellaneous Parameters

Table 8.2 summarizes the results of testing for chloroform. Section 8.2 tabulates the results for each compound. Results for chloroform adsorption tube analysis were in the range of 2-3 lb/hr. This was consistent with M18 chloroform values of 3-4 lb/hr.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 8.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Process description and operating data are included in Appendix C for all three bleach plants.

FIGURE 8.1
THC TREND ANALYSIS (7/10/92)
BLEACH PLANT 2 SCRUBBER OUTLET
(TI-BPSO2)

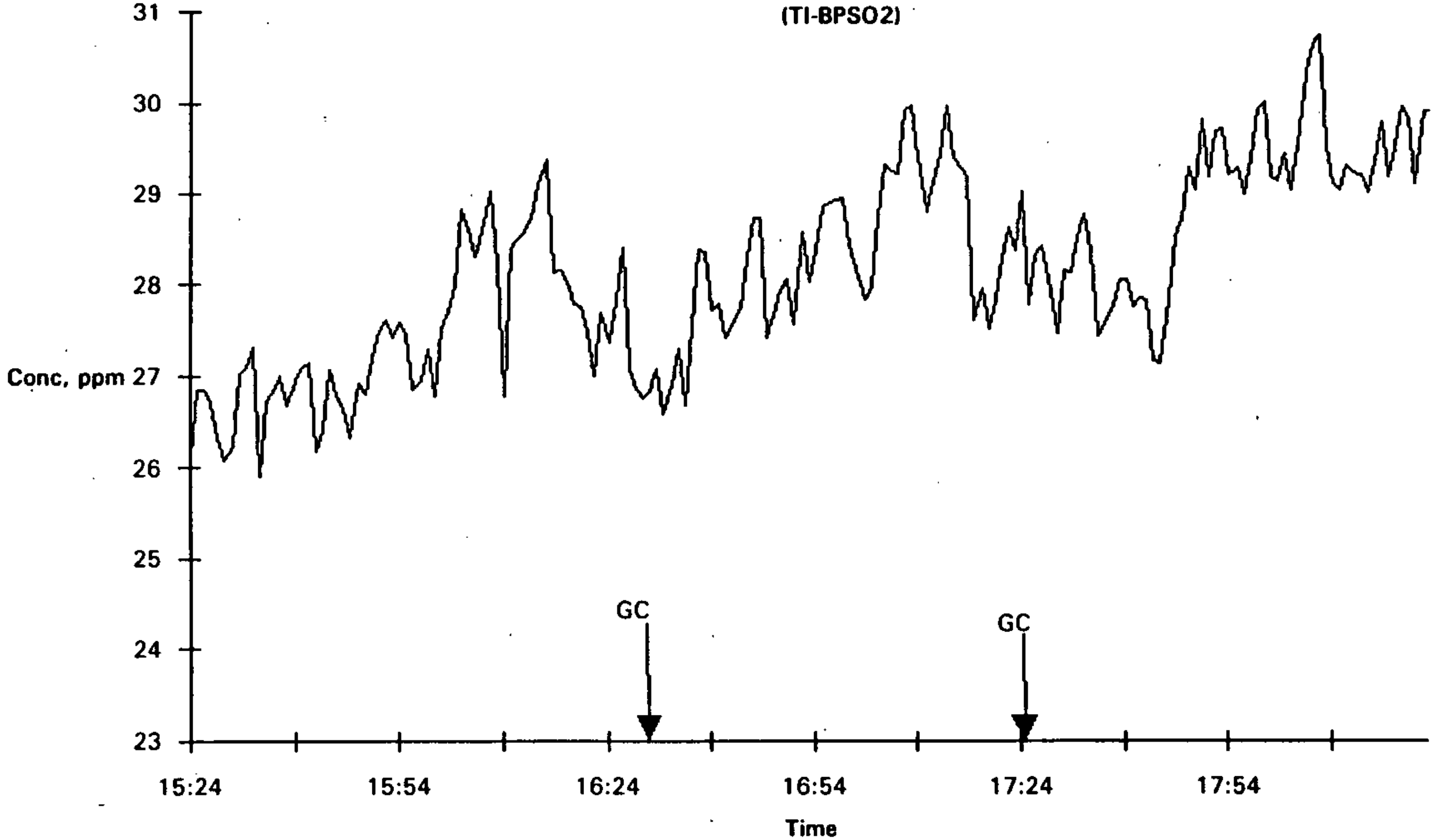

FIGURE 8.2
THC TREND ANALYSIS (7/11/92)
BLEACH PLANT 2 SCRUBBER OUTLET
(TI-BPSO2)

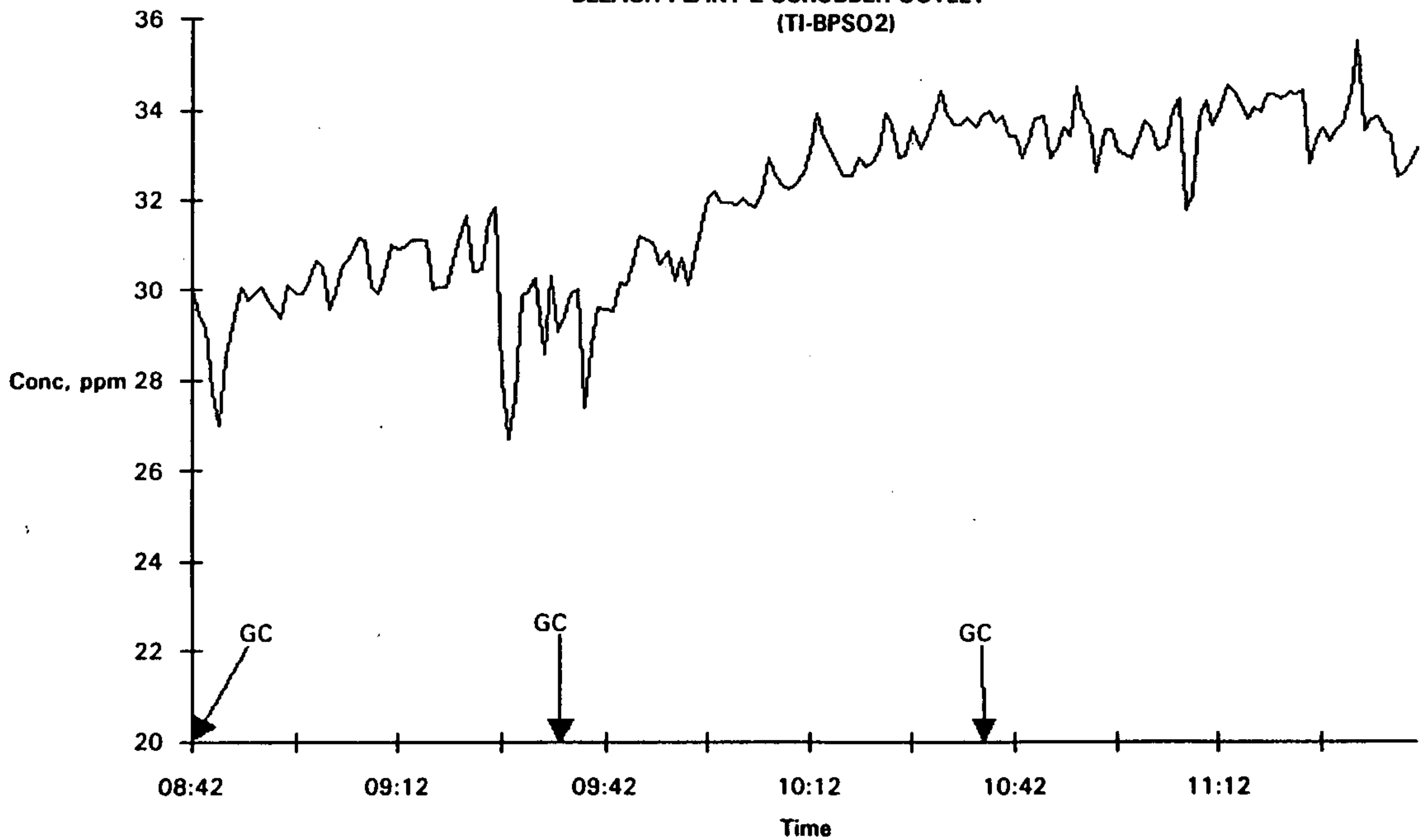

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TABLE 8.1 SUMMARY OF VOC RESULTS

Mill: TEMPLE-INLAND (Evadale) Source: Bleach Plant 2 Scrubber Outlet
Source Code: TI-BPSO2 Test Dates: 7/10/92 7/11/92
FIN: P-3 CIN: 134b & 135b EPN: 11-2

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	129	129	129	
Volumetric Flow Rate, x10³ DSCFM	15.7	16.8	16.3	
Process Operating Conditions				
Production Rate, ADT Pulp/hr				
Method 16 Data, lb/hr				
Hydrogen sulfide				
Methyl mercaptan				
Dimethyl sulfide				
Carbon disuflide				
Dimethyl disulfide				
Method 18 Data, lb/hr				
Methanol	2.0	2.6	2.3	0.2
Ethanol	ND	0.2	0.1	0.1
Acetone	ND	4.0	1.4	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	2.9	4.3	3.5	0.4
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.5
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.2
m-, p-Xylene	ND	ND	ND	0.2
o-Xylene	ND	ND	ND	0.2
Cumene	ND	ND	ND	0.2
alpha-Pinene	ND	ND	ND	0.2
beta-Pinene	ND	ND	ND	0.2
3-Carene	ND	ND	ND	0.2
Terpenes (Unspecified)	ND	ND	ND	0.2
p-Cymene	ND	ND	ND	0.2
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	1.1	2.2	1.5	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	1.1	2.2	1.5	0.1

ND=Not Detected
DL=Detection Limit

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TABLE 8.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: TEMPLE-INLAND
Source Code: TI-BPSO2
FIN: P-3 EPN: 11-2

Source: Bleach Plant 2 Scrubber Outlet
Test Dates: 7/10/92, 7/11/92
CIN: 134b & 135b

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	129	129	129	
Volumetric Flow Rate, x 10^3 DSCFM	15.7	16.8	16.3	
Process Operating Conditions				
Production Rate, ADT pulp/hr				
Emission Rate, lb/hr				
Chloroform	2.0	3.0	2.5	0.2

ND = Not Detected
DL = Detection Limit

Section 8.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale)	Source:	Bleach Plant 2 Scrubber Outlet		FIN:	P-3
Source Code: TI-BPSO2	Date:	7/10/92	EPN: 11-2	CIN:	134b&135b

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1523	1623	1723	
Flow Data				
Stack Temperature, °F	129			129
Moisture Content, %	14.8			14.8
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	20.6			20.6
Volumetric Flow Rate, x10^3 DSCFM	15.7			15.7
Process Operating Conditions				
Production Rate, ADT pulp/hr				
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd		25.0	25.9	25.5
Emission Rate, lb/hr		2.0	2.0	2.0
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd		0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd		28.5	19.1	23.8
Emission Rate, lb/hr		4.0	2.7	3.4
2-Propanol				
Concentration, ppmvd		0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: Bleach Plant 2 Scrubber Outlet FIN: P-3
Source Code: TI-BPSO2 Date: 7/10/92 EPN: 11-2 CIN: 134b&135b

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd		0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd		10.1	10.3	10.2
Emission Rate, lb/hr		2.9	3.0	3.0
Benzene				
Concentration, ppmvd		0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd		1.2 *	1.2 *	1.2 *
Emission Rate, lb/hr		0.5 *	0.5 *	0.5 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd		0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd		0.6 *	0.6 *	0.6 ·
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
m-, p-Xylene				
Concentration, ppmvd		0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
o-Xylene				
Concentration, ppmvd		0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
Cumene				
Concentration, ppmvd		0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
alpha-Pinene				
Concentration, ppmvd		0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
beta-Pinene				
Concentration, ppmvd		0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
3-Carene				
Concentration, ppmvd		0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
Terpenes (Unspecified)				
Concentration, ppmvd		0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: Bleach Plant 2 Scrubber Outlet FIN: P-3
Source Code: TI-BPSO2 Date: 7/10/92 EPN: 11-2 CIN: 134b&135b

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd		0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
Knowns as Carbon				
Concentration, ppmvd		73.6	60.0	66.8
Unknowns as Carbon				
Concentration, ppmvd		0.0	0.0	0.0
Sum M18 as Carbon, lb/hr		2.2	1.8	2.0
Unknown Compounds % of Total		0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	31.7	32.9	34.0	32.9
Emission Rate, lb/hr as C	0.9	1.0	1.0	1.0

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) | Source: Bleach Plant 2 Scrubber Outlet | FIN: P-3
Source Code: TI-BPSO2 | Date: 7/11/92 | EPN: 11-2 | CIN: 134b&135b

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	841	941	1041	
Flow Data				
Stack Temperature, °F			129	129
Moisture Content, %			14.7	14.7
Oxygen Concentration, %			20.8	20.8
Carbon Dioxide Concentration, %			0.0	0.0
Volumetric Flow Rate, x10^3 ACFM			22.0	22.0
Volumetric Flow Rate, x10^3 DSCFM			16.8	16.8
Process Operating Conditions				
Production Rate, ADT pulp/hr				
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	28.1	29.3	31.5	29.7
Emission Rate, lb/hr	2.4	2.5	2.6	2.5
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	1.5	1.4	1.6	1.5
Emission Rate, lb/hr	0.2	0.2	0.2	0.2
Acetone				
Concentration, ppmvd	0.6 *	0.6 *	0.5 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *	0.5 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: Bleach Plant 2 Scrubber Outlet FIN: P-3
Source Code: TI-BPSO2 Date: 7/11/92 EPN: 11-2 CIN: 134b&135b

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.5 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	11.1	12.0	13.7	12.3
Emission Rate, lb/hr	3.5	3.7	4.3	3.8
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.5 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.2 *	1.2 *	1.2 *	1.2 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.5 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.5 *	0.6 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.1 *	0.2 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.5 *	0.6 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.1 *	0.2 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.5 *	0.6 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.1 *	0.2 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 *	0.5 *	0.6 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.5 *	0.6 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.5 *	0.6 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.5 *	0.6 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 *	0.6 *	0.5 *	0.6 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale)	Source:	Bleach Plant 2 Scrubber Outlet		FIN:	P-3
Source Code: TI-BPSO2	Date:	7/11/92	EPN: 11-2	CIN:	134b&135b

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.5 *	0.6 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Knowns as Carbon				
Concentration, ppmvd	35.9	36.3	38.2	36.8
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	1.1	1.1	1.2	1.2
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	35.2	37.5	39.9	37.5
Emission Rate, lb/hr as C	1.1	1.2	1.3	1.2

* One or more values were less than the detection limit.

Section 8.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - MISCELLANEOUS

Mill: TEMPLE-INLAND (Evadale) | Source: Bleach Plant 2 Scrubber Outlet | FIN: P-3
Source Code: TI-BPSO2 | Date: 7/10/92 | EPN: 11-2 | CIN: 134b&135b

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1550			
Flow Data				
Stack Temperature, °F	129			129
Moisture Content, %	14.8			14.8
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	20.6			20.6
Volumetric Flow Rate, x10^3 DSCFM	15.7			15.7
Process Operating Conditions				
Production Rate, ADT pulp/hr				
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	6.8			6.8
Emission Rate, lb/hr	2.0			2.0

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - MISCELLANEOUS

Mill: TEMPLE-INLAND (Evadale) Source: Bleach Plant 2 Scrubber Outlet FIN: P-3
Source Code: TI-BPSO2 Date: 7/11/92 EPN: 11-2 CIN: 134b&135b

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	901			
Flow Data				
Stack Temperature, °F	129			129
Moisture Content, %	14.7			14.7
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	22.0			22.0
Volumetric Flow Rate, x10^3 DSCFM	16.8			16.8
Process Operating Conditions				
Production Rate, ADT pulp/hr				
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	9.7			9.7
Emission Rate, lb/hr	3.0			3.0

* One or more values were less than the detection limit.

Section 8.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL TEMPLE-INLAND SOURCE TI-BPSO2

1. CALIBRATION

THEOR	DATE	7/10/92	DATE		7/11/92
ppm	ppm	%REC	ppm	%REC	%REC
0	2		0		
90	85	94%	87		97%
360	361	100%	364		101%
747	746	100%	744		100%

2. PROPANE LINE RECOVERY

	DATE INST	7/10/92 LINE	%REC	DATE INST	7/11/92 LINE	%REC
BEFORE	97	96	99%	12	13	108%
AFTER	12	13	108%	16	18	113%

3. LINE BLANK

	[--------------FILE REF--------------]	
BEFORE RUN		
AFTER RUN		

QUALITY CONTROL SUMMARY
METHOD 18

MILL TEMPLE-INLAND SOURCE TI-BPSO2

1. CHECK STANDARD

ANALYTE	THEOR	DATE	7/10/92	THEOR	DATE	7/11/92
	ppm	ppm	%REC	ppm	ppm	%REC
ethanol	10.50	4.42	42%	10.50	0.00	0%
acetone	8.40	8.25	98%	8.40	3.72	44%
isopropanol	8.05	7.77	96%	8.05	4.80	60%
benzene	6.90	48.84	708%	6.90	41.89	607%
bromodichloromethane	7.58	6.20	82%	7.58	8.55	113%
toluene	5.80	5.91	102%	5.80	6.00	103%
ethyl benzene	5.03	5.13	102%	5.03	5.09	101%
m-xylene	5.03	5.15	102%	5.03	5.12	102%
o-xylene	5.05	5.09	101%	5.05	4.95	98%
cumene	4.43	4.59	104%	4.43	4.51	102%
alpha-pinene	3.87	3.95	102%	3.87	4.00	103%
beta-pinene	3.89	3.94	101%	3.89	3.71	95%
3-carene	3.89	3.99	103%	3.89	3.96	102%
p-cymene	3.95	3.89	98%	3.95	6.09	154%

2. PROPANE RESPONSE

	THEOR					
BEFORE RUN	29.9	31.29	105%	29.9	30.64	102%
AFTER RUN	29.9	30.64	102%	5.03	5.35	106%

3. METHANOL LINE RECOVERY

	THEOR					
BEFORE RUN	119.70	115.29	96%	107.65	110.63	103%
AFTER RUN	107.65	110.63	103%	108.40	113.49	105%

4. LINE BLANK

	[-------------FILE REF	-------------]
BEFORE RUN	GAB4007	GAB4014
AFTER RUN	GAB4014	GBB4007

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SECTION 9
BLEACH PLANT 3 SCRUBBER OUTLET
(TI-BPSO3)

9. TI-BPSO3

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SECTION 9
BLEACH PLANT 3 SCRUBBER OUTLET
(TI-BPSO3)

The No. 3 Scrubber Outlet was tested on three different days for volatile organic compounds by Methods 25A and 18. Chloroform was also analyzed using adsorption tubes. On Day 2 of testing, the process went down after one hour of testing, therefore, a third day of testing was performed.

Total Hydrocarbons (M25A)

Figures 9.1, 9.2 and 9.3 present the THC trends for the test periods on 7/9/92, 7/13/92 and 7/14/92. Total hydrocarbons were lower by a factor of two on 7/13/92 compared to 7/9/92. On 7/14/92, conditions were more stable but still lower than on 7/9/92 (145 ppm compared to 225 ppm).

Volatile Organic Compounds (M18)

Table 9.1 summarizes the results for the Method 18 target compounds, and Section 9.1 is a tabulation of the data. The volumetric flow was measured during sampling using a pitot tube. Methanol levels were consistent at approximately 1 lb/hr for all three days. Chloroform was the only other component of significance and was lower on the second and third days of testing. Emission rates were 22, 8, and 14 lb/hr for the three days.

Miscellaneous Parameters

Table 9.2 summarizes the results of testing for chloroform. Section 9.2 tabulates the results for each compound. Chloroform adsorption tube analysis results were comparable to M18 results for 7/9/92 and 7/10/92, but differed by a factor of three on 7/14/92.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 9.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Process description and operating data are included in Appendix C for all three bleach plants.

FIGURE 9.1
THC TREND ANALYSIS (7/9/92)
BLEACH PLANT 3 SCRUBBER OUTLET
(TI-BPSO3)

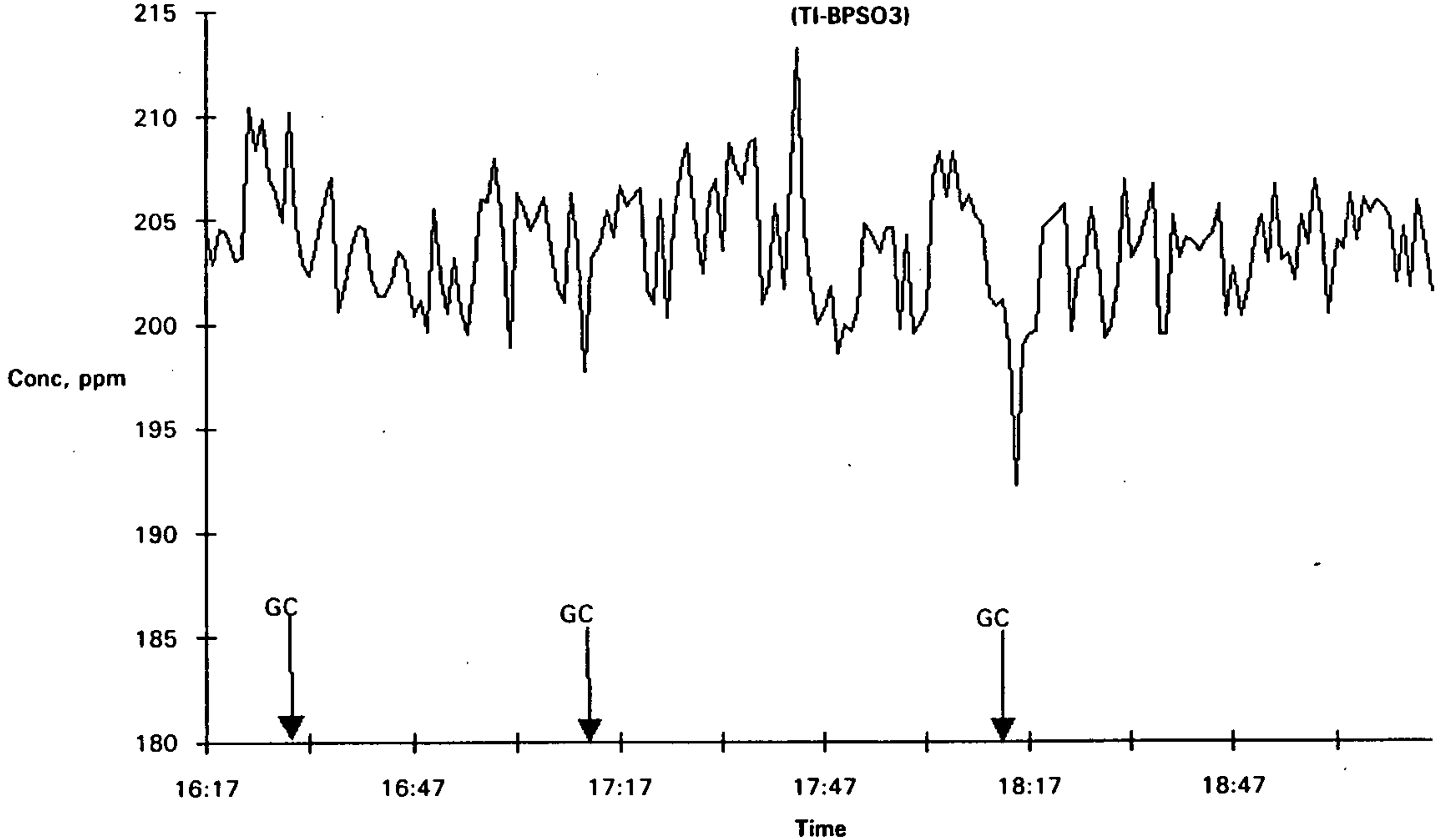

FIGURE 9.2
THC TREND ANALYSIS (7/13/92)
BLEACH PLANT 3 SCRUBBER OUTLET
(TI-BPSO3)

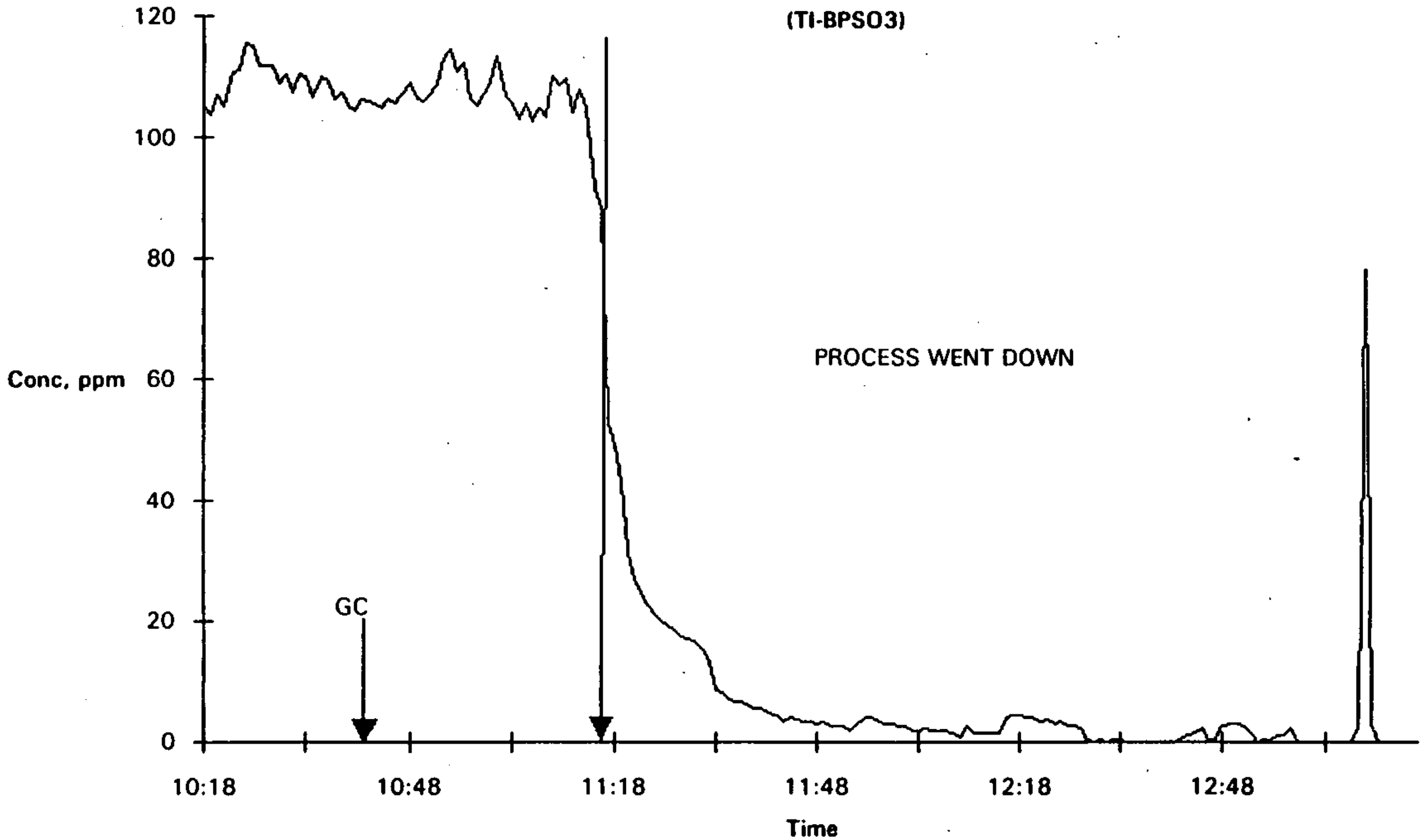

FIGURE 9.3

THC TREND ANALYSIS (7/14/92)
BLEACH PLANT 3 SCRUBBER OUTLET
(TI-BPSO3)

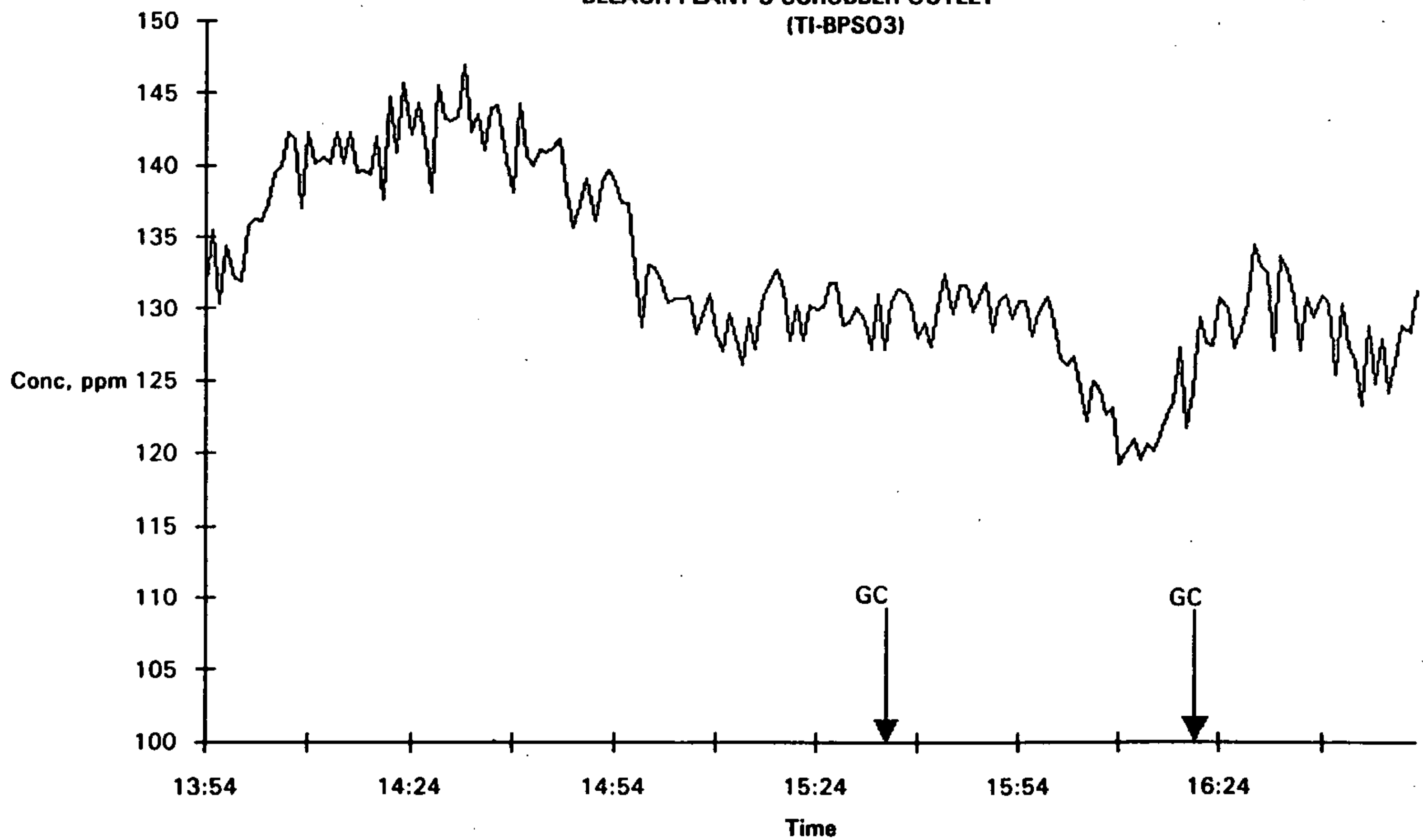

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TABLE 9.1 SUMMARY OF VOC RESULTS

Mill:	TEMPLE-INLAND (Evadale)	Source:	Bleach Plant 3 Scrubber Outlet
Source Code:	TI-BPSO3	Test Dates:	7/9/92, 7/13/92, 7/14/92
FIN: P-3	CIN: 134c & 135c	EPN:	11-3

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	108	114	111	
Volumetric Flow Rate, x10^3 DSCFM	4.7	5.6	5.1	
Process Operating Conditions				
Production Rate, ADT Pulp/hr				
Method 16 Data, lb/hr				
Hydrogen sulfide				
Methyl mercaptan				
Dimethyl sulfide				
Carbon disulfide				
Dimethyl disulfide				
Method 18 Data, lb/hr				
Methanol	0.9	1.1	1.0	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	<0.1	0.1	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	7.9	23.3	16.7	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	0.2	0.2	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	0.1	0.1	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	1.1	2.5	1.7	0.1
Unknowns as C, lb/hr	<0.1	0.1	0.1	0.1
Sum of Compounds as C, lb/hr	1.1	2.5	1.7	0.1

ND=Not Detected
DL=Detection Limit

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TABLE 9.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: TEMPLE-INLAND
Source Code: TI-BPSO3
FIN: P-3 EPN: 11-3

Source: Bleach Plant 3 Scrubber Outlet
Test Dates: 7/9/92, 7/13/92, 7/14/92
CIN: 134c & 135c

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	108	114	111	
Volumetric Flow Rate, x 10^3 DSCFM	4.7	5.6	5.1	
Process Operating Conditions				
Production Rate, ADT pulp/hr				
Emission Rate, lb/hr				
Chloroform	4.7	17.4	11.1	0.1

ND = Not Detected
DL = Detection Limit

Section 9.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: Bleach Plant 3 Scrubber Outlet FIN: P-3
Source Code: TI-BPSO3 Date: 7/9/92 EPN: 11-3 CIN: 134c&135c

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1616	1716	1816	
Flow Data				
Stack Temperature, °F	114			114
Moisture Content, %	9.8			9.8
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	5.6			5.6
Volumetric Flow Rate, x10^3 DSCFM	4.7			4.7
Process Operating Conditions				
Production Rate, ADT pulp/hr				
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	41.8	42.6	37.1	40.5
Emission Rate, lb/hr	1.0	1.0	0.9	0.9
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: Bleach Plant 3 Scrubber Outlet FIN: P-3
Source Code: TI-BPSO3 Date: 7/9/92 EPN: 11-3 CIN: 134c&135c

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	253.1	268.5	233.4	251.7
Emission Rate, lb/hr	21.9	23.3	20.2	21.8
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.3	1.4	1.3	1.4
Emission Rate, lb/hr	0.2	0.2	0.2	0.2
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	2.3	0.6	0.6 *	1.1
Emission Rate, lb/hr	0.2	0.1 *	0.1 *	0.1

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: Bleach Plant 3 Scrubber Outlet FIN: P-3
Source Code: TI-BPSO3 Date: 7/9/92 EPN: 11-3 CIN: 134c&135c

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	285.4	282.7	245.8	271.3
Unknowns as Carbon				
Concentration, ppmvd	5.9	8.4	3.8	6.0
Sum M18 as Carbon, lb/hr	2.5	2.5	2.2	2.4
Unknown Compounds % of Total	2.0%	2.9%	1.5%	2.1%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	226.2	226.2	226.2	226.2
Emission Rate, lb/hr as C	2.0	2.0	2.0	2.0

COMMENTS :

Process went down on day 2 during runs 2 and 3.

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: Bleach Plant 3 Scrubber Outlet FIN: P-3
Source Code: TI-BPSO3 Date: 7/13/92 EPN: 11-3 CIN: 134c&135c

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1017			
Flow Data				
Stack Temperature, °F	108			108
Moisture Content, %	8.2			8.2
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	6.6			6.6
Volumetric Flow Rate, x10^3 DSCFM	5.6			5.6
Process Operating Conditions				
Production Rate, ADT pulp/hr				
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	40.2			40.2
Emission Rate, lb/hr	1.1			1.1
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acetone				
Concentration, ppmvd	0.5			0.5
Emission Rate, lb/hr	0.1 *			0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) | Source: Bleach Plant 3 Scrubber Outlet | FIN: P-3

Source Code: TI-BPSO3 | Date: 7/13/92 | EPN: 11-3 | CIN: 134c&135c

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Chloroform				
Concentration, ppmvd	75.3			75.3
Emission Rate, lb/hr	7.9			7.9
Benzene				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *			1.1 *
Emission Rate, lb/hr	0.2 *			0.2 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Cumene				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
alpha-Pinene				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
beta-Pinene				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
3-Carene				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale)	Source:	Bleach Plant 3 Scrubber Outlet		FIN:	P-3
Source Code: TI-BPSO3	Date:	7/13/92	EPN: 11-3	CIN:	134c&135c

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Knowns as Carbon				
Concentration, ppmvd	99.8			99.8
Unknowns as Carbon				
Concentration, ppmvd	4.8			4.8
Sum M18 as Carbon, lb/hr	1.1			1.1
Unknown Compounds % of Total	4.6%			4.6%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	115.5			115.5
Emission Rate, lb/hr as C	1.2			1.2

COMMENTS :

Process went down on day 2 during runs 2 and 3.

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) | Source: Bleach Plant 3 Scrubber Outlet | FIN: P-3
Source Code: TI-BPSO3 | Date: 7/14/92 | EPN: 11-3 | CIN: 134c&135c

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1353	1453	1553	
Flow Data				
Stack Temperature, °F		110		110
Moisture Content, %		8.7		8.7
Oxygen Concentration, %		20.8		20.8
Carbon Dioxide Concentration, %		0.0		0.0
Volumetric Flow Rate, x10^3 ACFM		6.1		6.1
Volumetric Flow Rate, x10^3 DSCFM		5.1		5.1
Process Operating Conditions				
Production Rate, ADT pulp/hr				
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd		40.3	49.4	44.9
Emission Rate, lb/hr		1.0	1.3	1.1
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd		0.5 *	0.5	0.4
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: Bleach Plant 3 Scrubber Outlet FIN: P-3
Source Code: TI-BPSO3 Date: 7/14/92 EPN: 11-3 CIN: 134c&135c

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd		140.4	145.9	143.2
Emission Rate, lb/hr		13.3	13.8	13.5
Benzene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd		1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale)	Source:	Bleach Plant 3 Scrubber Outlet		FIN:	P-3
Source Code: TI-BPSO3	Date:	7/14/92	EPN: 11-3	CIN:	134c&135c

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	12.7	158.3	172.3	114.4
Unknowns as Carbon				
Concentration, ppmvd	0.5 *	3.3	4.8	2.9
Sum M18 as Carbon, lb/hr	0.1	1.5	1.7	1.1
Unknown Compounds % of Total	4.1%	2.0%	2.7%	3.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	153.3	142.4	139.1	144.9
Emission Rate, lb/hr as C	1.5	1.4	1.3	1.4

COMMENTS :

Process went down on day 2 during runs 2 and 3.

* One or more values were less than the detection limit.

Section 9.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - MISCELLANEOUS

Mill: TEMPLE-INLAND (Evadale)	Source:	Bleach Plant 3 Scrubber Outlet		FIN:	P-3
Source Code: TI-BPSO3	Date:	7/9/92	EPN: 11-3	CIN:	134c&135c

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1637			
Flow Data				
Stack Temperature, °F	114			114
Moisture Content, %	9.8			9.8
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	5.6			5.6
Volumetric Flow Rate, x10^3 DSCFM	4.7			4.7
Process Operating Conditions				
Production Rate, ADT pulp/hr				
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	200.4			200.4
Emission Rate, lb/hr	17.4			17.4

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - MISCELLANEOUS

Mill: TEMPLE-INLAND (Evadale) | Source: Bleach Plant 3 Scrubber Outlet | FIN: P-3

Source Code: TI-BPSO3 | Date: 7/13/92 | EPN: 11-3 | CIN: 134c&135c

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1042			
Flow Data				
Stack Temperature, °F	108			108
Moisture Content, %	8.2			8.2
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	6.6			6.6
Volumetric Flow Rate, x10^3 DSCFM	5.6			5.6
Process Operating Conditions				
Production Rate, ADT pulp/hr				
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	106.8			106.8
Emission Rate, lb/hr	11.2			11.2

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - MISCELLANEOUS

Mill: TEMPLE-INLAND (Evadale) Source: Bleach Plant 3 Scrubber Outlet FIN: P-3
Source Code: TI-BPSO3 Date: 7/14/92 EPN: 11-3 CIN: 134c&135c

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1517			
Flow Data				
Stack Temperature, °F	110			110
Moisture Content, %	8.7			8.7
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	6.1			6.1
Volumetric Flow Rate, x10^3 DSCFM	5.1			5.1
Process Operating Conditions				
Production Rate, ADT pulp/hr				
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	50.0			50.0
Emission Rate, lb/hr	4.7			4.7

* One or more values were less than the detection limit.

Section 9.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL TEMPLE-INLAND SOURCE TI-BSO3

1. CALIBRATION

THEOR	DATE	7/9/92	DATE	7/14/92
ppm	ppm	%REC	ppm	%REC
0	-4		-2	-0.2%
90	89	99%	87	-0.3%
360	369	103%	369	0.9%
747	742	99%	742	-0.5%

2. PROPANE LINE RECOVERY

	DATE	7/9/92		DATE			7/14/92
	INST	LINE	%REC	INST	LINE		%REC
BEFORE	16	17	106%		17	15	88%
AFTER	97	96	99%		11	12	109%

3. LINE BLANK

	DATE	7/9/92	[--------------ppm as C	DATE	--------------]
	INST	LINE		INST	LINE
BEFORE	3	2	67%	0	0
AFTER	1	2	200%	0	0

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QUALITY CONTROL SUMMARY
METHOD 18

MILL TEMPLE-INLAND SOURCE TI-BSO3

1. CHECK STANDARD

ANALYTE	THEOR	DATE	7/9/92	THEOR	DATE	7/14/92
	ppm	ppm	%REC	ppm	ppm	%REC
ethanol	3.34	0.00	0%	3.34		
acetone	2.67	2.78	104%	2.67		
isopropanol	2.56	0.00	0%	2.56		
benzene	2.19	42.05	1918%	2.19		
bromodichloromethane	2.41	5.97	248%	2.41		
toluene	1.84	1.76	96%	1.84		
ethyl benzene	1.60	1.57	98%	1.60		
m-xylene	1.60	1.60	100%	1.60		
o-xylene	1.61	1.54	96%	1.61		
cumene	1.41	1.44	102%	1.41		
alpha-pinene	1.23	1.21	99%	1.23		
beta-pinene	1.24	1.20	97%	1.24		
3-carene	1.24	1.24	100%	1.24		
p-cymene	1.26	1.31	104%	1.26		

2. PROPANE RESPONSE

	THEOR					
BEFORE RUN	120	129.70	108%	29.9	31.23	104%
AFTER RUN	29.9	32.31	108%	29.9	31.79	106%

3. METHANOL LINE RECOVERY

	THEOR					
BEFORE RUN	110.21	113.65	103%	124.24	117.92	95%
AFTER RUN	110.44	109.94	100%	130.34	129.51	99%

4. LINE BLANK

	[-------------FILE REF-------------]	
BEFORE RUN	GCB4008	GEB4007
AFTER RUN	GDB4010	GEB4014

NOTE: Temperature program for the G.C. did not start at the beginning of the run. The response was good,however the retentio times were off.

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SECTION 10
LIME KILN MUD WASHER VENT NO. 3
(TI-LKMW)

10. TI-LKMW

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SECTION 10
LIME KILN MUD WASHER VENT NO. 3
(TI-LKMW)

The Lime Kiln was tested on two different days for volatile organic compounds by Methods 25A, 16, and 18.

Total Hydrocarbons (M25A)

Figures 10.1 and 10.2 present the THC trends for the test periods on 7/20/92 and 7/21/92. Total hydrocarbon values ranged from 2-13 ppm with a spike at 50 ppm on 7/20/92 in the first hour of testing.

Volatile Organic Compounds (M16 and M18)

Table 10.1 summarizes the results for the Method 16 and Method 18 target compounds, and Section 10.1 is a tabulation of the data. The volumetric flow was measured during sampling using a pitot tube. No target compounds were identified at levels above detection limits.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 10.2. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Process data have not been provided for this source.

FIGURE 10.1
THC TREND ANALYSIS (7/20/92)
LIME KILN MUD WASHER VENT NO. 3
(TI-LKMW)

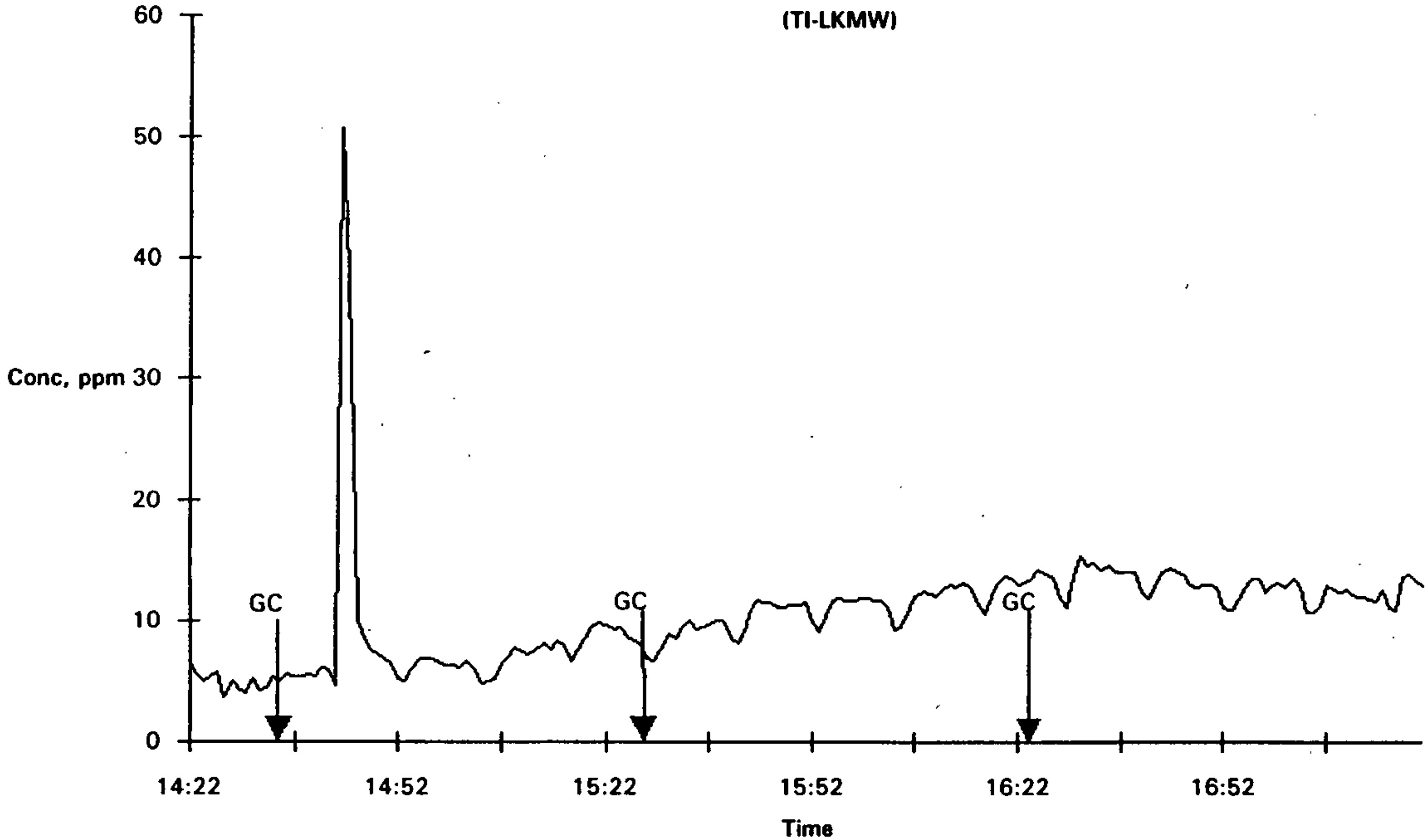

FIGURE 10.2
THC TREND ANALYSIS (7/21/92)
LIME KILN MUD WASHER VENT NO.3
(TI-LKMW)

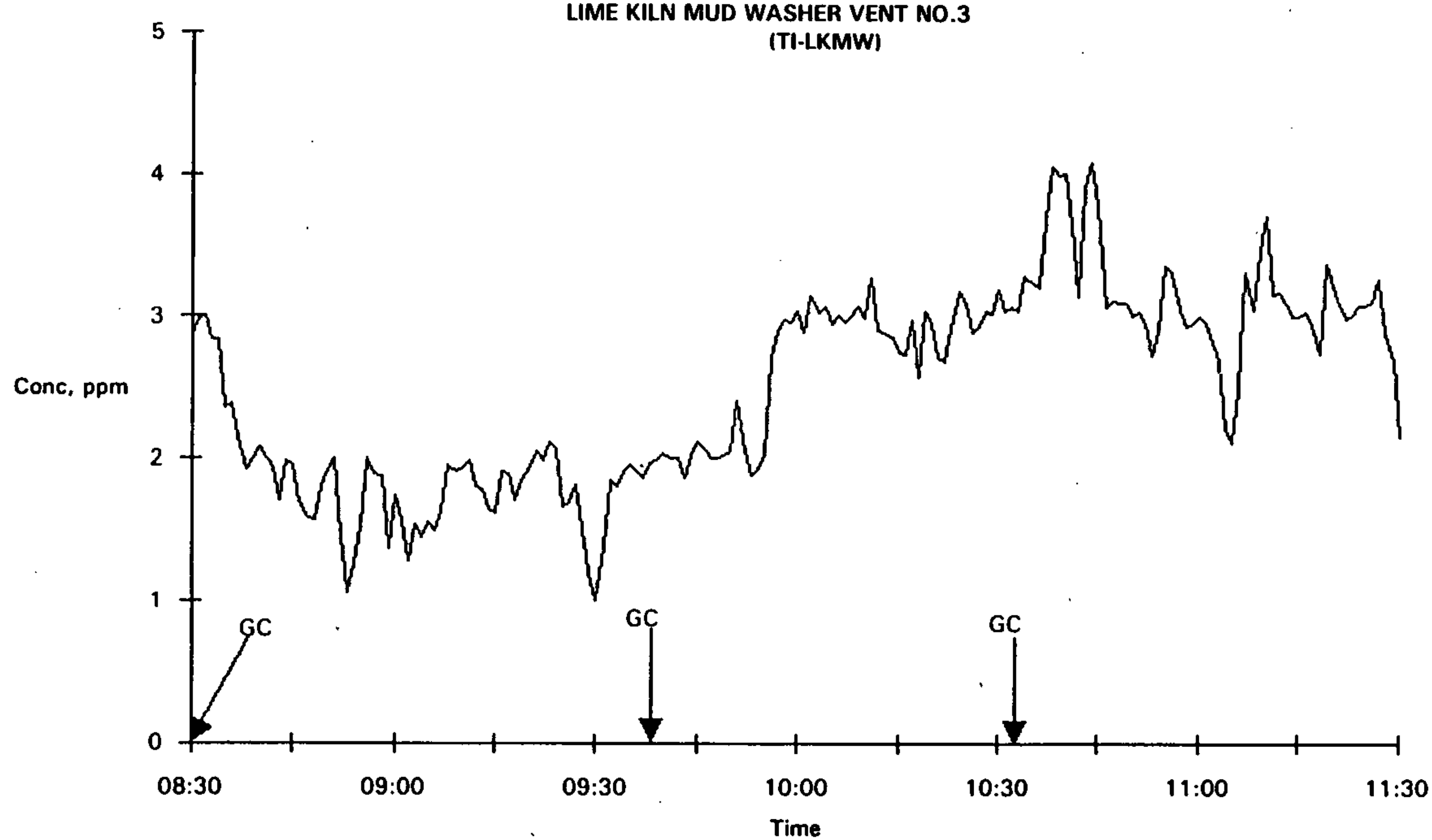

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TABLE 10.1 SUMMARY OF VOC RESULTS

Mill: TEMPLE-INLAND (Evadale) Source: Lime Kiln Mud Washer Vent No 3
Source Code: TI-LKMW Test Dates: 7/20/92 7/21/92
FIN: P-9 CIN: NONE EPN: 43-MW

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	153	153	153	
Volumetric Flow Rate, x10^3 DSCFM	0.3	0.3	0.3	
Process Operating Conditions				
Production Rate,				
Method 16 Data, lb/hr				
Hydrogen sulfide	ND	ND	ND	0.1
Methyl mercaptan	ND	ND	ND	0.1
Dimethyl sulfide	ND	ND	ND	0.1
Carbon disulfide	ND	ND	ND	0.1
Dimethyl disulfide	ND	ND	ND	0.1
Method 18 Data, lb/hr				
Methanol	ND	ND	ND	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	ND	ND	ND	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	ND	ND	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	ND	ND	ND	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	ND	ND	ND	0.1

ND=Not Detected
DL=Detection Limit

Section 10.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: Lime Kiln Mud Washer Vent No 3 FIN: P-9
Source Code: TI-LKMW Date: 7/20/92 EPN: 43-MW CIN: NONE

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1421	1521	1621	
Flow Data				
Stack Temperature, °F		153		153
Moisture Content, %		27.1		27.1
Oxygen Concentration, %		20.8		20.8
Carbon Dioxide Concentration, %		0.0		0.0
Volumetric Flow Rate, x10^3 ACFM		0.5		0.5
Volumetric Flow Rate, x10^3 DSCFM		0.3		0.3
Process Operating Conditions				
Production Rate, tons/hr				
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Method 18 Data				
Methanol				
Concentration, ppmvd	2.7 *	2.7 *	2.7 *	2.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill:	TEMPLE-INLAND (Evadale)	Source:	Lime Kiln Mud Washer Vent No 3			FIN:	P-9
Source Code:	TI-LKMW	Date:	7/20/92	EPN:	43-MW	CIN:	NONE

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.4 *	1.4 *	1.4 *	1.4 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Benzene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.4 *	1.4 *	1.4 *	1.4 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

*One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale)	Source:	Lime Kiln Mud Washer Vent No 3			FIN:	P-9
Source Code: TI-LKMW	Date:	7/20/92	EPN:	43-MW	CIN:	NONE

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	11.0	15.1	17.8	14.6
Emission Rate, lb/hr as C	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale)	Source:	Lime Kiln Mud Washer Vent No 3		FIN:	P-9
Source Code: TI-LKMW	Date:	7/21/92	EPN: 43-MW	CIN:	NONE

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	829	929	1029	
Flow Data				
Stack Temperature, °F			153	153
Moisture Content, %			27.2	27.2
Oxygen Concentration, %			20.8	20.8
Carbon Dioxide Concentration, %			0.0	0.0
Volumetric Flow Rate, x10^3 ACFM			0.5	0.5
Volumetric Flow Rate, x10^3 DSCFM			0.3	0.3
Process Operating Conditions				
Production Rate, tons/hr				
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl sulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Carbon disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Method 18 Data				
Methanol				
Concentration, ppmvd	2.7 *	2.7 *	2.7 *	2.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) | Source: Lime Kiln Mud Washer Vent No 3 | FIN: P-9

Source Code: TI-LKMW | Date: 7/21/92 | EPN: 43-MW | CIN: NONE

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.4 *	1.4 *	1.4 *	1.4 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Benzene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.4 *	1.4 *	1.4 *	1.4 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) | Source: Lime Kiln Mud Washer Vent No 3 | FIN: P-9
Source Code: TI-LKMW | Date: 7/21/92 | EPN: 43-MW | CIN: NONE

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	2.7	4.1	4.1	3.7
Emission Rate, lb/hr as C	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

Section 10.2 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL TEMPLE-INLAND SOURCE TI-LKMW

1. CALIBRATION

THEOR	DATE 7/20/92		DATE 7/21/92		
ppm	ppm	%REC	ppm	%REC	%REC
0	-4		-3		
90	84	93%	88		98%
360	377	105%	369		103%
747	739	99%	742		99%

2. PROPANE LINE RECOVERY

	DATE 7/20/92			DATE 7/21/92		
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	84	81	96%	10	11	110%
AFTER	10	11	110%	85	86	101%

3. LINE BLANK

	[-------------- ppm	--------------]		
BEFORE RUN	0	0	0	0
AFTER RUN	0	0	0	0

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QUALITY CONTROL SUMMARY
METHOD 18

MILL TEMPLE-INLAND SOURCE TI-LKMW

1. CHECK STANDARD

ANALYTE	THEOR	DATE	7/20/92	THEOR	DATE	7/21/92
	ppm	ppm	%REC	ppm	ppm	%REC
ethanol	55.64	35.71	64%	55.64	22.94	41%
acetone	44.47	37.73	85%	44.47	33.50	75%
isopropanol	42.65	40.57	95%	42.65	40.26	94%
benzene	36.54	79.13	217%	36.54	71.27	195%
bromodichloromethane	40.17	37.17	93%	40.17	36.86	92%
toluene	30.73	28.13	92%	30.73	27.11	88%
ethyl benzene	26.67	24.55	92%	26.67	23.22	87%
m-xylene	26.64	24.51	92%	26.64	23.09	87%
o-xylene	26.76	24.58	92%	26.76	23.09	86%
cumene	23.47	21.71	92%	23.47	20.49	87%
alpha-pinene	20.49	19.06	93%	20.49	18.22	89%
beta-pinene	20.59	16.14	78%	20.59	14.95	73%
3-carene	20.61	18.53	90%	20.61	17.46	85%
p-cymene	20.92	18.61	89%	20.92	17.74	85%

2. PROPANE RESPONSE

	THEOR					
BEFORE RUN	125	119.91	96%	5.03	4.85	96%
AFTER RUN	5.03	4.85	96%	29.90	28.36	95%

3. METHANOL LINE RECOVERY

	THEOR					
BEFORE RUN	103.89	102.15	98%	95.48	85.14	89%
AFTER RUN	110.76	91.64	83%	105.31	105.31	

4. LINE BLANK

	[-------------FILE REF-------------]	
BEFORE RUN	GJB4008	GKB4008
AFTER RUN	GKB4008	GLB4011A

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QUALITY CONTROL SUMMARY
METHOD 16

MILL TEMPLE-INLAND SOURCE TI-LKMW

1. CALIBRATION

ANALYTE	LO	MED	HI	CORR COEFF
	ppm	ppm	ppm	
7/20/92				
hydrogen sulfide	4.38	13.00	30.90	
methyl mercaptan	4.28	12.70	30.10	
dimethyl sulfide	5.78	17.20	40.70	
carbon disulfide	1.66	4.94	11.70	
dimethyl disulfide	2.69	8.01	19.00	
7/21/92				
hydrogen sulfide	3.23	12.10	29.00	
methyl mercaptan	3.16	11.80	28.40	
dimethyl sulfide	4.26	15.90	38.30	
carbon disulfide	1.23	4.58	11.00	
dimethyl disulfide	1.99	7.42	17.90	

2. HYDROGEN SULFIDE LINE RECOVERY

	DATE 7/20/92			DATE 7/21/92		
	INST	LINE	%REC	INST	LINE	%REC
BEFORE						
AFTER						

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SECTION 11
SEWER MANHOLE AREA
(TI-SMA)

Section 11.1 Emission Test Results - VOC

Section 11.2 Quality Control Results

11. TI-SMA

SECTION 11
SEWER MANHOLE AREA
(TI-SMA)

The Sewer Manhole Area was tested for volatile organic compounds on 7/21/92. One bag sample was collected and analyzed by Methods 25A, 16, and 18. All results are presented in Table 11.1.

Total Hydrocarbons (M25A)

The bag sample was diluted by a factor of 35.7 and analyzed for total hydrocarbons.

Volatile Organic Compounds (M16 and M18)

Reduced sulfur compounds were determined by making two dilutions of the bag sample. Method 18 analysis involved two injections of the diluted sample used for Method 25A analysis.

Section 11.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: TEMPLE-INLAND (Evadale) Source: Sewer manhole area
Source Code: TI-SMA EPN: Mn.Hle FIN: P-13

Compound	Sampling Date: Run 1	7/21/92 Run 2	Time: 1330 Avg Conc. (ppm)
METHOD 16			
Methyl mercaptan	2653.6	2632.2	2642.9
Dimethyl sulfide	122.5	134.6	128.6
Carbon disulfide	53.5 *	53.5 *	53.5 *
Dimethyl disulfide	378.4	371.3	374.9
METHOD 18			
Methanol	71.4 *	71.4 ●	71.4 ●
Ethanol	17.9 ●	17.9 *	17.9 *
Acetone	17.9 *	17.9 *	17.9 *
2-Propanol	17.9 *	17.9 *	17.9 *
2-Butanone	17.9 *	17.9 *	17.9 *
Chloroform	35.7 *	35.7 *	35.7 *
Benzene	17.9 *	17.9 *	17.9 *
Bromodichloromethane	35.7 *	35.7 *	35.7 *
Toluene	17.9 *	17.9 *	17.9 *
Ethyl benzene	17.9 ●	17.9 *	17.9 *
m-, p-Xylene	17.9 *	17.9 *	17.9 *
o-Xylene	17.9 *	17.9 *	17.9 *
Cumene	17.9 ●	17.9 *	17.9 *
alpha-Pinene	160.8	145.1	153.0
beta-Pinene	47.7	42.3	45.0
3-Carene	17.9 *	17.9 *	17.9 *
Terpenes	6.8	15.9	11.4
p-Cymene	17.9 ●	17.9 *	17.9 *
Knowns (as Carbon)	6148.2	6035.7	6092.0
Unknowns (as Carbon)	15.7	62.7	39.2
METHOD 25A			
Total Hydrocarbons (as Carbon)	6283.0		6283.0

M16 reported as dry ppm
M18, M25A reported as wet ppm
* Less than the detection limit given

WESTON

Section 11.2 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL TEMPLE-INLAND SOURCE TI-SMA

1. CALIBRATION

THEOR	DATE	7/21/92	DATE	
ppm	ppm	%REC	ppm	%REC
0	-4			
90	84	93%		
360	377	105%		
747	739	99%		

2. PROPANE LINE RECOVERY

	DATE 7/21/92 INST	LINE	%REC	DATE INST	LINE	%REC
BEFORE	85	86	101%			
AFTER	85	86	101%			

3. LINE BLANK

	[-------------- ppm -------------]		
BEFORE RUN	0	0	
AFTER RUN	0	0	

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QUALITY CONTROL SUMMARY
METHOD 18

MILL TEMPLE-INLAND SOURCE TI-SMA

1. CHECK STANDARD

ANALYTE	THEOR	DATE	7/21/92	THEOR	DATE	
	ppm	ppm	%REC	ppm	ppm	%REC
ethanol	55.64	22.94	41%			
acetone	44.47	33.50	75%			
isopropanol	42.65	40.26	94%			
benzene	36.54	71.27	195%			
bromodichloromethane	40.17	36.86	92%			
toluene	30.73	27.11	88%			
ethyl benzene	26.67	23.22	87%			
m-xylene	26.64	23.09	87%			
o-xylene	26.76	23.09	86%			
cumene	23.47	20.49	87%			
alpha-pinene	20.49	18.22	89%			
beta-pinene	20.59	14.95	73%			
3-carene	20.61	17.46	85%			
p-cymene	20.92	17.74	85%			

2. PROPANE RESPONSE

	THEOR				
BEFORE RUN	5.03	4.85	96%		
AFTER RUN	29.90	28.36	95%		

3. METHANOL LINE RECOVERY

	THEOR				
BEFORE RUN	95.48	85.14	89%		
AFTER RUN	107.18	105.31	98%		

4. LINE BLANK

	[-------------FILE REF-------------]	
BEFORE RUN	GKB4008	
AFTER RUN	GLA4011A	

* Analysis was performed upon bag sample.

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QUALITY CONTROL SUMMARY
METHOD 16

MILL TEMPLE-INLAND SOURCE TI-SMA

1. CALIBRATION

ANALYTE	LO	MED	HI	CORR COEFF
	ppm	ppm	ppm	
7/21/92				
hydrogen sulfide	3.23	12.10	29.00	
methyl mercaptan	3.16	11.80	28.40	
dimethyl sulfide	4.26	15.90	38.30	
carbon disulfide	1.23	4.58	11.00	
dimethyl disulfide	1.99	7.42	17.90	
hydrogen sulfide				
methyl mercaptan				
dimethyl sulfide				
carbon disulfide				
dimethyl disulfide				

2. HYDROGEN SULFIDE LINE RECOVERY

	DATE INST	7/21/92 LINE	%REC	DATE INST	LINE	%REC
BEFORE						
AFTER						

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APPENDIX A PROCESS STREAM SAMPLE RESULTS

APPENDIX A

WESTON MANAGERS DESIGNERS/CONSULTANTS

APPENDIX A PROCESS STREAM SAMPLE RESULTS

Process stream sample results were not provided by NCASI.

APPENDIX B COMPARISON OF CHLOROFORM RESULTS

APPENDIX B

WESTON
MANAGERS DESIGNERS/CONSULTANTS

APPENDIX B COMPARISON OF CHLOROFORM RESULTS

COMPARISON OF CHLOROFORM RESULTS

TEMPLE-INLAND

Source	Date	ppm Method 18			Sorbent Tube
BPSO1	7/9/92	41.3	49.9	36.0	39.0
	7/10/92	36.5	31.9	38.1	35.7
BPSO2	7/10/92	<1.2	10.1	10.3	6.8
	7/11/92	11.1	12.0	13.7	9.7
BPSO3	7/9/92	253.1	268.5	233.4	200.4
	7/13/92	75.3			106.8
	7/14/92	140.4	145.9		50.0

APPENDIX C BLEACH PLANT DESCRIPTION AND OPERATING CONDITIONS

BLEACH PLANT SCRUBBER

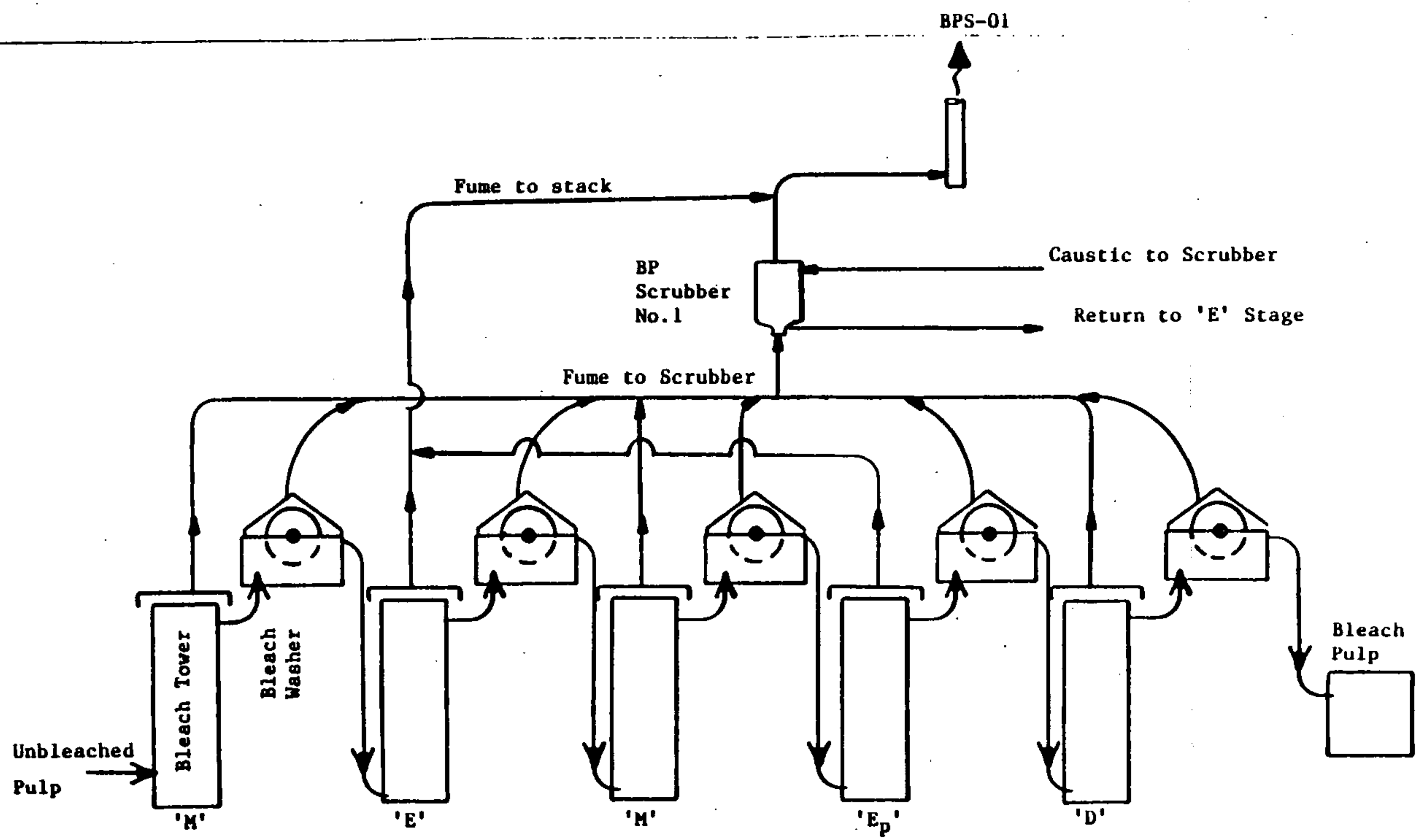
At this facility, vent gases from (M, E, and D, stage towers, washer hoods, and seal tanks are collected and transported to a scrubber system along with the vents from the ClO_2 generator/absorbers are collected and transported to scrubber systems for removal of Cl (Monox-L) and ClO_2 fumes. Diagram BP-1, Diagram BP-2, and Diagram BP-3 are schematics of the Cl_2 and ClO_2 scrubber collection system. Diagram BP-4 is schematic of the typical scrubber.

No.1 bleach plant scrubber system (hardwood) has a design flow rate of 10,000 ACFM at 125°F. This system uses a 3% caustic scrubber solution circulating at 450 gpm.

No.2 bleach plant scrubber system (softwood and ClO_2 generator) has a design flow rate of 16,500 ACFM at 130°F, using a 3% caustic scrubber solution circulating at 500 gpm.

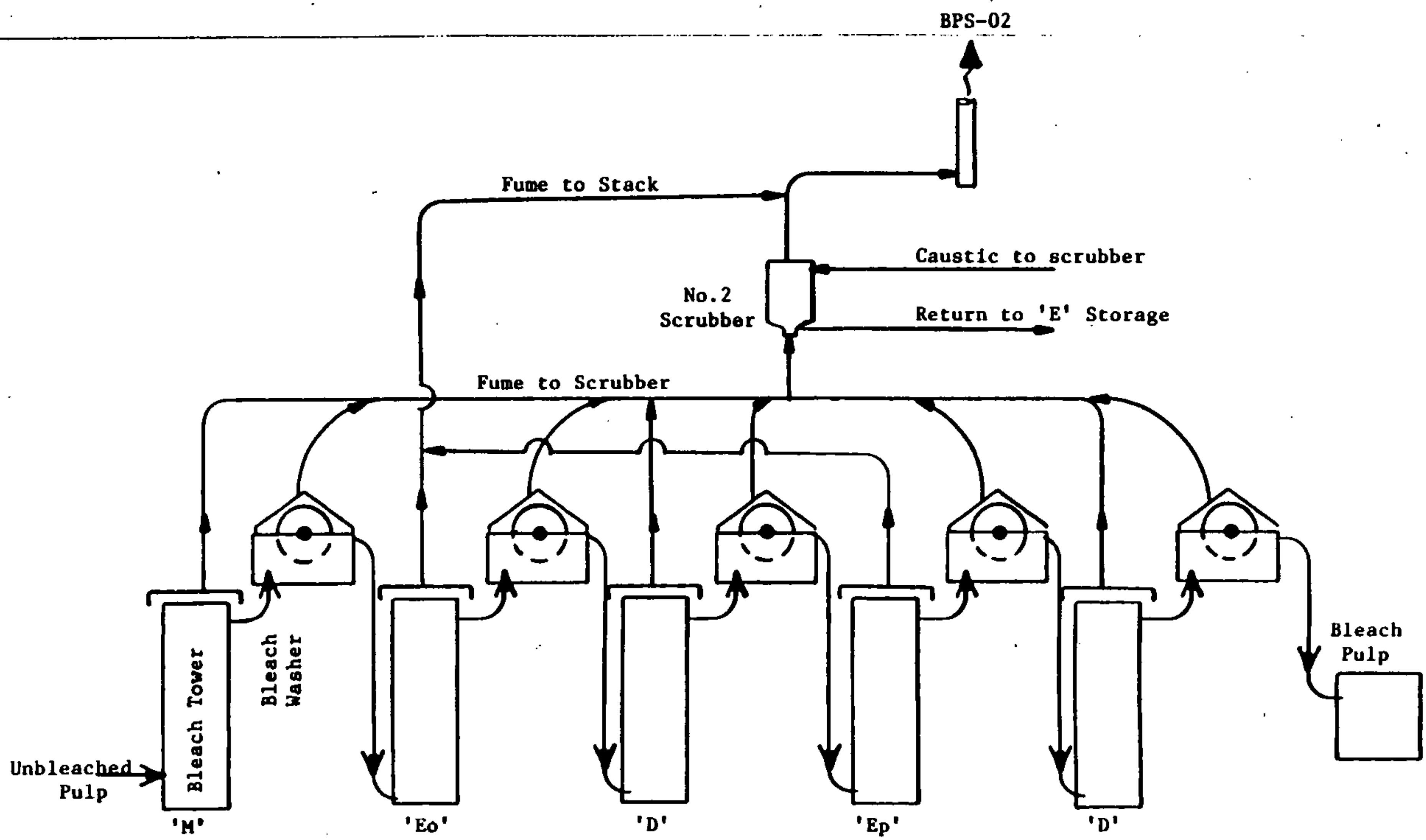
No.3 bleach plant scrubber system (softwood) has a design flow rate of 5700 ACFM at 115°F with a 3% caustic scrubbing media circulating at 400 gpm.

The mill has three parallel bleach lines with 5 sequences which produce 850 tons/day bleached kraft softwood pulp to a final G.E. brightness of 91 and a hardwood line productng 725 ADTD to a brightness of 91. Tables BP-1, BP-2, and BP-3 show bleach plant conditions during testing.



'M'-- Monox-L
'E'-- Caustic Extract
'p'-- Peroxide
'D'--Chlorine Dioxide

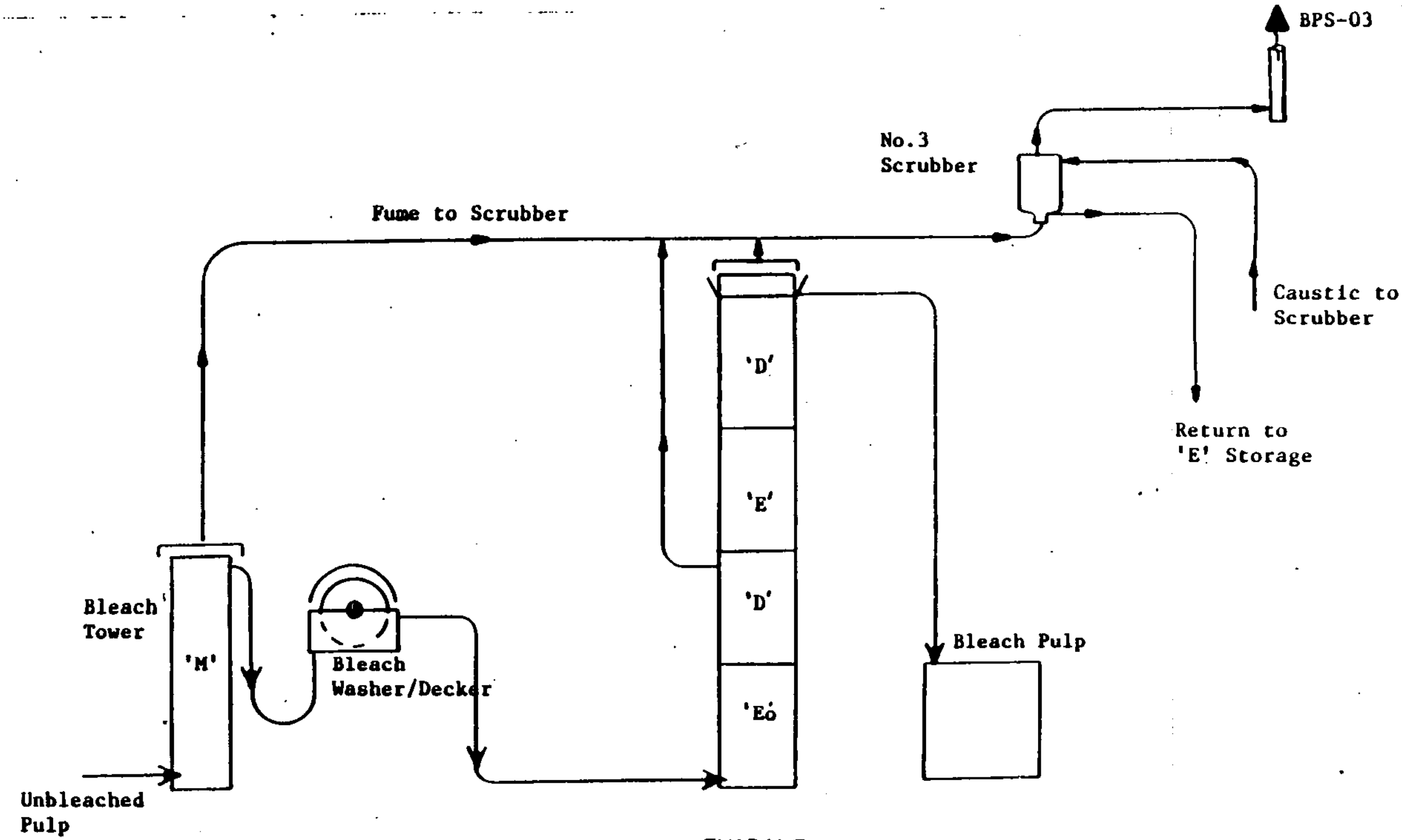
EVADALE
TEMPLE-INLAND
NO.1 B.ᴾ HDWD.



'M' -- Monox-L
'E' -- Caustic
'O' -- Oxygen
'p' -- peroxide
'D' -- Chlorine Dioxide

EVADALE
TEMPLE-INLAND
NO.2 B.P. SOFTWOOD

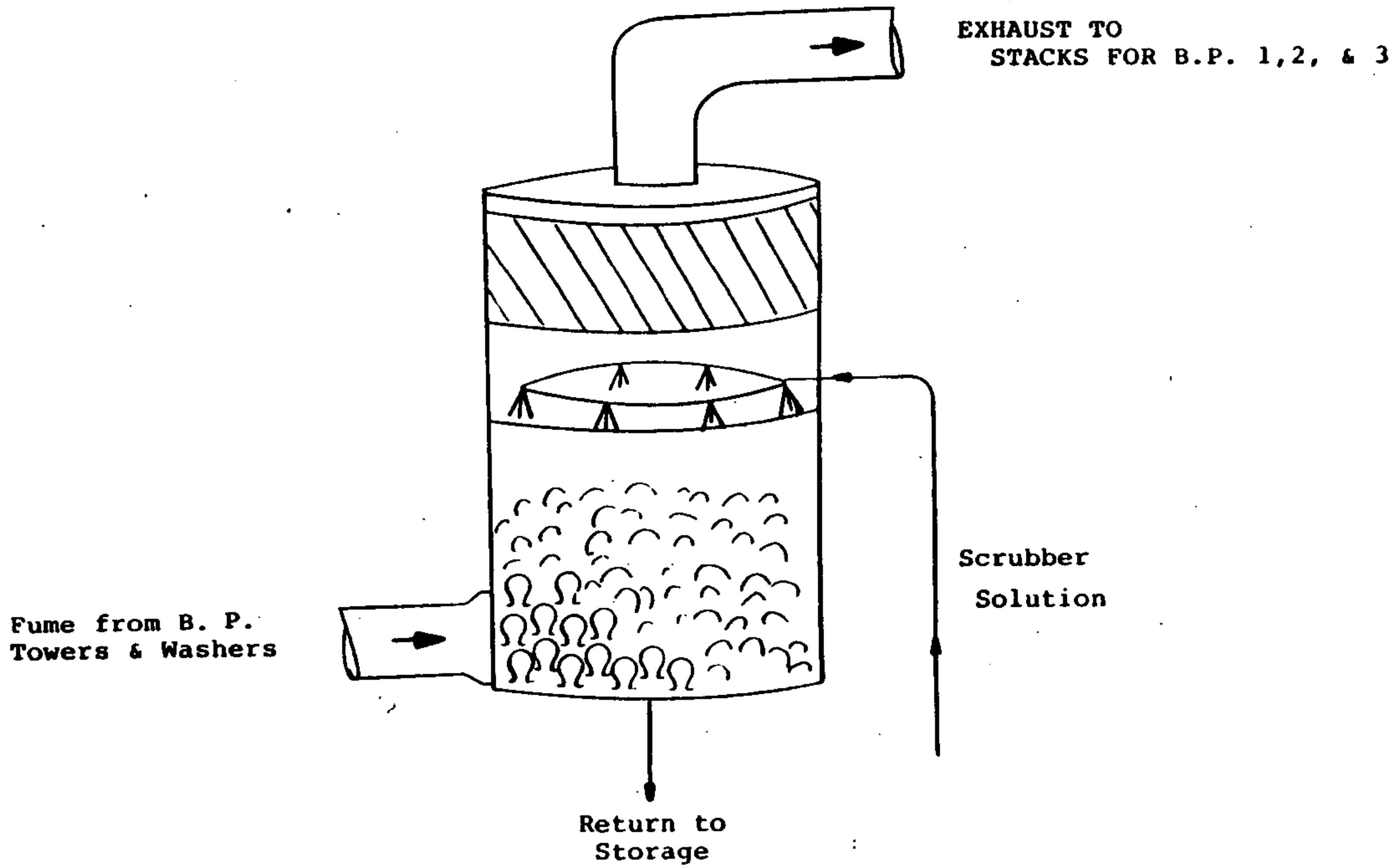
Diagram BP-2



EVADALE
TEMPLE-INLAND
NO.3 B.P. SOFTWOOD/BATCH HDWD

'M' - Monox-L
'E' - Caustic
'o' - Oxygen
'D' - Chlorine Dioxide

Diagram BP-3



EVADALE
TEMPLE-INLAND
B.P. SCRUBBERS Nos. 1,2, & 3

Diagram BP-4

BLEACHING SEQUENCE

BLEACH PLANT NO. 1					
STAGE	M	E	M	Ep	D
1. Consistency percent	(Into) 7/9 4.8 7/10 4.3	----- -----	----- -----	----- -----	----- -----
2. Temp. °F	7/9 --- 7/10 ----	160° 160°	---- ----	150°F 150°F	150°F 150°F
3. Time in Stage	7/9 No Data 7/10 No Data	----- -----	----- -----	----- -----	----- -----
4. Bl. Chemical use rate lb/ton	7/9 HOCl 65 7/10 HOCl 67	NaOH 15.3 NaOH 15.6	HOCl 25.1 HOCl 28.2	H_2O_2 4 H_2O_2 4	ClO_2 7.0 ClO_2 7.8
5. pH - Vat	7.9 3.7 7/10 3.8	10.5 10.8	5.4 5.7	10.8 10.8	5.5 5.5
6. K No.	7/9 7/10	----- -----	----- -----	----- -----	----- -----
7. Brightness	7/9 46 7/10 42	----- -----	77 75	----- -----	91 90

Table BP-1

BLEACHING SEQUENCE

BLEACH PLANT NO. 2					
STAGE	M	Eo	D	Ep	D
1. Consistency percent	7/9 (Into) 3.9 7/10 3.9	-------- ------	-------- --------	-------- ------	-------- --------
2. Temp.°F	7/9 ----- 7/10 -----	160°F 160°F	160°F 154°F	150°F 150°F	170°F 170°F
3. Time in Stage	7/9 No Data 7/10 No Data	-------- --------	-------- --------	-------- ------	-------- --------
4. Bl. Chemical use rate	7/9 ClO_2 6.0 Monox-L 120 7/10 ClO_2 6.0 Monox-L 90	NaOH 36 NaOH 39	ClO_2 22 ClO_2 19	NaOH 8-gpm NaOH 8-gpm	ClO_2 9.0 ClO_2 8.6
5. pH - Vat	7/9 3.5 7/10 3.1	11.0 11.1	3.7 3.2	11.0 11.0	5.6 5.8
6. K No.	7/9 7/10	-------- ------	-------- ------	-------- --------	-------- --------
7. Brightness	7/9 30 7/10 31	-------- --------	78 79	-------- --------	90 91

Table BP-2

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BLEACHING SEQUENCE

BLEACH PLANT NO. 3					
STAGE	M	Eo	D	E_2	D_2
1. Consistency percent	(Into) 7/9 4.0 7/10 4.0	------- -------	------- -------	------- -------	------- -------
2. Temp. °F	7/9 ------- 7/10 -------	150°F 150°F	150°F 150°F	------- -------	175°F 175°F
3. Time in Stage	7/9 No Data 7/10 No Data	------- -------	------- -------	------- -------	------- -------
4. Bl. Chemical use rate lb/ton	Monox-L 7/9 30 gpm Monox-L 7/10 30 gpm	NaOH 8 gpm NaOH 8 gpm	ClO_2 65 gpm ClO_2 65 gpm	NaOH 3.8 gpm NaOH 3.8 gpm	ClO_2 18 gpm ClO_2 14 gpm
5. pH - Vat	7/9 4.4 7/10 4.1	11.4 11.2	3.6 3.1	6.2 6.4	6.1 6.1
6. K No.	7/9 7/10	------- -------	------- -------	------- -------	------- -------
7. Brightness	7/9 39 7/10 38	------- -------	------- -------	------- -------	87.0 88.0

Table BP-3

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WESTON
MANAGERS DESIGNERS/CONSULTANTS

Section 20.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	Extraction Washer Vent			FIN:	PN2155
Source Code: SP-BPHEWV	Date:	6/10/92	EPN:	SN68	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1523	1623	1723	
Flow Data				
Stack Temperature, °F		101		101
Moisture Content, %		6.7		6.7
Oxygen Concentration, %		20.8		20.8
Carbon Dioxide Concentration, %		0.0		0.0
Volumetric Flow Rate, x10^3 ACFM		16.2		16.2
Volumetric Flow Rate, x10^3 DSCFM		14.2		14.2
Process Operating Conditions				
Production Rate, ADT pulp/hr	12.5	12.5	12.5	12.5
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	23.1	12.9	9.7	15.2
Emission Rate, lb/hr	1.6	0.9	0.7	1.1
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.6	0.4
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA　　Source: Extraction Washer Vent　　FIN: PN2155
Source Code: SP-BPHEWV　　Date: 6/10/92　　EPN: SN68　　CIN: NA

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.1 *	1.4	1.1 *	0.8
Emission Rate, lb/hr	0.3 *	0.4	0.3 *	0.2
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source: Extraction Washer Vent		FIN: PN2155
Source Code: SP-BPHEWV	Date: 6/10/92	EPN: SN68	CIN: NA

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Knowns as Carbon				
Concentration, ppmvd	15.3	11.1	8.5	11.6
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	2.1	0.7
Sum M18 as Carbon, lb/hr	0.4	0.3	0.3	0.3
Unknown Compounds % of Total	0.0%	0.0%	20.2%	6.7%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr as C	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

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Section 20.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA | Source: Extraction Washer Vent | FIN: PN2155
Source Code: SP-BPHEWV | Date: 6/10/92 | EPN: SN68 | CIN: NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1715			
Flow Data				
Stack Temperature, °F	101			101
Moisture Content, %	6.7			6.7
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	16.2			16.2
Volumetric Flow Rate, x10^3 DSCFM	14.2			14.2
Process Operating Conditions				
Production Rate, ADT pulp/hr	12.5			12.5
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	2.6			2.6
Emission Rate, lb/hr	0.7			0.7
Hydrogen chloride				
Concentration, ppmvd	1.1			1.1
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

Section 20.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL SP SOURCE SP-BPHEWV

1. CALIBRATION

THEOR	DATE	6/10/92	DATE
ppm	ppm	%REC	ppm
0	-7	-0.7%	
90	94	104.4%	
149	156	104.7%	
375	371	98.9%	

2. PROPANE LINE RECOVERY

	DATE	6/10/92		DATE	
	INST	LINE	%REC	INST	LINE
BEFORE	153	137	90%		
AFTER	155	145	94%		

3. LINE BLANK

	DATE	6/10/92	DATE	
	INST	LINE	INST	LINE
BEFORE	0	0		
AFTER	0	0		

QUALITY CONTROL SUMMARY
METHOD 18

MILL SP SOURCE SP-BPHEWV

1. CHECK STANDARD

ANALYTE	THEOR	DATE	6/10/92	THEOR	DATE	
	ppm	ppm	%REC	ppm	ppm	%REC
ethanol	55.64	31.93	57.39%			
acetone	44.47	33.14	74.51%			
isopropanol	42.65	35.49	83.21%			
dimethyl sulfide	9.78	8.25	84.39%			
benzene	36.54	35.27	96.53%			
bromodichloromethane	20.08	17.27	85.98%			
dimethyl disulfide	36.26	30.88	85.16%			
toluene	30.73	28.21	91.80%			
ethyl benzene	26.67	24.38	91.42%			
m-xylene	53.27	49.13	92.23%			
o-xylene	26.76	24.45	91.36%			
cumene	23.47	21.82	92.97%			
alpha-pinene	20.49	19.53	95.28%			
beta-pinene	20.59	19.77	96.03%			
3-carene	20.61	19.35	93.87%			
p-cymene	20.92	19.27	92.10%			

2. PROPANE RESPONSE

	THEOR			THEOR	
BEFORE RUN	89.7	90.2	100.5%		
AFTER RUN	89.7	90.2	100.6%		

3. METHANOL LINE RECOVERY

	THEOR			THEOR	
BEFORE RUN	100.0	106.8	106.8%		
AFTER RUN	109.3	111.8	102.3%		

4. LINE BLANK

	[--------------FILE REF--------------]	
BEFORE RUN	FAA4003	
AFTER RUN	FBA4001	

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Section 20.4 Process Operating Data

MILL: SIMPSON PAPER SOURCE: HARDWOOD BLEACH PLANT

	UNITS														
DATE		6/10 ->								6/16					
TIME		1044	1044	1523	1623	1723	1523	1623	1723	1110	1210	1310	1520	1620	1720
SOURCE		BPHSHW	BPHCWV	BPHCSS ->			BPHEWY ->			BPHCSS ->			BPHCTS ->		
FIN		PN2166	PN2151	PN2152 ->			PN2151 ->			PN2152 ->			PN2162 ->		
EPN		SN75	SN66	SN88 ->			SN66 ->			SN88 ->			SN74 ->		
WOOD		HARDWOOD ->													
PRODUCT	T/D	325	325	300	300	275	300	300	275	300	275	275	275	275	275
KAPPA		16.9	16.9	17.9	17.9	18.5	17.9	17.9	18.5	19.0	18.2	18.2	18.8	21.5	20.7
CHEM USAGE															
Cl_2	LB/T	112	112	112	112	80	112	112	80	136	128	128	72	108	116
NaOH	LB/T	114	114	108	108	105	108	108	105	132	133	133	133	130	130
NaOCl	LB/T	36	36	32	32	32	32	32	32	34	34	34	34	34	34
ClO_2	LB/T	17	17	17	17	17	17	17	17	17	17	17	17	17	17
NaOCl	LB/T	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NaOH	LB/T	8	8	8	8	8	8	8	8	4	4	4	4	4	4
C STOCK	F	100	190	100	100	100	100	100	100	116	116	116	116	116	116
E MIXER	F	110	110	110	110	110	110	110	110	118	118	118	118	118	118
H_1 MIXER	F	128	128	128	128	128	128	128	128	128	128	128	128	128	128
D UPFLOW	F	154	154	154	154	154	154	154	160	160	160	160	160	160	160
H_2 MIXR	F	110	110	110	110	110	110	110	110	110	110	110	110	110	110
pH LEVEL															
Eo		10.6	10.8	10.8	10.8	10.9	10.8	10.8	10.9	10.6	11.1	11.1	10.9	11.1	10.8
H_1		8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.0	7.8	7.8	8.1	8.3	8.5
D		4.5	4.5	4.5	4.5	4.6	4.5	4.5	3.9	4.0	3.8	3.8	4.1	3.7	4.1
H_2		9.0	9.0	9.0	9.0	9.0	9.0	9.0	8.8	8.6	8.7	8.7	8.6	8.6	8.6

SCRUBBER, Cl_2	(2) SCRUBBERS, ClO_2 TOWER AND SEAL BOX
TYPE - COLUMN	TYPE - COLUMN
SRB MED - TELLERETTES	SRB MED - TELLERETTES
GAS FLOW SCFM - NO FAN	GAS FLOW SCFM - NO FAN
LIQ FLOW 3 GPM 10% NaOH	LIQ FLOW 10 GPM DILUTE SODIUM BISULFITE
DP IN H_2O - NO FAN	DP IN H_2O - NO FAN

NOTES: 1.0 BLEACHING SEQUENCE -	RETENTION TIMES, MIN @ 350 T/D
CHLORINE, C	42
CAUSTIC SODA, E	42
1st SODIUM HYPOCHLORITE WITH CAUSTIC, H_1	170
CHLORINE DIOXIDE WITH CAUSTIC, D	220
2nd SODIUM HYPOCHLORITE WITH CAUSTIC, H_2	30

2.0 ALL VALUES ONE HOUR READINGS FROM OPERATIONS LOG

3.0 PRODUCTION IS IN OVEN DRY UNBLEACHED SHORT TONS

4.0 ClO_2 IS AS ClO_2

5.0 H_1 pH REPRESENTS VAT pH WHERE pH IS ADJUSTED BY ADDING CHLORINE FILTRATE TO REDUCE SCALING. ACTUAL pH IN THE HYPO TOWER IS IN THE RANGE OF 9.5.

Note: See Appendix D for Unit Process Description

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21. SP-BPHESB

SECTION 21
EXTRACTION SEAL BOX VENT
(SP-BPHESB)

SECTION 21
EXTRACTION SEAL BOX VENT
(SP-BPHESB)

The Extraction Seal Box Vent was tested on one day. The source was sampled for volatile organic compounds by Methods 25A and 18. Chloroform and hydrogen chloride samples were collected.

Total Hydrocarbons (M25A)

Figure 21.1 presents the THC trend for the test period on 6/20/92. During the first and last hour of testing, total hydrocarbon concentrations ranged from 9 to 67 ppm and 6 to 37 ppm, respectively. During the second hour, concentrations increased to 145 ppm.

Volatile Organic Compounds (M18)

Table 21.1 summarizes the results for Method 18 target compounds, and Section 21.1 is a tabulation of the data. Methanol and chloroform were detected by the Method 18 analyses. Methanol and chloroform concentrations (ppm) increased during the second hour of testing. The volumetric flow was measured during sampling with a pitot tube.

Miscellaneous Parameters

Table 21.2 summarizes the results of testing for hydrogen chloride and chloroform. Section 2.12 tabulates the results for each compound. Chloroform and hydrogen chloride were detected (<0.1 lb/hr).

VOC Quality Control Results

The VOC quality control data are tabulated in Section 21.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 21.4 includes the process operating data as recorded and provided by mill personnel.

FIGURE 21.1

THC TREND ANALYSIS (6/20/92)
EXTRACTION SEAL BOX VENT (SP-BPHESB)

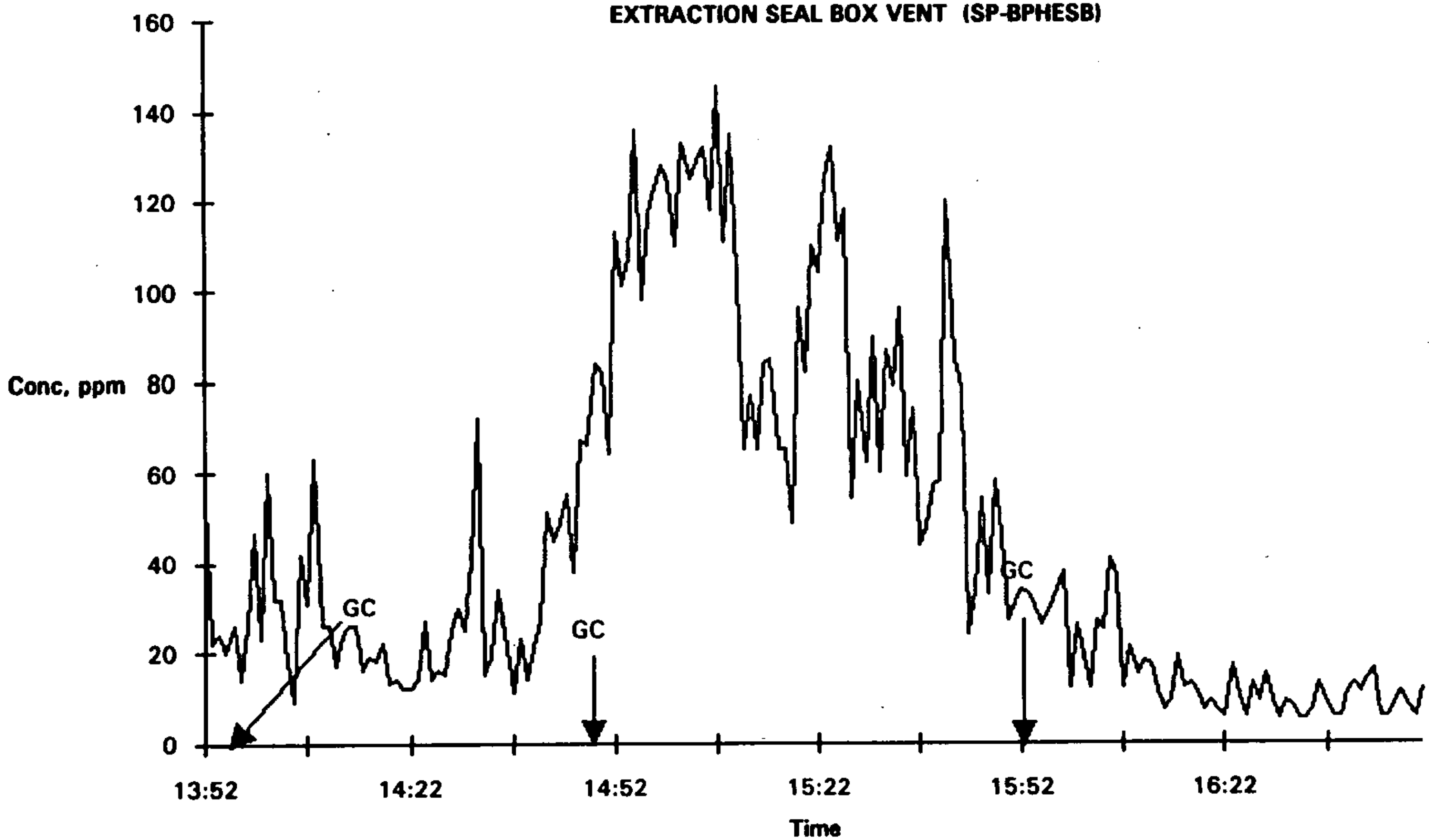

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TABLE 21.1 SUMMARY OF VOC RESULTS

Mill: SIMPSON - PASADENA Source: Extraction Seal Box Vent
Source Code: SP-BPHESB Test Dates: 6/20/92
FIN: PN2156 CIN: NA EPN: SN69

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	104	104	104	
Volumetric Flow Rate, $x10^3$ DSCFM	0.5	0.5	0.5	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	13.5	14.6	14.2	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	<0.1	<0.1	0.1	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	<0.1	0.1	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	<0.1	1.2	0.6	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	ND	ND	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	ND	0.1	0.1	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	<0.1	0.1	0.1	0.1

ND=Not Detected
DL=Detection Limit

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TABLE 21.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: SIMPSON-PASADENA
Source Code: SP-BPHESB
FIN: PN2156 EPN: SN69

Source: Extraction Seal Box Vent
Test Dates: 6/20/92
CIN: NA

	RUN 1	DL
Volumetric Flow Data		
Stack Temperature, °F	104	
Volumetric Flow Rate, x 10^5 DSCFM	0.5	
Process Operating Conditions		
Production Rate, ADT pulp/hr	14.6	
Emission Rate, lb/hr		
Chloroform	<0.1	0.1
Hydrogen chloride	<0.1	0.1

ND = Not Detected
DL = Detection Limit

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Section 21.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	Extraction Seal Box Vent			FIN:	PN2156
Source Code: SP-BPHESB	Date:	6/20/92	EPN:	SN69	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1351	1451	1551	
Flow Data				
Stack Temperature, °F			104	104
Moisture Content, %			7.3	7.3
Oxygen Concentration, %			20.8	20.8
Carbon Dioxide Concentration, %			0.0	0.0
Volumetric Flow Rate, x10^3 ACFM			0.6	0.6
Volumetric Flow Rate, x10^3 DSCFM			0.5	0.5
Process Operating Conditions				
Production Rate, ADT pulp/hr	14.6	14.6	13.5	14.2
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	3.0	23.4	6.3	10.9
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	3.7	0.5 *	0.5 *	1.4
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Extraction Seal Box Vent | FIN: PN2156
Source Code: SP-BPHESB | Date: 6/20/92 | EPN: SN69 | CIN: NA

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	2.1	135.1	59.9	65.7
Emission Rate, lb/hr	0.1 *	1.2	0.5	0.6
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source: Extraction Seal Box Vent	FIN: PN2156
Source Code: SP-BPHESB	Date: 6/20/92 EPN: SN69	CIN: NA

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	11.2	134.5	56.5	67.4
Unknowns as Carbon				
Concentration, ppmvd	0.6	10.7	3.9	5.1
Sum M18 as Carbon, lb/hr	0.1 *	0.1	0.1 *	0.1
Unknown Compounds % of Total	5.5%	7.4%	6.4%	6.4%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	33.4	94.9	16.2	48.2
Emission Rate, lb/hr as C	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

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Section 21.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA	Source:	Extraction Seal Box Vent		FIN:	PN2156
Source Code: SP-BPHESB	Date:	6/20/92	EPN: SN69	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1550			
Flow Data				
Stack Temperature, °F	104			104
Moisture Content, %	7.3			7.3
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.6			0.6
Volumetric Flow Rate, x10^3 DSCFM	0.5			0.5
Process Operating Conditions				
Production Rate, ADT pulp/hr	14.6			14.6
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	6.3			6.3
Emission Rate, lb/hr	0.1 *			0.1 *
Hydrogen chloride				
Concentration, ppmvd	8.8			8.8
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

Section 21.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL SP SOURCE SP-BPHESB

1. CALIBRATION

THEOR	DATE	6/20/92	DATE	1/1/99
ppm	ppm	%REC	ppm	%REC
0	2			
90	75	83.33%		0.00%
149	161	108.05%		0.00%
375	373	99.47%		0.00%

2. PROPANE LINE RECOVERY

	DATE	6/20/92		DATE		
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	88	70	80%			#DIV/0!
AFTER	84	86	102%			#DIV/0!

3. LINE BLANK

	DATE	6/20/92		DATE		
	INST	LINE		INST	LINE	
BEFORE	0	0				
AFTER	0	1				

WESTON QC SUMMARY
METHOD 18

MILL SIMPSON SOURCE SP-BPHESB

1. CHECK STANDARD

FILE NAME		[---------- %REC ----------]		
ppm	THEOR	EXP 1	EXP 2	EXP 3
		FLB4001		
ethanol	55.64	79.89%		
acetone	44.47	112.13%		
isopropanol	42.65	82.26%		
dimethyl sulfide	19.55	100.43%		
benzene	36.54	129.46%		
bromodichloromethane	40.17	120.90%		
dimethyl disulfide	36.26	85.37%		
toluene	30.73	102.00%		
ethyl benzene	26.67	101.85%		
m-xylene	26.64	100.95%		
o-xylene	26.76	101.82%		
cumene	23.47	101.88%		
alpha-pinene	20.49	101.67%		
beta-pinene	20.59	99.11%		
3-carene	20.61	97.81%		
p-cymene	20.92	98.97%		

2. PROPANE RESPONSE

	THEOR	%REC	%REC	%REC
BEFORE RUN	29.9	110.39%		
AFTER RUN	29.9	109.84%		

3. METHANOL RECOVERY

	THEOR	%REC	%REC	%REC
BEFORE RUN	100	77.99%		
AFTER RUN	100	112.40%		

4. LINE BLANK

	[---------- FILE REF ----------]		
BEFORE RUN	FKB4006		
AFTER RUN	FKB4014		

NOTES:

Section 21.4 Process Operating Data

MILL: SIMPSON PAPER | SOURCE: HARDWOOD BLEACH PLANT

DATE		6/19 ->			5/20						5/21		
TIME		0948	1049	1215	0833	0933	1033	1351	1451	1551	0914	1014	'114
SOURCE		BPHSHS ->			BPHFHS ->			BPHESB ->			BPHESB ->		
FIN		PN2187 ->			PN2159 ->			PN2156 ->			PN2156 ->		
EPN		SN76 ->			SN72 ->			SN69 ->			SN69 ->		
	UNITS												
WOOD		HARDWOOD ->											
PRODUCT	T/D	275	275	300	275	275	275	350	350	325	275	275	275
KAPPA		19.8	18.3	20.0	18.1	18.8	18.1	17.6	19.0	19.5	19.2	18.8	19.4
CHEM USAGE													
Cl_2	LB/T	128	120	128	108	108	108	176	176	176	168	168	168
NaOH	LB/T	104	104	111	120	120	135	127	127	153	145	145	134
NaOCl	LB/T	30	30	30	32	32	30	30	30	32	32	32	31
ClO_2	LB/T	16	16	17	17	17	17	18	18	17	17	17	17
NAOCl	LB/T	2	2	2	2	2	2	2	2	2	2	2	2
NaOH	LB/T	4	4	4	4	2	4	4	2	4	4	4	4
D STOCK	F	118	110	118	110	110	112	112	112	118	114	114	114
E MIXER	F	120	120	120	110	110	114	114	114	118	114	114	114
H_1 MIXER	F	128	120	128	120	120	124	120	120	128	124	114	124
D UPFLOW	F	162	162	182	183	183	183	182	162	182	110	110	110
H_2 MIXR	F	110	110	110	110	110	110	110	110	110	110	110	110
pH LEVEL													
E		10.7	10.7	10.8	10.7	10.7	10.0	10.7	10.7	10.5	10.7	10.7	10.9
H_1		7.3	7.3	7.2	8.2	8.2	8.9	7.0	7.0	7.0	7.0	7.0	9.9
D		4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
He_2		8.7	8.7	8.7	8.3	8.3	8.5	8.5	8.5	8.6	8.6	8.6	8.8

SCRUBBER. Cl_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW SCFM - NO FAN
LIQ FLOW 3 GPM 10% NaOH
DP IN H_2O - NO FAN

(2) SCRUBBERS. ClO_2 TOWER AND SEAL BOX
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW SCFM - NO FAN
LIQ FLOW 10 GPM DILUTE SODIUM BISULFITE
OF IN H_2O - NO FAN

NOTES:		RETENTION TIMES, MIN @ 350 T/D
1.0 BLEACHING SEQUENCE -	CHLORINE, C	42
	CAUSTIC SODA, E	42
	1st SODIUM HYPOCHLORITE WITH CAUSTIC, H_1	170
	CHLORINE DIOXIDE WITH CAUSTIC, D	220
	2nd SODIUM HYPOCHLORITE WITH CAUSTIC, H_2	30

2.0 ALL VALUES ONE HOUR READINGS FROM OPERATIONS LOG
3.0 PRODUCTION IS IN OVEN DRY UNBLEACHED SHORT TONS
4.0 ClO_2 IS AS ClO_2
5.0 H_1 pH REPRESENTS VAT pH WHERE pH IS ADJUSTED BY ADDING CHLORINE FILTRATE TO REDUCE SCALING. ACTUAL pH IN THE HYPO TOWER IS IN THE RANGE OF 9.5.

Note: See Appendix D for Unit Process Description

WESTON
MANAGERS DESIGNERS/CONSULTANTS

SECTION 22

FIRST NaOCl WASHER VENT

(SP-BPHFHW)

22. SP-BPHFHW

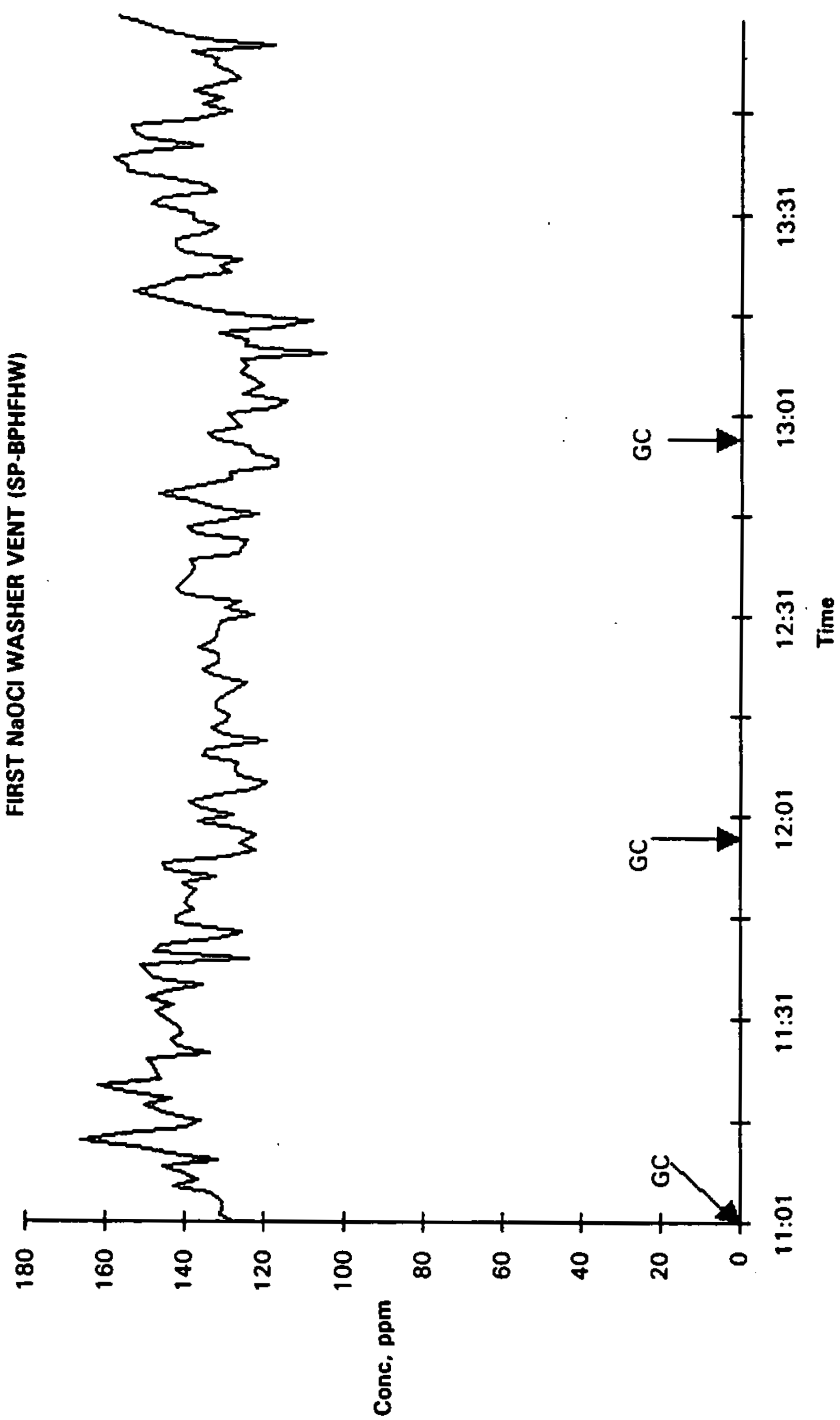

FIGURE 22.1
THC TREND ANALYSIS (6/17/92)
FIRST NaOCl WASHER VENT (SP-BPHFHW)

SECTION 22
FIRST NaOCl WASHER VENT
(SP-BPHFHW)

The First NaOCl Washer Vent was tested on one day. The source was sampled for volatile organic compounds using Methods 25A and 18. Chloroform and hydrogen chloride samples were collected.

Total Hydrocarbons (M25A)

Figure 22.1 presents the THC trend for the test period on 6/17/92. The total hydrocarbon concentrations varied from 105 to 166 ppm.

Volatile Organic Compounds (M18)

Table 22.1 summarizes the results for the Method 18 target compounds, and Section 22.1 is a tabulation of the data. Methanol and chloroform were identified. The volumetric flow was measured during sampling with a pitot tube.

Miscellaneous Parameters

Table 22.2 summarizes the results of testing for hydrogen chloride and chloroform. Section 22.2 tabulates the results for each compound. Chloroform results (lb/hr) were comparable to Method 18 data. Hydrogen chloride was detected (<0.1 lb/hr).

VOC Quality Control Results

The VOC quality control data are tabulated in Section 22.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 22.4 includes the process operating data as recorded and provided by mill personnel.

WESTON

TABLE 22.1 SUMMARY OF VOC RESULTS

Mill: SIMPSON - PASADENA
Source Code: SP-BPHFHW
FIN: PN2158 CIN: NA
Source: First NaOCl Washer Vent
Test Dates: 6/18/92
EPN: SN71

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	135	135	135	
Volumetric Flow Rate, x10^3 DSCFM	0.6	0.6	0.6	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	12.5	12.5	12.5	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	0.2	0.2	0.2	0.1
Ethanol	ND	ND	ND	0.1
Acetone	<0.1	<0.1	0.1	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	1.6	1.9	1.7	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	ND	ND	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	0.2	0.2	0.2	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	0.2	0.2	0.2	0.1

ND=Not Detected
DL=Detection Limit

WESTON
MANAGERS DESIGNERS/CONSULTANTS

TABLE 22.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: SIMPSON-PASADENA
Source Code: SP-BPHFHW
FIN: PN2158 EPN: SN71

Source: First NaOCl Washer Vent
Test Dates: 6/18/92
CIN: NA

	RUN 1	DL
Volumetric Flow Data		
Stack Temperature, °F	135	
Volumetric Flow Rate, x 10^3 DSCFM	0.6	
Process Operating Conditions		
Production Rate, ADT pulp/hr	11.5	
Emission Rate, lb/hr		
Chloroform	1.4	0.1
Hydrogen chloride	<0.1	0.1

ND = Not Detected
DL = Detection Limit

Section 22.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	First NaOCl Washer Vent			FIN:	PN2158
Source Code: SP-BPHFHW	Date:	6/18/92	EPN:	SN71	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1100	1200	1300	
Flow Data				
Stack Temperature, °F	135			135
Moisture Content, %	11.4			11.4
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.8			0.8
Volumetric Flow Rate, x10^3 DSCFM	0.6			0.6
Process Operating Conditions				
Production Rate, ADT pulp/hr	12.5	12.5	12.5	12.5
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd		61.6	70.1	65.9
Emission Rate, lb/hr		0.2	0.2	0.2
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd		0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd		1.8	1.2	1.5
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd		0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: First NaOCl Washer Vent | FIN: PN2158
Source Code: SP-BPHFHW | Date: 6/18/92 | EPN: SN71 | CIN: NA

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd		0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd		156.9	134.0	145.4
Emission Rate, lb/hr		1.9	1.6	1.7
Benzene				
Concentration, ppmvd		0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd		1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd		0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd		0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd		0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd		0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd		0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd		0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd		0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd		0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd		0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill:	SIMPSON - PASADENA	Source:	First NaOCl Washer Vent			FIN:	PN2158
Source Code:	SP-BPHFHW	Date:	6/18/92	EPN:	SN71	CIN:	NA

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd		0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd		191.8	178.0	184.9
Unknowns as Carbon				
Concentration, ppmvd		0.0	1.4	0.7
Sum M18 as Carbon, lb/hr		0.2	0.2	0.2
Unknown Compounds % of Total		0.0%	0.8%	0.4%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	159.1	147.9	152.4	153.1
Emission Rate, lb/hr as C	0.2	0.2	0.2	0.2

COMMENTS

M18 run 1 for 6/18/92 was rejected because not consistent with other GC injections.

* One or more values were less than the detection limit.

Section 22.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA | Source: First NaOCl Washer Vent | FIN: PN2158
Source Code: SP-BPHFHW | Date: 6/18/92 | EPN: SN71 | CIN: NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1310			
Flow Data				
Stack Temperature, °F	135			135
Moisture Content, %	11.4			11.4
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.8			0.8
Volumetric Flow Rate, x10^3 DSCFM	0.6			0.6
Process Operating Conditions				
Production Rate, ADT pulp/hr	11.5			11.5
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	117.1			117.1
Emission Rate, lb/hr	1.4			1.4
Hydrogen chloride				
Concentration, ppmvd	0.9			0.9
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

Section 22.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL SP **SOURCE** SP-BPHFHW

1. CALIBRATION

THEOR	DATE 6/18/92		DATE 1/0/00		
ppm	ppm	%REC	ppm	%REC	%REC
0	-4			#DIV/0!	
90	89	98.89%		#DIV/0!	0.00%
149	157	105.37%		#DIV/0!	0.00%
375	371	98.93%			0.00%

2. PROPANE LINE RECOVERY

	DATE INST	6/18/92 LINE	%REC	DATE INST	1/0/00 LINE		%REC
BEFORE	89	91	102%			0.00%	#DIV/0!
AFTER	89	80	90%			0.00%	#DIV/0!

3. LINE BLANK

	DATE INST	6/18/92 LINE	DATE INST	1/0/00 LINE	
BEFORE	0	0			#DIV/0!
AFTER	0	0			#DIV/0!

WESTON QC SUMMARY
METHOD 18

MILL SIMPSON SOURCE SP-BPHFHW

1. CHECK STANDARD

FILE NAME		[---------------- %REC ----------]		
ppm	THEOR	EXP 1	EXP 2	EXP 3
		FIB4002		
ethanol	55.64	76.31%		
acetone	44.47	109.29%		
isopropanol	42.65	86.88%		
dimethyl sulfide	19.55	102.01%		
benzene	36.54	128.94%		
bromodichloromethane	40.17	127.25%		
dimethyl disulfide	36.26	104.19%		
toluene	30.73	97.12%		
ethyl benzene	26.67	104.32%		
m-xylene	26.64	102.36%		
o-xylene	26.76	105.36%		
cumene	23.47	105.18%		
alpha-pinene	20.49	105.40%		
beta-pinene	20.59	99.62%		
3-carene	20.61	100.51%		
p-cymene	20.92	101.78%		

2. PROPANE RESPONSE

	THEOR	%REC	%REC	%REC
BEFORE RUN	29.9	104.89%		
AFTER RUN	29.9	109.44%		

3. METHANOL RECOVERY

	THEOR	%REC	%REC	%REC
BEFORE RUN	100	88.35%		
AFTER RUN	100	129.67%		

4. LINE BLANK

	[-------------- FILE REF ----------]		
BEFORE RUN	0		
AFTER RUN	FIB4012		

NOTES:

Section 22.4 Process Operating Data

MILL: SIMPSON PAPER | SOURCE: HARDWOOD BLEACH PLANT

DATE		6/17 ->						6/18 ->					
TIME		0939	1039	1139	0939	1039	1139	1100	1200	1300	1539	1639	1739
SOURCE		BPHCTS ->			BPHCBS ->			BPHFHW ->			BPHDWV ->		
FIN		PN2162 ->			PN2307 ->			PN2158 ->			PN2162 ->		
EPN		SN74 ->			SN89 ->			SN71 ->			SN74 ->		
	UNITS												
WOOD		HARDWOOD ->											
PRODUCT	T/D	275	275	300	275	275	300	300	300	275	275	275	275
KAPPA		19.5	17.6	16.0	19.5	17.3	16.0	16.6	17.0	17.0	17.7	17.7	18.5
CHEM USAGE													
Cl_2	LB/T	112	112	110	112	112	110	116	116	116	116	84	84
NaOH	LB/T	145	145	134	145	145	134	114	114	107	107	107	107
NaOCl	LB/T	34	34	34	34	34	34	28	34	28	34	28	34
ClO_2	LB/T	17	17	17	17	17	17	16	16	16	16	16	16
NAOCl	LB/T	2	2	2	2	2	2	2	2	2	2	2	2
NaOH	LB/T	4	2	4	4	2	4	2	2	2	2	4	4
C STOCK	F	118	110	116	118	110	118	120	120	120	120	120	120
E MIXER	F	118	118	118	118	118	118	120	120	120	120	120	120
H_1 MIXER	F	132	132	132	132	132	132	132	132	132	132	132	132
D UPFLOW	F	160	160	160	160	160	160	160	160	160	160	160	160
H_2 MIXR	F	110	110	110	110	110	110	110	110	110	110	110	110
pH LEVEL													
E		10.9	10.9	10.6	10.9	10.9	10.6	10.8	10.8	11.0	11.0	11.0	11.0
H_1		8.5	8.5	8.9	8.5	8.5	8.9	7.5	7.5	7.7	7.7	7.7	8.2
D		4.1	4.1	4.0	4.1	4.1	4.0	3.8	3.8	4.0	4.0	3.8	3.8
H_2		8.7	8.7	8.8	8.7	8.7	8.8	8.6	8.6	8.2	8.2	8.6	8.6

SCRUBBER, Cl_2	(2) SCRUBBERS, ClO_2 TOWER AND SEAL BOX
TYPE - COLUMN	TYPE - COLUMN
SRB MED - TELLERETTES	SRB MED - TELLERETTES
GAS FLOW SCFM - NO FAN	GAS FLOW SCFM - NO FAN
LIQ FLOW 3 GPM 10% NaOH	LIQ FLOW 10 GPM DILUTE SODIUM BISULFITE
DP IN H_2O - NO FAN	DP IN H_2O - NO FAN

NOTES: 1.0 BLEACHING SEQUENCE -	RETENTION TIMES, MIN @ 350 T/D
CHLORINE, C	42
CAUSTIC SODA, E	42
1st SODIUM HYPOCHLORITE WITH CAUSTIC, H_1	170
CHLORINE DIOXIDE WITH CAUSTIC, D	220
2nd SODIUM HYPOCHLORITE WITH CAUSTIC, H_2	30

2.0 ALL VALUES ONE HOUR READINGS FROM OPERATIONS LOG

3.0 PRODUCTION IS IN OVEN DRY UNBLEACHED SHORT TONS

4.0 ClO_2 IS AS ClO_2

5.0 H_1 pH REPRESENTS VAT pH WHERE pH IS ADJUSTED BY ADDING CHLORINE FILTRATE TO REDUCE SCALING. ACTUAL pH IN THE HYPO TOWER IS IN THE RANGE OF 9.5.

Note: See Appendix D for Unit Process Description

MANAGERS DESIGNERS/CONSULTANTS

SECTION 23

FIRST NaOCl SEAL BOX VENT

(SP-BPHFHS)

WESTON
MANAGERS DESIGNERS CONSULTANTS

SECTION 23
FIRST NaOCl SEAL BOX VENT
(SP-BPHFHS)

The First NaOCl Seal Box Vent was tested on two different days. The source was sampled for volatile organic compounds using Methods 25A and 18. Chloroform and hydrogen chloride samples were collected.

Total Hydrocarbons (M25A)

Figures 23.1 and 23.2 present the THC trends for the test periods on 6/20/92 and 6/21/92. On the first day, total hydrocarbon concentrations ranged from 655 to 688 ppm for the first half hour of testing. During the last two hours, concentrations varied from 397 to 650 ppm. On the second day, they ranged from 878 to 611 ppm exhibiting a slight downward trend. At 1034, the concentration dropped to 488 ppm.

Volatile Organic Compounds (M18)

Table 23.1 summarizes the results for the Method 18 target compounds, and Section 23.1 is a tabulation of the data. Method 18 runs for 6/20/92 were rejected because they were not consistent. Methanol, chloroform, and bromodichloromethane were identified. Unknowns recurred following chloroform (~0.8 ppm as carbon) and bromodichloromethane (~ 3.5 ppm as carbon). The volumetric flow was measured during sampling with a pitot tube.

Miscellaneous Parameters

Table 23.2 summarizes the results of testing for hydrogen chloride and chloroform. Section 23.2 tabulates the results for each compound. Chloroform results (lb/hr) were half the Method 18 data values. Hydrogen chloride was detected (<0.1 lb/hr).

VOC Quality Control Results

The VOC quality control data are tabulated in Section 23.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 23.4 includes the process operating data as recorded and provided by mill personnel. Not all process operating data was given for VOC run times. The data with the closest run time was used.

FIGURE 23.1

THC TREND ANALYSIS (06/20/92)
FIRST NaOCl SEAL BOX VENT (SP-BPHFHS)

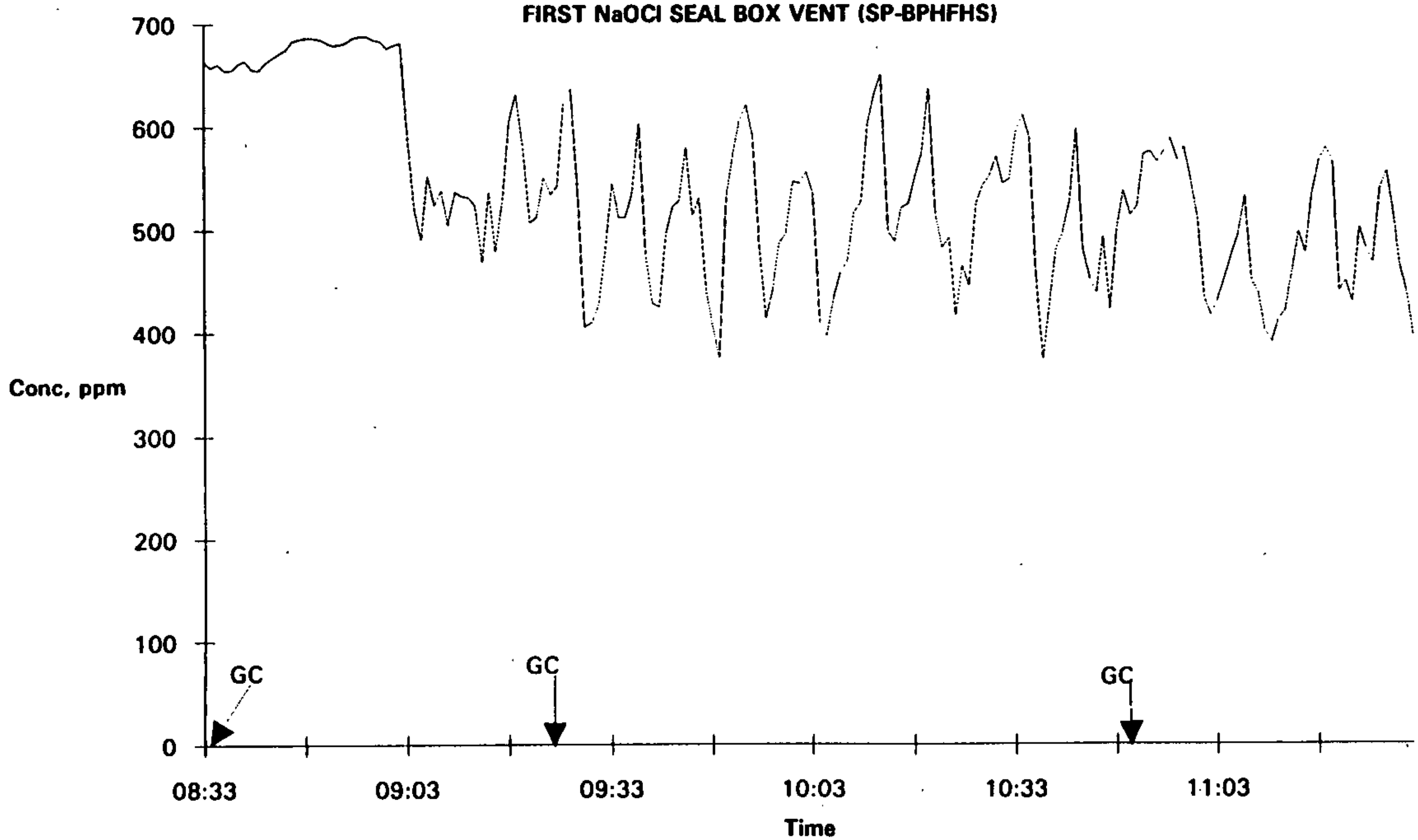

FIGURE 23.2

THC TREND ANALYSIS (6/21/92)
FIRST NaOCl SEAL BOX VENT (SP-BPHFHS)

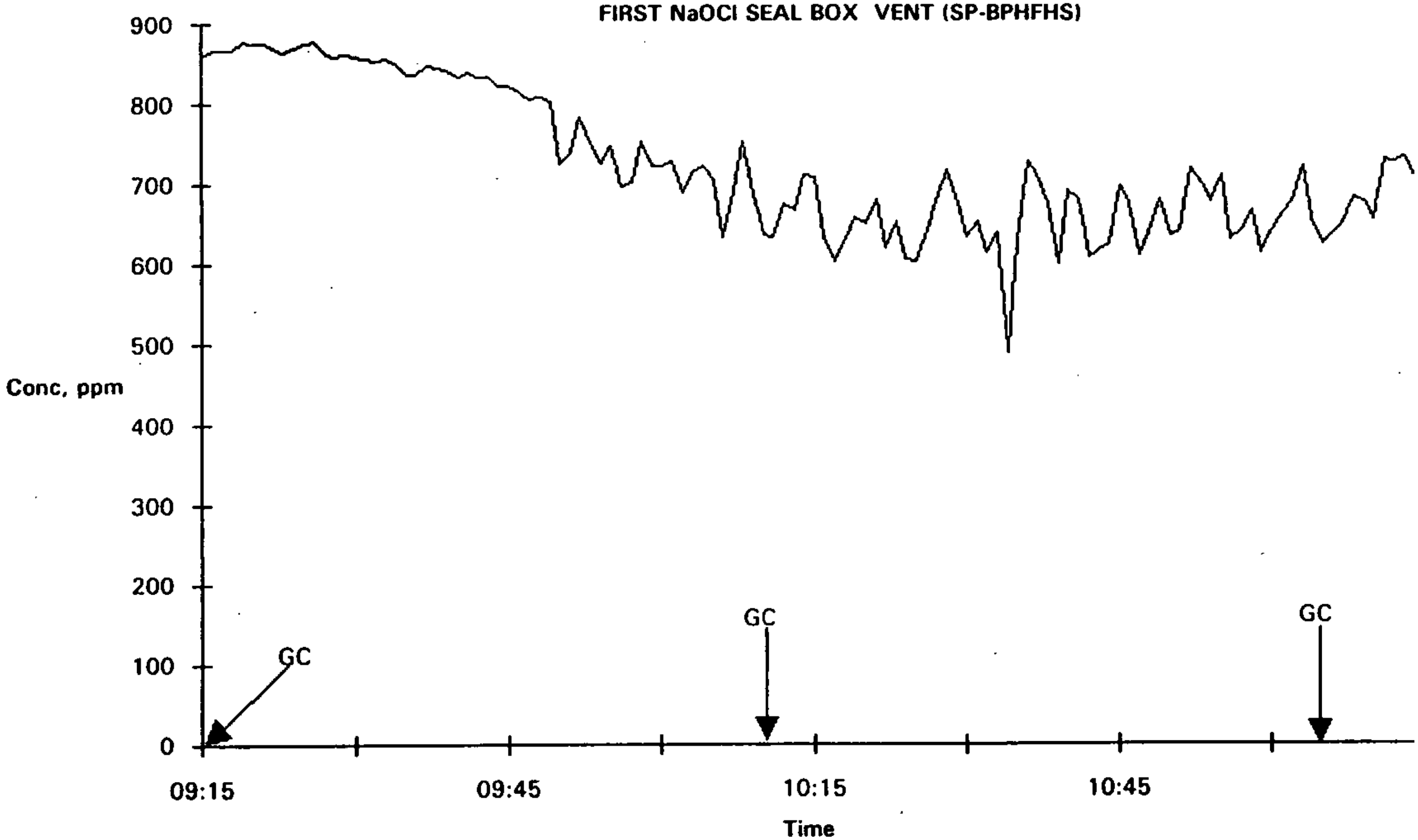

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TABLE 23.1 SUMMARY OF VOC RESULTS

Mill: SIMPSON - PASADENA
Source Code: SP-BPHFHS
FIN: PN2159 CIN: NA

Source: First NaOCl Seal Box Vent
Test Dates: 6/20/92 6/21/92
EPN: SN72

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	121	127	124	
Volumetric Flow Rate, x10^3 DSCFM	0.5	0.6	0.6	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	11.5	11.5	11.5	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	0.1	0.2	0.1	0.1
Ethanol	ND	<0.1	0.1	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	11.3	14.9	13.2	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	<0.1	<0.1	0.1	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	ND	ND	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	1.1	1.4	1.2	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	1.1	1.4	1.2	0.1

ND=Not Detected
DL=Detection Limit

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(L) WWC (R) DW 28 December 1992

TABLE 23.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: SIMPSON-PASADENA
Source Code: SP-BPHFHS
FIN: PN2159 EPN: SN72

Source: First NaOCl Washer Vent
Test Dates: 6/20/92, 6/21/92
CIN: NA

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	121	127	124	
Volumetric Flow Rate, x 10^3 DSCFM	0.5	0.6	0.6	
Process Operating Conditions				
Production Rate, ADT pulp/hr	11.5	11.5	11.5	
Emission Rate, lb/hr				
Chloroform	6.8	7.6	7.2	0.1
Hydrogen chloride	<0.1	<0.1	0.1	0.1

ND = Not Detected
DL = Detection Limit

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Section 23.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source: First NaOCl Seal Box Vent		FIN: PN2159
Source Code: SP-BPHFHS	Date: 6/20/92	EPN: SN72	CIN: NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	833	933	1033	
Flow Data				
Stack Temperature, °F			121	121
Moisture Content, %			11.9	11.9
Oxygen Concentration, %			20.8	20.8
Carbon Dioxide Concentration, %			0.0	0.0
Volumetric Flow Rate, x10^3 ACFM			0.6	0.6
Volumetric Flow Rate, x10^3 DSCFM			0.5	0.5
Process Operating Conditions				
Production Rate, ADT pulp/hr	11.5	11.5	11.5	11.5
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd				
Emission Rate, lb/hr				
Acetone				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Propanol				
Concentration, ppmvd				
Emission Rate, lb/hr				

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source: First NaOCl Seal Box Vent		FIN: PN2159
Source Code: SP-BPHFHS	Date: 6/20/92	EPN: SN72	CIN: NA

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd				
Emission Rate, lb/hr				
Chloroform				
Concentration, ppmvd				
Emission Rate, lb/hr				
Benzene				
Concentration, ppmvd				
Emission Rate, lb/hr				
Bromodichloromethane				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethyl benzene				
Concentration, ppmvd				
Emission Rate, lb/hr				
m-, p-Xylene				
Concentration, ppmvd				
Emission Rate, lb/hr				
o-Xylene				
Concentration, ppmvd				
Emission Rate, lb/hr				
Cumene				
Concentration, ppmvd				
Emission Rate, lb/hr				
alpha-Pinene				
Concentration, ppmvd				
Emission Rate, lb/hr				
beta-Pinene				
Concentration, ppmvd				
Emission Rate, lb/hr				
3-Carene				
Concentration, ppmvd				
Emission Rate, lb/hr				
Terpenes (Unspecified)				
Concentration, ppmvd				
Emission Rate, lb/hr				

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA   Source: First NaOCl Seal Box Vent   FIN: PN2159
Source Code: SP-BPHFHS   Date: 6/20/92   EPN: SN72   CIN: NA

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd				
Emission Rate, lb/hr				
Knowns as Carbon				
Concentration, ppmvd				
Unknowns as Carbon				
Concentration, ppmvd				
Sum M18 as Carbon, lb/hr				
Unknown Compounds % of Total				
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	682.2	583.4	563.0	609.5
Emission Rate, lb/hr as C	0.6	0.5	0.5	0.5

COMMENTS

All M18 runs for 6/20/92 were rejected because not consistent.

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill:	SIMPSON - PASADENA	Source:	First NaOCl Seal Box Vent		FIN:	PN2159
Source Code:	SP-BPHFHS	Date:	6/21/92	EPN: SN72	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	914	1014	1114	
Flow Data				
Stack Temperature, °F		127		127
Moisture Content, %		14.0		14.0
Oxygen Concentration, %		20.8		20.8
Carbon Dioxide Concentration, %		0.0		0.0
Volumetric Flow Rate, x10^3 ACFM		0.7		0.7
Volumetric Flow Rate, x10^3 DSCFM		0.6		0.6
Process Operating Conditions				
Production Rate, ADT pulp/hr	11.5	11.5	11.5	11.5
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	47.5	50.1	54.3	50.6
Emission Rate, lb/hr	0.1	0.1	0.2	0.1
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6	0.4
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source: First NaOCl Seal Box Vent		FIN: PN2159
Source Code: SP-BPHFHS	Date: 6/21/92	EPN: SN72	CIN: NA

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1434.2	1185.1	1188.4	1269.2
Emission Rate, lb/hr	14.9	12.3	12.4	13.2
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	2.4	2.3	2.3	2.3
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill:	SIMPSON - PASADENA	Source:	First NaOCl Seal Box Vent		FIN:	PN2159
Source Code:	SP-BPHFHS	Date:	6/21/92	EPN: SN72	CIN:	NA

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	1289.5	1074.2	1079.8	1147.8
Unknowns as Carbon				
Concentration, ppmvd	4.3	5.3	6.2	5.3
Sum M18 as Carbon, lb/hr	1.4	1.1	1.1	1.2
Unknown Compounds % of Total	0.3%	0.5%	0.6%	0.5%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	919.8	765.1	811.6	832.2
Emission Rate, lb/hr as C	1.0	0.8	0.9	0.9

COMMENTS

All M18 runs for 6/20/92 were rejected because not consistent.

*One or more values were less than the detection limit.

Section 23.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA	Source:	First NaOCl Seal Box Vent			FIN:	PN2159
Source Code: SP-BPHFHS	Date:	6/20/92	EPN:	SN72	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1015			
Flow Data				
Stack Temperature, °F	121			121
Moisture Content, %	11.9			11.9
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.6			0.6
Volumetric Flow Rate, x10^3 DSCFM	0.5			0.5
Process Operating Conditions				
Production Rate, ADT pulp/hr	11.5			11.5
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	870.7			870.7
Emission Rate, lb/hr	7.6			7.6
Hydrogen chloride				
Concentration, ppmvd	10.9			10.9
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA	Source:	First NaOCl Seal Box Vent			FIN:	PN2159
Source Code: SP-BPHFHS	Date:	6/21/92	EPN:	SN72	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1045			
Flow Data				
Stack Temperature, °F	127			127
Moisture Content, %	14.0			14.0
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.7			0.7
Volumetric Flow Rate, x10^3 DSCFM	0.6			0.6
Process Operating Conditions				
Production Rate, ADT pulp/hr	11.5			11.5
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	651.0			651.0
Emission Rate, lb/hr	6.8			6.8
Hydrogen chloride				
Concentration, ppmvd	3.9			3.9
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

Section 23.3 Quality Control Results

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QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL SP SOURCE SP-BPHFHS

1. CALIBRATION

THEOR	DATE	6/20/92	DATE	6/21/92
ppm	ppm	%REC	ppm	%REC
0	-2		-5	
90	84	93.33%	88	97.78%
149	159	106.71%	160	107.38%
375	372	99.20%	370	98.67%

2. PROPANE LINE RECOVERY

	DATE 6/20/92 INST	LINE	%REC	DATE 6/21/92 INST	LINE	%REC
BEFORE	84	88	105%	84	86	102.38%
AFTER	88	70	80%	384	354	92.19%

3. LINE BLANK

	DATE 6/20/92 INST	LINE		DATE 6/21/92 INST	LINE	
BEFORE	0	0		0	1	
AFTER	0	0		0	0	

WESTON QC SUMMARY
METHOD 18

MILL SIMPSON SOURCE SP-BPHFHS

1. CHECK STANDARD

FILE NAME		[------ %REC	------]	
ppm	THEOR	EXP 1	EXP 2	EXP 3
		FKB4001	FLB4001	
ethanol	55.64	82.13%	79.89%	
acetone	44.47	112.42%	112.13%	
isopropanol	42.65	79.05%	82.26%	
dimethyl sulfide	19.55	96.12%	100.43%	
benzene	36.54	109.82%	129.46%	
bromodichloromethane	40.17	119.58%	120.90%	
dimethyl disulfide	36.26	96.78%	85.37%	
toluene	30.73	95.61%	102.00%	
ethyl benzene	26.67	96.29%	101.85%	
m-xylene	26.64	94.79%	100.95%	
o-xylene	26.76	97.09%	101.82%	
cumene	23.47	96.72%	101.88%	
alpha-pinene	20.49	96.06%	101.67%	
beta-pinene	20.59	92.73%	99.11%	
3-carene	20.61	92.20%	97.81%	
p-cymene	20.92	94.65%	98.97%	

2. PROPANE RESPONSE

	THEOR	%REC	%REC	%REC
BEFORE RUN	29.9	111.86%	109.84%	
AFTER RUN	29.9	110.39%	113.12%	

3. METHANOL RECOVERY

	THEOR	%REC	%REC	%REC
BEFORE RUN	100	99.26%	88.97%	
AFTER RUN	100	77.99%	65.11%	

4. LINE BLANK

	[------ FILE REF	------]	
BEFORE RUN	FJB4013	FKB4014	
AFTER RUN	FKB4006	FLB4007	

NOTES:

Section 23.4 Process Operating Data

MILL: SIMPSON PAPER SOURCE: HARDWOOD BLEACH PLANT

DATE		6/19 ->			5/20						6/21		
TIME		0948	1049	1215	0833	0933	1033	1351	1451	1551	0914	1014	1114
SOURCE		BPHSHS ->			BPHFHS ->			BPHESB ->			BPHESB ->		
FIN		PN2167 ->			PN2159 ->			PN2156 ->			PN2156 ->		
EPN		SN76 ->			SN72 ->			SN69 ->			SN69 ->		
	UNITS												
WOOD		HARDWOOD ->											
PRODUCT	T/D	275	275	300	275	275	275	350	350	325	275	275	275
KAPPA		19.8	18.3	20.0	18.1	18.8	18.1	17.8	19.0	19.5	19.2	18.8	19.4
CHEM USAGE													
Cl_2	LB/T	128	120	128	108	108	108	176	176	176	168	168	168
NaOH	LB/T	104	104	111	120	120	135	127	127	153	145	145	134
NaOCl	LB/T	30	30	30	32	32	30	30	30	32	32	32	31
ClO_2	LB/T	16	16	17	17	17	17	18	18	17	17	17	17
NAOCl	LB/T	2	2	2	2	2	2	2	2	2	2	2	2
NaOH	LB/T	4	4	4	4	2	4	4	2	4	4	4	4
D STOCK	F	118	110	118	110	110	112	112	112	118	114	114	114
E MIXER	F	120	120	120	110	110	114	114	114	118	114	114	114
H_1 MIXER	F	128	120	128	120	120	124	120	120	128	124	114	124
D UPFLOW	F	162	162	162	163	163	163	162	162	162	110	110	110
H_2 MIXR	F	110	110	110	110	110	110	110	110	110	110	110	110
pH LEVEL													
E		10.7	10.7	10.8	10.7	10.7	10.0	10.7	10.7	10.5	10.7	10.7	10.9
H_1		7.3	7.3	7.2	8.2	8.2	8.9	7.0	7.0	7.0	7.0	7.0	9.9
D		4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
He_2		8.7	8.7	8.7	8.3	8.3	8.5	8.5	8.5	8.6	8.6	8.6	8.8

SCRUBBER. Cl_2	(2) SCRUBBERS. ClO_2 TOWER AND SEAL BOX
TYPE - COLUMN	TYPE - COLUMN
SRB MED - TELLERETTES	SRB MED - TELLERETTES
GAS FLOW SCFM - NO FAN	GAS FLOW SCFM - NO FAN
LIQ FLOW 3 GPM 10% NaOH	LIQ FLOW 10 GPM DILUTE SODIUM BISULFITE
DP IN H_2O - NO FAN	DP IN H_2O - NO FAN

NOTES:		RETENTION TIMES. MIN @ 350 T/D
1.0 BLEACHING SEQUENCE -	CHLORINE. C	42
	CAUSTIC SODA. E	42
	1st SODIUM HYPOCHLORITE WITH CAUSTIC. H_1	170
	CHLORINE DIOXIDE WITH CAUSTIC. D	220
	2nd SODIUM HYPOCHLORITE WITH CAUSTIC. H_2	30

2.0 ALL VALUES ONE HOUR READINGS FROM OPERATIONS LOG

3.0 PRODUCTION IS IN OVEN DRY UNBLEACHED SHORT TONS

4.0 ClO_2 IS AS ClO_2

5.0 H_1 pH REPRESENTS VAT pH WHERE pH IS ADJUSTED BY ADDING CHLORINE FILTRATE TO REDUCE SCALING. ACTUAL pH IN THE HYPO TOWER IS IN THE RANGE OF 9.5.

Note: See Appendix D for Unit Process Description

SECTION 24

ClO_2 TOWER SCRUBBER VENT

(SP-BPHCTS)

Section 24.1 Emission Test Results - VOC

Section 24.2 Emission Test Results - Miscellaneous

Section 24.3 Quality Control Results

Section 24.4 Process Operating Data

24. SP-BPHCTS

WESTON. MANAGERS DESIGNERS CONSULTANTS

SECTION 24
ClO_2 TOWER SCRUBBER VENT
(SP-BPHCTS)

The ClO_2 Tower Scrubber Vent was tested on two different days. The source was sampled for Methods 25A and 18. Chloroform and hydrogen chloride samples were collected.

Total Hydrocarbons (M25A)

Figures 24.1 and 24.2 present the THC trends for the test periods on 6/16/92 and 6/17/92. On the first day, the total hydrocarbon concentrations dropped several times to the 50 to 200 range. On the second day, they exhibited a slight downward trend from 643 to 414 ppm. Again the concentrations dropped to the 50 to 250 ppm range.

Volatile Organic Compounds (M18)

Table 24.1 summarizes the results for the Method 18 target compounds, and Section 24.1 is a tabulation of the data. Chloroform, benzene, and bromodichloromethane were detected the first day. Methanol and chloroform were identified the second day. Unknowns were present before chloroform both days at approximately 4.5 and 1.0 ppm, respectively. The volumetric flow was measured during sampling with a pitot tube.

Miscellaneous Parameters

Table 24.2 summarizes the results of testing for hydrogen chloride and chloroform. Section 24.2 tabulates the results for each compound. Chloroform results (lb/hr) were comparable to Method 18 data the first day. However, the second day, they were approximately three times lower. Hydrogen chloride was detected.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 24.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 24.4 includes the process operating data as recorded and provided by mill personnel.

FIGURE 24.1

THC TREND ANALYSIS (6/16/92)
ClO2 TOWER SCRUBBER VENT (SP-BPHCTS)

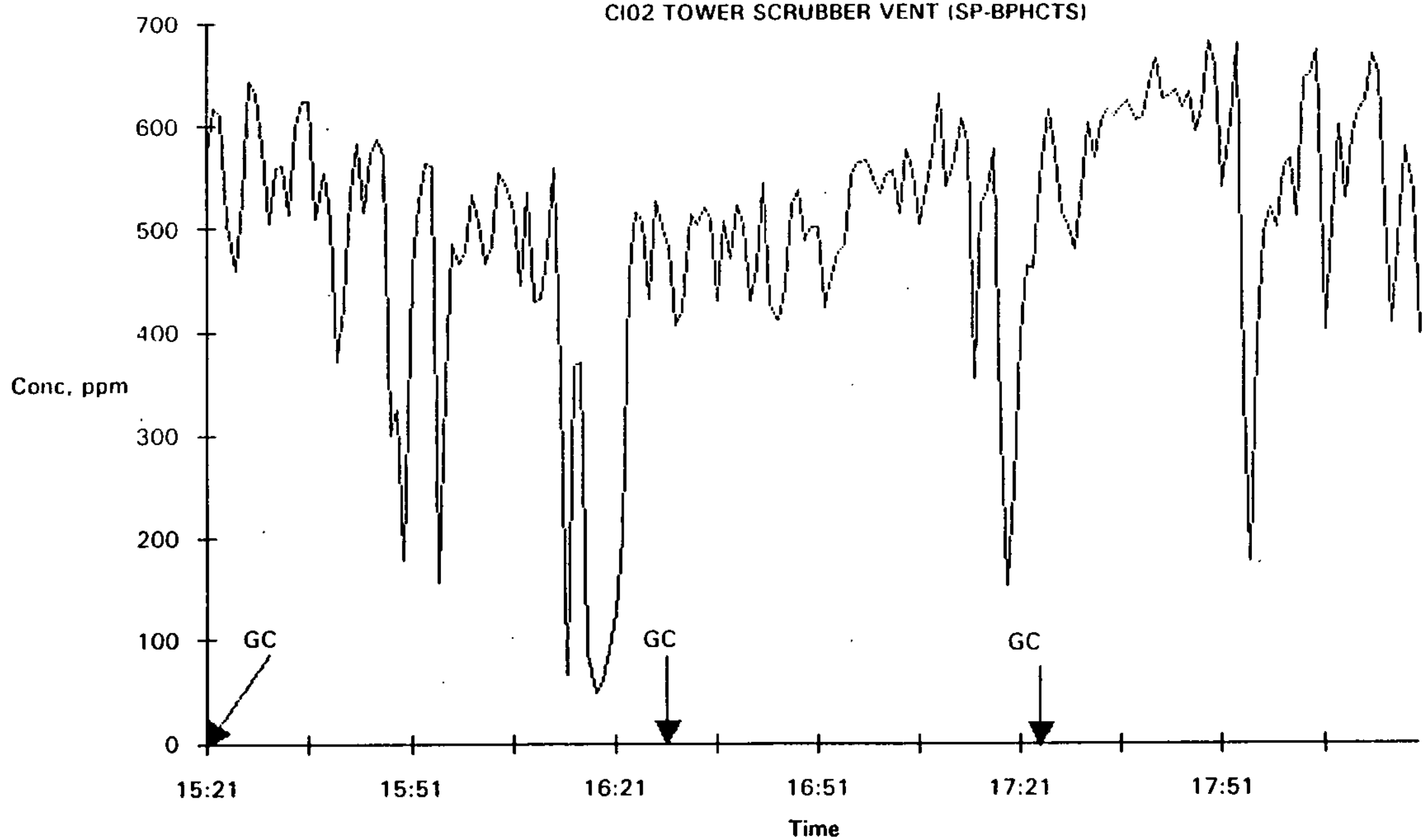
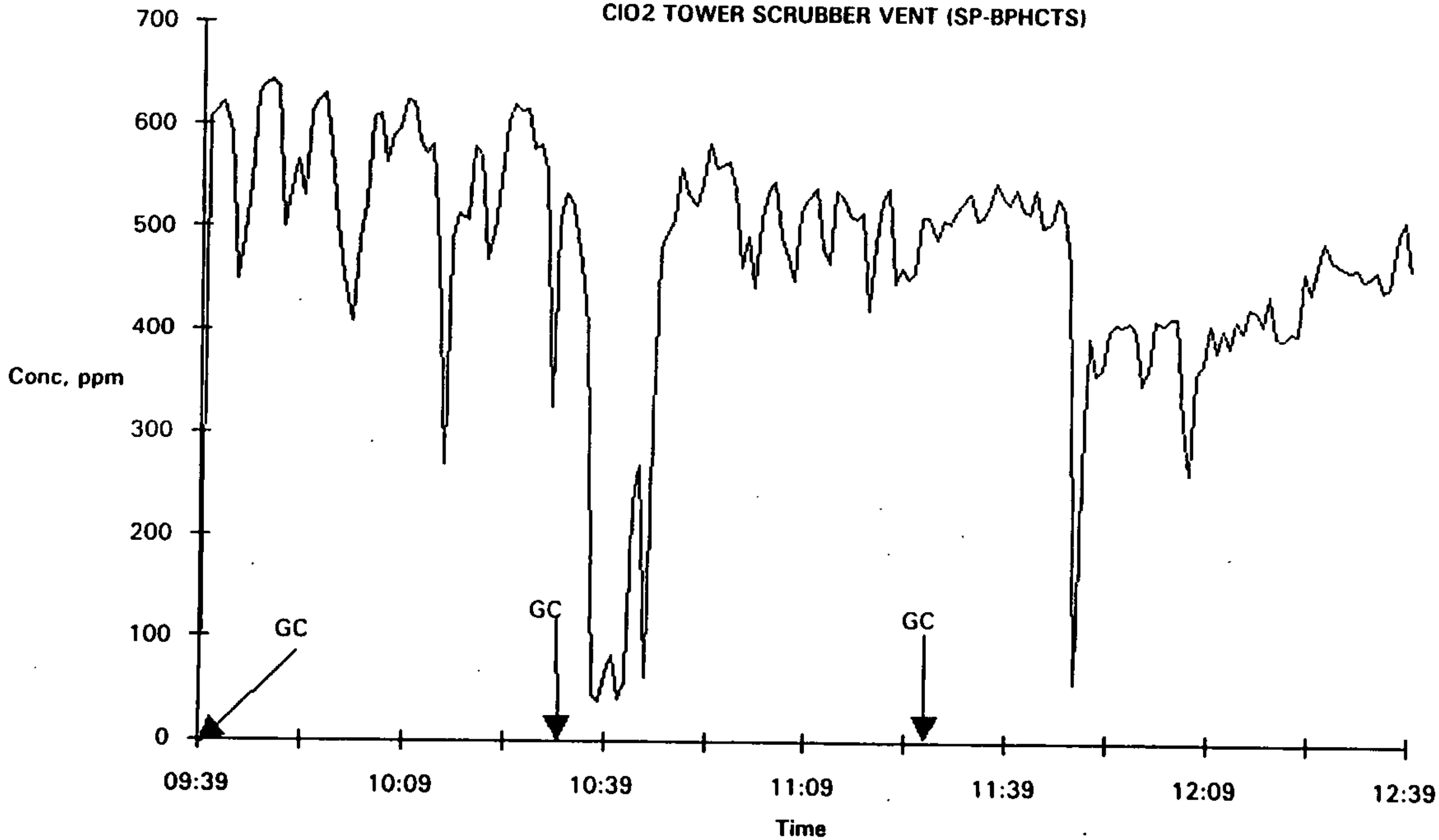


FIGURE 24.2

THC TREND ANALYSIS (6/17/92)
ClO2 TOWER SCRUBBER VENT (SP-BPHCTS)



WESTON
MANAGERS DESIGNERS/CONSULTANTS

TABLE 24.1 SUMMARY OF VOC RESULTS

Mill: SIMPSON - PASADENA
Source Code: SP-BPHCTS
FIN: PN2160 CIN: CN2161

Source: ClO_2 Tower Scrubber Vent
Test Dates: 6/16/92 6/17/92
EPN: SN73

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	105	111	108	
Volumetric Flow Rate, x10^3 DSCFM	0.3	0.4	0.4	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	11.5	11.5	11.5	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	ND	<0.1	0.1	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	5.2	9.4	7.5	0.1
Benzene	ND	<0.1	0.1	0.1
Bromodichloromethane	ND	<0.1	0.1	0.1
Toluene	ND	<0.1	0.1	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	<0.1	0.1	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	0.5	0.8	0.7	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	0.5	0.8	0.7	0.1

ND=Not Detected
DL=Detection Limit

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TABLE 24.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: SIMPSON-PASADENA
Source Code: SP-BPHCTS
FIN: PN2160 EPN: SN73

Source: ClO_2 Tower Scrubber Vent
Test Dates: 6/16/92, 6/17/92
CIN: CN2161

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	105	111	108	
Volumetric Flow Rate, x 10^3 DSCFM	0.3	0.4	0.4	
Process Operating Conditions				
Production Rate, ADT pulp/hr	11.5	12.5	12.0	
Emission Rate, lb/hr				
Chloroform	2.2	8.4	5.3	0.1
Hydrogen chloride	0.2	0.8	0.5	0.1

ND = Not Detected
DL = Detection Limit

Section 24.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	ClO2 Tower Scrubber Vent		FIN:	PN2160
Source Code: SP-BPHCTS	Date:	6/16/92	EPN: SN73	CIN:	CN2161

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1521	1620	1720	
Flow Data				
Stack Temperature, °F	111			111
Moisture Content, %	8.3			8.3
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.4			0.4
Volumetric Flow Rate, x10^3 DSCFM	0.3			0.3
Process Operating Conditions				
Production Rate, ADT pulp/hr	11.5	11.5	11.5	11.5
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	2.2 *	2.2 *	2.2 *	2.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: ClO2 Tower Scrubber Vent | FIN: PN2160
Source Code: SP-BPHCTS | Date: 6/16/92 | EPN: SN73 | CIN: CN2161

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1275.9	1075.2	1451.8	1267.6
Emission Rate, lb/hr	8.2	6.9	9.4	8.2
Benzene				
Concentration, ppmvd	5.8	15.0	3.3	8.0
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.3	1.1 *	1.9	1.2
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	2.2	2.0	1.1	1.7
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	ClO2 Tower Scrubber Vent			FIN:	PN2160
Source Code: SP-BPHCTS	Date:	6/16/92	EPN:	SN73	CIN:	CN2161

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	1106.8	982.1	1234.0	1107.6
Unknowns as Carbon				
Concentration, ppmvd	28.7	17.0	31.8	25.8
Sum M18 as Carbon, lb/hr	0.7	0.7	0.8	0.7
Unknown Compounds % of Total	2.5%	1.7%	2.5%	2.2%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	502.7	525.6	609.6	546.0
Emission Rate, lb/hr as C	0.3	0.3	0.4	0.4

COMMENTS

M18 run 2 for 6/17/92 was rejected due to dirty system.

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	ClO2 Tower Scrubber Vent		FIN:	PN2160
Source Code: SP-BPHCTS	Date:	6/17/92	EPN: SN73	CIN:	CN2161

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	939	1039	1139	
Flow Data				
Stack Temperature, °F	105			105
Moisture Content, %	7.5			7.5
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.4			0.4
Volumetric Flow Rate, x10^3 DSCFM	0.4			0.4
Process Operating Conditions				
Production Rate, ADT pulp/hr	11.5	11.5	11.5	11.5
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	4.6		5.8	5.2
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *		0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *		0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *		0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: ClO2 Tower Scrubber Vent | FIN: PN2160
Source Code: SP-BPHCTS | Date: 6/17/92 | EPN: SN73 | CIN: CN2161

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *		0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1210.9		789.7	1000.3
Emission Rate, lb/hr	7.9		5.2	6.5
Benzene				
Concentration, ppmvd	0.5 *		7.2	3.8
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *		1.1 *	1.1 *
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5		0.5 *	0.4
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *		0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *		0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *		0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.5 *		0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.5 *		0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.5 *		0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.5 *		0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *		0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source: ClO2 Tower Scrubber Vent		FIN: PN2160
Source Code: SP-BPHCTS	Date: 6/17/92	EPN: SN73	CIN: CN2161

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *		0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	1014.5		697.0	855.7
Unknowns as Carbon				
Concentration, ppmvd	39.0		10.6	24.8
Sum M18 as Carbon, lb/hr	0.7		0.5	0.6
Unknown Compounds % of Total	3.7%		1.5%	2.6%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	564.3	507.0	457.3	509.5
Emission Rate, lb/hr as C	0.4	0.3	0.3	0.3

COMMENTS

M18 run 2 for 6/17/92 was rejected due to dirty system.

* One or more values were less than the detection limit.

Section 24.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA	Source:	ClO2 Tower Scrubber Vent		FIN:	PN2160
Source Code: SP-BPHCTS	Date:	6/16/92	EPN: SN73	CIN:	CN2161

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1654			
Flow Data				
Stack Temperature, °F	111			111
Moisture Content, %	8.3			8.3
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.4			0.4
Volumetric Flow Rate, x10^3 DSCFM	0.3			0.3
Process Operating Conditions				
Production Rate, ADT pulp/hr	11.5			11.5
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	1296.5			1296.5
Emission Rate, lb/hr	8.4			8.4
Hydrogen chloride				
Concentration, ppmvd	425.0			425.0
Emission Rate, lb/hr	0.8			0.8

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA | Source: ClO2 Tower Scrubber Vent | FIN: PN2160

Source Code: SP-BPHCTS | Date: 6/17/92 | EPN: SN73 | CIN: CN2161

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1153			
Flow Data				
Stack Temperature, °F	105			105
Moisture Content, %	7.5			7.5
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.4			0.4
Volumetric Flow Rate, x10^3 DSCFM	0.4			0.4
Process Operating Conditions				
Production Rate, ADT pulp/hr	12.5			12.5
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	339.1			339.1
Emission Rate, lb/hr	2.2			2.2
Hydrogen chloride				
Concentration, ppmvd	123.6			123.6
Emission Rate, lb/hr	0.2			0.2

* One or more values were less than the detection limit.

Section 24.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL SP SOURCE SP-BPHCTS

1. CALIBRATION

THEOR	DATE	6/16/92	DATE		6/17/92
ppm	ppm	%REC	ppm	%REC	%REC
0	-3		-1	~~#DIV/0!~~	
90	91	101.1%	89	98.89%	
149	152	102.0%	152	102.01%	
375	373	99.5%	373	99.47%	

2. PROPANE LINE RECOVERY

	DATE	6/16/92		DATE	6/17/92	
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	327	357	109%	373	317	85%
AFTER	353	353	100%	351	307	87%

3. LINE BLANK

	DATE	6/16/92	DATE	6/17/92
	INST	LINE	INST	LINE
BEFORE	0	0	0	0
AFTER	0	2	0	0

WESTON QC SUMMARY
METHOD 18

MILL SIMPSON SOURCE SP-BPHCTS

1. CHECK STANDARD

FILE NAME		[------------- %REC	----------]	
ppm	THEOR	EXP 1	EXP 2	EXP 3
		FGA4001	FHA4001	
ethanol	55.64	65.68%	67.97%	
acetone	44.47	87.25%	83.71%	
isopropanol	42.65	91.63%	90.03%	
dimethyl sulfide	19.55	90.67%	89.35%	
benzene	36.54	99.32%	102.67%	
bromodichloromethane	40.17	92.52%	94.08%	
dimethyl disulfide	36.26	91.64%	91.39%	
toluene	30.73	98.54%	98.46%	
ethyl benzene	26.67	98.11%	98.82%	
m-xylene	26.64	98.67%	99.93%	
o-xylene	26.76	97.86%	98.48%	
cumene	23.47	99.90%	100.72%	
alpha-pinene	20.49	102.44%	104.69%	
beta-pinene	20.59	104.28%	101.38%	
3-carene	20.61	101.56%	102.11%	
p-cymene	20.92	177.19%	177.13%	

2. PROPANE RESPONSE

	THEOR	%REC	%REC	%REC
BEFORE RUN	29.9	110.93%	99.68%	
AFTER RUN	29.9	99.68%	114.09%	

3. METHANOL RECOVERY

	THEOR	%REC	%REC	%REC
BEFORE RUN	100	103.79%	108.53%	
AFTER RUN	100	108.53%	112.77%	

4. LINE BLANK

	[------------- FILE REF	----------]	
BEFORE RUN	FGA4010	FHA4007	
AFTER RUN	FHA4007	FIA4005	

NOTES:

Section 24.4 Process Operating Data

MILL: SIMPSON PAPER SOURCE: HARDWOOD BLEACH PLANT

	UNITS														
DATE		6/10 ->								6/18					
TIME		1044	1044	1523	1623	1723	1523	1623	1723	1110	1210	1310	1520	1620	1720
SOURCE		BPHSHW	BPHCWV	BPHCSS ->			BPHEWV ->			BPHCSS ->			BPHCTS ->		
FIN		PN2166	PN2151	PN2152 ->			PN2151 ->			PN2152 ->			PN2162 ->		
EPN		SN75	SN66	SN88 ->			SN66 ->			SN88 ->			SN74 ->		
WOOD		HARDWOOD ->													
PRODUCT	T/D	325	325	300	300	275	300	300	275	300	275	275	275	275	275
KAPPA		16.9	16.9	17.9	17.9	18.5	17.9	17.9	18.5	19.0	18.2	18.2	18.8	21.5	20.7
CHEM USAGE															
Cl_2	LB/T	112	112	112	112	80	112	112	80	136	128	128	72	108	116
NaOH	LB/T	114	114	108	108	105	108	108	105	132	133	133	133	130	130
NaOCl	LB/T	36	36	32	32	32	32	32	32	34	34	34	34	34	34
ClO_2	LB/T	17	17	17	17	17	17	17	17	17	17	17	17	17	17
NaOCl	LB/T	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NaOH	LB/T	8	8	8	8	8	8	8	8	4	4	4	4	4	4
C STOCK	F	100	100	100	100	100	100	100	100	116	116	116	116	116	116
E MIXER	F	110	110	110	110	110	110	110	110	118	118	118	118	118	118
H_1 MIXER	F	128	128	128	128	128	128	128	128	128	128	128	128	128	128
D UPFLOW	F	154	154	154	154	154	154	154	160	160	160	160	160	160	160
H_2 MIXR	F	110	110	110	110	110	110	110	110	110	110	110	110	110	110
pH LEVEL															
Eo		10.6	10.8	10.8	10.8	10.9	10.8	10.8	10.9	10.8	11.1	11.1	10.9	11.1	10.8
H_1		8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.0	7.8	7.8	8.1	8.3	8.5
D		4.5	4.5	4.5	4.6	4.5	4.5	4.5	3.9	4.0	3.8	3.8	4.1	3.7	4.1
H_2		9.0	9.0	9.0	9.0	9.0	9.0	9.0	8.8	8.6	8.7	8.7	8.6	8.6	8.6

SCRUBBER, Cl_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW SCFM - NO FAN
LIQ FLOW 3 GPM 10% NaOH
DP IN H_2O - NO FAN

(2) SCRUBBERS, ClO_2 TOWER AND SEAL BOX
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW SCFM - NO FAN
LIQ FLOW 10 GPM DILUTE SODIUM BISULFITE
DP IN H_2O - NO FAN

NOTES: 1.0 BLEACHING SEQUENCE -	RETENTION TIMES, MIN @ 350 T/D
CHLORINE, C	42
CAUSTIC SODA, E	42
1st SODIUM HYPOCHLORITE WITH CAUSTIC, H_1	170
CHLORINE DIOXIDE WITH CAUSTIC, D	220
2nd SODIUM HYPOCHLORITE WITH CAUSTIC, H_2	30

2.0 ALL VALUES ONE HOUR READINGS FROM OPERATIONS LOG
3.0 PRODUCTION IS IN OVEN DRY UNBLEACHED SHORT TONS
4.0 ClO_2 IS AS ClO_2
5.0 H_1 pH REPRESENTS VAT pH WHERE pH IS ADJUSTED BY ADDING CHLORINE FILTRATE TO REDUCE SCALING. ACTUAL pH IN THE HYPO TOWER IS IN THE RANGE OF 9.5.

Note: See Appendix D for Unit Process Description

MILL: SIMPSON PAPER SOURCE: HARDWOOD BLEACH PLANT

	UNITS												
DATE		6/17 ->						6/18 ->					
TIME		0939	1039	1139	0939	1039	1139	1100	1200	1300	1539	1639	1739
SOURCE		BPHCTS ->			BPHCBS ->			BPHFHW ->			BPHDWV ->		
FIN		PN2162 ->			PN2307 ->			PN2158 ->			PN2162 ->		
EPN		SN74 ->			SN89 ->			SN71 ->			SN74 ->		
WOOD		HARDWOOD ->											
PRODUCT	T/D	275	275	300	275	275	300	300	300	275	275	275	275
KAPPA		19.5	17.6	16.0	19.5	17.3	16.0	16.6	17.0	17.0	17.7	17.7	18.5
CHEM USAGE													
Cl_2	LB/T	112	112	110	112	112	110	116	116	116	116	84	84
NaOH	LB/T	145	145	134	145	145	134	114	114	107	107	107	107
NaOCl	LB/T	34	34	34	34	34	34	28	34	28	34	28	34
ClO_2	LB/T	17	17	17	17	17	17	16	16	16	16	16	16
NAOCl	LB/T	2	2	2	2	2	2	2	2	2	2	2	2
NaOH	LB/T	4	2	4	4	2	4	2	2	2	2	4	4
C STOCK	F	118	110	118	118	110	118	120	120	120	120	120	120
E MIXER	F	118	118	118	118	118	118	120	120	120	120	120	120
H_1 MIXER	F	132	132	132	132	132	132	132	132	132	132	132	132
D UPFLOW	F	160	160	160	160	160	160	160	160	160	160	160	160
H_2 MIXR	F	110	110	110	110	110	110	110	110	110	110	110	110
pH LEVEL													
E		10.9	10.9	10.6	10.9	10.9	10.6	10.8	10.8	11.0	11.0	11.0	11.0
H_1		8.5	8.5	8.9	8.5	8.5	8.9	7.5	7.5	7.7	7.7	7.7	8.2
D		4.1	4.1	4.0	4.1	4.1	4.0	3.8	3.8	4.0	4.0	3.8	3.8
H_2		8.7	8.7	8.8	8.7	8.7	8.8	8.6	8.6	8.2	8.2	8.6	8.6

SCRUBBER, Cl_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW SCFM - NO FAN
LIQ FLOW 3 GPM 10% NaOH
DP IN H_2O - NO FAN

(2) SCRUBBERS, ClO_2 TOWER AND SEAL BOX
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW SCFM - NO FAN
LIQ FLOW 10 GPM DILUTE SODIUM BISULFITE
DP IN H_2O - NO FAN

NOTES: 1.0 BLEACHING SEQUENCE -

	RETENTION TIMES, MIN @ 350 T/D
CHLORINE, C	42
CAUSTIC SODA, E	42
1st SODIUM HYPOCHLORITE WITH CAUSTIC, H_1	170
CHLORINE DIOXIDE WITH CAUSTIC, D	220
2nd SODIUM HYPOCHLORITE WITH CAUSTIC, H_2	30

2.0 ALL VALUES ONE HOUR READINGS FROM OPERATIONS LOG
3.0 PRODUCTION IS IN OVEN DRY UNBLEACHED SHORT TONS
4.0 ClO_2 IS AS ClO_2
5.0 H_1 pH REPRESENTS VAT pH WHERE pH IS ADJUSTED BY ADDING CHLORINE FILTRATE TO REDUCE SCALING. ACTUAL pH IN THE HYPO TOWER IS IN THE RANGE OF 9.5.

Note: See Appendix D for Unit Process Description

SECTION 25

ClO_2 WASHER VENT

(SP-BPHDWV)

25. SP-BPHDWV

SECTION 25
ClO_2 WASHER VENT
(SP-BPHDWV)

The ClO_2 Washer Vent was tested on one day. The source was sampled for Methods 25A and 18. Chloroform and hydrogen chloride samples were collected.

Total Hydrocarbons (M25A)

Figure 25.1 presents the THC trend for the test period on 6/18/92. The total hydrocarbon concentrations ranged from 76 to 105 ppm.

Volatile Organic Compounds (M18)

Table 25.1 summarizes the results for the Method 18 target compounds, and Section 25.1 is a tabulation of the data. Methanol, acetone, and chloroform were detected by the Method 18 analyses. Unknowns were present following chloroform, 0.7 to 6.4 ppm as carbon. The volumetric flow was measured during sampling with a pitot tube.

Miscellaneous Parameters

Table 25.2 summarizes the results of testing for hydrogen chloride and chloroform. Section 25.2 tabulates the results for each compound. Chloroform results (lb/hr) were comparable to Method 18 data. Hydrogen chloride was detected (<0.1 lb/hr).

VOC Quality Control Results

The VOC quality control data are tabulated in Section 25.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

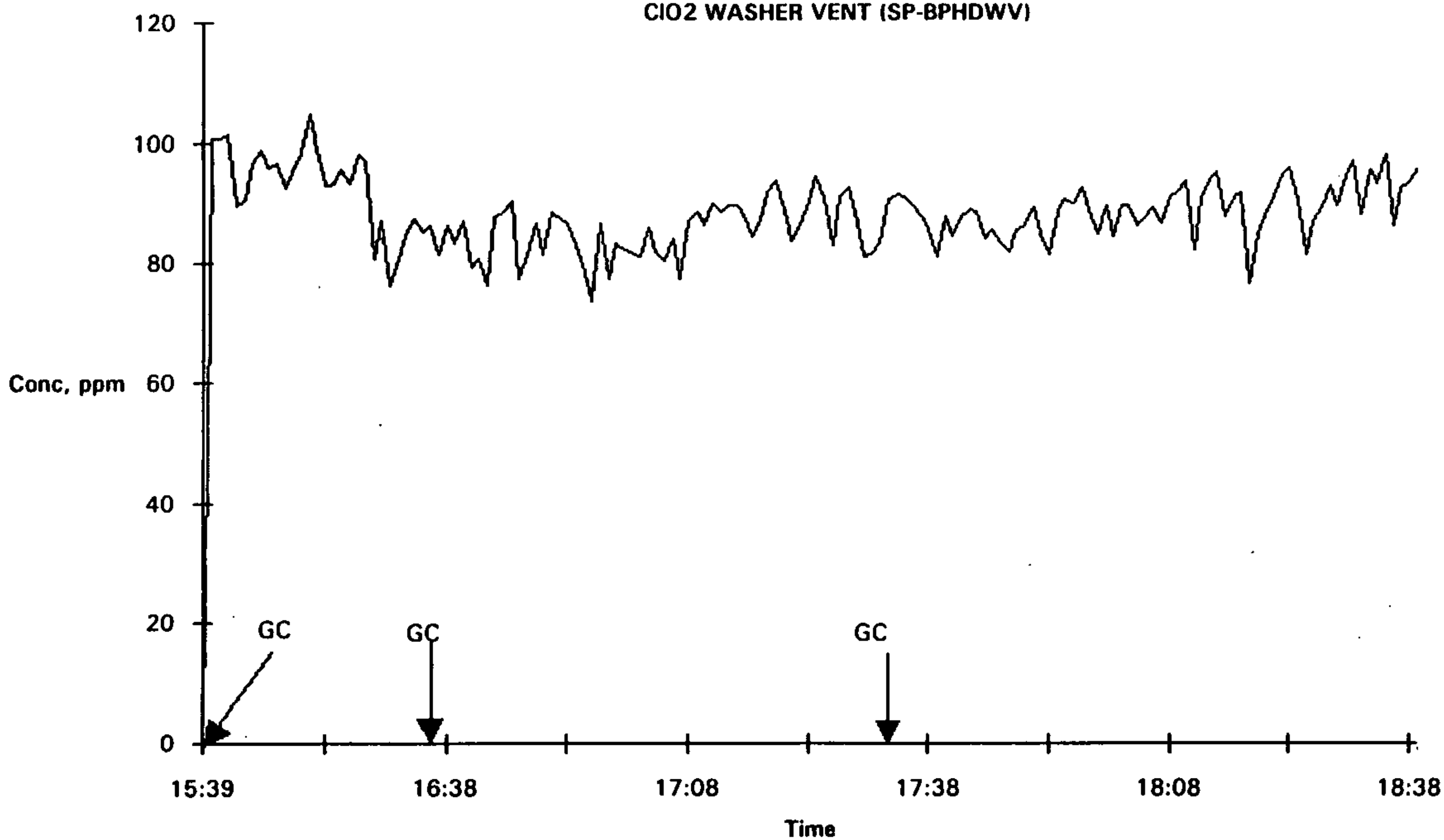
Process Description and Operating Conditions

Section 25.4 includes the process operating data as recorded and provided by mill personnel.

FIGURE 25.1

THC TREND ANALYSIS (6/18/92)

ClO2 WASHER VENT (SP-BPHDWV)



WESTON

TABLE 25.1 SUMMARY OF VOC RESULTS

Mill: SIMPSON - PASADENA | Source: ClO_2 Washer Vent
Source Code: SP-BPHDWV | Test Dates: 6/18/92
FIN: PN2162 CIN: NA | EPN: SN74

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	140	140	140	
Volumetric Flow Rate, $x10^3$ DSCFM	2.0	2.0	2.0	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	11.5	11.5	11.5	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	1.0	1.5	1.3	0.1
Ethanol	ND	ND	ND	0.1
Acetone	<0.1	<0.1	0.1	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	1.1	1.3	1.2	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	<0.1	0.1	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	0.5	0.8	0.6	0.1
Unknowns as C, lb/hr	ND	0.1	0.1	0.1
Sum of Compounds as C, lb/hr	0.5	0.8	0.7	0.1

ND=Not Detected
DL=Detection Limit

WESTON

TABLE 25.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: SIMPSON-PASADENA
Source Code: SP-BPHDWV
FIN: PN2162 EPN: SN74

Source: ClO_2 Washer Vent
Test Dates: 6/18/92
CIN: NA

	RUN 1	DL
Volumetric Flow Data		
Stack Temperature, °F	140	
Volumetric Flow Rate, x 10^3 DSCFM	2.0	
Process Operating Conditions		
Production Rate, ADT pulp/hr	11.5	
Emission Rate, lb/hr		
Chloroform	0.9	0.1
Hydrogen chloride	<0.1	0.1

ND = Not Detected
DL = Detection Limit

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(L) WWC (R) DW 28 December 1992

Section 25.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: ClO2 Washer Vent | FIN: PN2162
Source Code: SP-BPHDWV | Date: 6/18/92 | EPN: SN74 | CIN: NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1539	1639	1739	
Flow Data				
Stack Temperature, °F	140			140
Moisture Content, %	12.1			12.1
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	2.6			2.6
Volumetric Flow Rate, x10^3 DSCFM	2.0			2.0
Process Operating Conditions				
Production Rate, ADT pulp/hr	11.5	11.5	11.5	11.5
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	97.8	181.9	103.0	127.5
Emission Rate, lb/hr	1.0	1.8	1.0	1.3
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 •	0.6 •	0.6 •	0.6 •
Emission Rate, lb/hr	0.1 •	0.1 •	0.1 •	0.1 •
Acetone				
Concentration, ppmvd	1.5	0.8	1.5	1.3
Emission Rate, lb/hr	0.1 •	0.1 •	0.1 •	0.1 •
2-Propanol				
Concentration, ppmvd	0.6 •	0.6 •	0.6 •	0.6 •
Emission Rate, lb/hr	0.1 •	0.1 •	0.1 •	0.1 •

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: ClO2 Washer Vent | FIN: PN2162
Source Code: SP-BPHDWV | Date: 6/18/92 | EPN: SN74 | CIN: NA

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	34.7	29.8	33.3	32.6
Emission Rate, lb/hr	1.3	1.1	1.2	1.2
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.7	0.6 *	0.4
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 *	0.6 *	0.9	0.5
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	ClO2 Washer Vent		FIN:	PN2162
Source Code: SP-BPHDWV	Date:	6/18/92	EPN: SN74	CIN:	NA

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	151.5	207.7	143.3	167.5
Unknowns as Carbon				
Concentration, ppmvd	0.8	13.7	2.2	5.5
Sum M18 as Carbon, lb/hr	0.6	0.8	0.5	0.7
Unknown Compounds % of Total	0.5%	6.2%	1.5%	2.7%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	104.7	97.8	101.3	101.3
Emission Rate, lb/hr as C	0.4	0.4	0.4	0.4

* One or more values were less than the detection limit.

Section 25.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA	Source:	ClO2 Washer Vent		FIN:	PN2162
Source Code: SP-BPHDWV	Date:	6/18/92	EPN: SN74	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1730			
Flow Data				
Stack Temperature, °F	140			140
Moisture Content, %	12.1			12.1
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	2.6			2.6
Volumetric Flow Rate, x10^3 DSCFM	2.0			2.0
Process Operating Conditions				
Production Rate, ADT pulp/hr	11.5			11.5
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	25.2			25.2
Emission Rate, lb/hr	0.9			0.9
Hydrogen chloride				
Concentration, ppmvd	0.7			0.7
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

WESTON

Section 25.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL SP **SOURCE** SP-BPHDWV

1. CALIBRATION

THEOR	DATE	6/18/92	DATE		1/0/00
ppm	ppm	%REC	ppm	%REC	%REC
0	-4			#DIV/0!	
90	89	98.89%		#DIV/0!	0.00%
149	157	105.37%		#DIV/0!	0.00%
375	371	98.93%			0.00%

2. PROPANE LINE RECOVERY

	DATE INST	6/18/92 LINE	%REC	DATE INST	1/0/00 LINE		%REC
BEFORE	89	80	90%			0.00%	#DIV/0!
AFTER	60	61	102%			0.00%	#DIV/0!

3. LINE BLANK

	DATE INST	6/18/92 LINE	DATE INST	1/0/00 LINE	
BEFORE	0	0			#DIV/0!
AFTER	0	0			#DIV/0!

WESTON QC SUMMARY
METHOD 18

MILL SIMPSON SOURCE SP-BPHDWV

1. CHECK STANDARD

FILE NAME		%REC		
ppm	THEOR	EXP 1	EXP 2	EXP 3
		FIB4002		
ethanol	55.64	76.31%		
acetone	44.47	109.29%		
isopropanol	42.65	86.88%		
dimethyl sulfide	19.55	102.01%		
benzene	36.54	128.94%		
bromodichloromethane	40.17	127.25%		
dimethyl disulfide	36.26	104.19%		
toluene	30.73	97.12%		
ethyl benzene	26.67	104.32%		
m-xylene	26.64	102.36%		
o-xylene	26.76	105.36%		
cumene	23.47	105.18%		
alpha-pinene	20.49	105.40%		
beta-pinene	20.59	99.62%		
3-carene	20.61	100.51%		
p-cymene	20.92	101.78%		

2. PROPANE RESPONSE

	THEOR	%REC	%REC	%REC
BEFORE RUN	29.9	109.44%		
AFTER RUN	29.9	111.94%		

3. METHANOL RECOVERY

	THEOR	%REC	%REC	%REC
BEFORE RUN	100	129.67%		
AFTER RUN	100	97.19%		

4. LINE BLANK

	FILE REF		
BEFORE RUN	FIB4012		
AFTER RUN	FJB4002		

NOTES:

Section 25.4 Process Operating Data

MILL: SIMPSON PAPER SOURCE: HARDWOOD BLEACH PLANT

DATE		6/17 ->						6/18 ->					
TIME		0939	1039	1139	0939	1039	1139	1100	1200	1300	1539	1639	1739
SOURCE		BPHCTS ->			BPHCBS ->			BPHFHW ->			BPHDWV ->		
FIN		PN2162 ->			PN2307 ->			PN2158 ->			PN2162 ->		
EPN		SN74 ->			SN89 ->			SN71 ->			SN74 ->		
	UNITS												
WOOD		HARDWOOD ->											
PRODUCT	T/D	275	275	300	275	275	300	300	300	275	275	275	275
KAPPA		19.5	17.6	16.0	19.5	17.3	16.0	16.8	17.0	17.0	17.7	17.7	18.5
CHEM USAGE													
Cl_2	LB/T	112	112	110	112	112	110	116	116	116	116	84	84
NaOH	LB/T	145	145	134	145	145	134	114	114	107	107	107	107
NaOCl	LB/T	34	34	34	34	34	34	28	34	28	34	28	34
ClO_2	LB/T	17	17	17	17	17	17	16	16	16	16	16	16
NAOCl	LB/T	2	2	2	2	2	2	2	2	2	2	2	2
NaOH	LB/T	4	2	4	4	2	4	2	2	2	2	4	4
C STOCK	F	118	110	118	118	110	118	120	120	120	120	120	120
E MIXER	F	118	118	118	118	118	118	120	120	120	120	120	120
H_1 MIXER	F	132	132	132	132	132	132	132	132	132	132	132	132
D UPFLOW	F	160	160	160	160	160	160	160	160	160	160	160	160
H_2 MIXR	F	110	110	110	110	110	110	110	110	110	110	110	110
pH LEVEL													
E		10.9	10.9	10.8	10.9	10.9	10.8	10.8	10.8	11.0	11.0	11.0	11.0
H_1		8.5	8.5	8.9	8.5	8.5	8.9	7.5	7.5	7.7	7.7	7.7	8.2
D		4.1	4.1	4.0	4.1	4.1	4.0	3.8	3.8	4.0	4.0	3.8	3.8
H_2		8.7	8.7	8.8	8.7	8.7	8.8	8.6	8.6	8.2	8.2	8.6	8.6

SCRUBBER, Cl_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW SCFM - NO FAN
LIQ FLOW 3 GPM 10% NaOH
DP IN H_2O - NO FAN

(2) SCRUBBERS, ClO_2 TOWER AND SEAL BOX
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW SCFM - NO FAN
LIQ FLOW 10 GPM DILUTE SODIUM BISULFITE
DP IN H_2O - NO FAN

NOTES: 1.0 BLEACHING SEQUENCE -	RETENTION TIMES, MIN @ 350 T/D
CHLORINE, C	42
CAUSTIC SODA, E	42
1st SODIUM HYPOCHLORITE WITH CAUSTIC, H_1	170
CHLORINE DIOXIDE WITH CAUSTIC, D	220
2nd SODIUM HYPOCHLORITE WITH CAUSTIC, H_2	30

2.0 ALL VALUES ONE HOUR READINGS FROM OPERATIONS LOG
3.0 PRODUCTION IS IN OVEN DRY UNBLEACHED SHORT TONS
4.0 ClO_2 IS AS ClO_2
5.0 H_1 pH REPRESENTS VAT pH WHERE pH IS ADJUSTED BY ADDING CHLORINE FILTRATE TO REDUCE SCALING. ACTUAL pH IN THE HYPO TOWER IS IN THE RANGE OF 9.5.

Note: See Appendix D for Unit Process Description

SECTION 26

SECOND NaOCl WASHER VENT

(SP-BPHSHW)

SECTION 26
SECOND NaOCl WASHER VENT
(SP-BPHSHW)

The Second NaOCl Washer Vent was tested on one day. The source was sampled for volatile organic compounds using Methods 25A and 18. A chloroform sample was collected. Hydrogen chloride was not sampled because the bleach plant went down.

Total Hydrocarbons (M25A)

Figure 26.1 presents the THC trend for the test period on 6/10/92. The total hydrocarbon concentrations were between 0 and 1 ppm.

Volatile Organic Compounds (M18)

Table 26.1 summarizes the results for the Method 18 target compounds, and Section 26.1 is a tabulation of the data. Methanol and chloroform were identified by the Method 18 analyses. The volumetric flow was measured during sampling with a pitot tube.

Miscellaneous Parameters

Table 26.2 summarizes the results of testing for hydrogen chloride and chloroform. Section 26.2 tabulates the results for each compound. Chloroform results (lb/hr) were comparable to Method 18 data.

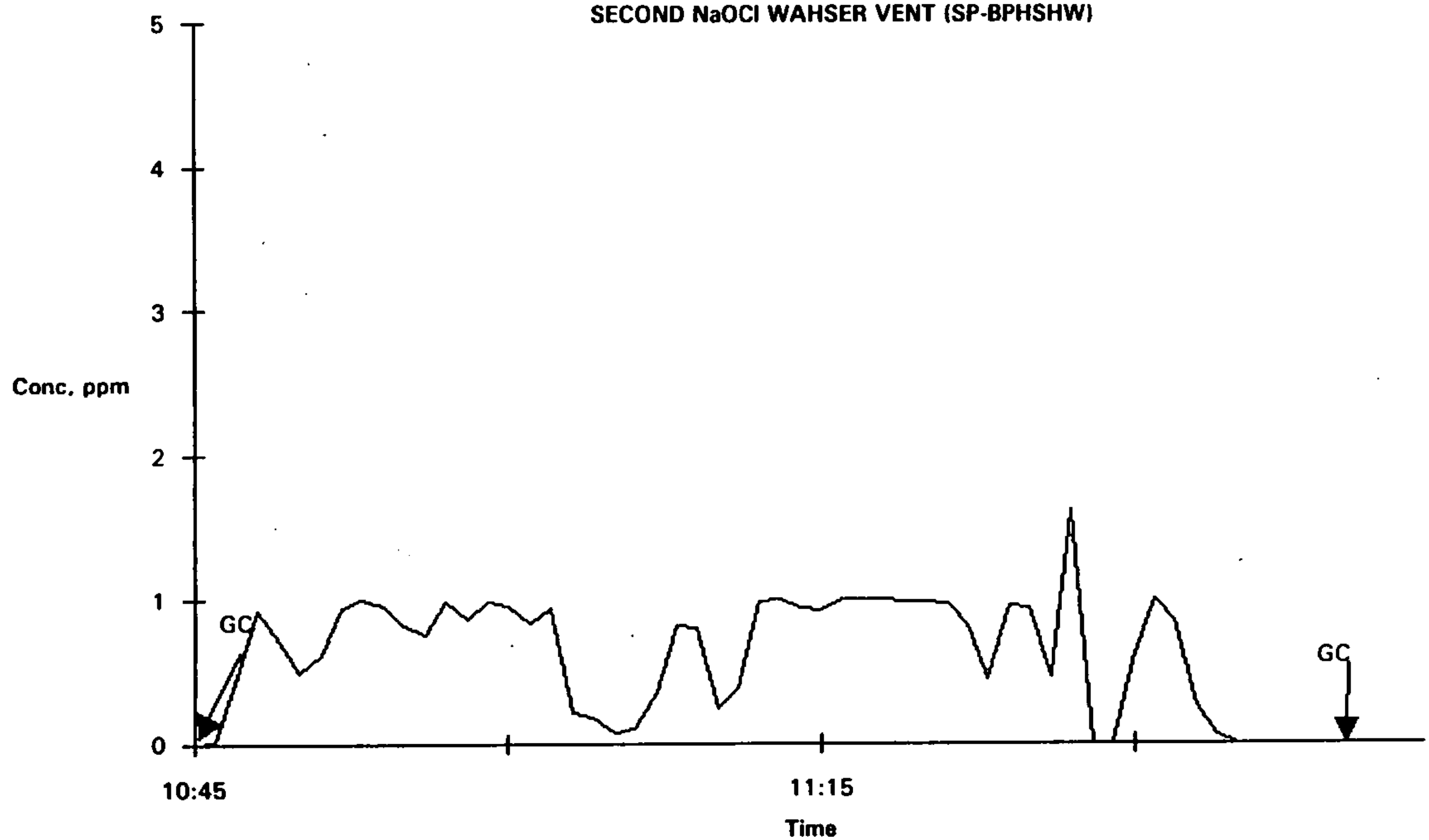
VOC Quality Control Results

The VOC quality control data are tabulated in Section 26.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 26.4 includes the process operating data as recorded and provided by mill personnel.

FIGURE 26.1
THC TREND ANALYSIS (6/10/92)
SECOND NaOCl WAHSER VENT (SP-BPHSHW)



WESTON MANAGERS DESIGNERS/CONSULTANTS

TABLE 26.1 SUMMARY OF VOC RESULTS

Mill: SIMPSON - PASADENA
Source Code: SP-BPHSHW
FIN: PN2166 CIN: NA

Source: Second NaOCl Washer Vent
Test Dates: 6/10/92
EPN: SN75

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	98	98	98	
Volumetric Flow Rate, x10^3 DSCFM	9.1	9.1	9.1	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	13.5	13.5	13.5	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	0.2	0.2	0.2	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	0.3	0.3	0.3	0.2
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.2
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	ND	ND	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	0.1	0.1	0.1	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	<0.1	<0.1	0.1	0.1

ND=Not Detected
DL=Detection Limit

TABLE 26.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: SIMPSON-PASADENA
Source Code: SP-BPHSHW
FIN: PN2166 EPN: SN75

Source: Second NaOCl Washer Vent
Test Dates: 6/10/92
CIN: NA

	RUN 1	DL
Volumetric Flow Data		
Stack Temperature, °F	98	
Volumetric Flow Rate, x 10^3 DSCFM	9.1	
Process Operating Conditions		
Production Rate, ADT pulp/hr	13.5	
Emission Rate, lb/hr		
Chloroform	0.3	0.1
Hydrogen chloride		0.1

ND = Not Detected
DL = Detection Limit

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(L) WWC (R) DW 28 December 1992

Section 26.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Second NaOCl Washer Vent | FIN: PN2166
Source Code: SP-BPHSHW | Date: 6/10/92 | EPN: SN75 | CIN: NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1044			
Flow Data				
Stack Temperature, °F	98			98
Moisture Content, %	6.1			6.1
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	10.3			10.3
Volumetric Flow Rate, x10^3 DSCFM	9.1			9.1
Process Operating Conditions				
Production Rate, ADT pulp/hr	13.5			13.5
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	4.2			4.2
Emission Rate, lb/hr	0.2			0.2
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Acetone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Second NaOCl Washer Vent | FIN: PN2166
Source Code: SP-BPHSHW | Date: 6/10/92 | EPN: SN75 | CIN: NA

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Chloroform				
Concentration, ppmvd	1.6			1.6
Emission Rate, lb/hr	0.3			0.3
Benzene				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *			1.1 *
Emission Rate, lb/hr	0.2 *			0.2 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Cumene				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
alpha-Pinene				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
beta-Pinene				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
3-Carene				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source: Second NaOCl Washer Vent		FIN: PN2166
Source Code: SP-BPHSHW	Date: 6/10/92	EPN: SN75	CIN: NA

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *
Knowns as Carbon				
Concentration, ppmvd	4.2			4.2
Unknowns as Carbon				
Concentration, ppmvd	0.0			0.0
Sum M18 as Carbon, lb/hr	0.1 *			0.1 *
Unknown Compounds % of Total	0.0%			0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	0.5 *			0.5 *
Emission Rate, lb/hr as C	0.1 *			0.1 *

* One or more values were less than the detection limit.

Section 26.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill:	SIMPSON - PASADENA	Source:	Second NaOCl Washer Vent			FIN:	PN2166
Source Code:	SP-BPHSHW	Date:	6/10/92	EPN:	SN75	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1100			
Flow Data				
Stack Temperature, °F	98			98
Moisture Content, %	6.1			6.1
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	10.3			10.3
Volumetric Flow Rate, x10^3 DSCFM	9.1			9.1
Process Operating Conditions				
Production Rate, ADT pulp/hr	13.5			13.5
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	1.8			1.8
Emission Rate, lb/hr	0.3			0.3
Hydrogen chloride				
Concentration, ppmvd				
Emission Rate, lb/hr				

COMMENTS :

Hydrogen chloride was not analyzed because the bleach plant down per Don Padfield.

* One or more values were less than the detection limit.

Section 26.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collecte. during and after the VOC testing on the source. The source test results have not been corre. for calibration error, sample line loss or other QC results. The reader should interpret t . emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL SP SOURCE SP-BPHSHW

1. CALIBRATION

THEOR	DATE 6/10/92		DATE
ppm	ppm	%REC	ppm
0	-7	-0.7%	
36	94	261.1%	
91	156	171.4%	
150	371	247.3%	

2. PROPANE LINE RECOVERY

	DATE INST	6/10/92 LINE	%REC	DATE INST	LINE
BEFORE	153	137	90%		
AFTER	155	145	94%		

3. LINE BLANK

	DATE INST	6/10/92 LINE	DATE INST	LINE
BEFORE	0	0		
AFTER	0	0		

QUALITY CONTROL SUMMARY
METHOD 18

MILL SP SOURCE SP-BPHSHW

1. CHECK STANDARD

ANALYTE	THEOR	DATE 6/10/92		THEOR	DATE	
	ppm	ppm	%REC	ppm	ppm	%REC
ethanol	55.64	31.93	57.39%			
acetone	44.47	33.14	74.51%			
isopropanol	42.65	35.49	83.21%			
dimethyl sulfide	9.78	8.25	84.39%			
benzene	36.54	35.27	96.53%			
bromodichloromethane	20.08	17.27	85.98%			
dimethyl disulfide	36.26	30.88	85.16%			
toluene	30.73	28.21	91.80%			
ethyl benzene	26.67	24.38	91.42%			
m-xylene	53.27	49.13	92.23%			
o-xylene	26.76	24.45	91.36%			
cumene	23.47	21.82	92.97%			
alpha-pinene	20.49	19.53	95.28%			
beta-pinene	20.59	19.77	96.03%			
3-carene	20.61	19.35	93.87%			
p-cymene	20.92	19.27	92.10%			

2. PROPANE RESPONSE

	THEOR			THEOR	
BEFORE RUN	89.7	90.9	101.3%		
AFTER RUN	89.7	90.2	100.5%		

3. METHANOL LINE RECOVERY

	THEOR			THEOR	
BEFORE RUN	110.7	105.1	94.9%		
AFTER RUN	106.8	111.8	104.6%		

4. LINE BLANK

	[--------------FILE REF--------------]	
BEFORE RUN	FAA4003	
AFTER RUN	FBA4001	

Section 26.4 Process Operating Data

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(L) WWC (R) DW 28 December 1992

MILL: SIMPSON PAPER   SOURCE: HARDWOOD BLEACH PLANT

	UNITS														
DATE		6/10 ->								6/16					
TIME		1044	1044	1523	1623	1723	1523	1623	1723	1110	1210	1310	1520	1620	1720
SOURCE		BPHSHW	BPHCWY	BPHCSS ->			BPHEWY ->			BPHCSS ->			BPHCTS ->		
FIN		PN2166	PN2151	PN2152 ->			PN2151 ->			PN2152 ->			PN2162 ->		
EPN		SN75	SN66	SN88 ->			SN66 ->			SN88 ->			SN74 ->		
WOOD		HARDWOOD ->													
PRODUCT	T/D	325	325	300	300	275	300	300	275	300	275	275	275	275	275
KAPPA		16.9	16.9	17.9	17.9	18.5	17.9	17.9	18.5	19.0	18.2	18.2	18.8	21.5	20.7
CHEM USAGE															
Cl_2	LB/T	112	112	112	112	80	112	112	80	136	128	128	72	108	116
NaOH	LB/T	114	114	108	108	105	108	108	105	132	133	133	133	130	130
NaOCl	LB/T	36	36	32	32	32	32	32	32	34	34	34	34	34	34
ClO_2	LB/T	17	17	17	17	17	17	17	17	17	17	17	17	17	17
NaOCl	LB/T	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NaOH	LB/T	8	8	8	8	8	8	8	8	4	4	4	4	4	4
C STOCK	F	100	100	100	100	100	100	100	100	116	116	116	116	116	116
E MIXER	F	110	110	110	110	110	110	110	110	118	118	118	118	118	118
H_1 MIXER	F	128	128	128	128	128	128	128	128	128	128	128	128	128	128
D UPFLOW	F	154	154	154	154	154	154	154	160	160	160	160	160	160	160
H_2 MIXR	F	110	110	110	110	110	110	110	110	110	110	110	110	110	110
pH LEVEL															
Eo		10.8	10.8	10.8	10.8	10.9	10.8	10.8	10.9	10.8	11.1	11.1	10.9	11.1	10.8
H_1		8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.0	7.8	7.8	8.1	8.3	8.5
D		4.5	4.5	4.5	4.5	4.5	4.5	4.5	3.9	4.0	3.8	3.8	4.1	3.7	4.1
H_2		9.0	9.0	9.0	9.0	9.0	9.0	9.0	8.8	8.8	8.7	8.7	8.6	8.6	8.6

SCRUBBER, Cl_2	(2) SCRUBBERS, ClO_2 TOWER AND SEAL BOX
TYPE - COLUMN	TYPE - COLUMN
SRB MED - TELLERETTES	SRB MED - TELLERETTES
GAS FLOW SCFM - NO FAN	GAS FLOW SCFM - NO FAN
LIQ FLOW 3 GPM 10% NaOH	LIQ FLOW 10 GPM DILUTE SODIUM BISULFITE
DP IN H_2O - NO FAN	DP IN H_2O - NO FAN

NOTES: 1.0 BLEACHING SEQUENCE -

	RETENTION TIMES, MIN @ 350 T/D
CHLORINE, C	42
CAUSTIC SODA, E	42
1st SODIUM HYPOCHLORITE WITH CAUSTIC, H_1	170
CHLORINE DIOXIDE WITH CAUSTIC, D	220
2nd SODIUM HYPOCHLORITE WITH CAUSTIC, H_2	30

2.0 ALL VALUES ONE HOUR READINGS FROM OPERATIONS LOG

3.0 PRODUCTION IS IN OVEN DRY UNBLEACHED SHORT TONS

4.0 ClO_2 IS AS ClO_2

5.0 H_1 pH REPRESENTS VAT pH WHERE pH IS ADJUSTED BY ADDING CHLORINE FILTRATE TO REDUCE SCALING. ACTUAL pH IN THE HYPO TOWER IS IN THE RANGE OF 9.5.

Note: See Appendix D for Unit Process Description

SECTION 27

SECOND NaOCl SEAL BOX VENT

(SP-BPHSHS)

27. SP-BPHSHS

SECTION 27
SECOND NaOCl SEAL BOX VENT
(SP-BPHSHS)

The Second NaOCl Seal Box Vent was tested on one day. The source was sampled for volatile organic compounds using Methods 25A and 18. Chloroform and hydrogen chloride samples were collected.

Total Hydrocarbons (M25A)

Figure 27.1 presents the THC trend for the test period on 6/19/92. The total hydrocarbon concentrations ranged from 31 to 47 ppm. At 1023, 1108, and 1255, the concentration increased from 54 to 66 ppm. At 1115, the concentration decreased to 12 ppm.

Volatile Organic Compounds (M18)

Table 27.1 summarizes the results for the Method 18 target compounds, and Section 27.1 is a tabulation of the data. Methanol and chloroform were detected by the Method 18 analyses. The volumetric flow was measured during sampling with a pitot tube.

Miscellaneous Parameters

Table 27.2 summarizes the results of testing for hydrogen chloride and chloroform. Section 27.2 tabulates the results for each compound. Chloroform results (lb/hr) were comparable to Method 18 data. Hydrogen chloride was detected (<0.1 lb/hr).

VOC Quality Control Results

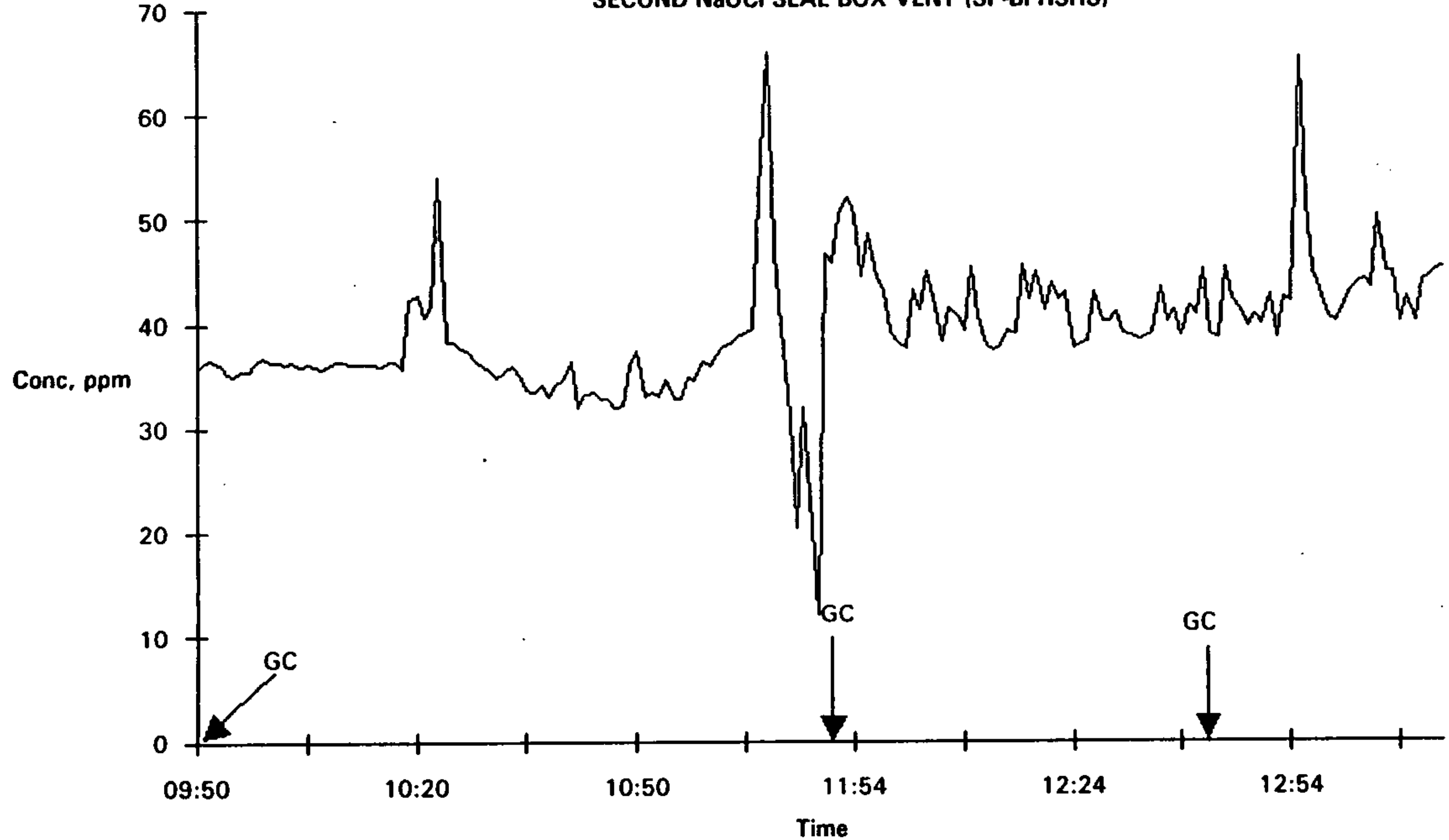
The VOC quality control data are tabulated in Section 27.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 27.4 includes the process operating data as recorded and provided by mill personnel.

FIGURE 27.1

THC TREND ANALYSIS (6/19/92)
SECOND NaOCl SEAL BOX VENT (SP-BPHSHS)



WESTON

TABLE 27.1 SUMMARY OF VOC RESULTS

Mill: SIMPSON - PASADENA
Source Code: SP-BPHSHS
FIN: PN2167 CIN: NA
Source: Second NaOCl Seal Box Vent
Test Dates: 6/19/92
EPN: SN76

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	122	122	122	
Volumetric Flow Rate, x10³ DSCFM	0.2	0.2	0.2	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	11.5	11.5	11.5	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	<0.1	<0.1	0.1	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	0.1	0.1	0.1	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	ND	ND	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	ND	ND	ND	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	ND	ND	ND	0.1

ND=Not Detected
DL=Detection Limit

WESTON

TABLE 27.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: SIMPSON-PASADENA
Source Code: SP-BPHSHS
FIN: PN2167 EPN: SN76

Source: Second NaOC Seal Box Vent
Test Dates: 6/19/92
CIN: NA

	RUN 1	DL
Volumetric Flow Data		
Stack Temperature, °F	122	
Volumetric Flow Rate, x 10^3 DSCFM	0.2	
Process Operating Conditions		
Production Rate, ADT pulp/hr	11.5	
Emission Rate, lb/hr		
Chloroform	<0.1	0.1
Hydrogen chloride	<0.1	0.1

ND = Not Detected
DL = Detection Limit

Section 27.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	Second NaOCl Seal Box Vent		FIN:	PN2167
Source Code: SP-BPHSHS	Date:	6/19/92	EPN: SN76	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	949	1049	1215	
Flow Data				
Stack Temperature, °F	122			122
Moisture Content, %	12.2			12.2
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.3			0.3
Volumetric Flow Rate, x10^3 DSCFM	0.2			0.2
Process Operating Conditions				
Production Rate, ADT pulp/hr	11.5	11.5	11.5	11.5
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	14.9	15.8	25.4	18.7
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source: Second NaOCl Seal Box Vent		FIN: PN2167
Source Code: SP-BPHSHS	Date: 6/19/92	EPN: SN76	CIN: NA

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	28.1	28.9	27.2	28.1
Emission Rate, lb/hr	0.1	0.1	0.1	0.1
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	Second NaOCl Seal Box Vent		FIN:	PN2167
Source Code: SP-BPHSHS	Date:	6/19/92	EPN: SN76	CIN:	NA

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	39.4	42.6	47.0	43.0
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	41.0	49.0	47.8	45.9
Emission Rate, lb/hr as C	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

Section 27.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill:	SIMPSON - PASADENA	Source:	Second NaOCl Seal Box Vent			FIN:	PN2167
Source Code:	SP-BPHSHS	Date:	6/19/92	EPN:	SN76	CIN:	NA

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1020			
Flow Data				
Stack Temperature, °F	122			122
Moisture Content, %	12.2			12.2
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.3			0.3
Volumetric Flow Rate, x10^3 DSCFM	0.2			0.2
Process Operating Conditions				
Production Rate, ADT pulp/hr	11.5			11.5
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	21.7			21.7
Emission Rate, lb/hr	0.1 *			0.1 *
Hydrogen chloride				
Concentration, ppmvd	0.7			0.7
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL SP SOURCE SP-BPHSHS

1. CALIBRATION

THEOR	DATE	6/19/92	DATE		1/0/00
ppm	ppm	%REC	ppm	%REC	%REC
0	-1			~~#DIV/0!~~	
90	82	91.11%		~~#DIV/0!~~	~~0.00%~~
149	161	108.05%		#DIV/0!	~~0.00%~~
375	371	98.93%			~~0.00%~~

2. PROPANE LINE RECOVERY

	DATE INST	6/19/92 LINE	%REC	DATE INST	1/0/00 LINE		%REC
BEFORE	60	61	102%			0.00%	#DIV/0!
AFTER	84	88	105%			0.00%	#DIV/0!

3. LINE BLANK

	DATE INST	6/19/92 LINE		DATE INST	1/0/00 LINE	
BEFORE	0	0				#DIV/0!
AFTER	0	0				#DIV/0!

Section 27.3 Quality Control Results

WESTON QC SUMMARY
METHOD 18

MILL SIMPSON SOURCE SP-BPHSHS

1. CHECK STANDARD

FILE NAME		[---------------- %REC	----------]	
ppm	THEOR	EXP 1	EXP 2	EXP 3
		FJB4003		
ethanol	55.64	162.46%		
acetone	44.47	138.15%		
isopropanol	42.65	119.14%		
dimethyl sulfide	19.55	103.56%		
benzene	36.54	134.63%		
bromodichloromethane	40.17	115.06%		
dimethyl disulfide	36.26	106.03%		
toluene	30.73	106.01%		
ethyl benzene	26.67	104.69%		
m-xylene	26.64	102.56%		
o-xylene	26.76	105.49%		
cumene	23.47	105.11%		
alpha-pinene	20.49	104.32%		
beta-pinene	20.59	101.30%		
3-carene	20.61	100.55%		
p-cymene	20.92	102.61%		

2. PROPANE RESPONSE

	THEOR	%REC	%REC	%REC
BEFORE RUN	29.9	111.94%		
AFTER RUN	29.9	111.86%		

3. METHANOL RECOVERY

	THEOR	%REC	%REC	%REC
BEFORE RUN	100	97.19%		
AFTER RUN	100	99.26%		

4. LINE BLANK

	[-------------- FILE REF	----------]	
BEFORE RUN	FJB4002		
AFTER RUN	FJB4013		

NOTES:

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Section 27.4 Process Operating Data

MILL: SIMPSON PAPER SOURCE: HARDWOOD BLEACH PLANT

DATE		6/19 ->			5/20						6/21		
TIME		0948	1049	1215	0833	0933	1033	1351	1451	1551	0914	1014	1114
SOURCE		BPHSHS ->			BPHFHS ->			BPHESB ->			BPHESB ->		
FIN		PN2167 ->			PN2159 ->			PN2156 ->			PN2156 ->		
EPN		SN76 ->			SN72 ->			SN69 ->			SN69 ->		
	UNITS												
WOOD		HARDWOOD ->											
PRODUCT	T/D	275	275	300	275	275	275	350	350	325	275	275	275
KAPPA		19.8	18.3	20.0	18.1	18.8	18.1	17.8	19.0	19.5	19.2	18.8	19.4
CHEM USAGE													
Cl_2	LB/T	128	120	128	108	108	108	176	176	176	168	168	168
NaOH	LB/T	104	104	111	120	120	135	127	127	153	145	145	134
NaOCl	LB/T	30	30	30	32	32	30	30	30	32	32	32	31
ClO_2	LB/T	16	16	17	17	17	17	18	18	17	17	17	17
NAOCl	LB/T	2	2	2	2	2	2	2	2	2	2	2	2
NaOH	LB/T	4	4	4	4	2	4	4	2	4	4	4	4
D STOCK	F	118	110	118	110	110	112	112	112	118	114	114	114
E MIXER	F	120	120	120	110	110	114	114	114	118	114	114	114
H_1 MIXER	F	128	120	128	120	120	124	120	120	128	124	114	124
D UPFLOW	F	162	162	162	163	163	163	162	162	162	110	110	110
H_2 MIXR	F	110	110	110	110	110	110	110	110	110	110	110	110
pH LEVEL													
E		10.7	10.7	10.8	10.7	10.7	10.0	10.7	10.7	10.5	10.7	10.7	10.9
H_1		7.3	7.3	7.2	8.2	8.2	8.9	7.0	7.0	7.0	7.0	7.0	9.9
D		4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
H_2		8.7	8.7	8.7	8.3	8.3	8.5	8.5	8.5	8.6	8.6	8.6	8.8

SCRUBBER, Cl_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW SCFM - NO FAN
LIQ FLOW 3 GPM 10% NaOH
DP IN H_2O - NO FAN

(2) SCRUBBERS, ClO_2 TOWER AND SEAL BOX
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW SCFM - NO FAN
LIQ FLOW 10 GPM DILUTE SODIUM BISULFITE
DP IN H_2O - NO FAN

NOTES: 1.0 BLEACHING SEQUENCE -	RETENTION TIMES, MIN @ 350 T/D
CHLORINE, C	42
CAUSTIC SODA, E	42
1st SODIUM HYPOCHLORITE WITH CAUSTIC, H_1	170
CHLORINE DIOXIDE WITH CAUSTIC, D	220
2nd SODIUM HYPOCHLORITE WITH CAUSTIC, H_2	30

2.0 ALL VALUES ONE HOUR READINGS FROM OPERATIONS LOG

3.0 PRODUCTION IS IN OVEN DRY UNBLEACHED SHORT TONS

4.0 ClO_2 IS AS ClO_2

5.0 H_1 pH REPRESENTS VAT pH WHERE pH IS ADJUSTED BY ADDING CHLORINE FILTRATE TO REDUCE SCALING. ACTUAL pH IN THE HYPO TOWER IS IN THE RANGE OF 9.5.

Note: See Appendix D for Unit Process Description

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SECTION 28

CHLORINATION SEAL BOX SCRUBBER VENT

(SP-BPHCSS)

28. SP-BPHCSS

SECTION 28
CHLORINATION SEAL BOX SCRUBBER VENT
(SP-BPHCSS)

The Chlorination Seal Box Scrubber Vent was tested on two different days. The source was sampled for volatile organic compounds by Methods 25A and 18. Chloroform and hydrogen chloride samples were collected.

Total Hydrocarbons (M25A)

Figures 28.1 and 28.2 present the THC trends for the test periods on 6/10/92 and 6/16/92. On the first day, the total hydrocarbon concentrations ranged from 36 to 79 ppm during the first two hours of testing. During the last hour, the concentrations varied from 0 to 45 ppm. On the second day, they were very erratic and ranged from 8 to 102 ppm.

Volatile Organic Compounds (M18)

Table 28.1 summarizes the results for the Method 18 target compounds, and Section 28.1 is a tabulation of the data. Methanol and chloroform were detected by the Method 18 analyses. Unknowns were present following chloroform. The volumetric flow was measured during sampling with a pitot tube.

Miscellaneous Parameters

Table 28.2 summarizes the results of testing for hydrogen chloride and chloroform. Section 28.2 tabulates the results for each compound. Chloroform results (lb/hr) were consistent with Method 18 data. Hydrogen chloride was detected on day 2 (<0.1 lb/hr).

VOC Quality Control Results

The VOC quality control data are tabulated in Section 28.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 28.4 includes the process operating data as recorded and provided by mill personnel.

FIGURE 28.1
THC TREND ANALYSIS (6/10/92)
CHLORINATION SEAL BOX SCRUBBER VENT
(SP-BPHCSS)

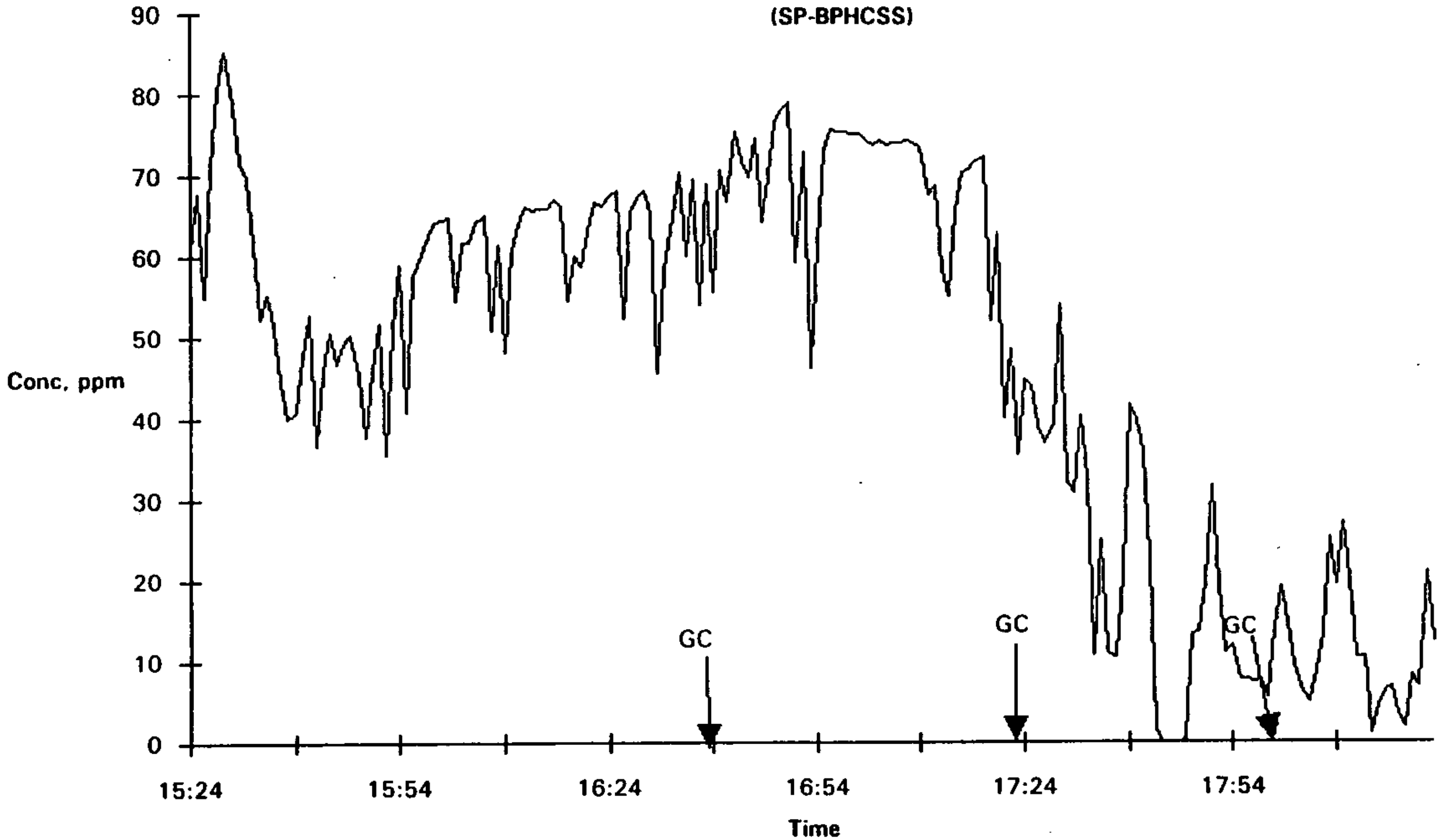

FIGURE 28.2

THC TREND ANALYSIS (6/16/92)
CHLORINATION SEAL BOX SCRUBBER VENT
(SP-BPHCSS)

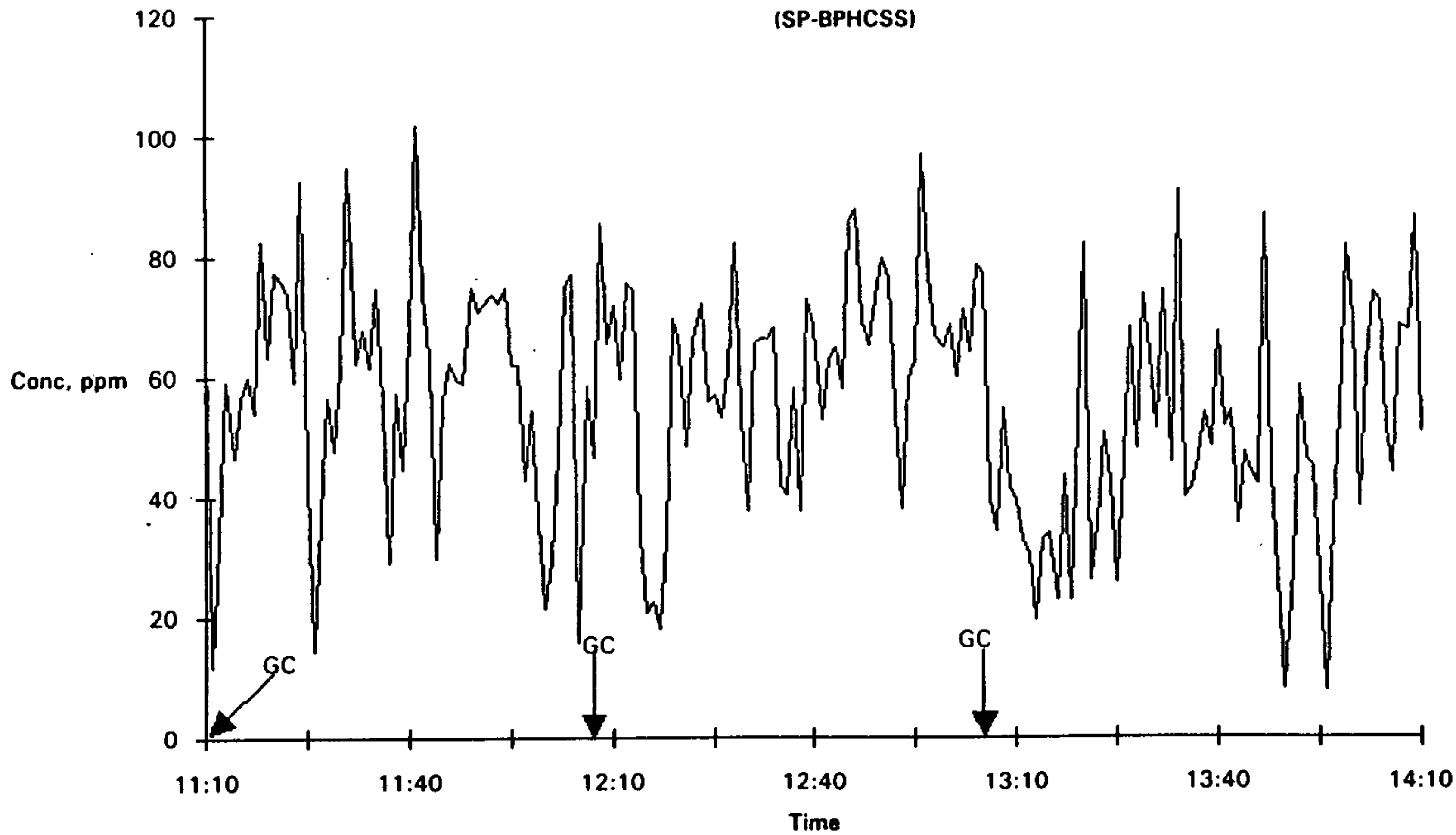

TABLE 28.1 SUMMARY OF VOC RESULTS

Mill: *SIMPSON - PASADENA* | Source: Chlorination Seal Box Scrubber Vent
Source Code: SP-BPHCSS | Test Dates: 6/10/92 6/16/92
FIN: PN2152 CIN: CN2153 | EPN: SN88

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	102	105	103	
Volumetric Flow Rate, x10^3 DSCFM	0.4	0.5	0.5	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	11.5	12.5	12.0	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	<0.1	0.1	0.1	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	ND	0.5	0.2	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	ND	ND	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	ND	0.1	0.1	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	<0.1	<0.1	0.1	0.1

ND=Not Detected
DL=Detection Limit

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TABLE 28.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: SIMPSON-PASADENA
Source Code: SP-BPHCSS
FIN: PN2152 EPN: SN88

Source: Chlorination Seal Box Scrubber Vent
Test Date: 6/10/92, 6/16/92
CIN: CN2153

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	102	105	104	
Volumetric Flow Rate, x 10^3 DSCFM	0.4	0.5	0.5	
Process Operating Conditions				
Production Rate, ADT pulp/hr	11.5	11.5	11.5	
Emission Rate, lb/hr				
Chloroform	<0.1	0.3	0.2	0.1
Hydrogen chloride	ND	<0.1	0.1	0.1

ND = Not Detected
DL = Detection Limit

Section 28.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Chlorination Seal Box Scrubber Vent | FIN: PN2152
Source Code: SP-BPHCSS | Date: 6/10/92 | EPN: SN88 | CIN: CN2153

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1523	1623	1723	
Flow Data				
Stack Temperature, °F	102			102
Moisture Content, %	6.8			6.8
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.4			0.4
Volumetric Flow Rate, x10^3 DSCFM	0.4			0.4
Process Operating Conditions				
Production Rate, ADT pulp/hr	12.5	12.5	11.5	12.2
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	41.2	35.7	6.6	27.8
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source:	Chlorination Seal Box Scrubber Vent	FIN:	PN2152
Source Code: SP-BPHCSS	Date:	6/10/92 EPN: SN88	CIN:	CN2153

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	32.4	3.5	1.1 *	12.2
Emission Rate, lb/hr	0.2	0.1 *	0.1 *	0.1
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Chlorination Seal Box Scrubber Vent | FIN: PN2152
Source Code: SP-BPHCSS | Date: 6/10/92 | EPN: SN88 | CIN: CN2153

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	58.9	27.1	5.0	30.4
Unknowns as Carbon				
Concentration, ppmvd	4.7	0.0	2.2	2.3
Sum M18 as Carbon, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Unknown Compounds % of Total	7.4%	0.0%	30.3%	12.6%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	62.2	70.8	18.2	50.4
Emission Rate, lb/hr as C	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Chlorination Seal Box Scrubber Vent | FIN: PN2152
Source Code: SP-BPHCSS | Date: 6/16/92 | EPN: SN88 | CIN: CN2153

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1110	1210	1310	
Flow Data				
Stack Temperature, °F	105			105
Moisture Content, %	7.5			7.5
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.6			0.6
Volumetric Flow Rate, x10^3 DSCFM	0.5			0.5
Process Operating Conditions				
Production Rate, ADT pulp/hr	12.5	11.5	11.5	11.8
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	57.4	30.7	36.4	41.5
Emission Rate, lb/hr	0.1	0.1 *	0.1 *	0.1
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: Chlorination Seal Box Scrubber Vent | FIN: PN2152
Source Code: SP-BPHCSS | Date: 6/16/92 EPN: SN88 | CIN: CN2153

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	51.7	4.1	28.0	27.9
Emission Rate, lb/hr	0.5	0.1 *	0.3	0.3
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA　　Source: Chlorination Seal Box Scrubber Vent　　FIN: PN2152
Source Code: SP-BPHCSS　　Date: 6/16/92　　EPN: SN88　　CIN: CN2153

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	90.8	24.8	51.0	55.5
Unknowns as Carbon				
Concentration, ppmvd	3.2	0.0	1.1	1.4
Sum M18 as Carbon, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Unknown Compounds % of Total	3.4%	0.0%	2.1%	1.8%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	63.8	63.8	53.0	60.2
Emission Rate, lb/hr as C	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

Section 28.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA		Source:	Chlorination Seal Box Scrubber Vent		FIN:	PN2152
Source Code:	SP-BPHCSS	Date:	6/10/92	EPN: SN88	CIN:	CN2153

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1750			
Flow Data				
Stack Temperature, °F	102			102
Moisture Content, %	6.8			6.8
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.4			0.4
Volumetric Flow Rate, x10^3 DSCFM	0.4			0.4
Process Operating Conditions				
Production Rate, ADT pulp/hr	11.5			11.5
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	1.7			1.7
Emission Rate, lb/hr	0.1 *			0.1 *
Hydrogen chloride				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA | Source: Chlorination Seal Box Scrubber Vent | FIN: PN2152
Source Code: SP-BPHCSS | Date: 6/16/92 | EPN: SN88 | CIN: CN2153

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1236			
Flow Data				
Stack Temperature, °F	105			105
Moisture Content, %	7.5			7.5
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.6			0.6
Volumetric Flow Rate, x10^3 DSCFM	0.5			0.5
Process Operating Conditions				
Production Rate, ADT pulp/hr	11.5			11.5
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	35.1			35.1
Emission Rate, lb/hr	0.3			0.3
Hydrogen chloride				
Concentration, ppmvd	0.5			0.5
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

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Section 28.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL SP SOURCE SP-BPHCSS

1. CALIBRATION

THEOR	DATE 6/10/92		DATE 6/16/92	
ppm	ppm	%REC	ppm	%REC
0	-7			
90	94	104.4%		
149	156	104.7%		
375	371	98.9%		
0			-3	
90			91	101.11%
149			152	102.01%
375			373	99.47%

2. PROPANE LINE RECOVERY

	DATE 6/10/92			DATE 6/16/92		
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	155	140	90%	372	347	93%
AFTER	158	151	96%	355	384	108%

3. LINE BLANK

	DATE 6/10/92		DATE 6/16/92	
	INST	LINE	INST	LINE
BEFORE	0	0	0	0
AFTER	0	0	0	0

WESTON QC SUMMARY
METHOD 18

MILL SIMPSON SOURCE SP-BPHCSS

1. CHECK STANDARD

FILE NAME		[---------- %REC	----------]	
ppm	THEOR	EXP 1	EXP 2	EXP 3
		FGB4001		
ethanol	55.64	76.71%		
acetone	44.47	105.90%		
isopropanol	42.65	81.16%		
dimethyl sulfide	19.55	95.50%		
benzene	36.54	111.27%		
bromodichloromethane	40.17	99.62%		
dimethyl disulfide	36.26	94.91%		
toluene	30.73	98.73%		
ethyl benzene	26.67	98.90%		
m-xylene	26.64	97.28%		
o-xylene	26.76	99.29%		
cumene	23.47	100.66%		
alpha-pinene	20.49	99.03%		
beta-pinene	20.59	97.92%		
3-carene	20.61	97.33%		
p-cymene	20.92	98.63%		

2. PROPANE RESPONSE

	THEOR	%REC	%REC	%REC
BEFORE RUN	29.9	106.81%		
AFTER RUN	29.9	113.92%		

3. METHANOL RECOVERY

	THEOR	%REC	%REC	%REC
BEFORE RUN	100	110.05%		
AFTER RUN	100	108.37%		

4. LINE BLANK

	[---------- FILE REF	----------]	
BEFORE RUN	FGB4004		
AFTER RUN	FGB4010		

NOTES:

Section 28.4 Process Operating Data

MILL: SIMPSON PAPER SOURCE: HARDWOOD BLEACH PLANT

	UNITS														
DATE		6/10 ->								6/16					
TIME		1044	1044	1523	1623	1723	1523	, 1623	1723	1110	1210	1310	1520	1620	1720
SOURCE		BPHSHW	BPHCWV	BPHCSS ->			BPHEWV ->			BPHCSS ->			BPHCTS ->		
FIN		PN2166	PN2151	PN2152 ->			PN2151 ->			PN2152 ->			PN2162 ->		
EPN		SN75	SN66	SN88 ->			SN66 ->			SN88 ->			SN74 ->		
WOOD		HARDWOOD ->													
PRODUCT	T/D	325	325	300	300	275	300	300	275	300	275	275	275	275	275
KAPPA		16.9	16.9	17.9	17.9	18.5	17.9	17.9	18.5	19.0	18.2	18.2	18.8	21.5	20.7
CHEM USAGE															
Cl_2	LB/T	112	112	112	112	80	112	112	80	136	128	128	72	108	116
NaOH	LB/T	114	114	108	108	105	108	108	105	132	133	133	133	130	130
NaOCl	LB/T	36	36	32	32	32	32	32	32	34	34	34	34	34	34
ClO_2	LB/T	17	17	17	17	17	17	17	17	17	17	17	17	17	17
NaOCl	LB/T	2	2	2	2	2	2	2	2	2	2	2	2	2	2
NaOH	LB/T	8	8	8	8	8	8	8	8	4	4	4	4	4	4
C STOCK	F	100	100	100	100	100	100	100	100	116	116	116	116	116	116
E MIXER	F	110	110	110	110	110	110	110	110	118	118	118	118	118	118
H_1 MIXER	F	128	128	128	128	128	128	128	128	128	128	128	128	128	128
D UPFLOW	F	154	154	154	154	154	154	154	160	160	160	160	160	160	160
H_2 MIXR	F	110	110	110	110	110	110	110	110	110	110	110	110	110	110
pH LEVEL															
Eo		10.6	10.8	10.8	10.8	10.9	10.8	10.8	10.9	10.8	11.1	11.1	10.9	11.1	10.8
H_1		8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.0	7.8	7.8	8.1	8.3	8.5
D		4.5	4.5	4.5	4.5	4.5	4.5	4.5	3.9	4.0	3.8	3.8	4.1	3.7	4.1
H_2		9.0	9.0	9.0	9.0	9.0	9.0	9.0	8.8	8.6	8.7	8.7	8.6	8.6	8.6

SCRUBBER, Cl_2
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW SCFM - NO FAN
LIQ FLOW 3 GPM 10% NaOH
DP IN H_2O - NO FAN

(2) SCRUBBERS, ClO_2 TOWER AND SEAL BOX
TYPE - COLUMN
SRB MED - TELLERETTES
GAS FLOW SCFM - NO FAN
LIQ FLOW 10 GPM DILUTE SODIUM BISULFITE
DP IN H_2O - NO FAN

NOTES: 1.0 BLEACHING SEQUENCE -	RETENTION TIMES, MIN @ 350 T/D
CHLORINE, C	42
CAUSTIC SODA, E	42
1st SODIUM HYPOCHLORITE WITH CAUSTIC, H_1	170
CHLORINE DIOXIDE WITH CAUSTIC, D	220
2nd SODIUM HYPOCHLORITE WITH CAUSTIC, H_2	30

2.0 ALL VALUES ONE HOUR READINGS FROM OPERATIONS LOG
3.0 PRODUCTION IS IN OVEN DRY UNBLEACHED SHORT TONS
4.0 ClO_2 IS AS ClO_2
5.0 H_1 pH REPRESENTS VAT pH WHERE pH IS ADJUSTED BY ADDING CHLORINE FILTRATE TO REDUCE SCALING. ACTUAL pH IN THE HYPO TOWER IS IN THE RANGE OF 9.5.

Note: See Appendix D for Unit Process Description

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SECTION 29

ClO_2 SEAL BOX SCRUBBER VENT

(SP-BPHCSB)

29. SP-BPHCSB

SECTION 29
ClO_2 SEAL BOX SCRUBBER VENT
(SP-BPHCSB)

The ClO_2 Seal Box Scrubber Vent was tested on two different days. The source was sampled for volatile organic compounds using Methods 25A and 18. Chloroform and hydrogen chloride samples were collected.

Total Hydrocarbons (M25A)

Figures 29.1 and 29.2 present the THC trends for the test periods on 6/16/92 and 6/17/92. On the first day, total hydrocarbon concentrations varied from 222 to 317 ppm for the first hour of testing. During the last two hours of testing, the concentrations increased and were between 230 and 413 ppm. On the second day, concentrations were consistently between 343 and 445 ppm except at 1118 when the concentration dropped to 237 ppm.

Volatile Organic Compounds (M18)

Table 29.1 summarizes the results for the Method 18 target compounds, and Section 29.1 is a tabulation of the data. Methanol, 2-Propanol, and chloroform were identified on day 1. Methanol and chloroform were detected on day 2. Unknowns were present following 2-Propanol and bromodichloromethane at approximately 1 ppm and 1 to 3 ppm as carbon, respectively. The volumetric flow was measured during sampling with a pitot tube.

Miscellaneous Parameters

Table 29.2 summarizes the results of testing for hydrogen chloride and chloroform. Section 29.2 tabulates the results for each compound. Chloroform and hydrogen chloride were detected. Chloroform results (lb/hr) were comparable to Method 18 data on the first day. However, on the second day they were slightly higher.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 29.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 29.4 includes the process operating data as recorded and provided by mill personnel. Not all process operating data were given for VOC run times. The data with the closest run time was used.

FIGURE 29.1

THC TREND ANALYSIS (6/16/92)
ClO2 SEAL BOX SCRUBBER VENT (SP-BPHCSB)

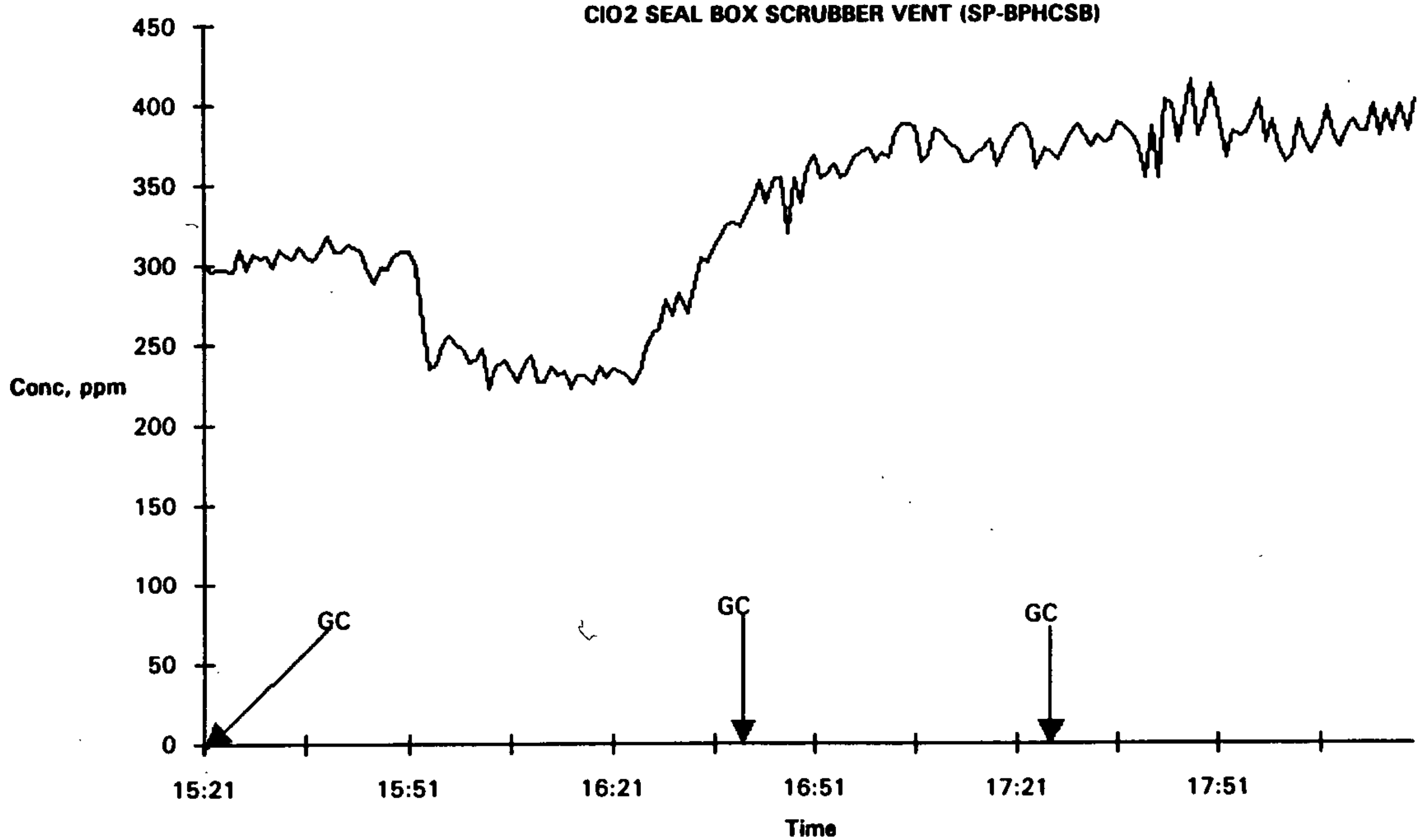

FIGURE 29.2

THC TREND ANALYSIS (6/17/92)
ClO2 SEAL BOX SCRUBBER VENT (SP-BPHCSB)

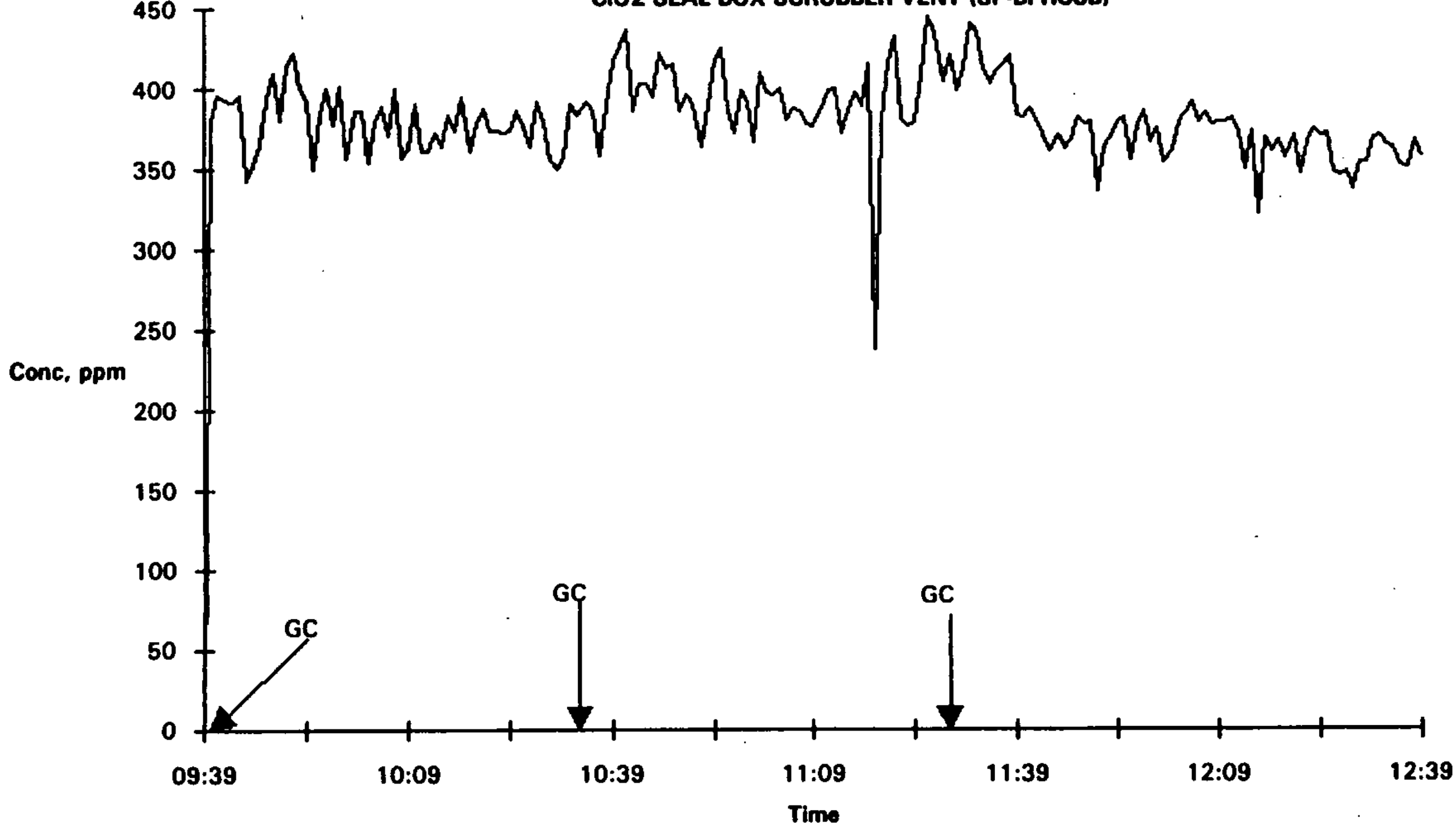

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TABLE 29.1 SUMMARY OF VOC RESULTS

Mill: SIMPSON - PASADENA | Source: ClO_2 Seal Box Scrubber Vent
Source Code: SP-BPHCSB | Test Dates: 6/16/92 6/17/92
FIN: PN2163 CIN: CN2164 | EPN: SN89

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	144	153	149	
Volumetric Flow Rate, x10^3 DSCFM	0.6	0.8	0.7	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	11.5	12.5	12.0	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	0.4	0.9	0.7	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	<0.1	0.1	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	3.2	3.7	3.6	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	<0.1	0.1	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	0.6	0.9	0.8	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	0.6	0.9	0.8	0.1

ND=Not Detected
DL=Detection Limit

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TABLE 29.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: SIMPSON-PASADENA
Source Code: SP-BPHCSB
FIN: PN2163 EPN: SN89

Source: ClO_2 Seal Box Scrubber Vent
Test Date: 6/16/92, 6/17/92
CIN: CN2164

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	144	153	149	
Volumetric Flow Rate, x 10^3 DSCFM	0.6	0.8	0.7	
Process Operating Conditions				
Production Rate, ADT pulp/hr	11.5	11.5	11.5	
Emission Rate, lb/hr				
Chloroform	3.9	4.9	4.4	0.1
Hydrogen chloride	<0.1	0.1	0.1	0.1

ND = Not Detected
DL = Detection Limit

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Section 29.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA   Source: ClO2 Seal Box Scrubber Vent   FIN: PN2163
Source Code: SP-BPHCSB   Date: 6/16/92   EPN: SN89   CIN: CN2164

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1520	1620	1720	
Flow Data				
Stack Temperature, °F			144	144
Moisture Content, %			10.3	10.3
Oxygen Concentration, %			20.8	20.8
Carbon Dioxide Concentration, %			0.0	0.0
Volumetric Flow Rate, x10^3 ACFM			1.1	1.1
Volumetric Flow Rate, x10^3 DSCFM			0.8	0.8
Process Operating Conditions				
Production Rate, ADT pulp/hr	11.5	11.5	11.5	11.5
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	88.7	134.8	180.6	134.7
Emission Rate, lb/hr	0.4	0.6	0.7	0.6
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.9	0.7	0.7
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source: ClO2 Seal Box Scrubber Vent	FIN: PN2163
Source Code: SP-BPHCSB	Date: 6/16/92 EPN: SN89	CIN: CN2164

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	210.1	229.4	232.9	224.2
Emission Rate, lb/hr	3.2	3.5	3.6	3.5
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: ClO2 Seal Box Scrubber Vent | FIN: PN2163
Source Code: SP-BPHCSB | Date: 6/16/92 | EPN: SN89 | CIN: CN2164

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	361.6	490.1	556.5	469.4
Unknowns as Carbon				
Concentration, ppmvd	2.1	2.3	4.7	3.0
Sum M18 as Carbon, lb/hr	0.6	0.8	0.9	0.7
Unknown Compounds % of Total	0.6%	0.5%	0.8%	0.6%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	303.2	372.4	427.0	367.5
Emission Rate, lb/hr as C	0.5	0.6	0.7	0.6

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA | Source: ClO2 Seal Box Scrubber Vent | FIN: PN2163
Source Code: SP-BPHCSB | Date: 6/17/92 | EPN: SN89 | CIN: CN2164

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	939	1039	1139	
Flow Data				
Stack Temperature, °F	153			153
Moisture Content, %	21.4			21.4
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.9			0.9
Volumetric Flow Rate, x10^3 DSCFM	0.6			0.6
Process Operating Conditions				
Production Rate, ADT pulp/hr	11.5	11.5	12.5	11.8
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	220.5	205.6	269.6	231.9
Emission Rate, lb/hr	0.7	0.7	0.9	0.7
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill:	SIMPSON - PASADENA	Source:	ClO2 Seal Box Scrubber Vent			FIN:	PN2163
Source Code:	SP-BPHCSB	Date:	6/17/92	EPN:	SN89	CIN:	CN2164

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	309.9	315.9	312.7	312.8
Emission Rate, lb/hr	3.7	3.7	3.7	3.7
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.3 *	1.3 *	1.3 *	1.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.6	0.6 *	0.6 *	0.4
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

29.1 - 5

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: SIMPSON - PASADENA	Source: ClO2 Seal Box Scrubber Vent		FIN: PN2163
Source Code: SP-BPHCSB	Date: 6/17/92	EPN: SN89	CIN: CN2164

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	673.7	662.7	687.4	674.6
Unknowns as Carbon				
Concentration, ppmvd	3.7	2.3	3.6	3.2
Sum M18 as Carbon, lb/hr	0.8	0.8	0.8	0.8
Unknown Compounds % of Total	0.5%	0.3%	0.5%	0.5%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	483.5	506.4	466.9	485.6
Emission Rate, lb/hr as C	0.6	0.6	0.6	0.6

* One or more values were less than the detection limit.

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Section 29.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA | Source: ClO2 Seal Box Scrubber Vent | FIN: PN2163
Source Code: SP-BPHCSB | Date: 6/16/92 | EPN: SN89 | CIN: CN2164

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1527			
Flow Data				
Stack Temperature, °F	144			144
Moisture Content, %	10.3			10.3
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	1.1			1.1
Volumetric Flow Rate, x10^3 DSCFM	0.8			0.8
Process Operating Conditions				
Production Rate, ADT pulp/hr	11.5			11.5
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	254.4			254.4
Emission Rate, lb/hr	3.9			3.9
Hydrogen chloride				
Concentration, ppmvd	30.2			30.2
Emission Rate, lb/hr	0.1			0.1

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: SIMPSON - PASADENA | Source: ClO2 Seal Box Scrubber Vent | FIN: PN2163
Source Code: SP-BPHCSB | Date: 6/17/92 | EPN: SN89 | CIN: CN2164

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1000			
Flow Data				
Stack Temperature, °F	153			153
Moisture Content, %	21.4			21.4
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.9			0.9
Volumetric Flow Rate, x10^3 DSCFM	0.6			0.6
Process Operating Conditions				
Production Rate, ADT pulp/hr	11.5			11.5
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	411.2			411.2
Emission Rate, lb/hr	4.9			4.9
Hydrogen chloride				
Concentration, ppmvd	3.1			3.1
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

Section 29.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

QUALITY CONTROL SUMMARY
METHOD 25A

MILL SP SOURCE SP-BPHCSB

1. CALIBRATION

THEOR	DATE	6/16/92	DATE	6/17/92
ppm	ppm	%REC	ppm	%REC
0			-1	
90		0.00%	88	97.78%
149		0.00%	152	102.01%
375		0.00%	373	99.47%

2. PROPANE LINE RECOVERY

	DATE	6/16/92		DATE	6/17/92	
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	355	384	108%	373	334	89.54%
AFTER	350	336	96%	361	363	100.55%

3. LINE BLANK

	DATE	6/16/92		DATE	6/17/92	
	INST	LINE		INST	LINE	
BEFORE	0	0		0	0	
AFTER	0	2		0	0	

WESTON QC SUMMARY
METHOD 18

MILL SIMPSON SOURCE SP-BPHCSB

1. CHECK STANDARD

FILE NAME		%REC		
ppm	THEOR	EXP 1	EXP 2	EXP 3
		FGB4001	FHB4001	
ethanol	55.64	76.71%	67.19%	
acetone	44.47	105.90%	97.88%	
isopropanol	42.65	81.16%	79.37%	
dimethyl sulfide	19.55	95.50%	90.26%	
benzene	36.54	111.27%	102.67%	
bromodichloromethane	40.17	99.62%	102.83%	
dimethyl disulfide	36.26	94.91%	79.43%	
toluene	30.73	98.73%	97.62%	
ethyl benzene	26.67	98.90%	98.46%	
m-xylene	26.64	97.28%	97.00%	
o-xylene	26.76	99.29%	99.19%	
cumene	23.47	100.66%	99.91%	
alpha-pinene	20.49	100.49%	101.12%	
beta-pinene	20.59	97.92%	98.15%	
3-carene	20.61	97.33%	97.40%	
p-cymene	20.92	98.63%	97.86%	

2. PROPANE RESPONSE

	THEOR	%REC	%REC	%REC
BEFORE RUN	29.9	113.92%	104.89%	
AFTER RUN	29.9	104.89%	114.74%	

3. METHANOL RECOVERY

	THEOR	%REC	%REC	%REC
BEFORE RUN	100	108.37%	108.53%	
AFTER RUN	100	115.24%	93.42%	

4. LINE BLANK

	FILE REF		
BEFORE RUN	FGB4010	FHB4007	
AFTER RUN	FHB4007	FIB4001	

NOTES:

Section 29.4 Process Operating Data

MILL: SIMPSON PAPER SOURCE: HARDWOOD BLEACH PLANT

	UNITS												
DATE		6/17 ->						6/18 ->					
TIME		0939	1039	1139	0939	1039	1139	1100	1200	1300	1539	1639	1739
SOURCE		BPHCTS ->			BPHCBS ->			BPHFHW ->			BPHDWV ->		
FIN		PN2162 ->			PN2307 ->			PN2158 ->			PN2162 ->		
EPN		SN74 ->			SN89 ->			SN71 ->			SN74 ->		
WOOD		HARDWOOD ->											
PRODUCT	T/D	275	275	300	275	275	300	300	300	275	275	275	275
KAPPA		19.5	17.6	16.0	19.5	17.3	16.0	16.6	17.0	17.0	17.7	17.7	18.5
CHEM USAGE													
Cl_2	LB/T	112	112	110	112	112	110	116	116	116	116	84	84
NaOH	LB/T	145	145	134	145	145	134	114	114	107	107	107	107
NaOCl	LB/T	34	34	34	34	34	34	28	34	28	34	28	34
ClO_2	LB/T	17	17	17	17	17	17	16	16	16	16	16	16
NAOCl	LB/T	2	2	2	2	2	2	2	2	2	2	2	2
NaOH	LB/T	4	2	4	4	2	4	2	2	2	2	4	4
C STOCK	F	118	110	118	118	110	118	120	120	120	120	120	120
E MIXER	F	118	118	118	118	118	118	120	120	120	120	120	120
H_1 MIXER	F	132	132	132	132	132	132	132	132	132	132	132	132
D UPFLOW	F	160	160	160	160	160	160	160	160	160	160	160	160
H_2 MIXR	F	110	110	110	110	110	110	110	110	110	110	110	110
pH LEVEL													
E		10.9	10.9	10.6	10.9	10.9	10.6	10.8	10.8	11.0	11.0	11.0	11.0
H_1		8.5	8.5	8.9	8.5	8.5	8.9	7.5	7.5	7.7	7.7	7.7	8.2
D		4.1	4.1	4.0	4.1	4.1	4.0	3.8	3.8	4.0	4.0	3.8	3.8
H_2		8.7	8.7	8.8	8.7	8.7	8.8	8.6	8.6	8.2	8.2	8.6	8.6

SCRUBBER, Cl_2	(2) SCRUBBERS, ClO_2 TOWER AND SEAL BOX
TYPE - COLUMN	TYPE - COLUMN
SRB MED - TELLERETTES	SRB MED - TELLERETTES
GAS FLOW SCFM - NO FAN	GAS FLOW SCFM - NO FAN
LIQ FLOW 3 GPM 10% NaOH	LIQ FLOW 10 GPM DILUTE SODIUM BISULFITE
DP IN H_2O - NO FAN	DF IN H_2O - NO FAN

NOTES: 1.0 BLEACHING SEQUENCE -	RETENTION TIMES, MIN @ 350 T/D
CHLORINE, C	42
CAUSTIC SODA, E	42
1st SODIUM HYPOCHLORITE WITH CAUSTIC, H_1	170
CHLORINE DIOXIDE WITH CAUSTIC, D	220
2nd SODIUM HYPOCHLORITE WITH CAUSTIC, H_2	30

2.0 ALL VALUES ONE HOUR READINGS FROM OPERATIONS LOG

3.0 PRODUCTION IS IN OVEN DRY UNBLEACHED SHORT TONS

4.0 ClO_2 IS AS ClO_2

5.0 H_1 pH REPRESENTS VAT pH WHERE pH IS ADJUSTED BY ADDING CHLORINE FILTRATE TO REDUCE SCALING. ACTUAL pH IN THE HYPO TOWER IS IN THE RANGE OF 9.5.

Note: See Appendix D for Unit Process Description

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APPENDIX A PRELIMINARY SCREENING DATA

A.1 Thermal Oxidation Plant Vent (VOST)

A.2 Recovery Furnace (SEMI-VOST)

A.1 THERMAL OXIDATION PLANT VENT (VOST)

EMISSION TEST RESULTS - VOST

Mill SIMPSON - PASADENA | Source: Tall Oil Process
Source Code: SP-TOP | EPN: | FIN: | CIN:

Sampling Date: March, 1992

Compound	TOP-T (μg)	TOP-TC (μg)	TOP-C (μg/L)	Total (μg)	SP-TOP (μg/m3)	Conc. (ppm)
TARGET COMPOUNDS						
Chloromethane		0.871		0.87	87.10	0.041
Bromomethane		0.049		0.05	4.90	0.001
Methylene Chloride	0.137	0.031		0.17	16.80	0.005
Acetone	9.358	0.260	8.90	10.00	1000.07	0.414
Carbon Disulfide	82.600	5.754	0.72	88.38	8838.50	2.792
Chloroform	25.125	0.170	2.85	25.42	2541.76	0.512
Trichlorofluoromethane		0.032		0.03	3.20	0.001
Dimethyl disulfide	0.543	0.008		0.55	55.10	0.014
n-Hexane	0.274	0.027		0.30	30.10	0.008
2-Butanone (MEK)	0.559			0.56	55.90	0.019
Bromodichloromethane	3.780			3.78	378.00	0.055
Dibromochloromethane	0.527			0.53	52.70	0.006
Benzene	41.204	0.106		41.31	4131.00	1.272
Toluene	0.803	0.007		0.81	81.00	0.021
TENTATIVELY IDENTIFIED CMPDS.						
Siloxane	14.913	0.145		15.06	1505.80	
Propenenitrile	1.307			1.31	130.70	
Subst'd HCs	0.876	0.081		0.96	95.70	
Octane	0.272			0.27	27.20	
Aldehyde	0.174			0.17	17.40	
Benzaldehyde	0.329			0.33	32.90	
Subst'd Aromatic	0.213			0.21	21.30	
2-Butene		0.107		0.11	10.70	
1-Buten-3-yne		0.019		0.02	1.90	
Furan		0.020		0.02	2.00	
SURROGATE STDS (% Recovery)						
Toluene-d8	113.3	104.2	95.9			
1,2-Dichloroethane-d4	41.3	105.2	96.8			
Benzene-d6	745.2	95.9	93.1			

NOTES:
- -T=Tenax
- -TC=Tenax/Charcoal
- -C = Condensate

Air Volume = 0.01000 cu.m.

Condensate Vol. = 43.0 mL

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HG954
RF FILE: ICAL 031692
DATE: 03/20/92
TLI PROJ #: 20332

SAMPLE ID. SPTOPV2 T
TLI ID: 54.153.12
ANALYSIS DATE: 03/16/92
DILUTION FACTOR: 1

QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1 Bromochloromethane	279		796	1		IS	
2 Chloromethane	0	.872	0	1	.021	ND	.05
3 Bromomethane	0	.634	0	1	.028	ND	.05
4 Vinyl Chloride	0	1.005	0	1	.018	ND	.05
5 Chloroethane	0	.848	0	1	.021	ND	.05
6 Methylene Chloride	191	1.245	601	1	.137	D	.05
7 Acetone	3426	.328	542	1	9.358	D	.05
8 Carbon Disulfide	388103	4.209	524	1	82.800	D	.05
9 1,1-Dichloroethene	0	1.090	0	1	.016	ND	.05
10 1,1-Dichloroethane	0	3.476	0	1	.005	ND	.05
11 trans-1,2-Dichloroethene	0	1.290	0	1	.014	ND	.05
12 Chloroform	85853	3.081	814	1	25.125	D	.05
13 1,2-Dichloroethane	0	2.165	0	1	.008	ND	.05
43 Trichlorofluoromethane	0	1.480	0	1	.012	ND	.05
46 Acrylonitrile	0	.502	0	1	.038	ND	.05
47 cis-1,2-Dichloroethene	0	1.514	0	1	.012	ND	.05
52 1,3-butadiene	0	.495	0	1	.036	ND	.05
57 Allyl chloride	0	.770	0	1	.023	ND	.05
62 Dimethyl disulfide	1956	3.228	1103	1	.543	D	.05
63 Dimethyl sulfide	0	1.545	0	1	.012	ND	.05
65 Iodomethane	0	2.351	0	1	.008	ND	.05
66 Isooctane	0	11.881	0	1	.002	ND	.05
68 Tert-Butyl methyl ether	0	3.206	0	1	.006	ND	.05
69 Vinyl Bromide	0	.945	0	1	.019	ND	.05
70 n-Hexane	953	3.111	683	1	.274	D	.05
14 1,4-Difluorobenzene	1518		932	14		IS	
15 2-Butanone	102	.030	780	14	.559	D	.05
16 1,1,1-Trichloroethane	0	.501	0	14	.007	ND	.05
17 Carbon Tetrachloride	0	.513	0	14	.006	ND	.05
18 Vinyl Acetate	0	.488	0	14	.007	ND	.05
19 Bromodichloromethane	11682	.509	1034	14	3.780	D	.05
20 1,2-Dichloropropane	0	.538	0	14	.006	ND	.05
21 cis-1,3-Dichloropropene	0	.757	0	14	.004	ND	.05
22 Trichloroethene	0	.545	0	14	.006	ND	.05
23 Dibromochloromethane	1600	.500	1284	14	.527	D	.05
24 1,1,2-Trichloroethane	0	.314	0	14	.010	ND	.05
25 Benzene	308250	1.232	871	14	41.204	D	.05
26 trans-1,3-Dichloropropene	0	.569	0	14	.006	ND	.05
27 Bromoform	0	.352	0	14	.009	ND	.05
54 1,4-Dichloro-2-butene	0	.107	0	14	.031	ND	.05
60 Dibromomethane	0	.195	0	14	.017	ND	.05
28 Chlorobenzene-d5	1701		1383	28		IS	
29 4-Methyl-2-Pentanone	0	.146	0	28	.020	ND	.05
30 2-Hexanone	0	.123	0	28	.024	ND	.05
31 Tetrachloroethene	0	.394	0	28	.007	ND	.05
32 1,1,2,2-Tetrachloroethane	0	.245	0	28	.012	ND	.05
33 Toluene	3470	.635	1149	28	.803	D	.05
34 Chlorobenzene	0	.938	0	28	.003	ND	.05

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HG954
RF FILE: ICAL 031692
DATE: 03/20/92
TLI PROJ #: 20332

SAMPLE ID: SPTOPV2 T
TLI ID: 54.153.12
ANALYSIS DATE: 03/16/92
DILUTION FACTOR: 1

QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
35 Ethylbenzene	0	.486	0	28	.006	ND	.05
36 Styrene	0	.984	0	28	.003	ND	.05
37 o-Xylene	0	.586	0	28	.005	ND	.05
38 m-/p-Xylene	0	.607	0	28	.005	ND	.05
49 1,2 Dichlorobenzene	0	.737	0	28	.004	ND	.05
50 1,2,3-Trichloropropane	0	.232	0	28	.013	ND	.05
51 1,3 Dichlorobenzene	0	.955	0	28	.003	ND	.05
53 1,4 Dichlorobenzene	0	.800	0	28	.004	ND	.05
56 A-Pinene	0	.964	0	28	.003	ND	.05
58 B-Pinene	0	1.001	0	28	.003	ND	.05
59 Cumene (isopropylbenzene)	0	1.545	0	28	.002	ND	.05
64 Ethyl methacrylate	0	.425	0	28	.007	ND	.05
67 P-Cymene	0	2.159	0	28	.001	ND	.05

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT,ug	CODE	% RECOVERY
39 Toluene-d8	1944	1.008	1139	28	.283	D	113.3
41 1,2-Dichloroethane-d4	209	1.816	881	1	.103	D	41.3
48 Benzene-d6	13928	1.231	895	14	1.863	D	745.2

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HG954
DATE: 03/20/92
TLI PROJ #: 20332

SAMPLE ID: SPTOPV2 T
TLI ID: 54.153.12
ANALYSIS DATE: 03/16/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
1 SILOXANE	1263	223033	1383	.25	8.691
2 SILOXANE	1779	154913	1383	.25	6.036
3 PROPENENITRILE	642	11693	796	.25	1.307
4 SUBSTITUTED HYDROCARBON	921	6234	796	.25	.697
5 OCTANE	1189	6993	1383	.25	.272
6 SILOXANE	1428	4784	1383	.25	.186
7 SUBSTITUTED HYDROCARBON	1472	4593	1383	.25	.179
8 ALDEHYDE	1582	4472	1383	.25	.174
9 BENZALDEHYDE	1844	8436	1383	.25	.329
10 SUBSTITUTED AROMATIC	1934	5464	1383	.25	.213

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	796	2236	1
Chlorobenzene-d5	1383	6416	28

Triangle Laboratories of RTP, Inc.	FILE NAME: HG938	SAMPLE ID:	SPTOPV2 TC
801 Capitola Drive	RF FILE: ICAL 031692	TLI ID:	54.153.12
Durham, NC 27713	DATE: 03/20/92	ANALYSIS DATE:	03/14/92
Telephone: (919) 544-5729	TLI PROJ #: 20332	DILUTION FACTOR:	1

Q U A N T I T A T I O N   R E P O R T

NAME	AREA	RF	SCAN	ISID	AMT,ug	CODE	QUAN LIMIT
1 Bromochloromethane	2724		786	1		IS	
2 Chloromethane	8281	.872	173	1	.871	D	.05
3 Bromomethane	341	.634	307	1	.049	E	.05
4 Vinyl Chloride	0	1.005	0	1	.002	ND	.05
5 Chloroethane	0	.848	0	1	.002	ND	.05
6 Methylene Chloride	415	1.245	593	1	.031	E	.05
7 Acetone	931	.328	535	1	.260	D	.05
8 Carbon Disulfide	263893	4.209	513	1	5.754	D	.05
9 1,1-Dichloroethene	0	1.090	0	1	.002	ND	.05
10 1,1-Dichloroethane	0	3.476	0	1	.001	ND	.05
11 trans-1,2-Dichloroethene	0	1.290	0	1	.001	ND	.05
12 Chloroform	5677	3.061	806	1	.170	D	.05
13 1,2-Dichloroethane	0	2.165	0	1	.001	ND	.05
43 Trichlorofluoromethane	508	1.480	409	1	.032	E	.05
46 Acrylonitrile	0	.502	0	1	.004	ND	.05
47 cis-1,2-Dichloroethene	0	1.514	0	1	.001	ND	.05
52 1,3-butadiene	0	.495	0	1	.004	ND	.05
57 Allyl chloride	0	.770	0	1	.002	ND	.05
62 Dimethyl disulfide	273	3.226	1092	1	.008	E	.05
63 Dimethyl sulfide	0	1.545	0	1	.001	ND	.05
65 Iodomethane	0	2.351	0	1	.001	ND	.05
66 Isooctane	0	11.661	0	1	.001	ND	.05
68 Tert-Butyl methyl ether	0	3.206	0	1	.001	ND	.05
69 Vinyl Bromide	0	.945	0	1	.002	ND	.05
70 n-Hexane	904	3.111	675	1	.027	E	.05
14 1,4-Difluorobenzene	14018		923	14		IS	
15 2-Butanone	0	.030	0	14	.012	ND	.05
16 1,1,1-Trichloroethane	0	.501	0	14	.001	ND	.05
17 Carbon Tetrachloride	0	.513	0	14	.001	ND	.05
18 Vinyl Acetate	0	.488	0	14	.001	ND	.05
19 Bromodichloromethane	0	.509	0	14	.001	ND	.05
20 1,2-Dichloropropane	0	.536	0	14	.001	ND	.05
21 cis-1,3-Dichloropropene	0	.757	0	14	.001	ND	.05
22 Trichloroethene	0	.545	0	14	.001	ND	.05
23 Dibromochloromethane	0	.500	0	14	.001	ND	.05
24 1,1,2-Trichloroethane	0	.314	0	14	.001	ND	.05
25 Benzene	7311	1.232	861	14	.106	D	.05
26 trans-1,3-Dichloropropene	0	.569	0	14	.001	ND	.05
27 Bromoform	0	.352	0	14	.001	ND	.05
54 1,4-Dichloro-2-butene	0	.107	0	14	.003	ND	.05
60 Dibromomethane	0	.195	0	14	.002	ND	.05
28 Chlorobenzene-d5	18642		1369	28		IS	
29 4-Methyl-2-Pentanone	0	.146	0	28	.002	ND	.05
30 2-Hexanone	0	.123	0	28	.002	ND	.05
31 Tetrachloroethene	0	.394	0	28	.001	ND	.05
32 1,1,2,2-Tetrachloroethane	0	.245	0	28	.001	ND	.05
33 Toluene	351	.635	1138	28	.007	E	.05
34 Chlorobenzene	0	.938	0	28	.001	ND	.05

Triangle Laboratories of RTP, Inc.	FILE NAME: HG938	SAMPLE ID:	SPTOPV2 TC
801 Capitola Drive	RF FILE: ICAL C31692	TLI ID:	54.153.12
Durham, NC 27713	DATE: 03/20/92	ANALYSIS DATE:	03/14/92
Telephone: (919) 544-5729	TLI PROJ #: 20332	DILUTION FACTOR:	1

Q U A N T I T A T I O N   R E P O R T

NAME	AREA	RF	SCAN	ISID	AMT,ug	CODE	QUAN LIMIT
35 Ethylbenzene	0	.486	0	28	.001	ND	.05
36 Styrene	0	.984	0	28	.001	ND	.05
37 o-Xylene	0	.566	0	28	.001	ND	.05
38 m-/p-Xylene	0	.607	0	28	.001	ND	.05
49 1,2 Dichlorobenzene	0	.737	0	28	.001	ND	.05
50 1,2,3-Trichloropropane	0	.232	0	28	.001	ND	.05
51 1,3 Dichlorobenzene	0	.955	0	28	.001	ND	.05
53 1,4 Dichlorobenzene	0	.800	0	28	.001	ND	.05
56 A-Pinene	0	.964	0	28	.001	ND	.05
58 B-Pinene	0	1.001	0	28	.001	ND	.05
59 Cumene (isopropylbenzene)	0	1.545	0	28	.001	ND	.05
64 Ethyl methacrylate	0	.425	0	28	.001	ND	.05
67 P-Cymene	0	2.159	0	28	.001	ND	.05

S U R R O G A T E S U M M A R Y	AREA	RF	SCAN	ISID	AMT,ug	CODE	% RECOVERY
39 Toluene-d8	19582	1.008	1128	28	.261	D	104.2
41 1,2-Dichloroethane-d4	5203	1.816	858	1	.263	D	105.2
48 Benzene-d6	16546	1.231	857	14	.240	D	95.9

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HG938
DATE: 03/20/92
TLI PROJ #: 20332

SAMPLE ID: SPTOPV2 TC
TLI ID: 54.153.12
ANALYSIS DATE: 3/14/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
1 SILOXANE	886	13983	923	.25	.091
2 SILOXANE	1252	11300	1370	.25	.054
3 SUBSTITUTED HYDROCARBON	2154	9128	1370	.25	.044
4 SUBSTITUTED HYDROCARBON	834	2718	788	.25	.037
5 2-BUTENE	212	7783	788	.25	.107
6 1-BUTEN-3-YNE	286	1398	788	.25	.019
7 FURAN	479	1483	788	.25	.020

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	788	18130	1
1,4-Difluorobenzene	923	38606	14
Chlorobenzene-d5	1370	52405	28

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HG930
RF FILE: HG919
DATE: 03/18/92
TLI PROJ #: 20332

SAMPLE ID: SPTOPV2
TLI ID: 54.153.12 (COND)
SAMPLE VOL: .005 L
ANALYSIS DATE: 03/13/92
DILUTION FACTOR: 1

Q U A N T I T A T I O N   R E P O R T

NAME	AREA	RF	SCAN	ISID	CONC, ug/L	CODE	QUAN LIMIT
1 Bromochloromethane	3680		783	1		IS	
2 Chloromethane	0	.685	0	1	.40	ND	10
3 Bromomethane	0	.705	0	1	.39	ND	10
4 Vinyl Chloride	0	.968	0	1	.28	ND	10
5 Chloroethane	0	.808	0	1	.34	ND	10
6 Methylene Chloride	0	1.255	0	1	.22	ND	10
7 Acetone	351	.536	531	1	8.90	E	10
8 Carbon Disulfide	235	4.454	509	1	.72	E	10
9 1,1-Dichloroethene	0	1.072	0	1	.25	ND	10
10 1,1-Dichloroethane	0	3.212	0	1	.08	ND	10
11 trans-1,2-Dichloroethene	0	1.279	0	1	.21	ND	10
12 Chloroform	652	3.112	801	1	2.85	E	10
13 1,2-Dichloroethane	0	2.215	0	1	.12	ND	10
43 Trichlorofluoromethane	0	1.630	0	1	.17	ND	10
46 Acrylonitrile	0	.489	0	1	.56	ND	10
47 cis-1,2-Dichloroethene	0	1.403	0	1	.19	ND	10
52 1,3-butadiene	0	.541	0	1	.50	ND	10
57 Allyl chloride	0	.764	0	1	.36	ND	10
62 Dimethyl disulfide	0	3.165	0	1	.09	ND	10
63 Dimethyl sulfide	0	1.358	0	1	.20	ND	10
65 Iodomethane	0	2.492	0	1	.11	ND	10
66 Isooctane	0	10.102	0	1	.03	ND	10
68 Tert-Butyl methyl ether	0	3.243	0	1	.08	ND	10
69 Vinyl Bromide	0	.946	0	1	.29	ND	10
70 n-Hexane	0	2.666	0	1	.10	ND	10
14 1,4-Difluorobenzene	16624		917	14		IS	
15 2-Butanone	0	.047	0	14	1.27	ND	10
16 1,1,1-Trichloroethane	0	.549	0	14	.11	ND	10
17 Carbon Tetrachloride	0	.570	0	14	.11	ND	10
18 Vinyl Acetate	0	.570	0	14	.11	ND	10
19 Bromodichloromethane	0	.531	0	14	.11	ND	10
20 1,2-Dichloropropane	0	.537	0	14	.11	ND	10
21 cis-1,3-Dichloropropene	0	.819	0	14	.07	ND	10
22 Trichloroethene	0	.636	0	14	.09	ND	10
23 Dibromochloromethane	0	.595	0	14	.10	ND	10
24 1,1,2-Trichloroethane	0	.387	0	14	.16	ND	10
25 Benzene	0	1.288	0	14	.05	ND	10
26 trans-1,3-Dichloropropene	0	.641	0	14	.09	ND	10
27 Bromoform	0	.512	0	14	.12	ND	10
54 1,4-Dichloro-2-butene	0	.201	0	14	.30	ND	10
60 Dibromomethane	0	.228	0	14	.26	ND	10
28 Chlorobenzene-d5	22114		1360	28		IS	
29 4-Methyl-2-Pentanone	0	.261	0	28	.17	ND	10
30 2-Hexanone	0	.240	0	28	.19	ND	10
31 Tetrachloroethene	0	.439	0	28	.10	ND	10
32 1,1,2,2-Tetrachloroethane	0	.372	0	28	.12	ND	10
33 Toluene	0	.664	0	28	.07	ND	10
34 Chlorobenzene	0	1.004	0	28	.05	ND	10

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

Triangle Laboratories of RTP, Inc.	FILE NAME: HG930	SAMPLE ID:	SPTOPV2
801 Capitola Drive	RF FILE: HG919	TLI ID:	54.153.12 (COND)
Durham, NC 27713	DATE: 03/18/92	SAMPLE VOL:	.005 L
Telephone: (919) 544-5729	TLI PROJ #: 20332	ANALYSIS DATE:	03/13/92
		DILUTION FACTOR:	1

QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	CONC, ug/L	CODE	QUAN LIMIT
35 Ethylbenzene	0	.514	0	28	.09	ND	10
36 Styrene	0	1.079	0	28	.04	ND	10
37 o-Xylene	0	.611	0	28	.07	ND	10
38 m-/p-Xylene	0	.660	0	28	.07	ND	10
49 1,2 Dichlorobenzene	0	.986	0	28	.05	ND	10
50 1,2,3-Trichloropropane	0	.372	0	28	.12	ND	10
51 1,3 Dichlorobenzene	0	1.116	0	28	.04	ND	10
53 1,4 Dichlorobenzene	0	.956	0	28	.05	ND	10
56 A-Pinene	0	.993	0	28	.05	ND	10
58 B-Pinene	0	.997	0	28	.05	ND	10
59 Cumene (isopropylbenzene)	0	1.608	0	28	.03	ND	10
64 Ethyl methacrylate	0	.550	0	28	.08	ND	10
67 P-Cymene	0	2.247	0	28	.02	ND	10

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT,ug	CODE	% RECOVERY
39 Toluene-d8	22417	1.057	1121	28	.24	D	95.9
41 1,2-Dichloroethane-d4	7042	1.976	852	1	.24	D	96.8
48 Benzene-d6	20316	1.313	852	14	.23	D	93.1

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

A.2 RECOVERY FURNACE (SEMI-VOST)

EMISSION TEST RESULTS - SEMI-VOST

Mill SIMPSON - PASADENA Source: Recovery Furnace
Source Code: SP-RF FIN: CIN:
EPN:

	Sampling Date: SP-RF (μg)	March, 1992 SP-RF (μg/m3)	Conc. (ppm)
TARGET COMPOUNDS			
Clean Air Act Cmpds			
Phenol	2086.57	69552.33	17.769
Naphthalene	17.95	598.33	0.112
Biphenyl	24.28	809.33	0.126
Di-n-butylphthalate	23.10	770.00	0.067
bis(2-Ethylhexyl)phthalate	10.82	360.67	0.022
Method 8270 Cmpds			
Phenol	2363.79	78793.00	20.129
Benzoic Acid	2169.41	72313.67	14.235
Naphthalene	21.48	716.00	0.134
Diethylphthalate	23.63	787.67	0.085
Di-n-butylphthalate	20.39	679.67	0.059
bis(2--Ethylhexyl)phthalate	8.23	274.33	0.017
TENTATIVELY IDENTIFIED CMPDS.			
Subst'd Aromatic HCs	2971.30	99043.33	
Siloxane	499.04	16634.67	
Subst'd Benzaldehyde	182.56	6085.33	
Subst'd Cyclic HCs	215.47	7182.33	
Phthalate	111.56	3718.67	
Hexanedioic Acid Ester	83.97	2799.00	

SURROGATE STDS (% Recovery)	**CAA**	**Method 8270**
Nitrobenzene-d5	----	----
Phenol-d5	----	----
Terphenyl-d14	84.1	80.9
1,3,5-Trichlorobenzene-d3	52.6	57.1
1,4-Dibromobenzene-d4	85.4	100.1
2-Fluorobiphenyl	66.5	72.4
2,4,6-Tribromophenol	84.9	123.2
Anthracene-d10	68.2	71.4
Pyrene-d10	99.5	87.6

NOTES:

Air Volume = 0.03000 cu.m.

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TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

DATA FILE:GH002
RF FILE: GG994
DATE: 03/30/92
TLI Project Number: 20333
ANALYSIS DATE: 03/21/92

SAMPLE ID: SPRFM1-6
DILN FACTOR: 1
TLI SAMPLE ID: 54-154-8,13

QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	1,4-Dichlorobenzene-d4	637		313	1		IS	
2	Naphthalene-d8	3776		497	2		IS	
3	Acenaphthene-d10	3298		741	3		IS	
4	Phenanthrene-d10	7765		943	4		IS	
5	Chrysene-d12	9712		1315	5		IS	
6	Perylene-d12	6358		1498	6		IS	
20	n-Nitrosodimethylamine	0	.507	0	1	2.48	ND	10
21	Cumene	0	3.200	0	1	.39	ND	10
22	a-Pinene	0	1.772	0	1	.71	ND	10
23	b-Pinene	0	2.206	0	1	.57	ND	10
24	Aniline	0	3.447	0	1	.36	ND	10
25	1,2,4-Trimethylbenzene	0	2.819	0	1	.45	ND ✓	10
26	Phenol	82887	2.495	326	1	2086.57	D	10
27	Benzyl Chloride	0	3.772	0	1	.33	ND	10
28	bis-(2-Chloroethyl)ether	0	1.902	0	1	.66	ND	10
29	n-Nitrosomorpholine	0	.764	0	1	1.64	ND	10
30	1,4-Dichlorobenzene	0	1.758	0	1	.71	ND	10
31	p-Cymene	0	3.492	0	1	.36	ND	10
32	Acetophenone	0	2.326	0	1	.54	ND	10
33	1,2-Dibromo-3-chloropropane	0	.758	0	1	1.66	ND	10
34	Hexachloroethane	0	.781	0	1	1.61	ND	10
35	o-Toluidine	0	3.145	0	1	.40	ND	10
36	2-Methylphenol	0	1.849	0	1	.68	ND	10
37	Nitrobenzene	0	.622	0	2	.34	ND	10
38	N,N-Dimethylaniline	0	.623	0	2	.34	ND	10
39	Isophorone	0	.714	0	2	.30	ND	10
40	Catechol	0	.315	0	2	.67	ND	10
41	3/4-Methylphenol	0	.394	0	2	.54	ND	10
42	1,2,4-Trichlorobenzene	0	.343	0	2	.62	ND	10
43	a-Terpineol	0	.210	0	2	1.01	ND	10
44	Naphthalene	2217	1.308	500	2	17.95	D ✓	10
45	o-Anisidine	0	.377	0	2	.56	ND	10
46	Hexachlorobutadiene	0	.168	0	2	1.26	ND	10
47	2-Chloroacetophenone	0	.821	0	2	.26	ND	10
48	a,a,a-Trichlorotoluene	0	.334	0	2	.63	ND	10
49	N,N-Diethylaniline	0	.622	0	2	.34	ND	10
50	1,4-Phenylenediamine	0	.403	0	2	.53	ND	10
51	Hydroquinone	0	.375	0	2	.56	ND	10
52	Pentamethylbenzene	0	.698	0	2	.30	ND	10
53	Hexachlorocyclopentadiene	0	.298	0	3	.81	ND	10
54	Phthalic Anhydride	0	.012	0	3	19.87	ND	10
55	2,4,6-Trichlorophenol	0	.437	0	3	.56	ND	10
56	2,4,5-Trichlorophenol	0	.446	0	3	.54	ND	10

Page: 2

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

DATA FILE:GH002
RF FILE: GG994
DATE: 03/30/92
TLI Project Number: 20333
ANALYSIS DATE: 03/21/92

SAMPLE ID: SPRFM1-6
DILN FACTOR: 1
TLI SAMPLE ID: 54-154-8,13

QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
57 2,4-Toluenediamine	0	.570	0	3	.43	ND	10
58 2,4-Dichlorophenol	0	.434	0	3	.56	ND	10
59 2,3-Dichlorophenol	0	.418	0	3	.58	ND	10
60 2,6-Dichlorophenol	0	.458	0	3	.53	ND	10
61 3,5-Dichlorophenol	0	.706	0	3	.34	ND	10
62 3,4-Dichlorophenol	0	.630	0	3	.39	ND	10
63 Biphenyl	2777	1.388	668	3	24.28	D ✓	10
64 Dimethylphthalate	0	1.158	0	3	.21	ND	10
65 2,4-Dinitrotoluene	0	.474	0	3	.51	ND	10
66 2,4-Dinitrophenol	0	.182	0	3	1.33	ND	10
67 4,6-Dinitro-2-methylphenol	0	.302	0	3	.80	ND	10
68 Dibenzofuran	0	1.981	0	3	.12	ND	10
69 4-Nitrophenol	0	.402	0	3	.60	ND	10
70 Trifluralin	0	.371	0	3	.65	ND	10
71 Hexachlorobenzene	0	.226	0	4	.46	ND	10
72 4-Aminobiphenyl	0	.933	0	4	.11	ND	10
73 Pentachlorophenol	0	.210	0	4	.49	ND	10
74 Pentachloronitrobenzene	0	.052	0	4	1.97	ND	10
75 4-Nitrobiphenyl	0	.428	0	4	.24	ND	10
76 Di-n-butylphthalate	5832	1.323	1067	4	23.10	D ✓	10
77 Pyrene	0	1.145	0	5	.07	ND	10
78 Benzidine	0	.563	0	5	.15	ND	10
79 4,4'-Methylenedianiline	0	.295	0	5	.28	ND	10
80 Dimethylaminoazobenzene	0	.333	0	5	.25	ND	10
81 Butylbenzylphthalate	0	.493	0	5	.17	ND	10
82 3,3'-Dimethylbenzidine	0	.693	0	5	.12	ND	10
83 Methylene bis-chloroaniline	0	.240	0	5	.34	ND	10
84 Chrysene	0	1.059	0	5	.08	ND	10
85 3,3'-Dichlorobenzidine	0	.466	0	5	.18	ND	10
86 bis(2-Ethylhexyl)phthalate	1787	.680	1367	5	10.82	D ✓	10
87 3,3'-Dimethoxybenzidine	0	.309	0	5	.27	ND	10

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
10 Phenol-d5	0	2.258	0	1	.6	ND	
12 Nitrobenzene-d5	0	.423	0	2	.5	ND	
13 1,3,5-Trichlorobenzene-d3	1701	.342	453	2	52.6	D	52.6
14 1,4-Dibromobenzene-d4	1629	1.197	502	1	85.4	D	85.4
15 2-Fluorobiphenyl	6674	1.218	659	3	66.5	D	66.5
16 2,4,6-Tribromophenol	1776	.254	855	3	84.9	D	84.9
17 Anthracene-d10	14814	1.119	950	4	68.2	D	68.2
18 Pyrene-d10	22027	.912	1140	5	99.5	D	99.5
19 Terphenyl-d14	19196	.941	1184	5	84.1	D	84.1

CODES: D = Detected; ND = Not Detected; E = Estimated; IS = Internal Standard

TRIANGLE LABORATORIES OF RTP, INC.
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DATA FILE: GG975
RF FILE: GG971
DATE: 04/02/92
TLI PROJ #: 20333

SAMPLE ID: SPRFW5 1-6
TLI ID: 54.154.8-13
DILUTION FACTOR: 1
ANALYSIS DATE: 03/19/92

Q U A N T I T A T I O N   R E P O R T

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	1,4-Dichlorobenzene-d4	800		326	1		IS	
2	Phenol	107860	2.2801	332	1	2363.79	D ✓	10
3	bis(2-Chloroethyl)ether	0	1.8650	0	1	.54	ND	10
4	2-Chlorophenol	0	1.4076	0	1	.71	ND	10
5	1,3-Dichlorobenzene	0	1.5563	0	1	.64	ND	10
6	1,4-Dichlorobenzene	0	1.5934	0	1	.63	ND	10
7	Benzyl alcohol	0	.8399	0	1	1.19	ND	10
8	1,2-Dichlorobenzene	0	1.5520	0	1	.64	ND	10
9	2-Methylphenol	0	1.6449	0	1	.61	ND	10
10	bis(2-Chloroisopropyl)ether	0	1.7351	0	1	.58	ND	10
11	4-Methylphenol	0	1.5545	0	1	.64	ND	10
12	N-Nitroso-di-n-propylamine	0	1.2392	0	1	.81	ND	10
13	Hexachloroethane	0	.6602	0	1	1.51	ND	10
14	Naphthalene-d8	4305		509	14		IS	
15	Nitrobenzene	0	.6453	0	14	.29	ND	10
16	Isophorone	0	.9324	0	14	.20	ND	10
17	2-Nitrophenol	0	.2139	0	14	.87	ND	10
18	2,4-Dimethylphenol	0	.2992	0	14	.62	ND	10
19	Benzoic acid	59340	.2541	590	14	2169.41	D ✓	10
20	bis(2-Chloroethoxy)methane	0	.5599	0	14	.33	ND	10
21	2,4-Dichlorophenol	0	.3190	0	14	.58	ND	10
22	1,2,4-Trichlorobenzene	0	.3521	0	14	.53	ND	10
23	Naphthalene	2470	1.0685	511	14	21.48	D ✓	10
24	4-Chloroaniline	0	.4403	0	14	.42	ND	10
25	Hexachlorobutadiene	0	.1381	0	14	1.35	ND	10
26	4-Chloro-3-methylphenol	0	.3194	0	14	.58	ND	10
27	2-Methylnaphthalene	0	.7259	0	14	.26	ND	10
28	Acenaphthene-d10	3896		753	28		IS	
29	Hexachlorocyclopentadiene	0	.0824	0	28	2.49	ND	10
30	2,4,6-Trichlorophenol	0	.2870	0	28	.72	ND	10
31	2,4,5-Trichlorophenol	0	.3716	0	28	.55	ND	10
32	2-Chloronaphthalene	0	1.0734	0	28	.19	ND	10
33	2-Nitroaniline	0	.3472	0	28	.59	ND	10
34	Dimethylphthalate	0	1.1891	0	28	.17	ND	10
35	Acenaphthylene	0	1.7648	0	28	.12	ND	10
36	3-Nitroaniline	0	.3719	0	28	.55	ND	10
37	Acenaphthene	0	1.0776	0	28	.19	ND	10
38	2,4-Dinitrophenol	0	.1611	0	28	1.27	ND	10
39	4-Nitrophenol	0	.0798	0	28	2.57	ND	10
40	Dibenzofuran	0	1.5967	0	28	.13	ND	10
41	2,4-Dinitrotoluene	0	.4832	0	28	.42	ND	10
42	2,6-Dinitrotoluene	0	.3737	0	28	.55	ND	10
43	Diethylphthalate	2881	1.2517	847	28	23.63	D ✓	10
44	4-Chlorophenyl-phenylether	0	.5788	0	28	.35	ND	10
45	Fluorene	0	1.4929	0	28	.14	ND	10
46	4-Nitroaniline	0	.4808	0	28	.43	ND	10
47	Phenanthrene-d10	8364		956	47		IS	
48	4,6-Dinitro-2-methylphenol	0	.1279	0	47	.75	ND	10

49	N-Nitrosodiphenylamine(1)	0	.5127	0	47	.19	ND	10

DES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
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DATA FILE: GG975
RF FILE: GG971
DATE: 04/02/92
TLI PROJ #: 20333

SAMPLE ID: SPRFM5 1-6
TLI ID: 54.154.8-13
DILUTION FACTOR: 1
ANALYSIS DATE: 03/19/92

QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
50	4-Bromophenyl-phenylether	0	.1435	0	47	.67	ND	10
51	Hexachlorobenzene	0	.1697	0	47	.56	ND	10
52	Pentachlorophenol	0	.1334	0	47	.72	ND	10
53	Phenanthrene	0	1.2569	0	47	.08	ND	10
54	Anthracene	0	1.2415	0	47	.08	ND	10
55	Di-n-butylphthalate	6625	1.5541	1079	47	20.39	D ✓	10
56	Fluoranthene	0	1.6518	0	47	.06	ND	10
57	Chrysene-d12	9076		1329	57		IS	
58	Pyrene	0	1.3525	0	57	.07	ND	10
59	Butylbenzylphthalate	0	.7289	0	57	.12	ND	10
60	3,3'-Dichlorobenzidine	0	.2990	0	57	.29	ND	10
61	Benzo(a)anthracene	0	1.2056	0	57	.07	ND	10
62	Chrysene	0	1.1574	0	57	.08	ND	10
63	bis(2-Ethylhexyl)phthalate	1856	.9937	1379	57	8.23	E ✓	10
64	Perylene-d12	6091		1513	64		IS	
65	Di-n-octylphthalate	0	3.5842	0	64	.04	ND	10
66	Benzo(b)fluoranthene	0	2.4085	0	64	.05	ND	10
67	Benzo(k)fluoranthene	0	2.8202	0	64	.05	ND	10
68	Benzo(a)pyrene	0	2.0428	0	64	.06	ND	10
69	Indeno(1,2,3-cd)pyrene	0	1.4702	0	64	.09	ND	10
70	Dibenz(a,h)anthracene	0	1.1137	0	64	.12	ND	10
71	Benzo(g,h,i)perylene	0	1.3023	0	64	.10	ND	10

SURROGATE SUMMARY

		AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
72	Nitrobenzene-d5	0	.5103	0	14	.00	ND	.0
73	2-Fluorobiphenyl	7805	1.1070	671	28	72.39	D	72.4
74	Terphenyl-d14	17942	.9770	1197	57	80.94	D	80.9
75	Phenol-d5	0	1.8487	0	1	.00	ND	.0
77	2,4,6-Tribromophenol	1374	.1145	868	28	123.18	D	123.2
81	1,4-Dibromobenzene-d4	1683	.8402	514	1	100.07	D	100.1
82	1,3,5-Trichlorobenzene-d3	1979	.3218	464	14	57.14	D	57.1
83	Anthracene-d10	16443	1.1007	963	47	71.44	D	71.4
84	Pyrene-d10	21073	1.0607	1154	57	87.56	D	87.6

TRIANGLE LABORATORIES OF RTP, INC.	FILE NAME: GG975	SAMPLE ID:	SPRFHS 1-6
801 Capitola Drive	DATE: 03/25/92	TLI ID:	54.154.6-13
Durham, NC 27713	TLI PROJ #: 20333	DILUTION FACTOR:	1
Telephone: (919) 544-5729		ANALYSIS DATE:	03/19/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

	NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
1	SUBSTITUTED AROMATIC	453	1893084	956	40.00	2021.67
2	SILOXANE	1119	467294	956	40.00	499.04
3	SUBSTITUTED AROMATIC	1041	391577	956	40.00	418.18
4	SUBSTITUTED AROMATIC	777	225958	956	40.00	241.31
5	SUBSTITUTED AROMATIC	1202	246324	1329	40.00	192.20
6	SUBSTITUTED BENZALDEHYDE	710	170950	956	40.00	182.56
7	SUBSTITUTED CYCLIC HYDROCARBON	759	112450	956	40.00	120.09
8	PHTHALATE	1025	104463	956	40.00	111.56
9	SUBSTITUTED AROMATIC	605	91711	956	40.00	97.94
10	SUBSTITUTED CYCLIC HYDROCARBON	386	89311	956	40.00	95.38
11	HEXANEDIOIC ACID ESTER	1311	107619	1329	40.00	83.97

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Phenanthrene-d10	956	37456	47
Chrysene-d12	1329	51263	57
Perylene-d12	1513	32984	64

EMISSION TEST RESULTS - VOST

Mill SIMPSON - PASADENA | Source: Recovery Furnace
Source Code: SP-RF | EPN: | FIN: | CIN:

Compound	RF-T (µg)	RF-TC (µg)	RF-C (µg/L)	Total (µg)	SP-RF (µg/m3)	Conc. (ppm)
			Sampling Date:		March, 1992	
TARGET COMPOUNDS						
Chloromethane	2.194	8.317		10.51	1051.10	0.500
Bromomethane		0.427		0.43	42.70	0.011
Methylene Chloride		0.045	2.64	0.16	15.85	0.004
Acetone		0.381	10.06	0.81	81.36	0.034
Carbon Disulfide	4.507	0.106		4.61	461.30	0.146
Chloroform	2.511	0.013	4.29	2.71	270.85	0.055
Trichlorofluoromethane		0.216		0.22	21.60	0.004
1,3-Butadiene		0.069		0.07	6.90	0.003
Dimethyl disulfide	380.331	1.472		381.80	38180.30	9.744
Dimethyl sulfide	207.379	0.902		208.28	20828.10	8.063
Isooctane		0.104		0.10	10.40	0.002
tert-Butyl Methyl Ether		0.043		0.04	4.30	0.001
n-Hexane	1.994	0.128		2.12	212.20	0.059
2-Butanone (MEK)	46.285	0.136		46.42	4642.10	1.548
Bromodichloromethane	0.661			0.66	66.10	0.010
Benzene	9.068			9.07	906.80	0.279
Toluene	9.107	0.013		9.12	912.00	0.238
Ethylbenzene	1.483			1.48	148.30	0.034
Styrene	0.725			0.73	72.50	0.017
o-Xylene	1.071			1.07	107.10	0.024
m-/p-Xylene	3.964			3.96	396.40	0.090
A-Pinene	0.712			0.71	71.20	0.013
Cumene	1.023			1.02	102.30	0.020
p-Cymene	3.681			3.68	368.10	0.066
TENTATIVELY IDENTIFIED CMPDS.						
Siloxane	59.776	0.055		59.83	5983.10	
Subst'd Cyclic HC	19.357			19.36	1935.70	
Subst'd HCs	22.901	0.656		23.56	2355.70	
Acid Ester	2.644			2.64	264.40	
Methyl Thiophene	7.122			7.12	712.20	
Dimethyl Thiophene	2.757			2.76	275.70	
Dimethyl Trisulfide		0.179		0.18	17.90	
Cyclic HC		0.057		0.06	5.70	
SURROGATE STDS (% Recovery)						
Toluene-d8	118.3	98.7	98.7			
1,2-Dichloroethane-d4	78.7	98.9	98.6			
Benzene-d6	95.9	103.6	88.7			

NOTES:
-T=Tenax
-TC=Tenax/Charcoal
-C = Condensate

Air Volume = 0.01000 cu.m.
Condensate Vol. = 43.0 mL

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HG953 | RF FILE: ICAL 031692 | DATE: 03/20/92 | TLI PROJ #: 20332
SAMPLE ID: SPRFV2 T | TLI ID: 54.153.9 | ANALYSIS DATE: 03/16/92 | DILUTION FACTOR: 1

QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	76		800	1		IS	
2	Chloromethane	578	.872	177	1	2.194	D	.05
3	Bromomethane	0	.634	0	1	.104	ND	.05
4	Vinyl Chloride	0	1.005	0	1	.066	ND	.05
5	Chloroethane	0	.848	0	1	.078	ND	.05
6	Methylene Chloride	0	1.245	0	1	.053	ND	.05
7	Acetone	0	.328	0	1	.202	ND	.05
8	Carbon Disulfide	5730	4.209	525	1	4.507	D	.05
9	1,1-Dichloroethene	0	1.090	0	1	.061	ND	.05
10	1,1-Dichloroethane	0	3.476	0	1	.019	ND	.05
11	trans-1,2-Dichloroethene	0	1.290	0	1	.051	ND	.05
12	Chloroform	2322	3.061	819	1	2.511	D	.05
13	1,2-Dichloroethane	0	2.165	0	1	.031	ND	.05
43	Trichlorofluoromethane	0	1.480	0	1	.045	ND	.05
46	Acrylonitrile	0	.502	0	1	.132	ND	.05
47	cis-1,2-Dichloroethene	0	1.514	0	1	.044	ND	.05
52	1,3-butadiene	0	.495	0	1	.134	ND	.05
57	Allyl chloride	0	.770	0	1	.086	ND	.05
62	Dimethyl disulfide	370637	3.226	1116	1	380.331	D	.05
63	Dimethyl sulfide	98787	1.545	535	1	207.379	D	.05
65	Iodomethane	0	2.351	0	1	.028	ND	.05
66	Isooctane	0	11.661	0	1	.006	ND	.05
68	Tert-Butyl methyl ether	0	3.208	0	1	.021	ND	.05
69	Vinyl Bromide	0	.945	0	1	.070	ND	.05
70	n-Hexane	1873	3.111	687	1	1.994	D	.05
14	1,4-Difluorobenzene	398		937	14		IS	
15	2-Butanone	2209	.030	783	14	46.285	D	.05
16	1,1,1-Trichloroethane	0	.501	0	14	.025	ND	.05
17	Carbon Tetrachloride	0	.513	0	14	.025	ND	.05
18	Vinyl Acetate	0	.488	0	14	.026	ND	.05
19	Bromodichloromethane	535	.509	1039	14	.661	D	.05
20	1,2-Dichloropropane	0	.536	0	14	.023	ND	.05
21	cis-1,3-Dichloropropene	0	.757	0	14	.017	ND	.05
22	Trichloroethene	0	.545	0	14	.023	ND	.05
23	Dibromochloromethane	0	.500	0	14	.025	ND	.05
24	1,1,2-Trichloroethane	0	.314	0	14	.040	ND	.05
25	Benzene	17773	1.232	874	14	9.068	D	.05
26	trans-1,3-Dichloropropene	0	.569	0	14	.022	ND	.05
27	Bromoform	0	.352	0	14	.036	ND	.05
54	1,4-Dichloro-2-butene	0	.107	0	14	.117	ND	.05
60	Dibromomethane	0	.195	0	14	.064	ND	.05
28	Chlorobenzene-d5	477		1388	28		IS	
29	4-Methyl-2-Pentanone	0	.146	0	28	.072	ND	.05
30	2-Hexanone	0	.123	0	28	.085	ND	.05
31	Tetrachloroethene	0	.394	0	28	.027	ND	.05
32	1,1,2,2-Tetrachloroethane	0	.245	0	28	.043	ND	.05
33	Toluene	11036	.635	1155	28	9.107	D	.05
34	Chlorobenzene	0	.938	0	28	.011	ND	.05

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

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801 Capitola Drive
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FILE NAME: HG953
RF FILE: ICAL 031692
DATE: 03/20/92
TLI PROJ #: 20332

SAMPLE ID: SPRFV2 T
TLI ID: 54.153.9
ANALYSIS DATE: 03/16/92
DILUTION FACTOR: 1

QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT, ug	CODE	QUAN LIMIT
35 Ethylbenzene	1376	.486	1423	28	1.483	D	.05
36 Styrene	1361	.984	1525	28	.725	D	.05
37 o-Xylene	1156	.566	1520	28	1.071	D	.05
38 m-/p-Xylene	4591	.607	1447	28	3.964	D	.05
49 1,2 Dichlorobenzene	0	.737	0	28	.014	ND	.05
50 1,2,3-Trichloropropane	0	.232	0	28	.045	ND	.05
51 1,3 Dichlorobenzene	0	.955	0	28	.011	ND	.05
53 1,4 Dichlorobenzene	0	.800	0	28	.013	ND	.05
56 A-Pinene	1310	.984	1591	28	.712	D	.05
58 B-Pinene	0	1.001	0	28	.010	ND	.05
59 Cumene (isopropylbenzene)	3017	1.545	1868	28	1.023	D	.05
64 Ethyl methacrylate	0	.425	0	28	.025	ND	.05
87 P-Cymene	15164	2.159	1997	28	3.681	D	.05

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT,ug	CODE	% RECOVERY
39 Toluene-d8	569	1.008	1145	28	.298	D	118.3
41 1,2-Dichloroethane-d4	108	1.816	885	1	.197	D	78.7
48 Benzene-d6	470	1.231	889	14	.240	D	95.9

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
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Telephone: (919) 544-5729

FILE NAME: HG953
DATE: 03/20/92
TLI PROJ #: 20332

SAMPLE ID: SPRFV2 T
TLI ID: 54.153.9
ANALYSIS DATE: 03/16/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

	NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
1	SILOXANE	1786	212005	1389	.25	37.044
2	SILOXANE	1268	130098	1389	.25	22.732
3	SUBSTITUTED CYCLIC HYDROCARBON C10H16	1977	110780	1389	.25	19.357
4	SUBSTITUTED HYDROCARBON	900	90085	1389	.25	15.741
5	SUBSTITUTED HYDROCARBON	923	24674	1389	.25	4.311
6	ACID ESTER	603	15134	1389	.25	2.644
7	SUBSTITUTED HYDROCARBON	674	16306	1389	.25	2.849
8	METHYL THIOPHENE	1173	21538	1389	.25	3.763
9	METHYL THIOPHENE	1199	19222	1389	.25	3.359
10	DIMETHYL THIOPHENE	1477	15780	1389	.25	2.757

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Chlorobenzene-d5	1389	1431	28

Triangle Laboratories of RTP, Inc. FILE NAME: MG937 SAMPLE ID SPRFV2 TC
801 Capitola Drive RF FILE: ICAL 031692 TLI ID: 54.153.9
Durham, NC 27713 DATE: 03/20/92 ANALYSIS DATE: 03/14/92
Telephone: (919) 544-5729 TLI PROJ #: 20332 DILUTION FACTOR 1

QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT,ug	CODE	QUAN LIMIT
1 Bromochloromethane	2530		783	1		IS	
2 Chloromethane	73388	.872	172	1	8.317	D	.05
3 Bromomethane	2739	.634	307	1	.427	D	.05
4 Vinyl Chloride	0	1.005	0	1	.002	ND	.05
5 Chloroethane	0	.848	0	1	.002	ND	.05
6 Methylene Chloride	571	1.245	591	1	.045	E	.05
7 Acetone	1265	.328	531	1	.381	D	.05
8 Carbon Disulfide	4526	4.209	511	1	.106	D	.05
9 1,1-Dichloroethene	0	1.090	0	1	.002	ND	.05
10 1,1-Dichloroethane	0	3.476	0	1	.001	ND	.05
11 trans-1,2-Dichloroethene	0	1.290	0	1	.002	ND	.05
12 Chloroform	396	3.061	801	1	.013	E	.05
13 1,2-Dichloroethane	0	2.165	0	1	.001	ND	.05
43 Trichlorofluoromethane	3240	1.480	407	1	.216	D	.05
46 Acrylonitrile	0	.502	0	1	.004	ND	.05
47 cis-1,2-Dichloroethene	0	1.514	0	1	.001	ND	.05
52 1,3-butadiene	344	.495	234	1	.069	D	.05
57 Allyl chloride	0	.770	0	1	.003	ND	.05
62 Dimethyl disulfide	48056	3.226	1076	1	1.472	D	.05
63 Dimethyl sulfide	14101	1.545	520	1	.902	D	.05
65 Iodomethane	0	2.351	0	1	.001	ND	.05
66 Isooctane	12293	11.661	873	1	.104	D	.05
68 Tert-Butyl methyl ether	1404	3.206	636	1	.043	E	.05
69 Vinyl Bromide	0	.945	0	1	.002	ND	.05
70 n-Hexane	4022	3.111	672	1	.128	D	.05
14 1,4-Difluorobenzene	12021		912	14		IS	
15 2-Butanone	197	.030	768	14	.136	D	.05
16 1,1,1-Trichloroethane	0	.501	0	14	.001	ND	.05
17 Carbon Tetrachloride	0	.513	0	14	.001	ND	.05
18 Vinyl Acetate	0	.488	0	14	.001	ND	.05
19 Bromodichloromethane	0	.509	0	14	.001	ND	.05
20 1,2-Dichloropropane	0	.536	0	14	.001	ND	.05
21 cis-1,3-Dichloropropene	0	.757	0	14	.001	ND	.05
22 Trichloroethene	0	.545	0	14	.001	ND	.05
23 Dibromochloromethane	0	.500	0	14	.001	ND	.05
24 1,1,2-Trichloroethane	0	.314	0	14	.001	ND	.05
25 Benzene	0	1.232	0	14	.001	ND	.05
26 trans-1,3-Dichloropropene	0	.569	0	14	.001	ND	.05
27 Bromoform	0	.352	0	14	.001	ND	.05
54 1,4-Dichloro-2-butene	0	.107	0	14	.004	ND	.05
60 Dibromomethane	0	.195	0	14	.002	ND	.05
28 Chlorobenzene-d5	15870		1366	28		IS	
29 4-Methyl-2-Pentanone	0	.146	0	28	.002	ND	.05
30 2-Hexanone	0	.123	0	28	.003	ND	.05
31 Tetrachloroethene	0	.394	0	28	.001	ND	.05
32 1,1,2,2-Tetrachloroethane	0	.245	0	28	.001	ND	.05
33 Toluene	543	.635	1121	28	.013	E	.05
34 Chlorobenzene	0	.938	0	28	.001	ND	.05

CODES: ND = Not Detected: D = Detected: E = Estimated: IS = Internal Standard

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HG937
RF FILE: ICAL 031692
DATE: 03/20/92
TLI PROJ #: 20332

SAMPLE ID: SPRFV2 TC
TLI ID: 54 153.9
ANALYSIS DATE: 03/14/92
DILUTION FACTOR: 1

QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	AMT,ug	CODE	QUAN LIMIT
35 Ethylbenzene	0	.486	0	28	.001	ND	.05
36 Styrene	0	.984	0	28	.001	ND	.05
37 o-Xylene	0	.566	0	28	.001	ND	.05
38 m-/p-Xylene	0	.607	0	28	.001	ND	.05
49 1,2 Dichlorobenzene	0	.737	0	28	.001	ND	.05
50 1,2,3-Trichloropropane	0	.232	0	28	.001	ND	.05
51 1,3 Dichlorobenzene	0	.955	0	28	.001	ND	.05
53 1,4 Dichlorobenzene	0	.800	0	28	.001	ND	.05
56 A-Pinene	0	.964	0	28	.001	ND	.05
58 B-Pinene	0	1.001	0	28	.001	ND	.05
59 Cumene (isopropylbenzene)	0	1.545	0	28	.001	ND	.05
64 Ethyl methacrylate	0	.425	0	28	.001	ND	.05
67 P-Cymene	0	2.159	0	28	.001	ND	.05

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT,ug	CODE	% RECOVERY
39 Toluene-d8	15786	1.008	1111	28	.247	D	98.7
41 1,2-Dichloroethane-d4	4544	1.816	851	1	.247	D	98.9
48 Benzene-d6	15332	1.231	850	14	.259	D	103.6

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

TRIANGLE LABORATORIES OF RTP, INC.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HG937
DATE: 03/20/92
TLI PROJ #: 20332

SAMPLE ID: SPRFV2 TC
TLI ID: 54.153.9
ANALYSIS DATE: 3/14/92

TENTATIVELY IDENTIFIED COMPOUND REPORT

NAME	Scan	Area	Scan # IS	Amt IS	Amt, ug
1 SUBSTITUTED HYDROCARBON	874	33565	783	.25	.529
2 DIMETHYL TRISULFIDE	1755	31590	1366	.25	.179
3 CYCLIC HYDROCARBON	958	3619	783	.25	.057
4 SILOXANE	1245	9679	1366	.25	.055
5 SUBSTITUTED HYDROCARBON	859	2927	783	.25	.046
6 SUBSTITUTED HYDROCARBON	739	2066	783	.25	.033
7 SUBSTITUTED HYDROCARBON	826	1817	783	.25	.029
8 SUBSTITUTED HYDROCARBON	1927	3352	1366	.25	.019

INTERNAL STANDARD	IS SCAN	IS AREA	IS ID
Bromochloromethane	783	15860	1
Chlorobenzene-d5	1366	44207	28

Triangle Laboratories of RTP, Inc.	FILE NAME: HG929	SAMPLE ID.	SPRFV2
801 Capitola Drive	RF FILE: HG919	TLI ID:	54.153.9 (COND)
Durham, NC 27713	DATE 03/18/92	SAMPLE VOL:	.005 L
Telephone: (919) 544-5729	TLI PROJ #: 20332	ANALYSIS DATE:	03/13/92
		DILUTION FACTOR:	1

Q U A N T I T A T I O N   R E P O R T

	NAME	AREA	RF	SCAN	ISID	CONC, ug/L	CODE	QUAN LIMIT
1	Bromochloromethane	3614		782	1		IS	
2	Chloromethane	0	.685	0	1	.40	ND	10
3	Bromomethane	0	.705	0	1	.39	ND	10
4	Vinyl Chloride	0	.968	0	1	.29	ND	10
5	Chloroethane	0	.808	0	1	.34	ND	10
6	Methylene Chloride	240	1.255	589	1	2.64	E	10
7	Acetone	390	.536	529	1	10.06	D	10
8	Carbon Disulfide	0	4.454	0	1	.06	ND	10
9	1,1-Dichloroethene	0	1.072	0	1	.26	ND	10
10	1,1-Dichloroethane	0	3.212	0	1	.09	ND	10
11	trans-1,2-Dichloroethene	0	1.279	0	1	.22	ND	10
12	Chloroform	985	3.112	800	1	4.29	E	10
13	1,2-Dichloroethane	0	2.215	0	1	.12	ND	10
43	Trichlorofluoromethane	0	1.630	0	1	.17	ND	10
46	Acrylonitrile	0	.489	0	1	.57	ND	10
47	cis-1,2-Dichloroethene	0	1.403	0	1	.20	ND	10
52	1,3-butadiene	0	.541	0	1	.51	ND	10
57	Allyl chloride	0	.764	0	1	.36	ND	10
62	Dimethyl disulfide	0	3.165	0	1	.09	ND	10
63	Dimethyl sulfide	0	1.358	0	1	.20	ND	10
65	Iodomethane	0	2.492	0	1	.11	ND	10
66	Isooctane	0	10.102	0	1	.03	ND	10
68	Tert-Butyl methyl ether	0	3.243	0	1	.09	ND	10
69	Vinyl Bromide	0	.946	0	1	.29	ND	10
70	n-Hexane	0	2.666	0	1	.10	ND	10
14	1,4-Difluorobenzene	17581		915	14		IS	
15	2-Butanone	0	.047	0	14	1.20	ND	10
16	1,1,1-Trichloroethane	0	.549	0	14	.10	ND	10
17	Carbon Tetrachloride	0	.570	0	14	.10	ND	10
18	Vinyl Acetate	0	.570	0	14	.10	ND	10
19	Bromodichloromethane	0	.531	0	14	.11	ND	10
20	1,2-Dichloropropane	0	.537	0	14	.11	ND	10
21	cis-1,3-Dichloropropene	0	.819	0	14	.07	ND	10
22	Trichloroethene	0	.636	0	14	.09	ND	10
23	Dibromochloromethane	0	.595	0	14	.10	ND	10
24	1,1,2-Trichloroethane	0	.387	0	14	.15	ND	10
25	Benzene	0	1.288	0	14	.04	ND	10
26	trans-1,3-Dichloropropene	0	.641	0	14	.09	ND	10
27	Bromoform	0	.512	0	14	.11	ND	10
54	1,4-Dichloro-2-butene	0	.201	0	14	.28	ND	10
60	Dibromomethane	0	.228	0	14	.25	ND	10
28	Chlorobenzene-d5	22393		1357	28		IS	
29	4-Methyl-2-Pentanone	0	.261	0	28	.17	ND	10
30	2-Hexanone	0	.240	0	28	.19	ND	10
31	Tetrachloroethene	0	.439	0	28	.10	ND	10
32	1,1,2,2-Tetrachloroethane	0	.372	0	28	.12	ND	10
33	Toluene	0	.664	0	28	.07	ND	10
34	Chlorobenzene	0	1.004	0	28	.04	ND	10

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

Triangle Laboratories of RTP, Inc.
801 Capitola Drive
Durham, NC 27713
Telephone: (919) 544-5729

FILE NAME: HG929
RF FILE: HG919
DATE: 03/18/92
TLI PROJ #: 20332

SAMPLE ID SPRFV2
TLI ID: 54.153.9 (COND)
SAMPLE VOL: .005 L
ANALYSIS DATE: 03/13/92
DILUTION FACTOR: 1

QUANTITATION REPORT

NAME	AREA	RF	SCAN	ISID	CONC, ug/L	CODE	QUAN LIMIT
35 Ethylbenzene	0	.514	0	28	.09	ND	10
36 Styrene	0	1.079	0	28	.04	ND	10
37 o-Xylene	0	.611	0	28	.07	ND	10
38 m-/p-Xylene	0	.660	0	28	.07	ND	10
49 1,2 Dichlorobenzene	0	.986	0	28	.05	ND	10
50 1,2,3-Trichloropropane	0	.372	0	28	.12	ND	10
51 1,3 Dichlorobenzene	0	1.116	0	28	.04	ND	10
53 1,4 Dichlorobenzene	0	.956	0	28	.05	ND	10
56 A-Pinene	0	.993	0	28	.04	ND	10
58 B-Pinene	0	.997	0	28	.04	ND	10
59 Cumene (isopropylbenzene)	0	1.608	0	28	.03	ND	10
64 Ethyl methacrylate	0	.550	0	28	.08	ND	10
67 P-Cymene	0	2.247	0	28	.02	ND	10

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMT,ug	CODE	% RECOVERY
39 Toluene-d8	23358	1.057	1118	28	.25	D	98.7
41 1,2-Dichloroethane-d4	7043	1.976	651	1	.25	D	98.6
48 Benzene-d6	20489	1.313	850	14	.22	D	88.7

CODES: ND = Not Detected; D = Detected; E = Estimated; IS = Internal Standard

APPENDIX B PROCESS STREAM SAMPLE RESULTS

WEST COAST REGIONAL CENTER
P.O. Box 458
Corvallis, OR 97339
(503) 752-8801

ncasi

NATIONAL COUNCIL OF THE PAPER INDUSTRY FOR AIR AND STREAM IMPROVEMENT, INC.

November 24, 1992

MEMO TO: Mr. Don Padfield, Simpson Pasadena Paper Company

FROM: Alex R. Gholson, NCASI ARG

SUBJECT: Results of Method 25D and Method 305 Analyses for the TACB Emissions Speciation Study, Simpson Pasadena Mill

In support of the TACB Emissions Speciation Study, NCASI analyzed selected samples using EPA Draft Method 25D. As part of a method development effort, the samples were analyzed for specific volatile organic compounds using an experimental method referred to as Method 305. This memo is an update from a previous memos issued on September 10, 1992 and November 11, 1992 to include additional discussion of the analytical methods and reporting procedures and to make minor text changes.

A sample was collected by the contractor Roy F. Weston and sent to NCASI's West Coast Regional Center in Corvallis. Volatile organic sampling procedures were used to collect the sample instead of the sampling procedures specified by Method 25D. I feel that the Method 25D sample procedures are prone to both contamination from the outside environment during storage and shipment of sample containers half filled with polyethylene glycol (PEG), and bias due to spillage of sample/PEG during sample collection. The sample was carefully transferred to a vial containing PEG in the NCASI laboratory.

The sample was analyzed as described by the draft Method 25D proposed in the Federal Register with the modifications mentioned above. Method 25D was proposed to determine if a sample has a total volatile organic emission potential below a specified limit (500 ppmwVO). The sample analyzed from Simpson Pasadena Mill was found to be below that limit. However, for this study it was desired to use the method to provide an estimate of the actual level of volatile organic in each sample collected. Because this objective differs slightly from the defined purpose of the method, a brief discussion of the method and the method results are in order. In Method 25D a sample is purged under specified conditions to remove the volatile compounds. The removed compounds are then analyzed for total organic carbon using a flame ionization detector (FID) resulting in a value expressed as parts-per-million carbon (as CH_4) by weight (ppmwC) or µgC/g. The total purged chlorine is measured with an electrolytic conductivity detector and reported as ppm chlorine by weight (ppmwCl) or µgCl/g. Method 25D then calculates a total volatile organic by summing the total organic carbon and the total organic chlorine and reports the total as parts-per-million volatile organic (ppmwVO). Because the method was designed to show that a value is below a level well within its standard working range, no guidance is provided for reporting values near or below the limit of detection (LOD) or adding values when one or both are below the LOD. For this study the American Chemical Society definition of LOD which is defined as three standard deviations of the measurement above the blank response was used. All Method 25D values are blank corrected so the blank level is well characterized and the standard deviation of multiple blank measurements is used to determine the LOD. The LOD for the total carbon value was 12.1 ppmwC and 5.7 ppmwCl total chlorine value for the 15.3 gram sample. Actual LODs were dependant on the sample size. When measured concentration values are below the LOD, they are reported as not detected (ND) and the LOD is then listed in parentheses. The total volatile organic which is the sum of two measured values was not reported for this study. Because proper guidance for handling values below the LOD is not provided by the method, the data user should choose the most appropriate method for determining the total which is consistent with the users data objectives and his best professional judgement. For example, in the case of an evaporator condensate, a non-detect for chlorine could be considered as a zero when determining a total. Likewise, for a bleach plant sewer, it might be prudent to assume the LOD as the best estimate of the chlorine level.

The experimental modifications made to speciate the volatile organics purged using Method 25D included removing a third slip stream from the sample purge line at a flowrate of approximately 100 mL/min through an ice cooled aqueous impinger and into a Tenax/charcoal adsorbent trap. The aqueous impinger solution was analyzed for methanol, ethanol, acetone, 2-propanol, and 2-butanone by microdistillation followed by GC-FID analysis. The Tenax/charcoal trap was thermally desorbed and analyzed by GC/MS calibrated for a list of 28 compounds. Table 1 lists the results of the Method 25D and Method 305 analyses. All Method 305 values are reported in the units of microgram of compound per gram of sample (μg/g). No effort was made to determine the LOD for this method because of the lack of historical data needed to characterize the background level or the analytical variance. Not detected (ND) was reported for all compounds not found or found but below a level generally considered reliable based on professional judgment of a limited database. This level was chosen to be 1.0 μg/g for the impinger values and 0.1 μg/g for the trap values.

The quality assurance checks of Method 25D for this program included two sets of sample duplicates and a matrix spike duplicate. Only volatile carbon was detected by Method 25D in the sample duplicates. The difference between duplicate values relative to the average value expressed as a percent or relative percent difference (RPD) were 8.1 and 5.6 percent indicating good precision. Only one set of duplicates were obtained using the experimental Method 305. Methanol duplicate results were found to have an RPD of 1.3 percent. Values of other compounds detected at lower levels and analyzed using the adsorbent trap and GC/MS were of lower precision. RPDs for compounds detected ranged from 112 percent for dimethyl sulfide to 10.2 percent for ß-pinene.

The matrix spike duplicate provided both recovery and precision information for the two methods. For Method 25D the total carbon average recovery was 61.6 percent with an RPD of 0.3 percent. This indicates good recovery because typical recovery for a QC spike in reagent water is 70 percent. The less than 100 percent recovery found is due to the large percentage of methanol in the spiking solution which has a poor FID response relative to the calibration gas propane. The chlorine spike level was near the LOD for chlorine and an average recovery of 47.8 percent with a RPD of 13.7 percent was found. It is believed the low recovery of the chlorine spike is due to the low concentration level spiked. The average recovery of methanol by Method 305 was found to be 82.6 percent with a RPD of 10.8 percent. Acetone and 2-butanone had approximately 50 percent recoveries with 10 percent RPDs. Trap recoveries of compounds more volatile than chloroform were generally less than 10 percent including dimethyl sulfide. Chloroform recovery was 71 percent with a RPD of 58 percent. Recoveries of the other compounds ranged from 33 percent for ß-pinene to 134 percent for limonene with RPDs ranging from 8.9 percent to 56.8 percent.

In summary, the Method 25D and Method 305 methanol QA results are within an acceptable range. The Method 305 results other than the methanol values are not within a generally acceptable range and should be considered semi-quantitative at this time. Method development is currently being performed to improve the overall data quality for Method 305.

cc: Ashok Jain
Larry LaFleur

TABLE 1. RESULTS OF METHOD 25D AND METHOD 305 ANALYSIS AT SIMPSON'S PASADENA MILL

Compound	Concentration (µg/g) SP-SDTV7/1/H2O/0519
Method 25D	
Total Carbon (ppmwC)	12.9
Total Chlorine (ppmwCl)	ND (5.6)
Method 350	
Impinger analysis	
Methanol	31.8
Ethanol	ND
Impinger + Trap	
Acetone	ND
2-Butanone	ND
Trap analysis	
Dimethyl sulfide	ND
Methylene chloride	ND
Chloroform	ND
Benzene	ND
Bromodichloromethane	ND
Dimethyl disulfide	ND
Toluene	ND
α-Pinene	ND
β-Pinene	ND
Limonene	ND

ND is not detected. The limit of detection is given in parenthesis when available (see text for explanation).

APPENDIX C COMPARISON OF CHLOROFORM RESULTS

APPENDIX C

COMPARISON OF CHLOROFORM RESULTS

SIMPSON-PASADENA

Source	Date	ppm Method 18			ppm Sorbent Tube
BPSETV	6/8/92	88.6	101.1	56.1	127.4
BPSEWV	6/5/92	10.7	9.5	11.9	12.7
	6/6/92	10.4	9.9	8.3	11.0
BPSESB	6/3/92	rejected	935.8	930.8	727.5
	6/4/92	1409.4	1240.8	1130.2	1439.2
BPSFHT	6/7/92	1294.0	1897.7	1438.0	782.1
BPSFHW	6/5/92	rejected	rejected	rejected	5.3
	6/6/92	4.6	4.6	4.0	3.9
BPSFHS	6/3/92	1089.5	860.3	830.9	1126.6
	6/4/92	1568.5	1490.1	1078.3	1598.4
BPSCCS	6/7/92	30.5	40.1	49.4	66.4
	6/8/92	<1.1	<1.1	2.6	8.8
BPSCSV	6/7/92	14.4	22.4	21.0	39.9
	6/8/92	14.0	13.7	rejected	9.2
BPSSHT	6/8/92	58.4			24.8
BPSSHW	6/5/92	1.8	2.0	3.2	4.3
	6/7/92	1.5	1.6	1.4	1.6
BPSSHS	6/5/92	294.4	267.2	218.5	349.6
	6/7/92	74.6	72.6	67.6	63.7
BPHCWV	6/10/92	2.7		Mill down	
BPHEWV	6/10/92	<1.1	1.4	<1.1	2.6
BPHESB	6/20/92	2.1	135.1	59.9	6.3
BPHFHW	6/18/92	rejected	156.9	134.0	117.1
BPHFHS	6/20/92	rejected	rejected	rejected	870.7
	6/21/92	1434.2	1185.1	1188.4	651.0
BPHCTS	6/16/92	1275.9	1075.2	1451.8	1296.5
	6/17/92	1210.9	rejected	789.7	339.1

COMPARISON OF CHLOROFORM RESULTS

SIMPSON-PASADENA

Source	Date	ppm Method 18			ppm Sorbent Tube
BPHDWV	6/18/92	97.8	181.9	103.0	25.2
BPHSHW	6/10/92	1.6			1.8
BPHSHS	6/19/92	28.1	28.9	27.2	21.7
BPHCSS	6/10/92	32.4	3.5	<1.1	1.7
		51.7	4.1	28.0	35.1
BPHCSB	6/16/92	210.1	229.4	232.9	254.4
		309.9	315.9	312.7	411.2

Appendix D

UNIT PROCESS DESCRIPTION

Batch Digester Operations

The mill uses 9 batch digesters to produce pine and hardwood kraft pulp. Drawing PN1100 traces the sequences involved in Wood Chip Digestion & Brown Stock Washing.

Representative operating conditions:

- Wood species: pine and mixed southern hardwoods
- Production rates: 446 MTPD pine. 291 MTPD hardwood
- Active alkali: pine 6550 lbs Na_2O/cook. hardwood 7725 lbs/cook
- Sulfidity: 26%
- Cooking Temperature: pine 345 (359 final). hwd 334 (348 final)
- Digester Pressure: 120 psi
- Kappa number of pulp: pine 21.1. hwd 13.0
- Chip charge: pine 36.580 lbs. hwd 43.710 lbs
- Liquor charge, gallons, W/B: pine 1051/536, hwd 1234/355

Chemical Recovery Operations

No. 7 Recovery Boiler is a Babcock & Wilcox Unit beginning operation in 1973. It is fitted with a direct contact venturi scrubber followed by a cyclone type evaporator. The unit is capable of firing 1,700,000 pounds of black liquor solids which corresponds to a pulp production rate of 550 tons/day. Combustion air is added at three levels. Primary and secondary air is added at the second floor level and tertiary air at the fourth floor level. Liquor is fed through two guns located between the secondary and the tertiary air ports. The furnace fires natural gas through five burners located just above the primary air ports. Black liquor is fired at 62 to 65 % solids. The Btu of black liquor fired is around 5830 Btu/lb. The Recovery furnace temperature is in excess of 2000 degrees Fahrenheit. The black liquor fed to the furnace has been oxidized in two stages in series and the residual sulfide is typically <.001 gm/l. Brine from the Tall Oil Plant and saltcake from the Chlorine Dioxide Plant is added to the heavy liquor feed to the cyclone.

Particulate exiting the furnace is cleaned by means of an ESP which has eight fields in series is each of two parallel chambers. The particulate level in gases entering the precipitator is typically 15 - 20 grs/cf.

Fumes from the Smelt Dissolving Tank are treated in a scrubber which uses a chevron type packing. The scrubbing medium is fresh water.

A simplied flow diagram of the Black Liquor Chemical Recovery Cycle is show in Drawing PN1300.

Lime Kiln

The lime kiln is a rotary type manufactured by F.L. Smidth and entered service in 1960. The kiln is 11'6" in diameter and 275' long. The chain section is 75' long and the unit is fired on natural gas only. No noncondensible gases are burned in the kiln. The kiln produced an average of 195 tons of CaO/day in 1992. Particulate emissions are controlled with a 2 chamber precipitator which has 6 fields in each chamber. The precipitator has a dry bottom. An Eimco belt filter is used for mud washing and dewatering. The filter is 16 feet wide and has a diameter of 10 feet.

Representative Operating Conditions:

Production, tons CaO/hr = 8.1

Fuel, natural gas at 56,000 cf/hr

Btu/Ton product = 7.1 MMBtu/ton of lime

End Temperatures, Fahrenheit, hot = 2000, cold = 360

Solids content of mud = 70%

Na_2S and soda content of mud = 0.29% Na_2O

Particulate control device = ESP

The general flow path of the Caustizing Area is shown in the Causticizing Process Drawing PN1400.

Thermal Oxidation Plant

Mill odor control is aided by the use of a Thermal Oxidation Plant to convert total reduced sulfur gases collected from various parts of the plant, as well as those stripped from condensates to sulfur dioxide, which is then removed by scrubbing. Strong gases exiting the blow condenser are collected in a gas holder and then metered into the incinerator. Strong gases from the black liquor multi-effect evaporators and the by-products plant are collected and burned in the incinerator. Strong condensates from the digester area, the by-products plant and the evaporator area are stripped with air which is then burned in the incinerator. Pertinent process tanks throughout the mill area are kept under a slight negative draft with any gases collected added to the air intake for the stripper. The incinerator is a refractory lined vessel. Natural gas is used to supplement combustion of the total reduced sulfur gases. Incineration is carried out at a temperature of 1400 degrees Fahrenheit and a retention time of 0.5 seconds. Flue gases from the incinerator are scrubbed first in a venturi scrubber and then in a bubble plate column scrubber. A combination of fresh and recirculated diluted caustic is used in the scrubbers. The venturi scrubber utilizes 20 gpm of 10% caustic make up and 31 gpm of recirculation as the scrubbing medium. The plate column uses recirculated caustic as the scrubbing medium. Stripped condensate is is sewered to the waste treatment plant.

The manner that the odor incinerator is connected to associated mill processes is show by the Drawing PN1600 entitled Thermal Oxidation Plant.

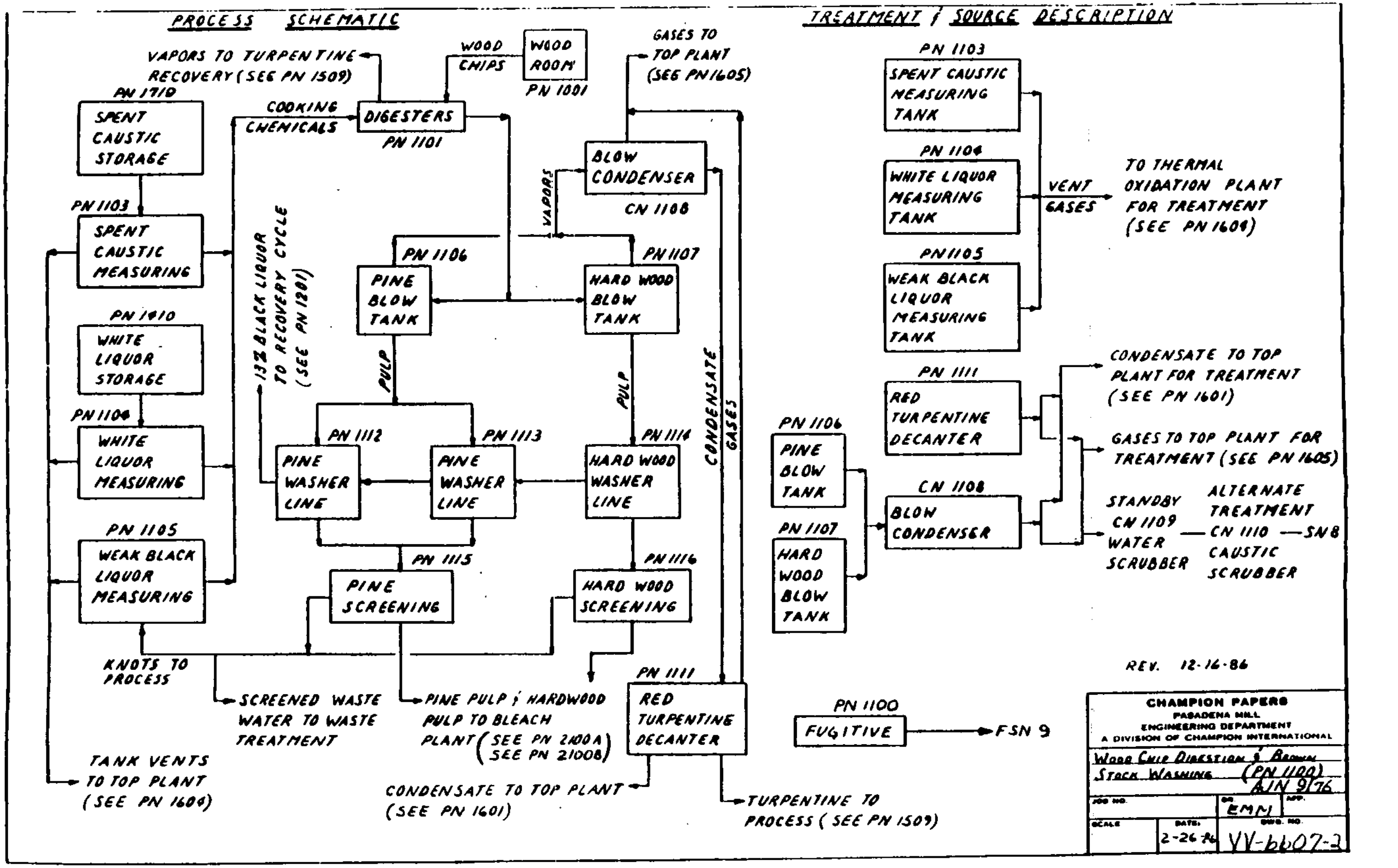
Bleaching Operations

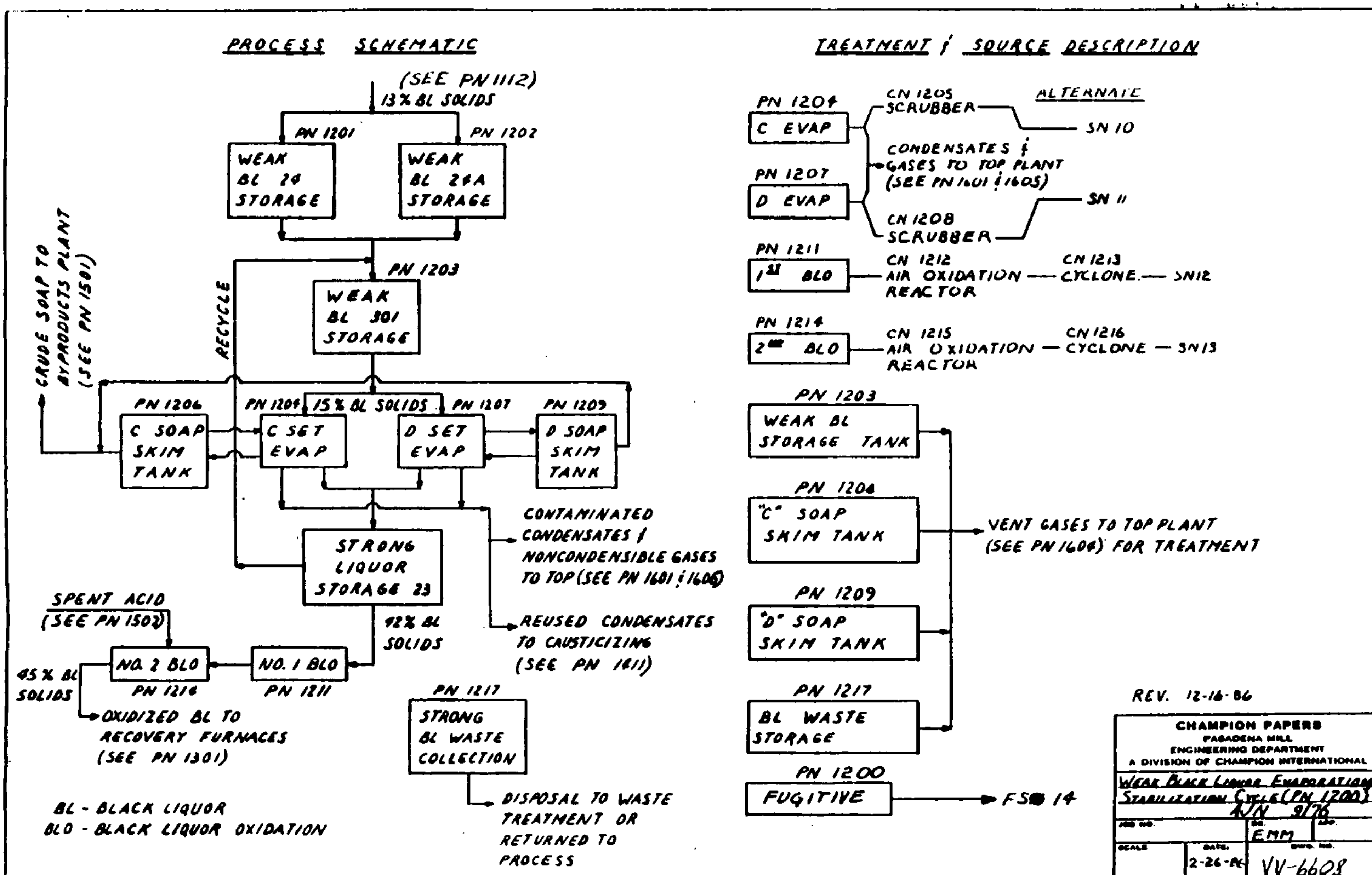
The mill has two parallel bleaching lines, one for hardwood and one for pine. The pine bleaching sequence is Dc/Eo/H_1/D/H_2 and the hardwood sequence is C/E/H_1/D/H_2. The final G.E. brightness target range is 86-88. During the test period the Pine Bleach Plant utilized a 70% ClO_2 substitution rate and the Hardwood Bleach Plant did not use any. Fresh water is used on the pine Dc and the hardwood C and H_1 showers. White water from the Paper Machines is used on the pine H_2 showers and the hardwood D and H_2 showers.

The process flow for the pine bleach plant is shown in Drawing PN2100A and that for the hardwood bleach plant in Drawing PN2100B.

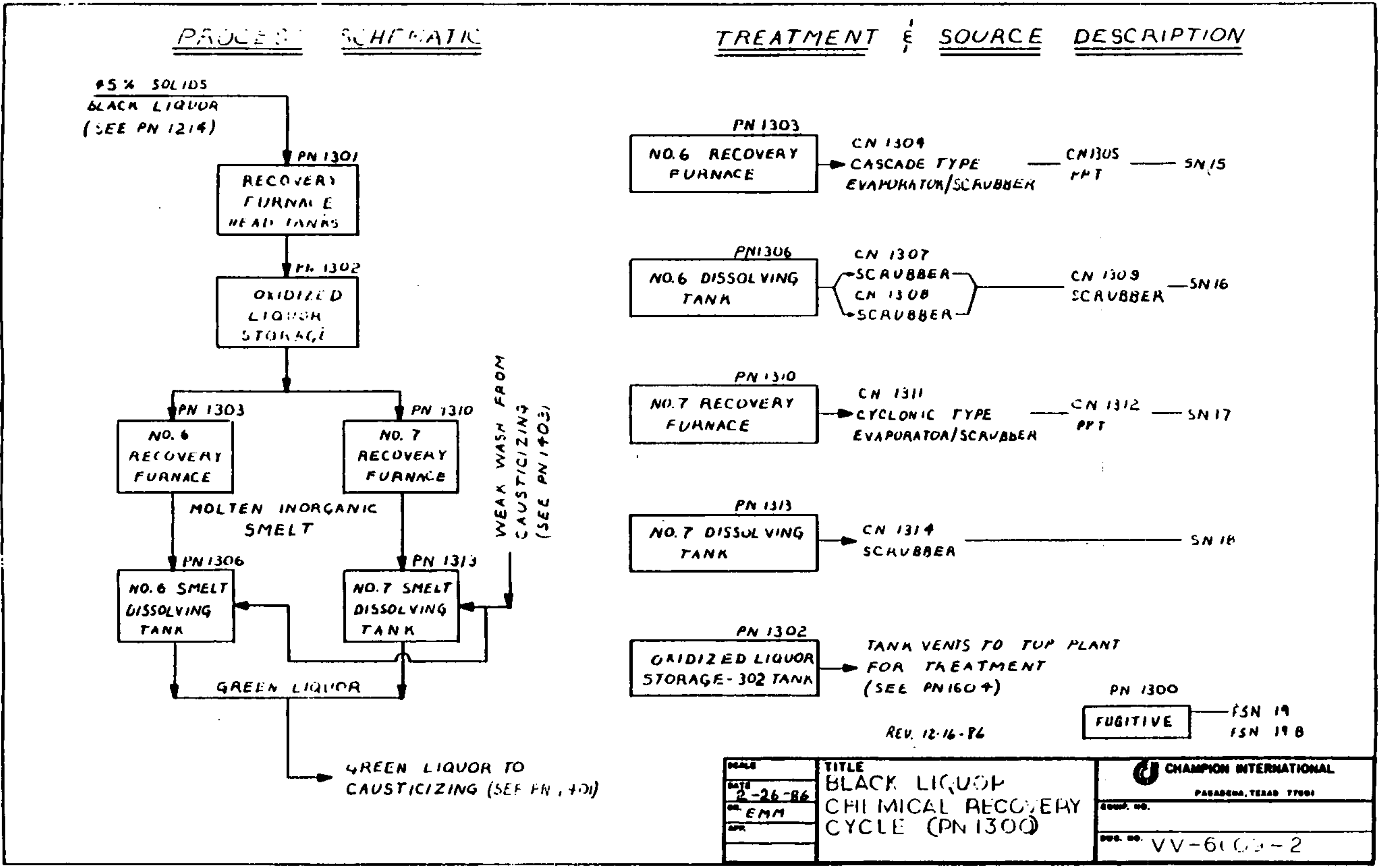
Gas Fired Utility Boilers

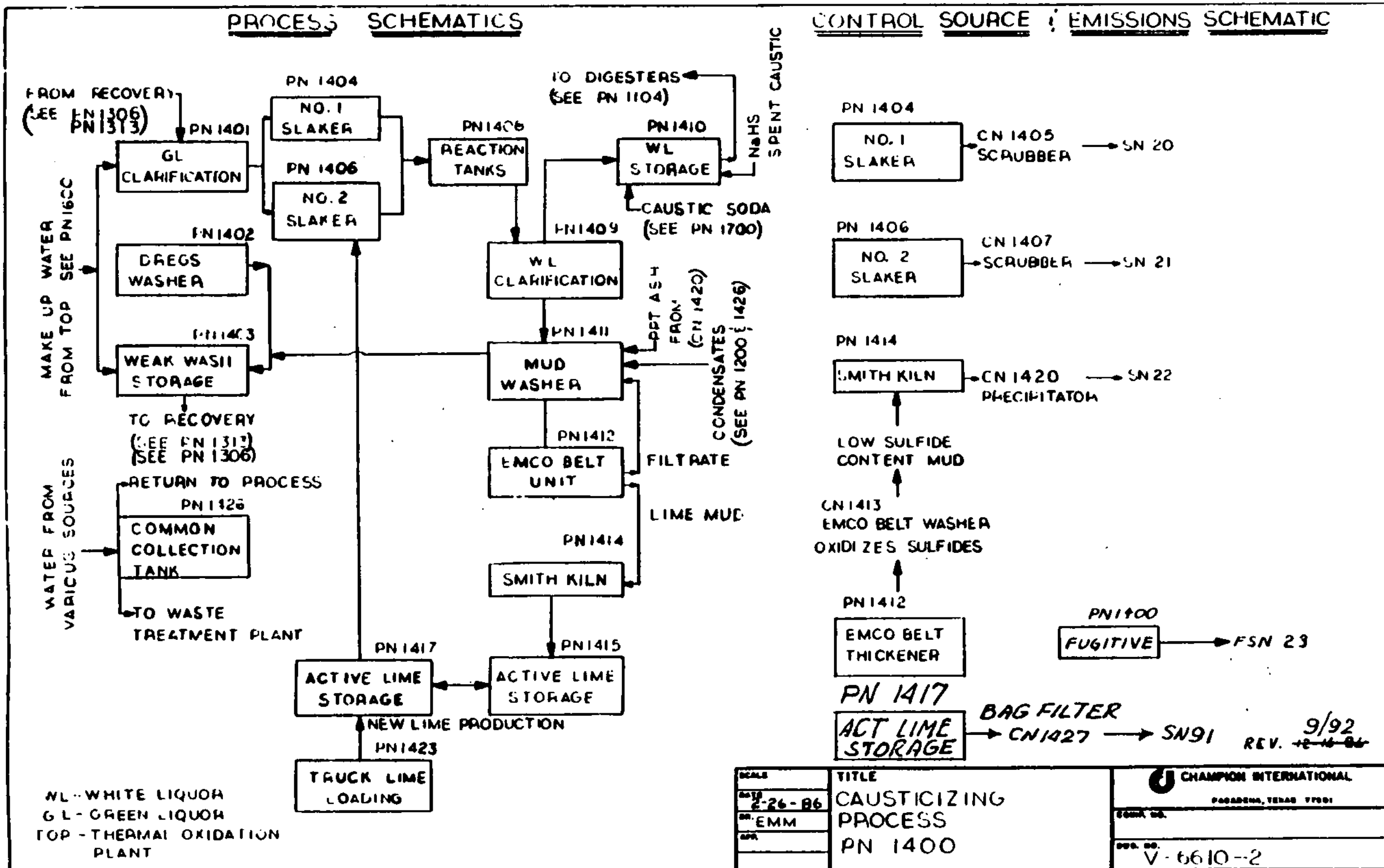
The utility boilers tested in the 1992 mill survey are natural gas fired.

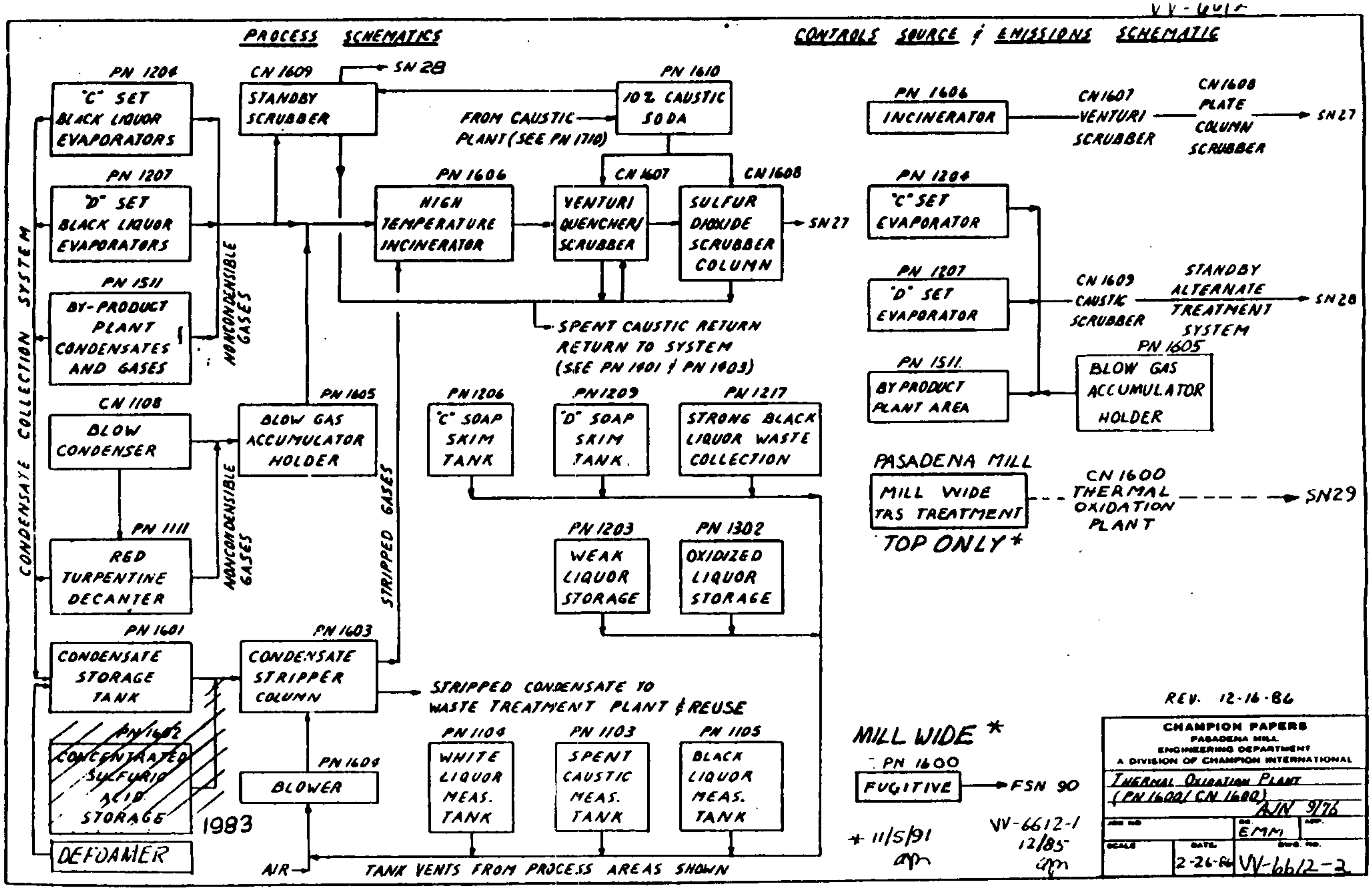

PROCESS SCHEMATIC
TREATMENT & SOURCE DESCRIPTION
VAPORS TO TURPENTINE RECOVERY (SEE PN 1509)
WOOD CHIPS
WOOD ROOM
PN 1001
GASES TO TOP PLANT (SEE PN 1605)
PN 1710
SPENT CAUSTIC STORAGE
COOKING CHEMICALS
DIGESTERS
PN 1101
BLOW CONDENSER
CN 1108
VAPORS
PN 1103
SPENT CAUSTIC MEASURING
13% BLACK LIQUOR TO RECOVERY CYCLE (SEE PN 1201)
PN 1106
PINE BLOW TANK
PN 1107
HARD WOOD BLOW TANK
PN 1410
WHITE LIQUOR STORAGE
PULP
CONDENSATE
GASES
PN 1104
WHITE LIQUOR MEASURING
PN 1112
PINE WASHER LINE
PN 1113
PINE WASHER LINE
PN 1114
HARD WOOD WASHER LINE
PN 1105
WEAK BLACK LIQUOR MEASURING
PN 1115
PINE SCREENING
PN 1116
HARD WOOD SCREENING
KNOTS TO PROCESS
SCREENED WASTE WATER TO WASTE TREATMENT
PINE PULP & HARDWOOD PULP TO BLEACH PLANT (SEE PN 2100A SEE PN 2100B)
PN 1111
RED TURPENTINE DECANTER
TANK VENTS TO TOP PLANT (SEE PN 1604)
CONDENSATE TO TOP PLANT (SEE PN 1601)
TURPENTINE TO PROCESS (SEE PN 1509)
PN 1103
SPENT CAUSTIC MEASURING TANK
PN 1104
WHITE LIQUOR MEASURING TANK
VENT GASES
TO THERMAL OXIDATION PLANT FOR TREATMENT (SEE PN 1604)
PN 1105
WEAK BLACK LIQUOR MEASURING TANK
PN 1111
RED TURPENTINE DECANTER
CONDENSATE TO TOP PLANT FOR TREATMENT (SEE PN 1601)
GASES TO TOP PLANT FOR TREATMENT (SEE PN 1605)
PN 1106
PINE BLOW TANK
CN 1108
BLOW CONDENSER
PN 1107
HARD WOOD BLOW TANK
STANDBY CN 1109 WATER SCRUBBER
ALTERNATE TREATMENT CN 1110 CAUSTIC SCRUBBER
SN 8
REV. 12-16-86
PN 1100
FUGITIVE
FSN 9
CHAMPION PAPERS
PASADENA MILL
ENGINEERING DEPARTMENT
A DIVISION OF CHAMPION INTERNATIONAL
Wood Chip Digestion & Brown Stock Washing (PN 1100)
AJN 9/76
EMN
2-26-76
VV-6607-2

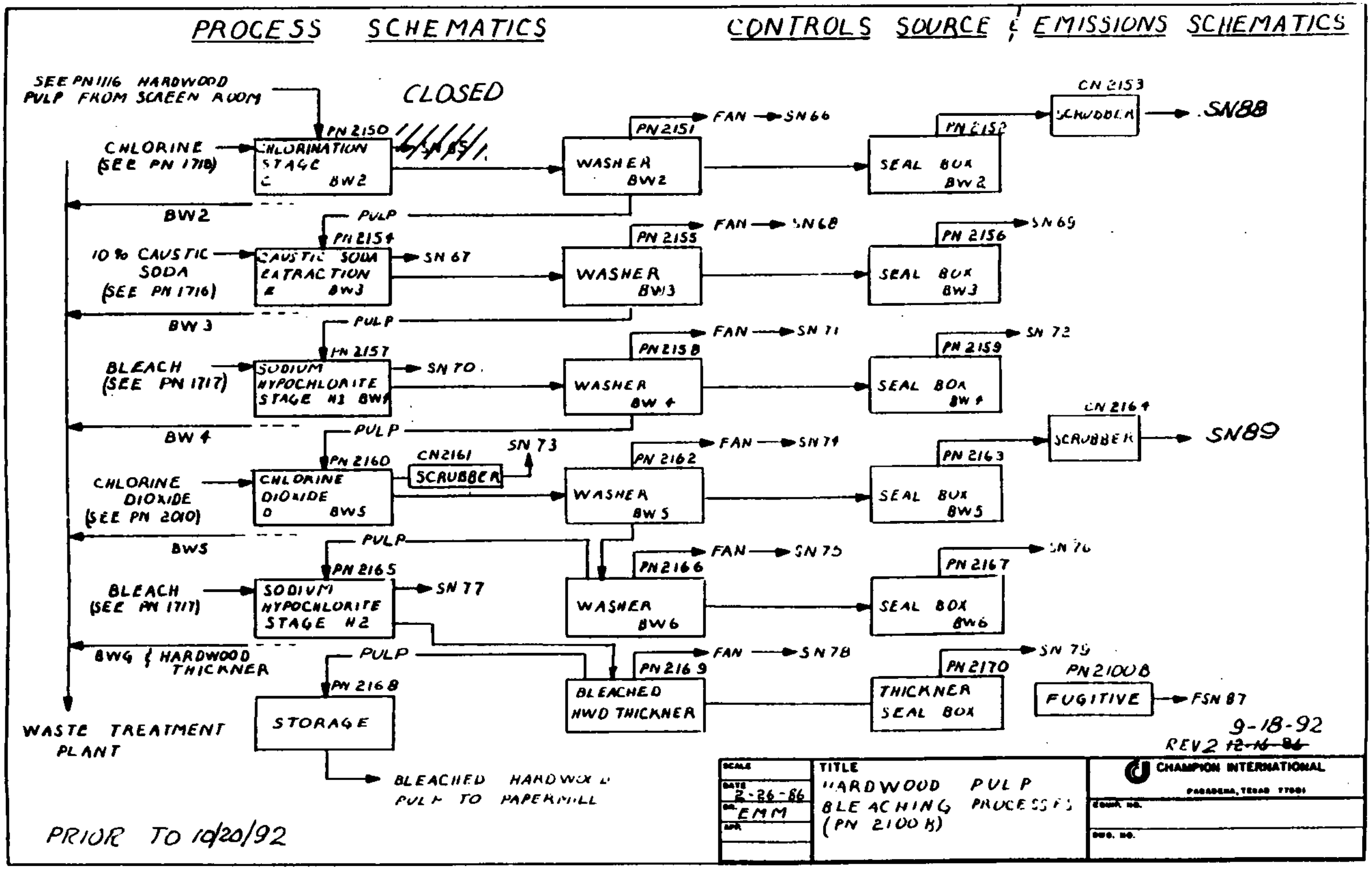


PROCESS SCHEMATIC
(SEE PN 1112)
13% BL SOLIDS
PN 1201
WEAK BL 24 STORAGE
PN 1202
WEAK BL 24A STORAGE
RECYCLE
PN 1203
WEAK BL 301 STORAGE
CRUDE SOAP TO BYPRODUCTS PLANT (SEE PN 1501)
PN 1206
C SOAP SKIM TANK
PN 1204
15% BL SOLIDS
C SET EVAP
PN 1207
D SET EVAP
PN 1209
D SOAP SKIM TANK
CONTAMINATED CONDENSATES & NONCONDENSIBLE GASES TO TOP (SEE PN 1601 & 1606)
STRONG LIQUOR STORAGE 23
REUSED CONDENSATES TO CAUSTICIZING (SEE PN 1611)
SPENT ACID (SEE PN 1502)
92% BL SOLIDS
NO. 2 BLO
PN 1214
NO. 1 BLO
PN 1211
45% BL SOLIDS
OXIDIZED BL TO RECOVERY FURNACES (SEE PN 1301)
PN 1217
STRONG BL WASTE COLLECTION
DISPOSAL TO WASTE TREATMENT OR RETURNED TO PROCESS
BL - BLACK LIQUOR
BLO - BLACK LIQUOR OXIDATION
TREATMENT & SOURCE DESCRIPTION
PN 1204
C EVAP
CN 1205 SCRUBBER
ALTERNATE
SN 10
CONDENSATES & GASES TO TOP PLANT (SEE PN 1601 & 1605)
PN 1207
D EVAP
SN 11
CN 1208 SCRUBBER
PN 1211
1ST BLO
CN 1212 AIR OXIDATION REACTOR
CN 1213 CYCLONE
SN 12
PN 1214
2ND BLO
CN 1215 AIR OXIDATION REACTOR
CN 1216 CYCLONE
SN 13
PN 1203
WEAK BL STORAGE TANK
PN 1204
"C" SOAP SKIM TANK
VENT GASES TO TOP PLANT (SEE PN 1606) FOR TREATMENT
PN 1209
"D" SOAP SKIM TANK
PN 1217
BL WASTE STORAGE
PN 1200
FUGITIVE
FS 14
REV. 12-16-86
CHAMPION PAPERS
PASADENA MILL
ENGINEERING DEPARTMENT
A DIVISION OF CHAMPION INTERNATIONAL
WEAK BLACK LIQUOR EVAPORATION/STABILIZATION CYCLE (PN 1200)
AJN 9/76
EMM
2-26-86
VV-6608


PROCESS SCHEMATIC
TREATMENT & SOURCE DESCRIPTION
45% SOLIDS
BLACK LIQUOR
(SEE PN 1214)
PN 1301
RECOVERY FURNACE HEAD TANKS
PN 1302
OXIDIZED LIQUOR STORAGE
PN 1303
NO. 6 RECOVERY FURNACE
PN 1310
NO. 7 RECOVERY FURNACE
MOLTEN INORGANIC SMELT
WEAK WASH FROM CAUSTICIZING (SEE PN 1403)
PN 1306
NO. 6 SMELT DISSOLVING TANK
PN 1313
NO. 7 SMELT DISSOLVING TANK
GREEN LIQUOR
GREEN LIQUOR TO CAUSTICIZING (SEE PN 1401)
PN 1303
NO. 6 RECOVERY FURNACE
CN 1304
CASCADE TYPE
EVAPORATOR/SCRUBBER
CN 1305
PPT
SN 15
PN 1306
NO. 6 DISSOLVING TANK
CN 1307
SCRUBBER
CN 1308
SCRUBBER
CN 1309
SCRUBBER
SN 16
PN 1310
NO. 7 RECOVERY FURNACE
CN 1311
CYCLONIC TYPE
EVAPORATOR/SCRUBBER
CN 1312
PPT
SN 17
PN 1313
NO. 7 DISSOLVING TANK
CN 1314
SCRUBBER
SN 18
PN 1302
OXIDIZED LIQUOR STORAGE - 302 TANK
TANK VENTS TO TOP PLANT
FOR TREATMENT
(SEE PN 1604)
PN 1300
FUGITIVE
FSN 19
FSN 19 B
REV. 12-16-86
SCALE
DATE 2-26-86
DR. EMM
APP.
TITLE
BLACK LIQUOR
CHEMICAL RECOVERY
CYCLE (PN 1300)
CHAMPION INTERNATIONAL
PASADENA, TEXAS 77501
EQUIP. NO.
DWG. NO. VV-6
-2

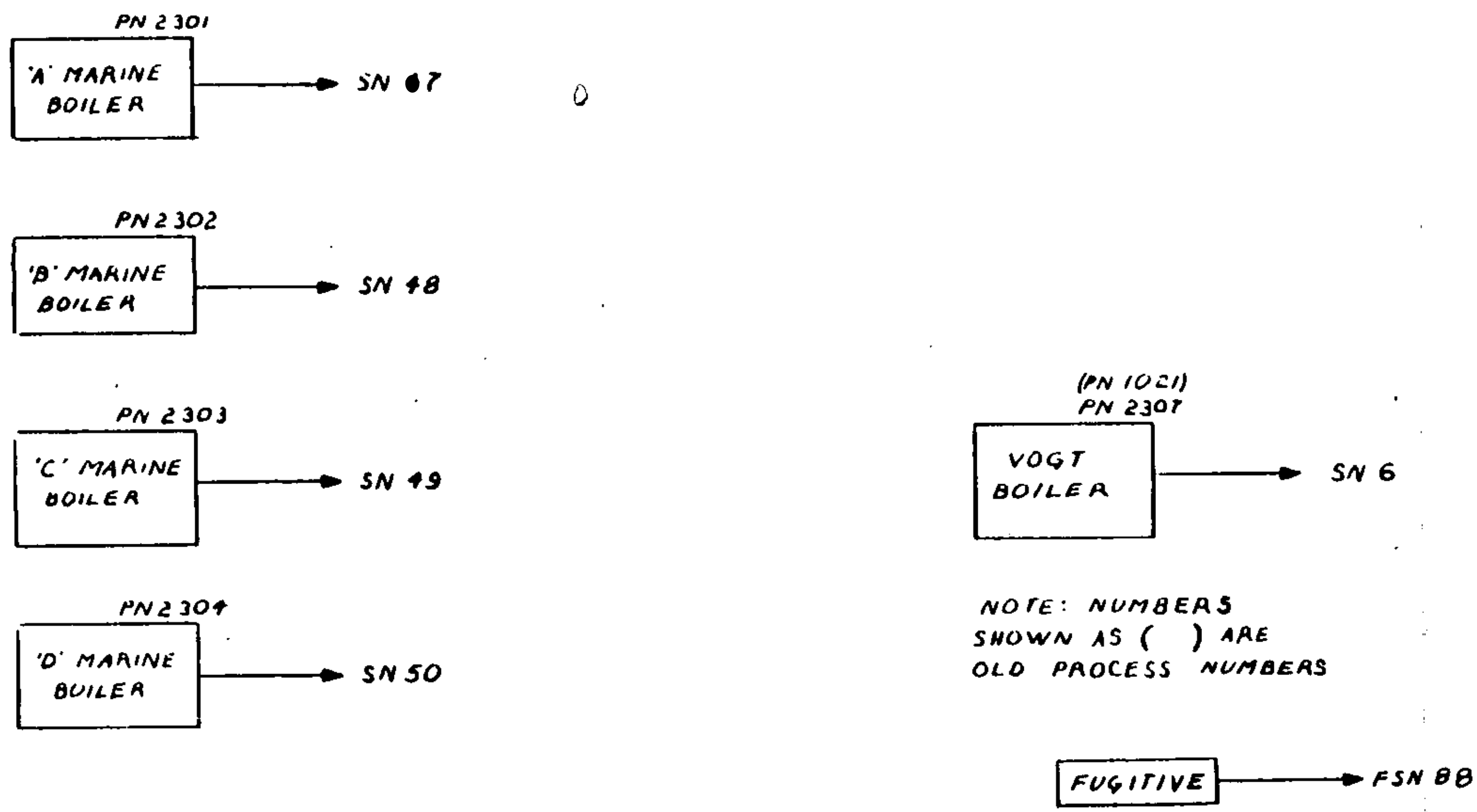

PROCESS SCHEMATICS
CONTROL SOURCE & EMISSIONS SCHEMATIC
FROM RECOVERY (SEE PN1306 PN1313)
PN1401
GL CLARIFICATION
PN 1404
NO. 1 SLAKER
PN 1406
NO. 2 SLAKER
PN1406
REACTION TANKS
TO DIGESTERS (SEE PN 1104)
PN1410
WL STORAGE
NaHS
SPENT CAUSTIC
CAUSTIC SODA (SEE PN 1700)
PN1409
WL CLARIFICATION
MAKE UP WATER FROM TOP SEE PN1600
PN1402
DREGS WASHER
PN1403
WEAK WASH STORAGE
TO RECOVERY (SEE PN 1313) (SEE PN 1306)
PN1411
MUD WASHER
PPT ASH
FROM (CN 1420)
CONDENSATES (SEE PN 1200 & 1426)
PN1412
EMCO BELT UNIT
FILTRATE
LIME MUD
PN1414
SMITH KILN
WATER FROM VARIOUS SOURCES
RETURN TO PROCESS
PN1426
COMMON COLLECTION TANK
TO WASTE TREATMENT PLANT
PN1417
ACTIVE LIME STORAGE
PN1415
ACTIVE LIME STORAGE
NEW LIME PRODUCTION
PN1423
TRUCK LIME LOADING
WL - WHITE LIQUOR
GL - GREEN LIQUOR
TOP - THERMAL OXIDATION PLANT
PN 1404
NO. 1 SLAKER
CN 1405 SCRUBBER
SN 20
PN 1406
NO. 2 SLAKER
CN 1407 SCRUBBER
SN 21
PN 1414
SMITH KILN
CN 1420 PRECIPITATOR
SN 22
LOW SULFIDE CONTENT MUD
CN1413 EMCO BELT WASHER OXIDIZES SULFIDES
PN1412
EMCO BELT THICKENER
PN1400
FUGITIVE
FSN 23
PN 1417
ACT LIME STORAGE
BAG FILTER CN1427
SN91
REV. 9/92 ~~12-16-86~~
SCALE
DATE 2-26-86
DR. EMM
APP.
TITLE
CAUSTICIZING PROCESS PN 1400
CHAMPION INTERNATIONAL
PASADENA, TEXAS 77501
DWG. NO. V-6610-2


VV-6612
PROCESS SCHEMATICS
CONTROLS SOURCE & EMISSIONS SCHEMATIC
PN 1204
"C" SET BLACK LIQUOR EVAPORATORS
PN 1207
"D" SET BLACK LIQUOR EVAPORATORS
PN 1511
BY-PRODUCT PLANT CONDENSATES AND GASES
CN 1108
BLOW CONDENSER
PN 1111
RED TURPENTINE DECANTER
PN 1601
CONDENSATE STORAGE TANK
PN 1602
CONCENTRATED SULFURIC ACID STORAGE
1983
DEFOAMER
CONDENSATE COLLECTION SYSTEM
NONCONDENSIBLE GASES
NONCONDENSIBLE GASES
CN 1609
STANDBY SCRUBBER
SN 28
FROM CAUSTIC PLANT (SEE PN 1710)
PN 1610
10% CAUSTIC SODA
PN 1606
HIGH TEMPERATURE INCINERATOR
CN 1607
VENTURI QUENCHER/ SCRUBBER
CN 1608
SULFUR DIOXIDE SCRUBBER COLUMN
SN 27
SPENT CAUSTIC RETURN
RETURN TO SYSTEM
(SEE PN 1401 & PN 1403)
PN 1605
BLOW GAS ACCUMULATOR HOLDER
STRIPPED GASES
PN 1603
CONDENSATE STRIPPER COLUMN
PN 1604
BLOWER
AIR
STRIPPED CONDENSATE TO WASTE TREATMENT PLANT & REUSE
PN 1206
"C" SOAP SKIM TANK
PN 1209
"D" SOAP SKIM TANK
PN 1217
STRONG BLACK LIQUOR WASTE COLLECTION
PN 1203
WEAK LIQUOR STORAGE
PN 1302
OXIDIZED LIQUOR STORAGE
PN 1104
WHITE LIQUOR MEAS. TANK
PN 1103
SPENT CAUSTIC MEAS. TANK
PN 1105
BLACK LIQUOR MEAS. TANK
TANK VENTS FROM PROCESS AREAS SHOWN
PN 1606
INCINERATOR
CN 1607
VENTURI SCRUBBER
CN 1608
PLATE COLUMN SCRUBBER
SN 27
PN 1204
"C" SET EVAPORATOR
PN 1207
"D" SET EVAPORATOR
PN 1511
BY PRODUCT PLANT AREA
CN 1609
CAUSTIC SCRUBBER
STANDBY ALTERNATE TREATMENT SYSTEM
SN 28
PN 1605
BLOW GAS ACCUMULATOR HOLDER
PASADENA MILL
MILL WIDE TRS TREATMENT
TOP ONLY*
CN 1600
THERMAL OXIDATION PLANT
SN29
MILL WIDE *
PN 1600
FUGITIVE
FSN 90
* 11/5/91
VV-6612-1
12/85
REV. 12-16-86
CHAMPION PAPERS
PASADENA MILL
ENGINEERING DEPARTMENT
A DIVISION OF CHAMPION INTERNATIONAL
THERMAL OXIDATION PLANT
(PN 1600/CN 1600)
AJN 9/76
EMM
2-26-86
VV-6612-2



PROCESS SCHEMATICS
CONTROLS SOURCE & EMISSIONS SCHEMATICS
SEE PN1116 HARDWOOD PULP FROM SCREEN ROOM
CLOSED
CHLORINE (SEE PN 1718)
PN 2150
CHLORINATION STAGE C BW2
SN 65
PN 2151
FAN
SN 66
WASHER BW2
PN 2152
SEAL BOX BW2
CN 2153
SCRUBBER
SN88
BW2
PULP
PN 2154
10% CAUSTIC SODA (SEE PN 1716)
CAUSTIC SODA EXTRACTION E BW3
SN 67
PN 2155
FAN
SN 68
WASHER BW3
PN 2156
SN 69
SEAL BOX BW3
BW 3
PULP
PN 2157
BLEACH (SEE PN 1717)
SODIUM HYPOCHLORITE STAGE H1 BW4
SN 70
PN 2158
FAN
SN 71
WASHER BW 4
PN 2159
SN 72
SEAL BOX BW 4
CN 2164
SCRUBBER
SN89
BW 4
PULP
PN 2160
CN2161
SCRUBBER
SN 73
CHLORINE DIOXIDE (SEE PN 2010)
CHLORINE DIOXIDE D BW5
PN 2162
FAN
SN 74
WASHER BW 5
PN 2163
SEAL BOX BW5
BW5
PULP
PN 2165
BLEACH (SEE PN 1717)
SODIUM HYPOCHLORITE STAGE H2
SN 77
PN 2166
FAN
SN 75
WASHER BW6
PN 2167
SN 76
SEAL BOX BW6
BW6 & HARDWOOD THICKNER
PULP
PN 2168
STORAGE
PN 2169
FAN
SN 78
BLEACHED HWD THICKNER
PN 2170
SN 79
THICKNER SEAL BOX
PN 2100B
FUGITIVE
FSN 87
WASTE TREATMENT PLANT
BLEACHED HARDWOOD PULP TO PAPERMILL
PRIOR TO 10/20/92
9-18-92
REV 2 ~~12-16-86~~
SCALE
DATE 2-26-86
DR. EMM
APR.
TITLE
HARDWOOD PULP BLEACHING PROCESSES (PN 2100 B)
CHAMPION INTERNATIONAL
PASADENA, TEXAS 77001
CONTR. NO.
DWG. NO.

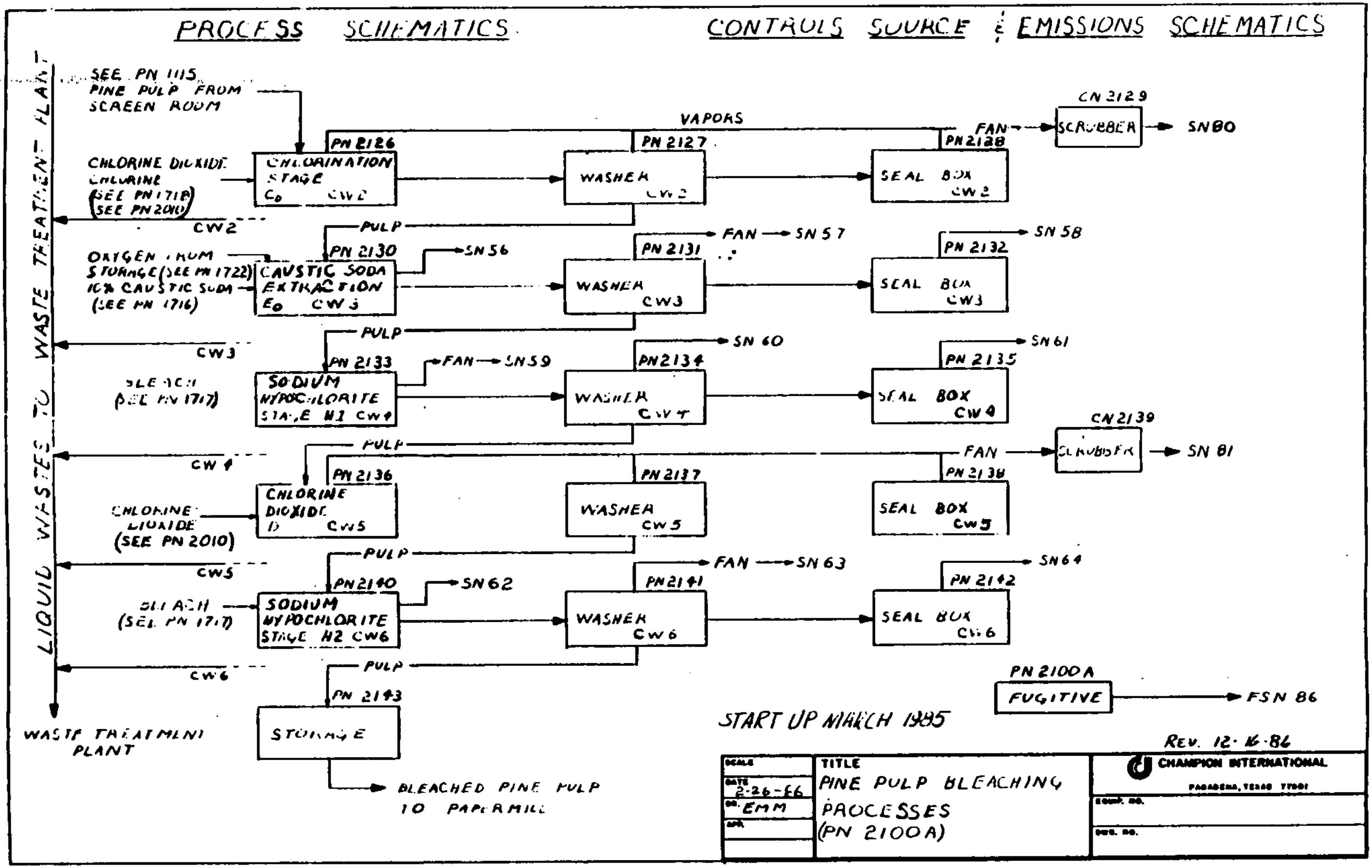
AUXILLIARY STEAM BOILERS (PN 2300)
PROCESS UNIT & SOURCE DESCRIPTION



NOTE: NUMBERS SHOWN AS ( ) ARE OLD PROCESS NUMBERS

REV. 12-16-86

SCALE	TITLE	CHAMPION INTERNATIONAL PASADENA, TEXAS 77501
DATE 2-26-86	PN 2300	EQUIP. NO.
DR. EMM		DWG. NO. VV-6617-2 Sht. 1 of 3
APP.		



PROCESS SCHEMATICS
CONTROLS SOURCE & EMISSIONS SCHEMATICS
LIQUID WASTES TO WASTE TREATMENT PLANT
SEE PN 1115 PINE PULP FROM SCREEN ROOM
CHLORINE DIOXIDE CHLORINE (SEE PN 1718) (SEE PN 2010)
OXYGEN FROM STORAGE (SEE PN 1722) 10% CAUSTIC SODA (SEE PN 1716)
BLEACH (SEE PN 1717)
CHLORINE DIOXIDE (SEE PN 2010)
BLEACH (SEE PN 1717)
CW2
CW3
CW4
CW5
CW6
PULP
PN 2126
CHLORINATION STAGE Co CW2
PN 2130
CAUSTIC SODA EXTRACTION Eo CW3
SN 56
PN 2133
SODIUM HYPOCHLORITE STAGE H1 CW4
FAN
SN 59
PN 2136
CHLORINE DIOXIDE D CW5
PN 2140
SODIUM HYPOCHLORITE STAGE H2 CW6
SN 62
PN 2143
STORAGE
BLEACHED PINE PULP TO PAPER MILL
VAPORS
PN 2127
WASHER CW2
PN 2131
WASHER CW3
SN 57
PN 2134
WASHER CW4
SN 60
PN 2137
WASHER CW5
PN 2141
WASHER CW6
SN 63
PN 2128
SEAL BOX CW2
PN 2132
SEAL BOX CW3
SN 58
PN 2135
SEAL BOX CW4
SN 61
PN 2138
SEAL BOX CW5
PN 2142
SEAL BOX CW6
SN 64
CN 2129
SCRUBBER
SN 80
CN 2139
SCRUBBER
SN 81
PN 2100A
FUGITIVE
FSN 86
WASTE TREATMENT PLANT
START UP MARCH 1985
REV. 12-16-86
SCALE
DATE 2-26-86
BY EMM
APR.
TITLE
PINE PULP BLEACHING PROCESSES (PN 2100A)
CHAMPION INTERNATIONAL
PASADENA, TEXAS 77501
COMP. NO.
DWG. NO.

SECTION 8

GROUNDWOOD, OLD GRINDER

(CS-GWOG)

8. CS-GWOG

SECTION 8
GROUNDWOOD, OLD GRINDER
(CS-GWOG)

The Groundwood, Old Grinder was tested on two different days for volatile organic compounds by M25A and M18.

Total Hydrocarbons (M25A)

Figures 8.1 and 8.2 present the THC trends for the test periods on 6/22/92 and 6/23/92. Emissions varied over a wide range, 300-800 ppm.

Volatile Organic Compounds (M18)

Table 8.1 summarizes the results for Method 18 target compounds, and Section 8.1 is a tabulation of the data. TRS was not analyzed. The volumetric flow was measured during sampling with a pitot tube. Ninety-seven percent of the emissions are due to the pinenes and the unspecified terpenes. Ethanol was present at trace levels.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 8.2. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 8.3 includes the process operating data as recorded and provided by mill personnel.

FIGURE 8.1
THC TREND ANALYSIS (6/22/92)
GROUNDWOOD, OLD GRINDER (CS-GWOG)

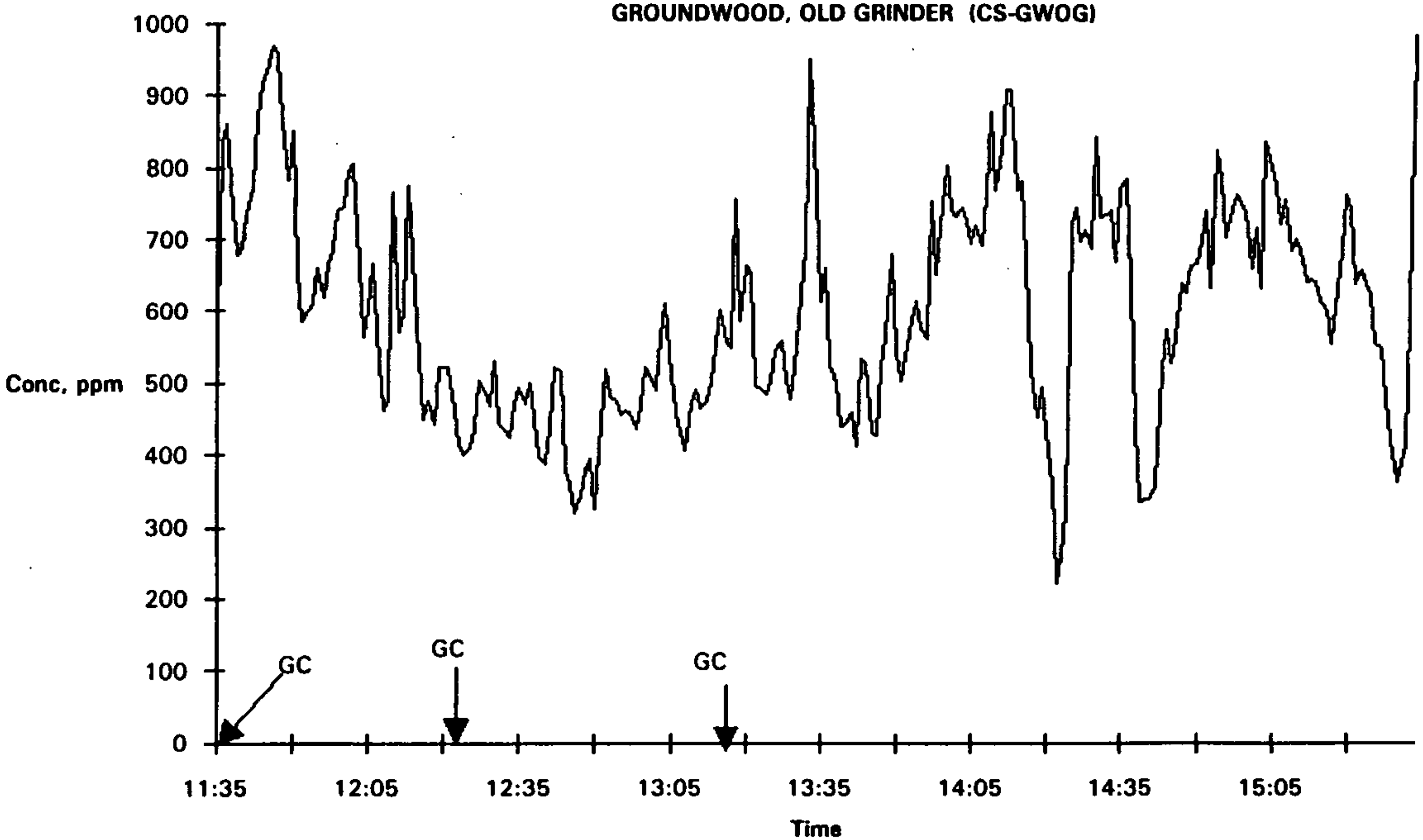
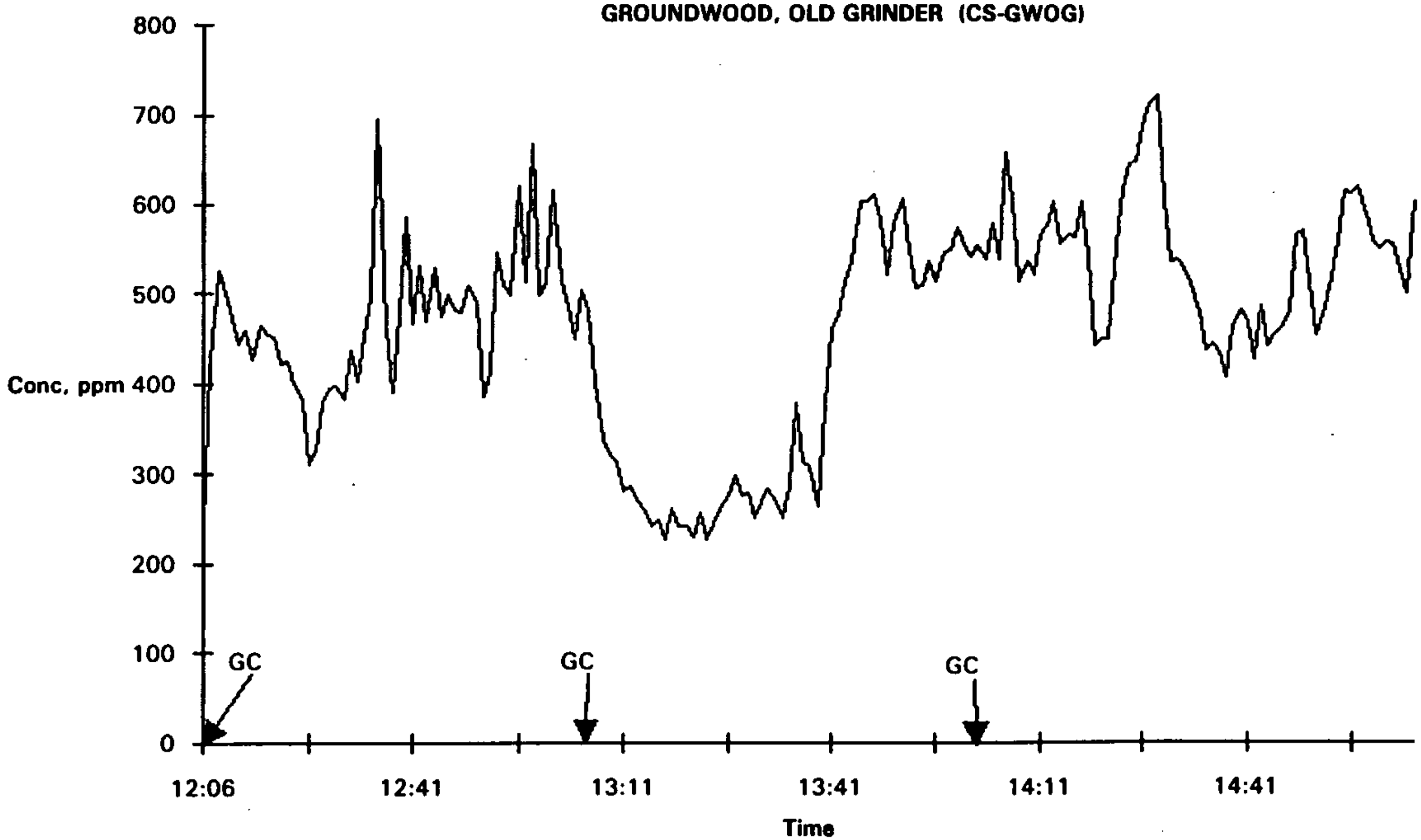


FIGURE 8.2
THC TREND ANALYSIS (6/23/92)
GROUNDWOOD, OLD GRINDER (CS-GWOG)



WESTON
MANAGERS DESIGNERS CONSULTANTS

TABLE 8.1 SUMMARY OF VOC RESULTS

Mill: CHAMPION - SHELDON
Source Code: CS-GWOG
FIN: - CIN:

Source: Groundwood, Old Grinder
Test Dates: 6/22/92 6/23/92
EPN: -

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	99	107	103	
Volumetric Flow Rate, x10^3 DSCFM	17.6	26.0	21.8	
Process Operating Conditions				
Production Rate, ADT/hr	9.6	12.3	11.0	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.2
Method 18 Data, lb/hr				
Methanol	ND	ND	ND	0.2
Ethanol	ND	0.3	0.2	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	ND	ND	ND	0.4
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.6
Toluene	ND	ND	ND	0.2
Ethyl benzene	ND	ND	ND	0.2
m-, p-Xylene	ND	ND	ND	0.2
o-Xylene	ND	ND	ND	0.2
Cumene	ND	0.5	0.2	0.2
alpha-Pinene	13.5	47.2	29.9	0.2
beta-Pinene	8.1	23.7	15.7	0.2
3-Carene	ND	ND	ND	0.2
Terpenes (Unspecified)	3.8	12.5	7.4	0.2
p-Cymene	ND	4.4	1.0	0.2
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	22.3	71.6	46.3	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	22.3	71.6	46.3	0.1

ND=Not Detected
DL=Detection Limit

Section 8.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON   Source: Groundwood, Old Grinder   FIN: -
Source Code: CS-GWOG   Date: 6/22/92   EPN: -   CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1134	1234	1334	
Flow Data				
Stack Temperature, °F	107			107
Moisture Content, %	7.8			7.8
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	30.6			30.6
Volumetric Flow Rate, x10^3 DSCFM	26.0			26.0
Process Operating Conditions				
Production Rate, ADT/hr	12.3	12.3	12.3	12.3
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd		2.2 *	2.2 *	2.2 *
Emission Rate, lb/hr		0.3 *	0.3 *	0.3 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd		1.5	1.2	1.4
Emission Rate, lb/hr		0.3	0.2	0.3
Acetone				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON
Source Code: CS-GWOG
Source: Groundwood, Old Grinder
Date: 6/22/92 EPN: -
FIN: -
CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
Chloroform				
Concentration, ppmvd		1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr		0.5 *	0.5 *	0.5 *
Benzene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
Bromodichloromethane				
Concentration, ppmvd		1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr		0.7 *	0.7 *	0.7 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
Ethyl benzene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
m-, p-Xylene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
o-Xylene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.2 *	0.2 *	0.2 *
Cumene				
Concentration, ppmvd		0.5 *	1.0	0.6
Emission Rate, lb/hr		0.3 *	0.5	0.3
alpha-Pinene				
Concentration, ppmvd		70.3	85.4	77.8
Emission Rate, lb/hr		38.8	47.2	43.0
beta-Pinene				
Concentration, ppmvd		38.1	43.0	40.5
Emission Rate, lb/hr		21.0	23.7	22.4
3-Carene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.3 *	0.3 *	0.3 *
Terpenes (Unspecified)				
Concentration, ppmvd		13.6	22.6	18.1
Emission Rate, lb/hr		7.5	12.5	10.0

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill:	CHAMPION - SHELDON	Source:	Groundwood, Old Grinder	FIN:	-
Source Code:	CS-GWOG	Date:	6/22/92 EPN: -	CIN:	-

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd		8.0	0.5	4.3
Emission Rate, lb/hr		4.4	0.3	2.3
Knowns as Carbon				
Concentration, ppmvd		1254.2	1468.4	1361.3
Unknowns as Carbon				
Concentration, ppmvd		0.0	0.0	0.0
Sum M18 as Carbon, lb/hr		61.2	71.6	66.4
Unknown Compounds % of Total		0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	685.5	547.7	673.5	635.6
Emission Rate, lb/hr as C	33.4	26.7	32.8	31.0

COMMENTS :

M18 data for run 1 on 6/22/92 was rejected because not consistent with other GC injections.

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Groundwood, Old Grinder | FIN:
Source Code: CS-GWOG | Date: 6/23/92 | EPN: - | CIN:

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1205	1305	1405	
Flow Data				
Stack Temperature, °F	99			99
Moisture Content, %	6.3			6.3
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	20.0			20.0
Volumetric Flow Rate, x10^3 DSCFM	17.6			17.6
Process Operating Conditions				
Production Rate, ADT/hr	9.6	9.6	9.6	9.6
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	2.1 *	2.1 *	2.1 *	2.1 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.7	0.4
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Groundwood, Old Grinder | FIN: -

Source Code: CS-GWOG | Date: 6/23/92 | EPN: - | CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
alpha-Pinene				
Concentration, ppmvd	49.3	36.1	85.0	56.8
Emission Rate, lb/hr	18.4	13.5	31.8	21.2
beta-Pinene				
Concentration, ppmvd	25.1	21.7	43.5	30.1
Emission Rate, lb/hr	9.4	8.1	16.3	11.3
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Terpenes (Unspecified)				
Concentration, ppmvd	10.2	11.6	24.0	15.3
Emission Rate, lb/hr	3.8	4.3	9.0	5.7

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON	Source: Groundwood, Old Grinder			FIN: -
Source Code: CS-GWOG	Date: 6/23/92	EPN: -		CIN: -

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.6	0.4
Emission Rate, lb/hr	0.2 *	0.2 *	0.2	0.1
Knowns as Carbon				
Concentration, ppmvd	818.8	676.2	1493.0	996.0
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	27.0	22.3	49.3	32.9
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	499.5	420.5	575.2	498.4
Emission Rate, lb/hr as C	16.5	13.9	19.0	16.4

COMMENTS :

M18 data for run 1 on 6/22/92 was rejected because not consistent with other GC injections.

*One or more values were less than the detection limit.

Section 8.2 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

SOURCE CS-GWOG

QUALITY CONTROL SUMMARY
METHOD 25A

1. CALIBRATION

THEOR	6/22/92		6/23/92	
ppm	ppm	%ERR	ppm	%ERR
0.0	0.0	0.0	46.0	3.1
91.0	90.0	-0.1	95.0	0.3
244.0	245.0	0.1	184.0	4.0
1506.0	1505.0	-0.1	1515.0	0.6
CORR COEFF	0.9999		0.9980	

2. PROPANE LINE RECOVERY

	DATE	6/22/92		DATE	6/23/92	
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	246.0	236.0	95.9%	1495.0	1517.0	101.5%
AFTER	237.0	250.0	105.5%	1509.0	1464.0	97.0%

3. LINE BLANK

	6/22/92	6/23/92
	ppm	ppm
BEFORE	4.0	2.0
AFTER	2.0	3.0

SOURCE CS-GWOG

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR ppm	DATE 6/22/92 ppm	%REC	DATE 6/23/92 ppm	%REC
ethanol	52.0	45.7	87.9%	43.5	83.6%
acetone	41.6	39.3	94.5%	37.1	89.2%
isopropanol	39.9	37.1	93.2%	38.4	96.2%
dimethyl sulfide	9.1	8.9	97.8%	8.9	97.8%
benzene	34.2	34.5	100.9%	35.9	105.1%
bromodichloromethane	18.8	17.3	92.0%	16.9	89.9%
dimethyl disulfide	33.9	32.6	96.2%	32.5	95.9%
toluene	28.7	27.7	96.4%	27.6	96.2%
ethyl benzene	24.9	24.0	96.5%	33.6	134.9%
m-xylene	49.8	47.6	95.6%	48.2	96.8%
o-xylene	25.0	26.1	104.4%	22.5	89.9%
cumene	21.9	22.2	101.3%	19.9	90.9%
alpha-pinene	19.2	22.0	114.8%	21.8	113.7%
beta-pinene	19.2	18.6	96.4%	17.6	91.6%
3-carene	19.3	19.8	102.6%	16.7	86.6%
p-cymene	19.6	20.8	106.4%	16.6	84.8%

2. PROPANE RESPONSE

	THEOR		%REC		%REC
BEFORE	31.5	34.0	107.9%	***36.5	101.4%
AFTER	31.5	27.1	86.0%	***32.7	90.8%

3. METHANOL LINE RECOVERY

	6/22/92 GC	LINE	%REC	6/23/92 GC	LINE	%REC
BEFORE	*			12.0	12.0	100.0%
AFTER	11.2	11.9	106.3%	11.6	11.2	96.6%

4. LINE BLANK

	[--------------FILE REF--------------]	
BEFORE	** FMA2005	FMA2006
AFTER	FMA2006	FNA2010

*Not performed

** Line blank contaminated with pinenes from TORV

***THEOR ppm = 36

Section 8.3 Process Description and Operating Conditions

GRINDER PRODUCTION, ADT

DATE	TIME	Grinder #1 ADT	Grinder #2 ADT	Grinder #3 ADT	Grinder #4 ADT	Grinder #5 ADT	Grinder #7 ADT	Grinder #8 ADT	Grinder #9 ADT	Grinder #10 ADT	Grinder #11 ADT	GWD MILL ADT	GWD MILL ADT /GR.HR.	GWD MILL HRS. RUN
06/22/92	7:00													
06/22/92	8:00													
06/22/92	9:00													
06/22/92	10:00													
06/22/92	11:00													
06/22/92	12:00													
06/22/92	13:00													
06/22/92	14:00	14.49	20.70	24.15	19.32	20.01	13.80	27.60	26.22	26.22	22.08	214.59	3.45	62.17
06/22/92	15:00													
06/22/92	16:00													
06/22/92	17:00													
06/22/92	18:00													
06/22/92	19:00													
06/22/92	20:00													
06/22/92	21:00													
06/22/92	22:00	17.25	20.70	22.08	22.77	20.01	19.32	24.15	22.77	22.77	21.39	213.21	3.06	69.67
06/22/92	23:00													
06/22/92	24:00													
06/22/92	1:00													
06/22/92	2:00													
06/22/92	3:00													
06/22/92	4:00													
06/22/92	5:00													
06/22/92	6:00	19.32	17.25	20.70	19.32	18.63	22.08	24.84	24.15	26.22	20.70	213.21	2.86	74.67
06/23/92	7:00													
06/23/92	8:00													
06/23/92	9:00													
06/23/92	10:00													
06/23/92	11:00													
06/23/92	12:00													
06/23/92	13:00													
06/23/92	14:00	12.42	8.97	22.08	19.32	13.80	22.77	24.15	24.15	23.46	18.63	189.75	3.34	56.83
06/23/92	15:00													
06/23/92	16:00													
06/23/92	17:00													
06/23/92	18:00													
06/23/92	19:00													
06/23/92	20:00													
06/23/92	21:00													
06/23/92	22:00	18.63	14.49	20.70	17.94	6.90	18.63	19.32	21.39	21.39	17.25	176.64	2.74	64.58
06/23/92	23:00													
06/23/92	24:00													
06/23/92	1:00													
06/23/92	2:00													
06/23/92	3:00													
06/23/92	4:00													
06/23/92	5:00													
06/23/92	6:00	20.01	17.94	20.70	18.63	13.11	22.08	23.46	23.46	24.15	19.32	202.86	2.80	72.50
AVG		17.02	16.68	21.74	19.55	15.41	19.78	23.92	23.69	24.03	19.89	201.71	3.04	66.74
STD		2.98	4.44	1.36	1.67	5.16	3.37	2.68	1.61	1.92	1.82	15.51	0.30	6.76
MIN		12.42	8.97	20.70	17.94	6.90	13.80	19.32	21.39	21.39	17.25	176.64	2.74	56.83
MAX		20.01	20.70	24.15	22.77	20.01	22.77	27.60	26.22	26.22	22.08	214.59	3.45	74.67
NO.		6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
LCL		8.08	3.36	17.65	14.54	-0.06	9.67	15.89	18.85	18.27	14.43	155.17	2.15	46.47
UCL		25.96	29.99	25.82	24.56	30.88	29.89	31.95	28.53	29.80	25.36	248.25	3.93	87.01

STATISTICS FOR PERIOD 06/22/92 TO 06/23/92

GRINDER PRODUCTION, ADT

DATE	TIME	Grinder #1 ADT	Grinder #2 ADT	Grinder #3 ADT	Grinder #4 ADT	Grinder #5 ADT	Grinder #7 ADT	Grinder #8 ADT	Grinder #9 ADT	Grinder #10 ADT	Grinder #11 ADT	GWD MILL ADT	GWD MILL ADT /GR.HR.	GWD MILL HRS. RUN
06/23/92	7:00													
06/23/92	8:00													
06/23/92	9:00													
06/23/92	10:00													
06/23/92	11:00													
06/23/92	12:00													
06/23/92	13:00													
06/23/92	14:00	12.42	8.97	22.08	19.32	13.80	22.77	24.15	24.15	23.46	18.63	189.75	3.34	56.83
06/23/92	15:00													
06/23/92	16:00													
06/23/92	17:00													
06/23/92	18:00													
06/23/92	19:00													
06/23/92	20:00													
06/23/92	21:00													
06/23/92	22:00	18.63	14.49	20.70	17.94	6.90	18.63	19.32	21.39	21.39	17.25	176.64	2.74	64.50
06/23/92	23:00													
06/23/92	24:00													
06/23/92	1:00													
06/23/92	2:00													
06/23/92	3:00													
06/23/92	4:00													
06/23/92	5:00													
06/23/92	6:00	20.01	17.94	20.70	18.63	13.11	22.88	23.46	23.46	24.15	19.32	202.86	2.80	72.50
AVG		17.02	13.80	21.16	18.63	11.27	21.16	22.31	23.00	23.00	18.40	189.75	2.96	64.64
STD		4.04	4.52	0.80	0.69	3.80	2.22	2.61	1.44	1.44	1.05	13.11	0.33	7.83
MIN		12.42	8.97	20.70	17.94	6.90	18.63	19.32	21.39	21.39	17.25	176.64	2.74	56.83
MAX		20.01	17.94	22.08	19.32	13.80	22.77	24.15	24.15	24.15	19.32	202.86	3.34	72.50
NO.		3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
LCL		4.89	0.23	18.77	16.56	-0.13	14.51	14.47	18.69	18.69	15.24	150.42	1.96	41.14
UCL		29.15	27.37	23.55	20.70	22.67	27.81	30.15	27.31	27.31	21.56	229.08	3.95	88.14

STATISTICS FOR PERIOD 06/23/92 TO 06/23/92

06/23/92 8:00													
[illegible]													
06/23/92 10:00													
06/23/92 11:00													
06/23/92 12:00													
06/23/92 13:00													
06/23/92 14:00	12.42	8.97	22.08	19.32	13.80	22.77	20.15	24.15	23.46	18.63	189.75	3.34	56.83
06/23/92 15:00													
06/23/92 16:00													
06/23/92 17:00													
06/23/92 18:00													
06/23/92 19:00													
06/23/92 20:00													
06/23/92 21:00													
06/23/92 22:00	18.63	14.49	20.70	17.94	6.90	18.63	19.32	21.39	21.39	17.25	176.64	2.74	64.58
06/23/92 23:00													
06/23/92 24:00													
06/23/92 1:00													
06/23/92 2:00													
06/23/92 3:00													
06/23/92 4:00													
06/23/92 5:00													
06/23/92 6:00	20.01	17.94	20.70	18.63	13.11	22.08	23.46	23.46	24.15	19.32	202.86	2.80	72.50
06/24/92 7:00													
06/24/92 8:00													
06/24/92 9:00													
06/24/92 10:00													
06/24/92 11:00													
06/24/92 12:00													
06/24/92 13:00													
06/24/92 14:00	21.39	11.73	24.84	22.77	8.28	15.18	25.53	25.53	24.84	8.20	188.37	3.95	47.75
06/24/92 15:00													
06/24/92 16:00													
06/24/92 17:00													
06/24/92 18:00													
06/24/92 19:00													
06/24/92 20:00													
06/24/92 21:00													
06/24/92 22:00	15.18	20.01	22.77	22.08	6.21	20.70	22.08	22.77	17.25	7.59	176.64	2.96	59.67
06/24/92 23:00													
06/24/92 24:00													
06/24/92 1:00													
06/24/92 2:00													
06/24/92 3:00													
06/24/92 4:00													
06/24/92 5:00													
06/24/92 6:00	21.39	20.70	20.70	21.39	6.21	20.70	20.70	20.70	23.46	20.01	195.96	2.88	68.17
AVG	18.17	15.64	21.97	20.35	9.08	20.01	22.54	23.00	22.42	15.18	188.37	3.11	61.58
STD	3.64	4.71	1.66	1.99	3.48	2.76	2.30	1.78	2.79	5.69	10.44	0.46	8.82
MIN	12.42	8.97	20.70	17.94	6.21	15.18	19.32	20.70	17.25	7.59	176.64	2.74	47.75
MAX	21.39	20.70	24.84	22.77	13.80	22.77	25.53	25.53	24.84	20.01	202.86	3.94	72.50
NO.	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
LCL	7.24	1.50	16.99	14.39	-1.34	11.73	15.65	17.66	14.07	-1.89	157.06	1.72	35.12
UCL	29.10	29.78	26.94	26.32	19.51	28.29	29.43	28.34	30.78	32.25	219.68	4.49	88.05

STATISTICS FOR PERIOD 06/23/92 TO 06/24/92

WESTON
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SECTION 9

GROUNDWOOD, NEW GRINDER

(CS-GWNG)

9. CS-GWNG

SECTION 9
GROUNDWOOD, NEW GRINDER
(CS-GWNG)

The Groundwood, New Grinder was tested on two different days for volatile organic compounds by M25A and M18.

Total Hydrocarbons (M25A)

Figures 9.1 and 9.2 present the THC trends for the test periods on 6/23/92 and 6/24/92. THC emissions for the two days were consistent, with fluctuations ranging from 500-1000 ppm.

Volatile Organic Compounds (M18)

Table 9.1 summarizes the results for the Method 18 target compounds, and Section 9.1 is a tabulation of the data. TRS was not analyzed. The volumetric flow was measured during sampling with a pitot tube. The predominant species identified were the pinenes and the terpenes (98% of the target compounds).

VOC Quality Control Results

The VOC quality control data are tabulated in Section 9.2. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 9.3 includes the process operating data as recorded and provided by mill personnel.

FIGURE 9.1
THC TREND ANALYSIS (6/23/92)
GROUNDWOOD, NEW GRINDER (CS-GWNG)

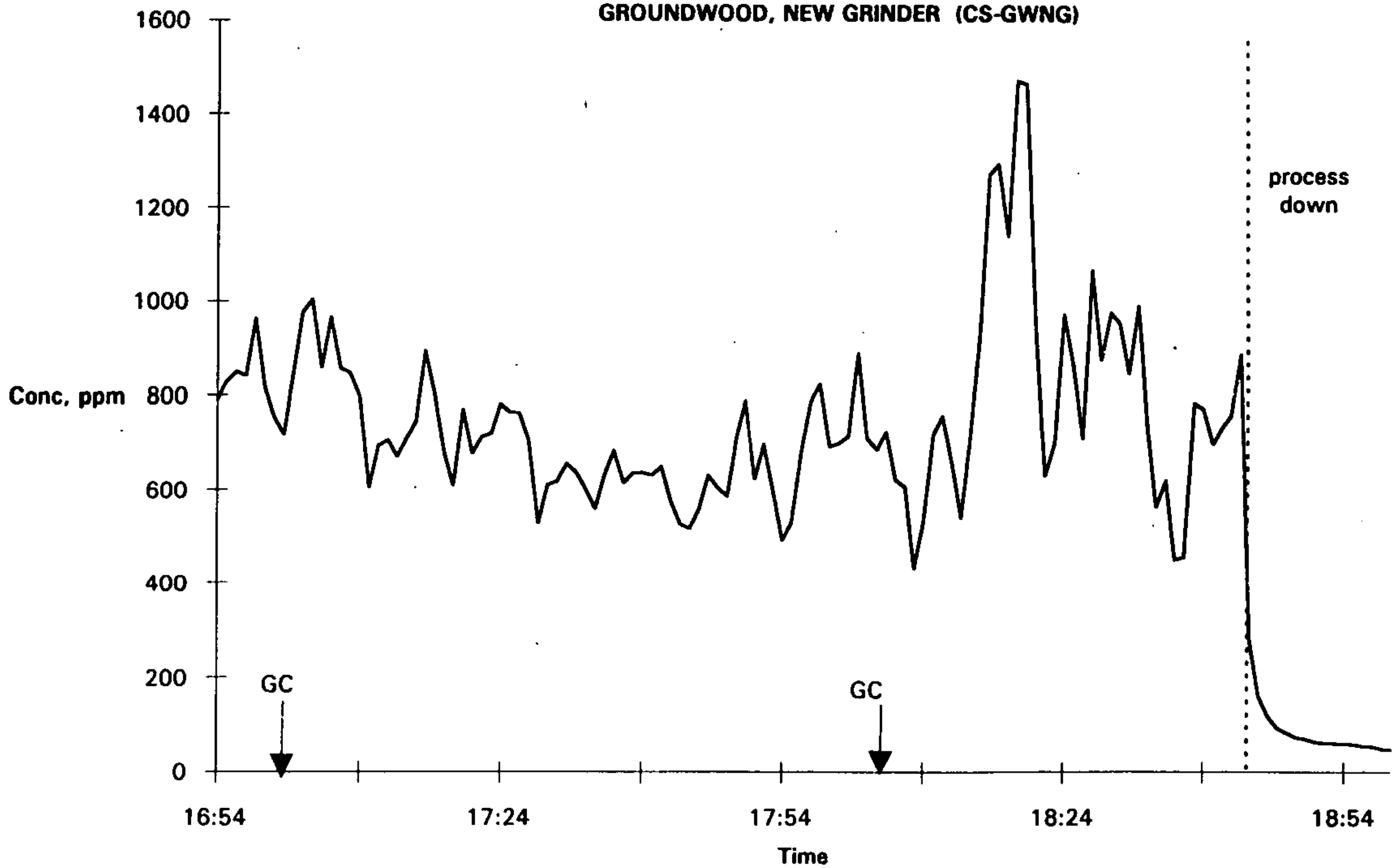


FIGURE 9.2

THC TREND ANALYSIS (6/24/92)
GROUNDWOOD, NEW GRINDER (CS-GWNG)

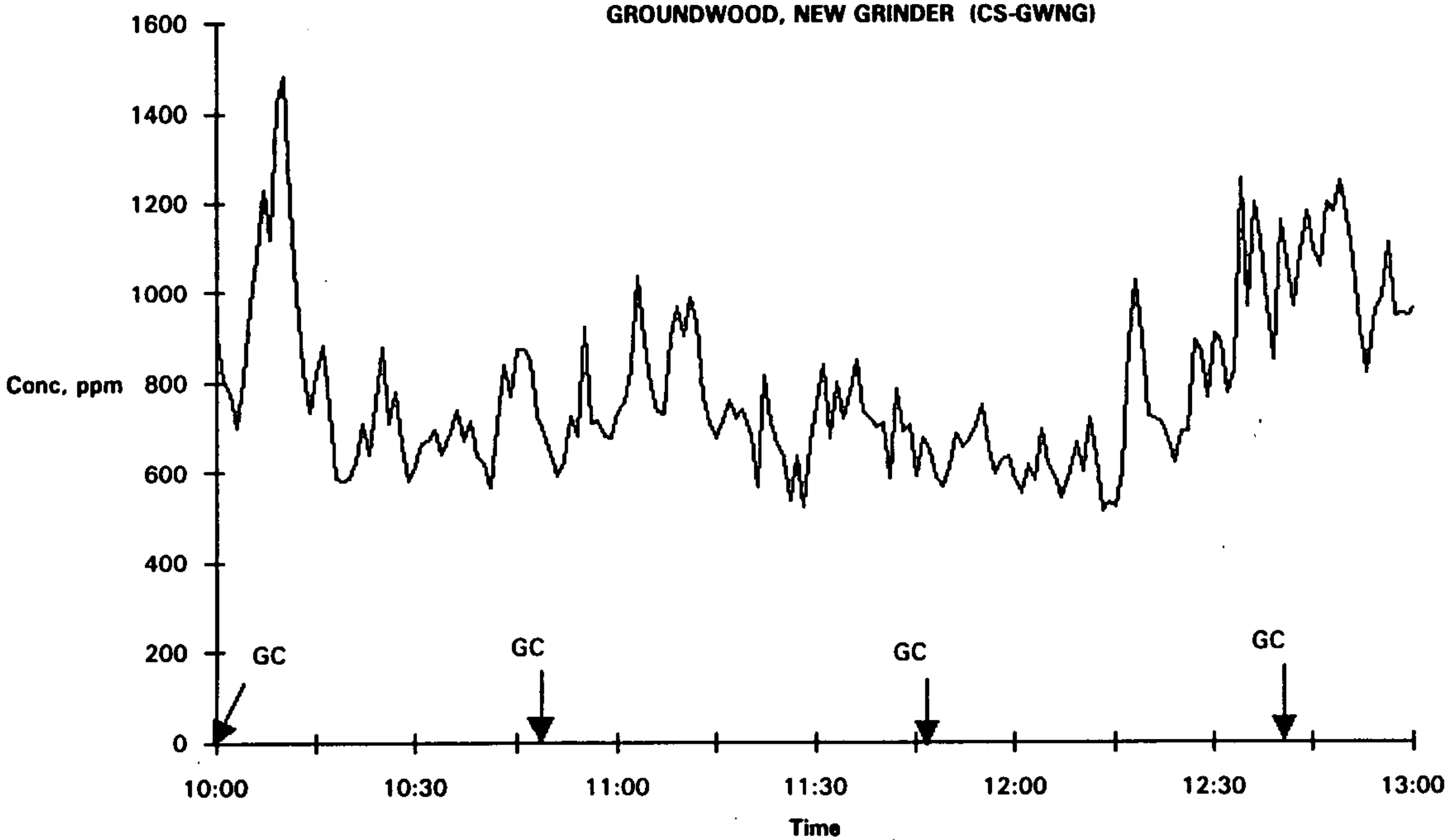


TABLE 9.1 SUMMARY OF VOC RESULTS

Mill: CHAMPION - SHELDON | Source: Groundwood, New Grinder
Source Code: CS-GWNG | Test Dates: 6/23/92 6/24/92
FIN: 3000 CIN: | EPN: FE

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	117	122	120	
Volumetric Flow Rate, x10^3 DSCFM	30.7	32.3	31.5	
Process Operating Conditions				
Production Rate, ADT/hr	12.2	12.4	12.3	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.2
Carbon disulfide				0.2
Dimethyl disulfide				0.2
Method 18 Data, lb/hr				
Methanol	ND	0.5	0.4	0.4
Ethanol	0.3	0.5	0.4	0.1
Acetone	ND	ND	ND	0.2
2-Propanol	ND	0.2	0.2	0.2
2-Butanone	ND	ND	ND	0.2
Chloroform	ND	ND	ND	0.7
Benzene	ND	ND	ND	0.2
Bromodichloromethane	ND	ND	ND	0.9
Toluene	ND	ND	ND	0.3
Ethyl benzene	ND	ND	ND	0.3
m-, p-Xylene	ND	ND	ND	0.3
o-Xylene	ND	ND	ND	0.3
Cumene	ND	0.9	0.6	0.3
alpha-Pinene	65.3	102.3	76.8	0.4
beta-Pinene	33.4	53.8	42.5	0.4
3-Carene	ND	1.8	0.7	0.4
Terpenes (Unspecified)	6.6	24.9	15.6	0.4
p-Cymene	ND	0.4	0.4	0.4
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	52.6	124.3	84.3	0.1
Unknowns as C, lb/hr	ND	<0.1	0.1	0.1
Sum of Compounds as C, lb/hr	52.6	124.4	84.3	0.1

ND=Not Detected
DL=Detection Limit

WESTON MANAGERS DESIGNERS/CONSULTANTS

Section 9.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON		Source:	Groundwood, New Grinder		FIN:	3000
Source Code:	CS-GWNG	Date:	6/23/92	EPN: FE	CIN:	-

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1653	1753		
Flow Data				
Stack Temperature, °F	122			122
Moisture Content, %	11.9			11.9
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	38.6			38.6
Volumetric Flow Rate, x10^3 DSCFM	30.7			30.7
Process Operating Conditions				
Production Rate, ADT/hr	12.2	12.2		12.2
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	2.9	2.3		2.6
Emission Rate, lb/hr	0.5	0.3		0.4
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	2.2	1.6		1.9
Emission Rate, lb/hr	0.5	0.4		0.4
Acetone				
Concentration, ppmvd	0.6 *	0.6 *		0.6 *
Emission Rate, lb/hr	0.2 *	0.2 *		0.2 *
2-Propanol				
Concentration, ppmvd	0.7	0.6		0.6
Emission Rate, lb/hr	0.2	0.2		0.2

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Groundwood, New Grinder | FIN: 3000
Source Code: CS-GWNG | Date: 6/23/92 | EPN: FE | CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *		0.6 *
Emission Rate, lb/hr	0.2 *	0.2 *		0.2 *
Chloroform				
Concentration, ppmvd	1.1 *	1.1 *		1.1 *
Emission Rate, lb/hr	0.6 *	0.6 *		0.6 *
Benzene				
Concentration, ppmvd	0.6 *	0.6 *		0.6 *
Emission Rate, lb/hr	0.2 *	0.2 *		0.2 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *		1.1 *
Emission Rate, lb/hr	0.9 *	0.9 *		0.9 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *		0.6 *
Emission Rate, lb/hr	0.3 *	0.3 *		0.3 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *		0.6 *
Emission Rate, lb/hr	0.3 *	0.3 *		0.3 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *		0.6 *
Emission Rate, lb/hr	0.3 *	0.3 *		0.3 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *		0.6 *
Emission Rate, lb/hr	0.3 *	0.3 *		0.3 *
Cumene				
Concentration, ppmvd	0.8	1.0		0.9
Emission Rate, lb/hr	0.5	0.6		0.5
alpha-Pinene				
Concentration, ppmvd	116.2	102.3		109.3
Emission Rate, lb/hr	75.8	66.7		71.2
beta-Pinene				
Concentration, ppmvd	67.5	63.1		65.3
Emission Rate, lb/hr	44.0	41.2		42.6
3-Carene				
Concentration, ppmvd	0.6 *	0.8		0.5
Emission Rate, lb/hr	0.4 *	0.5		0.4
Terpenes (Unspecified)				
Concentration, ppmvd	38.1	26.9		32.5
Emission Rate, lb/hr	24.9	17.5		21.2

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Groundwood, New Grinder | FIN: 3000

Source Code: CS-GWNG | Date: 6/23/92 | EPN: FE | CIN: -

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6		0.4
Emission Rate, lb/hr	0.4 *	0.4		0.3
Knowns as Carbon				
Concentration, ppmvd	2160.7	1874.3		2017.5
Unknowns as Carbon				
Concentration, ppmvd	0.7	0.6 *		0.6
Sum M18 as Carbon, lb/hr	124.4	107.9		116.1
Unknown Compounds % of Total	0.0%	0.0%		0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	811.6	900.1		855.8
Emission Rate, lb/hr as C	46.7	51.8		49.2

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON	Source:	Groundwood, New Grinder		FIN:	3000
Source Code: CS-GWNG	Date:	6/24/92	EPN: FE	CIN:	-

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	959	1059	1159	
Flow Data				
Stack Temperature, °F			117	117
Moisture Content, %			10.7	10.7
Oxygen Concentration, %			20.8	20.8
Carbon Dioxide Concentration, %			0.0	0.0
Volumetric Flow Rate, x10^3 ACFM			39.8	39.8
Volumetric Flow Rate, x10^3 DSCFM			32.3	32.3
Process Operating Conditions				
Production Rate, ADT/hr	12.4	12.4	12.4	12.4
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	4.5 *	4.5 *	4.5 *	4.5 *
Emission Rate, lb/hr	0.7 *	0.7 *	0.7 *	0.7 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	1.9	1.2	1.8	1.6
Emission Rate, lb/hr	0.4	0.3	0.4	0.4
Acetone				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
2-Propanol				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Groundwood, New Grinder | FIN: 3000
Source Code: CS-GWNG | Date: 6/24/92 | EPN: FE | CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Chloroform				
Concentration, ppmvd	2.2 *	2.2 *	2.2 *	2.2 *
Emission Rate, lb/hr	1.3 *	1.3 *	1.3 *	1.3 *
Benzene				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Bromodichloromethane				
Concentration, ppmvd	2.2 *	2.2 *	2.2 *	2.2 *
Emission Rate, lb/hr	1.8 *	1.8 *	1.8 *	1.8 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.5 *	0.5 *	0.5 *	0.5 *
Ethyl benzene				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.6 *	0.6 *	0.6 *	0.6 *
m-, p-Xylene				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.6 *	0.6 *	0.6 *	0.6 *
o-Xylene				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.6 *	0.6 *	0.6 *	0.6 *
Cumene				
Concentration, ppmvd	1.1 *	1.5	1.2	1.1
Emission Rate, lb/hr	0.7 *	0.9	0.7	0.7
alpha-Pinene				
Concentration, ppmvd	107.7	95.4	149.5	117.5
Emission Rate, lb/hr	73.7	65.3	102.3	80.4
beta-Pinene				
Concentration, ppmvd	48.8	58.5	78.6	62.0
Emission Rate, lb/hr	33.4	40.0	53.8	42.4
3-Carene				
Concentration, ppmvd	1.1 *	1.1 *	2.7	1.3
Emission Rate, lb/hr	0.8 *	0.8 *	1.8	0.9
Terpenes (Unspecified)				
Concentration, ppmvd	13.7	12.5	25.9	17.4
Emission Rate, lb/hr	9.3	8.6	17.7	11.9

*One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Groundwood, New Grinder | FIN: 3000
Source Code: CS-GWNG | Date: 6/24/92 | EPN: FE | CIN: -

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.8 *	0.8 *	0.8 *	0.8 *
Knowns as Carbon				
Concentration, ppmvd	892.9	871.2	1372.2	1045.5
Unknowns as Carbon				
Concentration, ppmvd	1.1 *	0.0	0.0	0.4
Sum M18 as Carbon, lb/hr	54.0	52.6	82.8	63.1
Unknown Compounds % of Total	0.1%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	873.5	809.6	955.2	879.4
Emission Rate, lb/hr as C	52.7	48.9	57.7	53.1

* One or more values were less than the detection limit.

Section 9.2 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

SOURCE CS-GWNG

QUALITY CONTROL SUMMARY
METHOD 25A

1. CALIBRATION

THEOR	6/23/92		6/24/92	
ppm	ppm	%ERR	ppm	%ERR
0.0	46.0	3.1	5.0	0.3
91.0	95.0	0.3	89.0	-0.1
244.0	184.0	4.0	239.0	-0.3
1506.0	1515.0	0.6	1506.0	0.0
CORR COEFF	0.9980		0.9999	

2. PROPANE LINE RECOVERY

	DATE	6/23/92		DATE	6/24/92	
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	1495.0	1517.0	101.5%	1510.0	1500.0	99.3%
AFTER	1510.0	1500.0	99.3%	1509.0	1429.0	94.7%

3. LINE BLANK

	6/23/92	6/24/92
	ppm	ppm
BEFORE	2.0	17.0
AFTER	17.0	13.0

SOURCE CS-GWNG

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR ppm	DATE 6/23/92 ppm	%REC	DATE 6/24/92 ppm	%REC
ethanol	52.0	43.5	83.6%	43.9	84.4%
acetone	41.6	37.1	89.2%	36.7	88.2%
isopropanol	39.9	38.4	96.2%	40.4	101.3%
dimethyl sulfide	9.1	8.9	97.8%	9.1	100.0%
benzene	34.2	35.9	105.1%	33.8	99.0%
bromodichloromethane	18.8	16.9	89.9%	17.3	92.0%
dimethyl disulfide	33.9	32.5	95.9%	32.9	97.2%
toluene	28.7	27.6	96.2%	28.1	97.8%
ethyl benzene	24.9	33.6	134.9%	24.1	96.7%
m-xylene	49.8	48.2	96.8%	49.6	99.6%
o-xylene	25.0	22.5	89.9%	23.2	92.8%
cumene	21.9	19.9	90.9%	23.5	107.0%
alpha-pinene	19.2	21.8	113.7%	21.5	112.3%
beta-pinene	19.2	17.6	91.6%	18.3	95.1%
3-carene	19.3	16.7	86.6%	17.4	90.3%
p-cymene	19.6	16.6	84.8%	18.7	95.4%

2. PROPANE RESPONSE

	THEOR		%REC		%REC
BEFORE	36.0	32.7	90.8%	37.3	103.6%
AFTER	36.0	37.3	103.6%	35.9	99.7%

3. METHANOL LINE RECOVERY

	6/23/92			6/24/92		
	GC	LINE	%REC	GC	LINE	%REC
BEFORE	11.6	11.2	96.6%	11.1	11.4	102.7%
AFTER	11.1	11.4	102.7%	12.1	11.3	93.4%

4. LINE BLANK

	[-------------FILE REF--------------]	
BEFORE	FNA2010	FOA2003
AFTER	FOA2003	*

* Not performed

Section 9.3 Process Description and Operating Conditions

GRINDER PRODUCTION, ADT

DATE	TIME	Grinder #1 ADT	Grinder #2 ADT	Grinder #3 ADT	Grinder #4 ADT	Grinder #5 ADT	Grinder #7 ADT	Grinder #8 ADT	Grinder #9 ADT	Grinder #10 ADT	Grinder #11 ADT	GWD MILL ADT	GWD MILL ADT /GR.HR.	GWD MILL HRS. RUN
06/22/92	7:00													
06/22/92	8:00													
06/22/92	9:00													
06/22/92	10:00													
06/22/92	11:00													
06/22/92	12:00													
06/22/92	13:00													
06/22/92	14:00	14.49	20.70	24.15	19.32	20.01	13.80	27.60	26.22	26.22	22.08	214.59	3.45	62.17
06/22/92	15:00													
06/22/92	16:00													
06/22/92	17:00													
06/22/92	18:00													
06/22/92	19:00													
06/22/92	20:00													
06/22/92	21:00													
06/22/92	22:00	17.25	20.70	22.08	22.77	20.01	19.32	24.15	22.77	22.77	21.39	213.21	3.06	69.67
06/22/92	23:00													
06/22/92	24:00													
06/22/92	1:00													
06/22/92	2:00													
06/22/92	3:00													
06/22/92	4:00													
06/22/92	5:00													
06/22/92	6:00	19.32	17.25	20.70	19.32	18.63	22.08	24.84	24.15	26.22	20.70	213.21	2.86	74.67
06/23/92	7:00													
06/23/92	8:00													
06/23/92	9:00													
06/23/92	10:00													
06/23/92	11:00													
06/23/92	12:00													
06/23/92	13:00													
06/23/92	14:00	12.42	8.97	22.08	19.32	13.80	22.77	24.15	24.15	23.46	18.63	189.75	3.34	56.83
06/23/92	15:00													
06/23/92	16:00													
06/23/92	17:00													
06/23/92	18:00													
06/23/92	19:00													
06/23/92	20:00													
06/23/92	21:00													
06/23/92	22:00	18.63	14.49	20.70	17.94	6.90	18.63	19.32	21.39	21.39	17.25	176.64	2.74	64.50
06/23/92	23:00													
06/23/92	24:00													
06/23/92	1:00													
06/23/92	2:00													
06/23/92	3:00													
06/23/92	4:00													
06/23/92	5:00													
06/23/92	6:00	20.01	17.94	20.70	18.63	13.11	22.08	23.46	23.46	24.15	19.32	202.06	2.88	72.50

	Grinder #1 ADT	Grinder #2 ADT	Grinder #3 ADT	Grinder #4 ADT	Grinder #5 ADT	Grinder #7 ADT	Grinder #8 ADT	Grinder #9 ADT	Grinder #10 ADT	Grinder #11 ADT	GWD MILL ADT	GWD MILL ADT /GR.HR.	GWD MILL HRS. RUN
AVG	17.02	16.68	21.74	19.55	15.41	19.78	23.92	23.69	24.03	19.89	201.71	3.04	66.74
STD	2.98	4.44	1.36	1.67	5.16	3.37	2.68	1.61	1.92	1.82	15.51	0.30	6.76
MIN	12.42	8.97	20.70	17.94	6.90	13.80	19.32	21.39	21.39	17.25	176.64	2.74	56.83
MAX	20.01	20.70	24.15	22.77	20.01	22.77	27.60	26.22	26.22	22.08	214.59	3.45	74.67
NO.	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
LCL	8.08	3.36	17.65	14.54	-0.06	9.67	15.09	18.85	18.27	14.43	155.17	2.15	46.47
UCL	25.96	29.99	25.82	24.56	30.88	29.89	31.95	28.53	29.80	25.36	248.25	3.93	87.01

STATISTICS FOR PERIOD 06/22/92 TO 06/23/92

GRINDER PRODUCTION, ADT

DATE	TIME	Grinder #1 ADT	Grinder #2 ADT	Grinder #3 ADT	Grinder #4 ADT	Grinder #5 ADT	Grinder #7 ADT	Grinder #8 ADT	Grinder #9 ADT	Grinder #10 ADT	Grinder #11 ADT	GWD MILL ADT	GWD MILL ADT /GR.HR.	GWD MILL HRS. RUN
06/23/92	7:00													
06/23/92	8:00													
06/23/92	9:00													
06/23/92	10:00													
06/23/92	11:00													
06/23/92	12:00													
06/23/92	13:00													
06/23/92	14:00	12.42	8.97	22.08	19.32	13.80	22.77	24.15	24.15	23.46	18.63	189.75	3.34	56.83
06/23/92	15:00													
06/23/92	16:00													
06/23/92	17:00													
06/23/92	18:00													
06/23/92	19:00													
06/23/92	20:00													
06/23/92	21:00													
06/23/92	22:00	18.63	14.49	20.70	17.94	6.90	18.63	19.32	21.39	21.39	17.25	176.64	2.74	64.58
06/23/92	23:00													
06/23/92	24:00													
06/23/92	1:00													
06/23/92	2:00													
06/23/92	3:00													
06/23/92	4:00													
06/23/92	5:00													
06/23/92	6:00	20.01	17.94	20.70	18.63	13.11	22.08	23.46	23.46	24.15	19.32	202.86	2.88	72.50
AVG		17.02	13.80	21.16	18.63	11.27	21.16	22.31	23.00	23.00	18.40	189.75	2.96	64.64
STD		4.04	4.52	0.80	0.69	1.80	2.22	2.61	1.44	1.44	1.05	13.11	0.33	7.83
MIN		12.42	8.97	20.70	17.94	6.90	18.63	19.32	21.39	21.39	17.25	176.64	2.74	56.83
MAX		20.01	17.94	22.08	19.32	13.80	22.77	24.15	24.15	24.15	19.32	202.86	3.34	72.50
NO.		3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
LCL		4.89	0.23	18.77	16.56	-0.13	14.51	14.47	18.69	18.69	15.24	150.42	1.96	41.14
UCL		29.15	27.37	23.55	20.70	22.67	27.81	30.15	27.31	27.31	21.56	229.08	3.95	88.14

STATISTICS FOR PERIOD 06/23/92 TO 06/23/92

GRINDER PRODUCTION, ADT

DATE	TIME	Grinder #1 ADT	Grinder #2 ADT	Grinder #3 ADT	Grinder #4 ADT	Grinder #5 ADT	Grinder #7 ADT	Grinder #8 ADT	Grinder #9 ADT	Grinder #10 ADT	Grinder #11 ADT	GWD MILL ADT	GWD MILL ADT /GR.HR.	GWD MILL HRS. RUN
06/23/92	7:00													
06/23/92	8:00													
06/23/92	9:00													
06/23/92	10:00													
06/23/92	11:00													
06/23/92	12:00													
06/23/92	13:00													
06/23/92	14:00	12.42	8.97	22.08	19.32	13.80	22.77	24.15	24.15	23.46	18.63	189.75	3.34	56.83
06/23/92	15:00													
06/23/92	16:00													
06/23/92	17:00													
06/23/92	18:00													
06/23/92	19:00													
06/23/92	20:00													
06/23/92	21:00													
06/23/92	22:00	18.63	14.49	20.70	17.94	6.90	18.63	19.32	21.39	21.39	17.25	176.64	2.74	64.58
06/23/92	23:00													
06/23/92	24:00													
06/23/92	1:00													
06/23/92	2:00													
06/23/92	3:00													
06/23/92	4:00													
06/23/92	5:00													
06/23/92	6:00	20.01	17.94	20.70	18.63	13.11	22.08	23.46	23.46	24.15	19.32	202.86	2.80	72.50
06/24/92	7:00													
06/24/92	8:00													
06/24/92	9:00													
06/24/92	10:00													
06/24/92	11:00													
06/24/92	12:00													
06/24/92	13:00													
06/24/92	14:00	21.39	11.73	24.84	22.77	0.28	15.18	25.53	25.53	24.84	0.28	180.37	3.95	47.75
06/24/92	15:00													
06/24/92	16:00													
06/24/92	17:00													
06/24/92	18:00													
06/24/92	19:00													
06/24/92	20:00													
06/24/92	21:00													
06/24/92	22:00	15.18	20.01	22.77	22.08	6.21	20.70	22.08	22.77	17.25	7.59	176.64	2.96	59.67
06/24/92	23:00													
06/24/92	24:00													
06/24/92	1:00													
06/24/92	2:00													
06/24/92	3:00													
06/24/92	4:00													
06/24/92	5:00													
06/24/92	6:00	21.39	20.70	20.70	21.39	6.21	20.70	20.70	20.70	23.46	20.01	195.96	2.88	64.17
AVG		18.17	15.64	21.37	20.15	9.08	20.01	22.54	23.00	22.42	15.18	188.37	3.11	61.58
STD		3.64	4.71	1.66	1.99	3.48	2.76	2.30	1.78	2.79	5.69	10.44	0.46	8.82
MIN		12.42	8.97	20.70	17.94	6.21	15.18	19.32	20.70	17.25	7.59	176.64	2.74	47.75
MAX		21.39	20.70	24.84	22.77	13.80	22.77	25.53	25.53	24.84	20.01	202.86	3.94	72.50
NO.		6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
LCL		7.24	1.50	16.99	14.39	-1.34	11.73	15.65	17.66	14.07	-1.89	157.06	1.72	35.12
UCL		29.10	29.78	26.94	26.32	19.51	28.29	29.43	28.34	30.78	32.25	219.68	4.49	88.05

STATISTICS FOR PERIOD 06/23/92 TO 06/24/92

WESTON MANAGERS DESIGNERS/CONSULTANTS

SECTION 10

GROUNDWOOD, COARSE SCREEN VENT

(CS-GWCSV)

10. CS-GWCSV

WESTON MANAGERS DESIGNERS CONSULTANTS

SECTION 10
GROUNDWOOD, COARSE SCREEN VENT
(CS-GWCSV)

The Groundwood, Course Screen Vent was tested on two different days for volatile organic compounds by M18 and M25A.

Total Hydrocarbons (M25A)

Figures 10.1 and 10.2 present the THC trends for the test periods on 6/22/92 and 6/23/92. THC readings for the two days were comparable ranging from 40-100 ppm.

Volatile Organic Compounds (M18)

Table 10.1 summarizes the results for the Method 18 target compounds, and Section 10.1 is a tabulation of the data. TRS was not analyzed. The volumetric flow was measured during sampling with a pitot tube. The pinenes and the terpenes constituted 100% of the volatile organic emissions.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 10.6. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 10.3 includes the process operating data as recorded and provided by mill personnel.

FIGURE 10.1

THC TREND ANALYSIS (6/22/92)
GROUNDWOOD, COARSE SCREEN VENT
(CS-GWCSV)

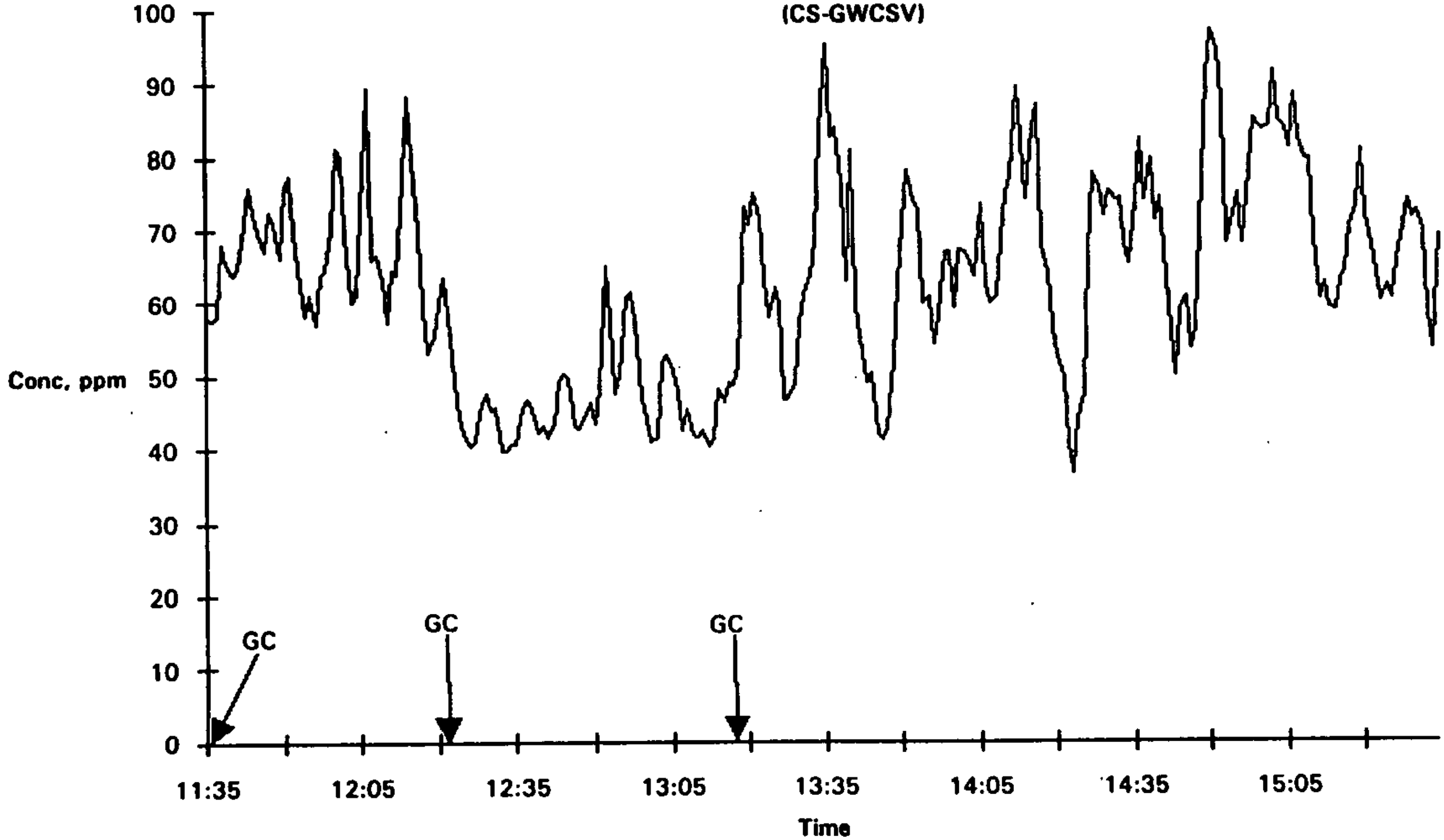
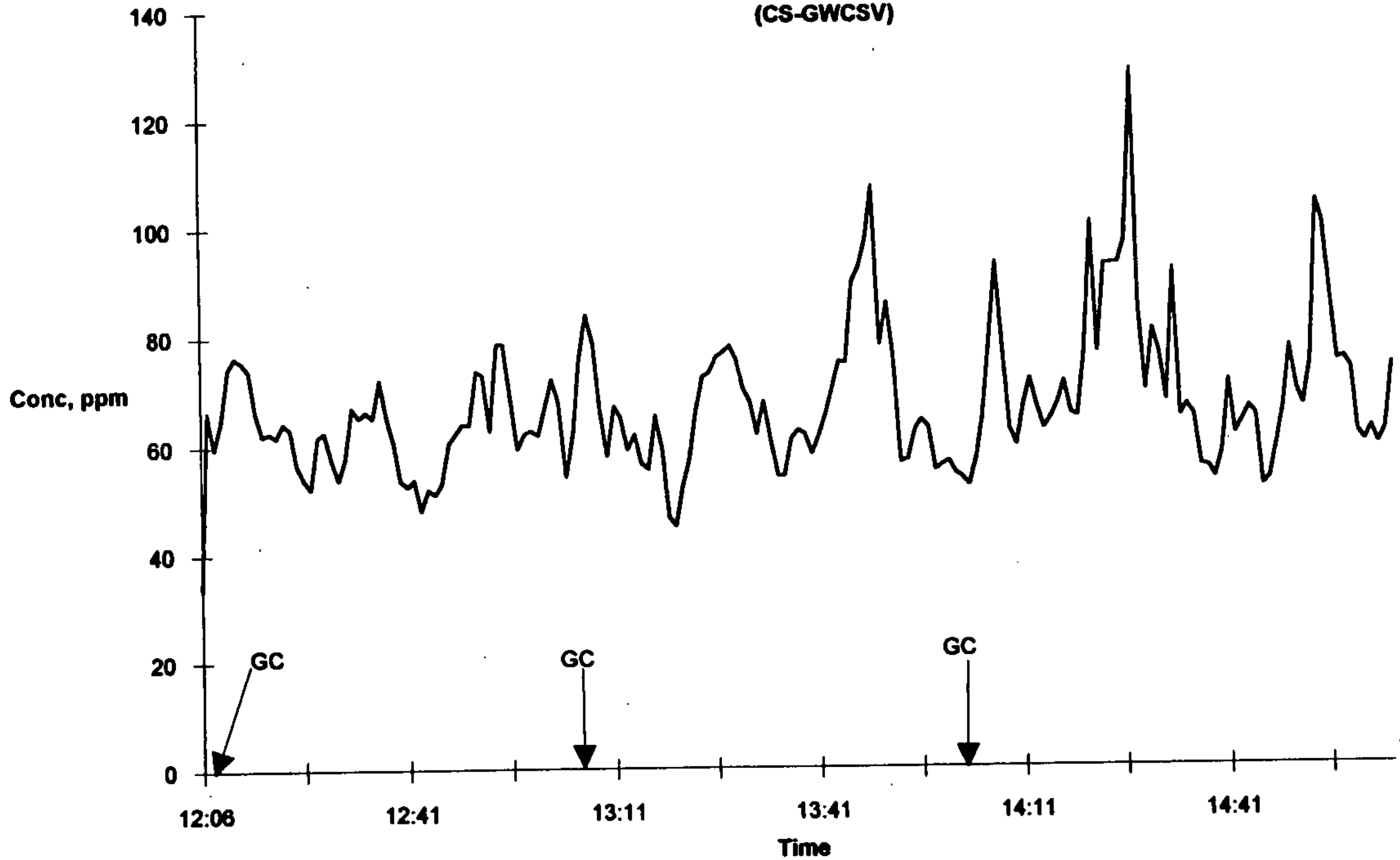


FIGURE 10.2

THC TREND ANALYSIS (6/23/92)
GROUNDWOOD, COARSE SCREEN VENT
(CS-GWCSV)



WESTON
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TABLE 10.1 SUMMARY OF VOC RESULTS

Mill: CHAMPION - SHELDON
Source Code: CS-GWCSV
FIN: - CIN:
Source: Groundwood, Coarse Screen Vent
Test Dates: 6/22/92 6/23/92
EPN: -

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	91	97	94	
Volumetric Flow Rate, $x10^3$ DSCFM	16.4	16.9	16.7	
Process Operating Conditions				
Production Rate, ADT/hr	9.6	12.3	11.0	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	ND	ND	ND	0.2
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	ND	ND	ND	0.3
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.4
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.2
alpha-Pinene	1.4	2.7	2.1	0.2
beta-Pinene	0.7	1.7	1.2	0.2
3-Carene	ND	ND	ND	0.2
Terpenes (Unspecified)	0.7	1.1	0.9	0.2
p-Cymene	ND	0.2	0.1	0.2
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	2.4	4.6	3.6	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	2.4	4.6	3.6	0.1

ND=Not Detected
DL=Detection Limit

WESTON MANAGERS DESIGNERS/CONSULTANTS

Section 10.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON　　Source: Groundwood, Coarse Screen Vent　　FIN: -
Source Code: CS-GWCSV　　Date: 6/22/92　　EPN: -　　CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1134	1234	1334	
Flow Data				
Stack Temperature, °F			97	97
Moisture Content, %			4.9	4.9
Oxygen Concentration, %			20.8	20.8
Carbon Dioxide Concentration, %			0.0	0.0
Volumetric Flow Rate, x10^3 ACFM			18.2	18.2
Volumetric Flow Rate, x10^3 DSCFM			16.4	16.4
Process Operating Conditions				
Production Rate, ADT/hr	12.3	12.3	12.3	12.3
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	2.1 *	2.1 *	2.1 *	2.1 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON Source: Groundwood, Coarse Screen Vent FIN: -

Source Code: CS-GWCSV Date: 6/22/92 EPN: - CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.4 *	0.4 *	0.4 *	0.4 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
alpha-Pinene				
Concentration, ppmvd	4.6	4.0	5.5	4.7
Emission Rate, lb/hr	1.6	1.4	1.9	1.6
beta-Pinene				
Concentration, ppmvd	2.7	2.0	3.4	2.7
Emission Rate, lb/hr	1.0	0.7	1.2	0.9
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Terpenes (Unspecified)				
Concentration, ppmvd	2.2	2.0	2.7	2.3
Emission Rate, lb/hr	0.8	0.7	1.0	0.8

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Groundwood, Coarse Screen Vent | FIN: -
Source Code: CS-GWCSV | Date: 6/22/92 | EPN: - | CIN: -

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5	0.5 *	0.5 *	0.4
Emission Rate, lb/hr	0.2	0.2 *	0.2 *	0.1
Knowns as Carbon				
Concentration, ppmvd	97.8	77.7	112.6	96.0
Unknowns as Carbon				
Concentration, ppmvd	0.5 *	0.0	0.5 *	0.4
Sum M18 as Carbon, lb/hr	3.0	2.4	3.5	3.0
Unknown Compounds % of Total	0.5%	0.0%	0.5%	0.3%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	65.2	53.6	68.3	62.4
Emission Rate, lb/hr as C	2.0	1.6	2.1	1.9

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Groundwood, Coarse Screen Vent | FIN: -
Source Code: CS-GWCSV | Date: 6/23/92 | EPN: - | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1205	1305	1405	
Flow Data				
Stack Temperature, °F	91			91
Moisture Content, %	4.2			4.2
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	18.6			18.6
Volumetric Flow Rate, x10^3 DSCFM	16.9			16.9
Process Operating Conditions				
Production Rate, ADT/hr	9.6	9.6	9.6	9.6
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	2.1 *	2.1 *	2.1 *	2.1 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Groundwood, Coarse Sqreen Vent | FIN: -
Source Code: CS-GWCSV | Date: 6/23/92 | EPN: - | CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 •
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1.0 •	1.0 •	1.0 *	1.0 *
Emission Rate, lb/hr	0.3 *	0.3 *	0.3 *	0.3 *
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 •	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 •	0.1 •
Bromodichloromethane				
Concentration, ppmvd	1.0 *	1.0 *	1.0 *	1.0 *
Emission Rate, lb/hr	0.5 *	0.5 •	0.5 •	0.5 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 •
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 •	0.1 •
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 •
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 •	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 •	0.5 *	0.5 •
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
alpha-Pinene				
Concentration, ppmvd	7.2	6.7	7.5	7.1
Emission Rate, lb/hr	2.6	2.4	2.7	2.6
beta-Pinene				
Concentration, ppmvd	4.6	3.5	4.2	4.1
Emission Rate, lb/hr	1.7	1.3	1.5	1.5
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 •
Terpenes (Unspecified)				
Concentration, ppmvd	2.1	2.5	3.0	2.5
Emission Rate, lb/hr	0.8	0.9	1.1	0.9

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON　　Source: Groundwood, Coarse Screen Vent　　FIN:

Source Code: CS-GWCSV　　Date: 6/23/92　　EPN: -　　CIN:

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.2 *	0.2 *	0.2 *	0.2 *
Knowns as Carbon				
Concentration, ppmvd	132.0	121.5	144.5	132.7
Unknowns as Carbon				
Concentration, ppmvd	0.5	0.5	0.5 *	0.5
Sum M18 as Carbon, lb/hr	4.2	3.9	4.6	4.2
Unknown Compounds % of Total	0.4%	0.4%	0.4%	0.4%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	65.8	68.9	76.2	70.3
Emission Rate, lb/hr as C	2.1	2.2	2.4	2.2

* One or more values were less than the detection limit.

Section 10.2 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

SOURCE CS-GWCSV

QUALITY CONTROL SUMMARY
METHOD 25A

1. CALIBRATION

THEOR	6/22/92		6/23/92	
ppm	ppm	%ERR	ppm	%ERR
0.0	2.0	0.8	1.0	0.4
36.0	35.0	-0.4	36.0	0.0
91.0	88.0	-1.3	87.0	-1.7
244.0	245.0	0.4	245.0	0.4
CORR COEFF	0.9998		0.9997	

2. PROPANE LINE RECOVERY

	DATE	6/22/92		DATE	6/23/92	
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	*			243.0	238.0	97.9%
AFTER	243.0	238.0	97.9%	232.0	229.0	98.7%

3. LINE BLANK

	6/22/92	6/23/92
	ppm	ppm
BEFORE	*	3.0
AFTER	3.0	3.0

* Not performed - man lift needed to reach source

SOURCE CS-GWCSV

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR ppm	DATE 6/22/92 ppm	%REC	DATE 6/23/92 ppm	%REC
ethanol	52.0	41.2	79.3%	38.6	74.2%
acetone	41.6	37.1	89.3%	35.9	86.3%
isopropanol	39.9	37.6	94.3%	34.8	87.4%
dimethyl sulfide	9.1	9.1	100.0%	8.8	96.7%
benzene	34.2	37.8	110.7%	37.7	110.5%
bromodichloromethane	18.8	18.3	97.3%	17.6	93.6%
dimethyl disulfide	33.9	31.1	91.7%	30.0	88.4%
toluene	28.7	28.1	98.0%	28.0	97.6%
ethyl benzene	24.9	25.2	101.0%	26.1	104.9%
m-xylene	49.8	50.6	101.6%	51.2	102.8%
o-xylene	25.0	27.4	109.6%	24.9	99.5%
cumene	21.9	21.6	98.5%	22.0	100.3%
alpha-pinene	19.2	18.9	98.8%	20.9	109.3%
beta-pinene	19.2	13.2	68.4%	16.1	83.6%
3-carene	19.3	18.8	97.5%	18.4	95.5%
p-cymene	19.6	19.5	99.9%	19.4	99.1%

2. PROPANE RESPONSE

	THEOR		%REC		%REC
BEFORE	31.5	31.1	98.7%	* 37.	105.3%
AFTER	31.5	27.8	88.3%	* 33.	94.2%

3. METHANOL LINE RECOVERY

	6/22/92 GC	6/22/92 LINE	6/22/92 %REC	6/23/92 GC	6/23/92 LINE	6/23/92 %REC
BEFORE	**			17.0	16.7	98.2%
AFTER	17.0	16.7	98.2%	12.6	12.5	99.2%

4. LINE BLANK

	[-------------FILE REF-------------]	
BEFORE	FMB2005	FNB2004
AFTER	FNB2004	FNB2010

* THEOR ppm = 36

** Not performed - man lift needed to reach source

Section 10.3 Process Description and Operating Conditions

GRINDER PRODUCTION, ADT

DATE	TIME	Grinder #1 ADT	Grinder #2 ADT	Grinder #3 ADT	Grinder #4 ADT	Grinder #5 ADT	Grinder #7 ADT	Grinder #8 ADT	Grinder #9 ADT	Grinder #10 ADT	Grinder #11 ADT	GWD MILL ADT	GWD MILL ADT /GR.HR.	GWD MILL HRS-RUN
06/22/92	7:00													
06/22/92	8:00													
06/22/92	9:00													
06/22/92	10:00													
06/22/92	11:00													
06/22/92	12:00													
06/22/92	13:00													
06/22/92	14:00	14.49	20.70	24.15	19.32	20.01	13.80	27.60	26.22	26.22	22.08	214.59	3.45	62.17
06/22/92	15:00													
06/22/92	16:00													
06/22/92	17:00													
06/22/92	18:00													
06/22/92	19:00													
06/22/92	20:00													
06/22/92	21:00													
06/22/92	22:00	17.25	20.70	22.08	22.77	20.01	19.32	24.15	22.77	22.77	21.39	213.21	3.06	69.67
06/22/92	23:00													
06/22/92	24:00													
06/22/92	1:00													
06/22/92	2:00													
06/22/92	3:00													
06/22/92	4:00													
06/22/92	5:00													
06/22/92	6:00	19.32	17.25	20.70	19.32	18.63	22.08	24.84	24.15	26.22	20.70	213.21	2.86	74.67
06/23/92	7:00													
06/23/92	8:00													
06/23/92	9:00													
06/23/92	10:00													
06/23/92	11:00													
06/23/92	12:00													
06/23/92	13:00													
06/23/92	14:00	12.42	8.97	22.08	19.32	13.80	22.77	24.15	24.15	23.46	18.63	189.75	3.34	56.83
06/23/92	15:00													
06/23/92	16:00													
06/23/92	17:00													
06/23/92	18:00													
06/23/92	19:00													
06/23/92	20:00													
06/23/92	21:00													
06/23/92	22:00	18.63	14.49	20.70	17.94	6.90	18.63	19.32	21.39	21.39	17.25	176.64	2.74	64.50
06/23/92	23:00													
06/23/92	24:00													
06/23/92	1:00													
06/23/92	2:00													
06/23/92	3:00													
06/23/92	4:00													
06/23/92	5:00													
06/23/92	6:00	20.01	17.94	20.70	18.63	13.11	22.08	23.46	23.46	24.15	19.32	202.86	2.80	72.50
AVG		17.02	16.68	21.74	19.55	15.41	19.78	23.92	23.69	24.03	19.89	201.71	3.04	66.74
STD		2.98	4.44	1.36	1.67	5.16	3.37	2.68	1.61	1.92	1.82	15.51	0.30	6.76
MIN		12.42	8.97	20.70	17.94	6.90	13.80	19.32	21.39	21.39	17.25	176.64	2.74	56.83
MAX		20.01	20.70	24.15	22.77	20.01	22.77	27.60	26.22	26.22	22.08	214.59	3.45	74.67
NO.		6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
LCL		8.08	3.36	17.65	14.54	-0.06	9.67	15.89	18.85	18.27	14.43	155.17	2.15	46.47
UCL		25.96	29.99	25.82	24.56	30.88	29.89	31.95	28.53	29.80	25.36	248.25	3.93	87.01

STATISTICS FOR PERIOD 06/22/92 TO 06/23/92

GRINDER PRODUCTION, ADT

DATE	TIME	Grinder #1 ADT	Grinder #2 ADT	Grinder #3 ADT	Grinder #4 ADT	Grinder #5 ADT	Grinder #7 ADT	Grinder #8 ADT	Grinder #9 ADT	Grinder #10 ADT	Grinder #11 ADT	GWD MILL ADT	GWD MILL ADT /GR.HR.	GWD MILL HRS. RUN
06/23/92	7:00													
06/23/92	8:00													
06/23/92	9:00													
06/23/92	10:00													
06/23/92	11:00													
06/23/92	12:00													
06/23/92	13:00													
06/23/92	14:00	12.42	8.97	22.08	19.32	13.80	22.77	24.15	24.15	23.46	18.63	189.75	3.34	56.83
06/23/92	15:00													
06/23/92	16:00													
06/23/92	17:00													
06/23/92	18:00													
06/23/92	19:00													
06/23/92	20:00													
06/23/92	21:00													
06/23/92	22:00	18.63	14.49	20.70	17.94	6.90	18.63	19.32	21.39	21.39	17.25	176.64	2.74	64.58
06/23/92	23:00													
06/23/92	24:00													
06/23/92	1:00													
06/23/92	2:00													
06/23/92	3:00													
06/23/92	4:00													
06/23/92	5:00													
06/23/92	6:00	20.01	17.94	20.70	18.63	13.11	22.08	23.46	23.46	24.15	19.32	202.86	2.80	72.50

	Grinder #1 ADT	Grinder #2 ADT	Grinder #3 ADT	Grinder #4 ADT	Grinder #5 ADT	Grinder #7 ADT	Grinder #8 ADT	Grinder #9 ADT	Grinder #10 ADT	Grinder #11 ADT	GWD MILL ADT	GWD MILL ADT /GR.HR.	GWD MILL HRS. RUN
AVG	17.02	13.80	21.16	18.63	11.27	21.16	22.31	23.00	23.00	18.40	189.75	2.96	64.64
STD	4.04	4.52	0.80	0.69	3.80	2.22	2.61	1.44	1.44	1.05	13.11	0.33	7.83
MIN	12.42	8.97	20.70	17.94	6.90	18.63	19.32	21.39	21.39	17.25	176.64	2.74	56.83
MAX	20.01	17.94	22.08	19.32	13.80	22.77	24.15	24.15	24.15	19.32	202.86	3.34	72.50
NO.	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
LCL	4.89	0.23	18.77	16.56	-0.13	14.51	14.47	18.69	18.69	15.24	150.42	1.96	41.14
UCL	29.15	27.37	23.55	20.70	22.67	27.81	30.15	27.31	27.31	21.56	229.08	3.95	88.14

STATISTICS FOR PERIOD 06/23/92 TO 06/23/92

GRINDER PRODUCTION, ADT

DATE	TIME	Grinder #1 ADT	Grinder #2 ADT	Grinder #3 ADT	Grinder #4 ADT	Grinder #5 ADT	Grinder #7 ADT	Grinder #8 ADT	Grinder #9 ADT	Grinder #10 ADT	Grinder #11 ADT	GWD MILL ADT	GWD MILL ADT /GR.HR.	GWD MILL HRS. RUN
06/23/92	7:00													
06/23/92	8:00													
06/23/92	9:00													
06/23/92	10:00													
06/23/92	11:00													
06/23/92	12:00													
06/23/92	13:00													
06/23/92	14:00	12.42	8.97	22.00	19.32	13.80	22.77	24.15	24.15	23.46	18.63	189.75	3.34	56.83
06/23/92	15:00													
06/23/92	16:00													
06/23/92	17:00													
06/23/92	18:00													
06/23/92	19:00													
06/23/92	20:00													
06/23/92	21:00													
06/23/92	22:00	18.63	14.49	20.70	17.94	6.90	18.63	19.32	21.39	21.39	17.25	176.64	2.74	64.58
06/23/92	23:00													
06/23/92	24:00													
06/23/92	1:00													
06/23/92	2:00													
06/23/92	3:00													
06/23/92	4:00													
06/23/92	5:00													
06/23/92	6:00	20.01	17.94	20.70	18.63	13.11	22.08	23.46	23.46	24.15	19.32	202.86	2.80	72.50
06/24/92	7:00													
06/24/92	8:00													
06/24/92	9:00													
06/24/92	10:00													
06/24/92	11:00													
06/24/92	12:00													
06/24/92	13:00													
06/24/92	14:00	21.39	11.73	24.84	22.77	8.28	15.18	25.53	25.53	24.84	8.28	188.37	3.95	47.75
06/24/92	15:00													
06/24/92	16:00													
06/24/92	17:00													
06/24/92	18:00													
06/24/92	19:00													
06/24/92	20:00													
06/24/92	21:00													
06/24/92	22:00	15.18	20.01	22.77	22.08	6.21	20.70	22.08	22.77	17.25	7.59	176.64	2.96	59.67
06/24/92	23:00													
06/24/92	24:00													
06/24/92	1:00													
06/24/92	2:00													
06/24/92	3:00													
06/24/92	4:00													
06/24/92	5:00													
06/24/92	6:00	21.39	20.70	20.78	21.39	6.21	20.70	20.70	20.70	23.46	20.01	195.96	2.88	68.17
AVG		18.17	15.64	21.97	20.35	9.08	20.01	22.54	23.08	22.42	15.18	188.37	3.11	61.50
STD		3.64	4.71	1.66	1.99	3.48	2.76	2.30	1.78	2.79	5.69	10.44	0.46	8.82
MIN		12.42	8.97	20.70	17.94	6.21	15.18	19.32	20.70	17.25	7.59	176.64	2.74	47.75
MAX		21.39	20.70	24.84	22.77	13.80	22.77	25.53	25.53	24.84	20.01	202.86	3.94	72.50
NO.		6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.40	6.00	6.00	6.00
LCL		7.24	1.50	16.99	14.39	-1.34	11.73	15.65	17.66	14.07	-1.89	157.06	1.72	35.12
UCL		29.10	29.78	26.94	26.32	19.51	28.29	29.43	28.34	30.78	32.25	219.68	4.49	88.05

STATISTICS FOR PERIOD 06/23/92 TO 06/24/92

11. CS-NCGLK

SECTION 11

NCG VENT AT LIME KILN

(CS-NCGLK)

SECTION 11
NCG VENT AT LIME KILN
(CS-NCGLK)

The NCG Vent at the Lime Kiln was tested for volatile organic compounds by EPA Methods 16 and 18. Bag samples were collected on 6/24/92 and 6/25/92. Analyses were performed by gas chromatography using static dilution techniques.

Volatile Organic Compounds (M16 and M18)

Table 11.1 summarizes the results for the Method 16 and Method 18 target compounds, and Section 11.1 is a tabulation of the data. The reduced sulfur compounds detected were hydrogen sulfide, methyl mercaptan and dimethyl sulfide. Run 1 was terminated after elution of methyl mercaptan; consequently, no data was reported for dimethyl sulfide, carbon disulfide and dimethyl disulfide. The volumetric flow was measured during sampling using a hot wire anemometer. The Method 18 compounds identified on both days were alpha- and beta-pinene plus unspecified terpenes. Acetone and o-xylene were detected on 6/25/92.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 11.2. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 11.3 includes the process operating data as recorded and provided by mill personnel.

TABLE 11.1
SUMMARY OF VOC RESULTS

Mill: CHAMPION - SHELDON   Source: NCG Vent at Lime Kiln
Source Code: CS-NCGLK   Test Dates: 6/24/92 6/25/92
FIN: 7200 CIN: EPN: E74

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	103	103	103	
Volumetric Flow Rate, x10^3 DSCFM	0.04	0.04	0.04	
Process Operating Conditions				
Production Rate, tons/hr	16.9	18.6	17.6	
Method 16 Data, lb/hr				
Hydrogen sulfide	5.7	12.0	9.8	0.1
Methyl mercaptan	44.9	57.5	51.1	0.1
Dimethyl sulfide	20.4	44.8	28.1	0.1
Carbon disulfide	ND	ND	ND	0.1
Dimethyl disulfide	ND	ND	ND	0.1
Method 18 Data, lb/hr				
Methanol	ND	<0.1	0.1	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	0.2	0.1	0.1
2-Propanol	ND	<0.1	0.1	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	ND	ND	ND	0.1
Benzene	ND	<0.1	0.1	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	<0.1	0.1	0.1
Ethyl benzene	ND	<0.1	0.1	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	0.4	0.2	0.1
Cumene	ND	<0.1	0.1	0.1
alpha-Pinene	0.3	6.2	3.2	0.1
beta-Pinene	0.2	1.8	0.9	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	0.2	1.5	0.8	0.1
p-Cymene	ND	<0.1	0.1	0.1
Method 16 Plus Method 18 Data				
Known as C, lb/hr	4.7	25.0	13.7	0.1
Unknowns as C, lb/hr	ND	1.3	0.4	0.1
Sum of Compounds as C, lb/hr	4.8	25.6	14.1	0.1

ND=Not Detected

WESTON
MANAGERS DESIGNERS/CONSULTANTS

Section 11.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON　　Source: NCG Vent at Lime Kiln　　FIN: 7200
CS-NCGLK　　Date: 6/24/92　　EPN: E74　　CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1800	1805	1810	
Flow Data				
Stack Temperature, °F	103			103
Moisture Content, %	3.6			3.6
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.04			0.04
Volumetric Flow Rate, x10^3 DSCFM	0.04			0.04
Process Operating Conditions				
Production Rate, tons/hr	16.9	16.9	16.9	16.9
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	36993.0	40323.0	61275.0	46197.0
Emission Rate, lb/hr	7.2	7.9	12.0	9.1
Methyl mercaptan				
Concentration, ppmvd	196333.0	170340.0	207960.0	191544.3
Emission Rate, lb/hr	54.3	47.1	57.5	53.0
Dimethyl sulfide				
Concentration, ppmvd	69622.0	61764.0	125430.0	85605.3
Emission Rate, lb/hr	24.9	22.1	44.8	30.6
Carbon disulfide				
Concentration, ppmvd	12238.0 *	12238.0 *	12238.0 *	12238.0 *
Emission Rate, lb/hr	5.4 •	5.4 *	5.4 *	5.4 *
Dimethyl disulfide				
Concentration, ppmvd	12238.0 *	12238.0 •	12238.0 *	12238.0 *
Emission Rate, lb/hr	6.6 *	6.6 *	6.6 *	6.6 *
Method 18 Data				
Methanol				
Concentration, ppmvd	113.1	231.3	103.7 *	132.1
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	25.9 *	25.9 *	25.9 *	25.9 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	110.0	68.5	79.9	86.1
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 •
2-Propanol				
Concentration, ppmvd	25.9 •	25.9 *	25.9 *	25.9 *
Emission Rate, lb/hr	0.1 •	0.1 *	0.1 •	0.1 *

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON CS-NCGLK | Source: NCG Vent at Lime Kiln | FIN: 7200
Date: 6/24/92 | EPN: E74 | CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	25.9 *	25.9 *	25.9 *	25.9 *
Emission Rate, lb/hr	0.1 •	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	51.9 *	51.9 *	51.9 *	51.9 •
Emission Rate, lb/hr	0.1 *	0.1 •	0.1 •	0.1 *
Benzene				
Concentration, ppmvd	25.9 *	25.9 *	25.9 *	25.9 *
Emission Rate, lb/hr	0.1 •	0.1 *	0.1 *	0.1 •
Bromodichloromethane				
Concentration, ppmvd	51.9 *	51.9 *	51.9 •	51.9 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	39.4	25.9 *	25.9 *	21.8
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	25.9 •	25.9 *	25.9 *	25.9 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	25.9 *	25.9 *	25.9 •	25.9 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	25.9 *	25.9 *	25.9 *	25.9 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 •	0.1 *
Cumene				
Concentration, ppmvd	78.8	40.5	25.9 *	44.1
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 •	0.1 *
alpha-Pinene				
Concentration, ppmvd	3431.5	2272.8	1140.0	2281.5
Emission Rate, lb/hr	2.7	1.8	0.9	1.8
beta-Pinene				
Concentration, ppmvd	1014.5	477.2	254.1	582.0
Emission Rate, lb/hr	0.8	0.4	0.2	0.5
3-Carene				
Concentration, ppmvd	25.9 *	25.9 *	25.9 •	25.9 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	869.3	361.0	206.4	478.9
Emission Rate, lb/hr	0.7	0.3	0.2	0.4

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON	Source:	NCG Vent at Lime Kiln		FIN:	7200
CS-NCGLK	Date:	6/24/92	EPN: E74	CIN:	-

-	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	52.3	25.9 *	25.9 *	26.1
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	162939.8	84230.3	68207.5	105125.9
Unknowns as Carbon				
Concentration, ppmvd	546.7	463.7	735.5	582.0
Sum M18 as Carbon, lb/hr	11.3	5.9	4.8	7.3
Unknown Compounds % of Total	0.3%	0.5%	1.1%	0.6%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C				
Emission Rate, lb/hr as C				

COMMENTS

Velocity taken using a hot wire anemometer.
Run 1 on 6/25/92 was terminated after MeSH eluted, DMS, CS2 and DMDS are not reported.
Run 2 on 6/25/92 was lost due to a leak in the sample bag.
Dilution factor for TRS compounds (Day 1=24475, Day 2=53900)
Dilution factor for M18 compounds (Day 1=50, Day 2=98)

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill:	CHAMPION - SHELDON	Source:	NCG Vent at Lime Kiln		FIN:	7200
	CS-NCGLK	Date:	6/25/92	EPN: E74	CIN:	-

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1400	1405	1410	
Flow Data				
Stack Temperature, °F	103			103
Moisture Content, %	3.6			3.6
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.04			0.04
Volumetric Flow Rate, x10^3 DSCFM	0.04			0.04
Process Operating Conditions				
Production Rate, tons/hr	18.6		18.6	18.6
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd	61123.0		28854.0	44988.5
Emission Rate, lb/hr	12.0		5.7	8.8
Methyl mercaptan				
Concentration, ppmvd	186220.0		162260.0	174240.0
Emission Rate, lb/hr	51.5		44.9	48.2
Dimethyl sulfide				
Concentration, ppmvd			57166.0	57166.0
Emission Rate, lb/hr			20.4	20.4
Carbon disulfide				
Concentration, ppmvd			26950.0 *	26950.0 *
Emission Rate, lb/hr			11.8 *	11.8 *
Dimethyl disulfide				
Concentration, ppmvd			26950.0 *	26950.0 *
Emission Rate, lb/hr			14.6 *	14.6 *
Method 18 Data				
Methanol				
Concentration, ppmvd	203.3 *		203.3 *	203.3 *
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	50.8 *		50.8 *	50.8 *
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *
Acetone				
Concentration, ppmvd	50.8 *		477.2	251.3
Emission Rate, lb/hr	0.1 *		0.2	0.1
2-Propanol				
Concentration, ppmvd	159.8		129.7	144.7
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON	Source:	NCG Vent at Lime Kiln		FIN:	7200
CS-NCGLK	Date:	6/25/92	EPN: E74	CIN:	-

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	50.8 *		50.8 *	50.8 *
Emission Rate, lb/hr	0.1 *		0.1 •	0.1 *
Chloroform				
Concentration, ppmvd	101.7 *		101.7 *	101.7 *
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *
Benzene				
Concentration, ppmvd	80.9		50.8 *	53.2
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	101.7 •		101.7 *	101.7 *
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	50.8 *		53.9	39.7
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	53.9		50.8 *	39.7
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	50.8 *		50.8 *	50.8 *
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	646.3		535.3	590.8
Emission Rate, lb/hr	0.4		0.3	0.4
Cumene				
Concentration, ppmvd	53.9		138.0	96.0
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	5736.5		7966.8	6851.7
Emission Rate, lb/hr	4.5		6.2	5.4
beta-Pinene				
Concentration, ppmvd	1579.9		2309.1	1944.5
Emission Rate, lb/hr	1.2		1.8	1.5
3-Carene				
Concentration, ppmvd	50.8 *		50.8 *	50.8 *
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	1862.0		1968.9	1915.5
Emission Rate, lb/hr	1.5		1.5	1.5

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill:	CHAMPION - SHELDON	Source:	NCG Vent at Lime Kiln		FIN:	7200
	CS-NCGLK	Date:	6/25/92	EPN: E74	CIN:	-

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	50.8 *		50.8 *	50.8 *
Emission Rate, lb/hr	0.1 *		0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	311217.8		360863.1	336040.5
Unknowns as Carbon				
Concentration, ppmvd	19117.2		9333.0	14225.1
Sum M18 as Carbon, lb/hr	22.8		25.6	24.2
Unknown Compounds % of Total	5.8%		2.5%	4.2%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C				
Emission Rate, lb/hr as C				

COMMENTS

Velocity taken using a hot wire anemometer.
Run 1 on 6/25/92 was terminated after MeSH eluted, DMS, CS2 and DMDS are not reported.
Run 2 on 6/25/92 was lost due to a leak in the sample bag.
Dilution factor for TRS compounds (Day 1=24475, Day 2=53900)
Dilution factor for M18 compounds (Day 1=50, Day 2=98)

* One or more values were less than the detection limit.

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Section 11.2 Quality Control Results

SOURCE NCGLK

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR	DATE	6/24/92	DATE	6/25/92
	ppm	ppm	%REC	ppm	%REC
ethanol	52.0	43.9	84.4%	40.9	78.6%
acetone	41.6	36.7	88.2%	34.2	82.3%
isopropanol	39.9	40.4	101.3%	37.5	94.0%
dimethyl sulfide	9.1	9.1	100.0%	8.5	93.6%
benzene	34.2	33.8	99.0%	34.5	101.0%
bromodichloromethane	18.8	17.3	92.0%	16.7	89.1%
dimethyl disulfide	33.9	32.9	97.2%	31.2	91.9%
toluene	28.7	28.1	97.8%	26.1	90.8%
ethyl benzene	24.9	24.1	96.7%	22.7	90.9%
m-xylene	49.8	49.6	99.6%	45.2	90.7%
o-xylene	25.0	23.2	92.8%	22.2	88.7%
cumene	21.9	23.5	107.0%	19.3	88.0%
alpha-pinene	19.2	21.5	112.3%	17.8	93.0%
beta-pinene	19.2	18.3	95.1%	17.0	88.5%
3-carene	19.3	17.4	90.3%	16.0	83.2%
p-cymene	19.6	18.7	95.4%	16.0	81.7%

2. PROPANE RESPONSE

	THEOR		%REC		%REC
BEFORE	36.0	37.3	103.6%	29.8	82.8%
AFTER	36.0	36.0	100.0%	*	

3. METHANOL LINE RECOVERY

	6/24/92			6/25/92		
	GC	LINE	%REC	GC	LINE	%REC
BEFORE	NA			NA		
AFTER	NA			NA		

4. LINE BLANK

	[-------------FILE REF-------------]	
BEFORE	NA	NA
AFTER	NA	NA

* Not performed

NA = Not applicable for bag samples

NOTE: Bag samples were analyzed on both channels - Channel A QC summary is presented here.

SOURCE NCGLK

QUALITY CONTROL SUMMARY
METHOD 16

1. CALIBRATION

ANALYTE	LO ppm	MED ppm	HI ppm	CORR COEFF
6/24/92				
hydrogen sulfide	1.5	4.3	10.5	1.0000
methyl mercaptan	1.4	4.0	9.8	1.0000
dimethyl sulfide	1.9	5.6	13.6	1.0000
carbon disulfide	0.6	1.8	4.3	1.0000
dimethyl disulfide	0.8	2.4	5.9	1.0000
6/25/92 •				
hydrogen sulfide	1.5	4.3	10.5	1.0000
methyl mercaptan	1.4	4.0	9.8	1.0000
dimethyl sulfide	1.9	5.6	13.6	1.0000
carbon disulfide	0.6	1.8	4.3	1.0000
dimethyl disulfide	0.8	2.4	5.9	1.0000

• Calibration from 6/24/92 checked and used

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Section 11.3 Process Operating Data

UNIT PROCESS DESCRIPTION

CONTINUOUS DIGESTERS

The mill uses a continuous digester to produce 450 ton/day of kraft pulp. A diffusion washer follows the digester. Information on process parameters is provided below.

Wood species pulped : Southern pine
Production rate : 450 tons/day
Active alkali : 6.0 lb/cu ft as Na_2O
Sulfidity : 27%
Cooking temperature : 317°F
Digester pressure : 150 psig
Kappa no. of pulp : 19.8
Chip feed rate : N/A
Liquor feed rate : 300 gpm

	KAMYR DIGESTER		BLEACH PLANT	
DATE	OPERATING HOURS	METERED PRODUCTION	OPERATING HOURS	METERED PRODUCTION
06/24/92	24.00	406.49	24.00	400.00
06/25/92	24.00	446.61	24.00	400.00
AVERAGE	24.00	426.55	24.00	400.00
TOTAL	48.00	853.11	48.00	800.00

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SECTION 12

TMP NO. 1 PREHEATER VENT

(CS-TMP1PH)

12. CS-TMP1PH

SECTION 12
TMP NO. 1 PREHEATER VENT
(CS-TMP1PH)

Two grab samples were collected in the morning and the afternoon on 17 September 1992. One sample was analyzed from each time period for volatile organic compounds using Method 18.

The samples from the source were extremely wet, >95% steam. It was not possible to obtain volumetric flow measurements. The results are reported in Table 12.1 as µg/L water.

Sample collection involved pulling a sample from the source through an impinger (in an ice bath) to condense most of the water. The remaining gas was pumped into a Tedlar bag by a diaphragm pump.

The condensate (water plus organics) in the impinger was extracted with a known volume of hexane to remove the non-polar compounds. The hexane extract, the extracted condensate, and the gas in the Tedlar bag were analyzed for VOC using the Method 18 GC-FID. The bag contained very little air from the source. The mass of each compound in each fraction was calculated from the concentration and the volume. The total mass was obtained from the sum of the three fractions and the concentrations in the water condensed was calculated.

Table 12.2 summarizes the operating conditions during the testing. Table 12.3 presents the results from the liquid and stock samples analyzed for turpentine.

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TABLE 12.1
SUMMARY OF VOC RESULTS

Mill: CHAMPION-SHELDON
Source Code: CS-TMP1PH
FIN: 2000 EPN: E9A

Source: TMP No. 1 Preheater Vent
Test Dates: 9/17/92
CIN: -

	MIN	MAX	MEAN
Volumetric Flow Data			
Stack Temperature, °F			
Volumetric Flow Rate, x 10^3 ASCFM			
Process Operating Conditions			
Production Rate, tons/hr	51.1	51.1	51.1
	CONCENTRATION (µg/L water)		
Method 18 Data	Run 1	Run 2	Mean
Methanol	27	29	28
Ethanol	20	19	20
Acetone	3	3	3
Dimethyl Sulfide	<1	<1	1
Benzene	4	3	4
Ethyl Benzene	<1	<1	1
Cumene	5	5	5
a-Pinene	592	725	659
B-Pinene	458	532	495
3-Carene	5	6	6
p-Cymene	2	2	2

TABLE 12.2. SUMMARY OF PRODUCTION RATE DURING TESTING

T M P UPTIME - TONS - ENERGY

DATE	PRI REFINER HOURS #1	PRI REFINER HOURS #2	PRI REFINER HOURS #3	PRI REFINER HOURS TOTAL	SEC REFINER HOURS #1	SEC REFINER HOURS #2	SEC REFINER HOURS REJECT	TMP PRI PROD., TONS #1	TMP PRI PROD., TONS #2	TMP PRI PROD., TONS #3	TMP PRI PROD., TONS TOTAL	TMP ENERGY HPD/TON #1	TMP ENERGY HPD/TON #2	TMP ENERGY HPD/TON #3	REF	PLANT
09/16/92	13.3	15.6	15.4	44.3	15.6	13.8	15.5	82.0	93.0	92.0	267.0	68.1	66.1	72.9	136.0	152.8
09/17/92	24.0	24.0	24.0	72.0	24.0	24.0	24.0	160.0	160.0	160.0	480.0	59.4	62.9	66.4	125.7	137.4
09/18/92	24.0	24.0	24.0	72.0	24.0	24.0	24.0	160.0	160.0	160.0	480.0	59.4	62.9	62.9	122.2	131.5
AVERAGE	20.4	21.2	21.1	62.8	21.2	20.6	21.2	134.0	137.7	137.3	409.0	62.3	63.9	67.4	128.0	140.6
TOTAL	61.3	63.6	63.4	188.3	63.6	61.8	63.5	402.0	413.0	412.0	1227.0	186.9	191.8	202.1	384.0	421.7

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TABLE 12.3 TURPENTINE ANALYSIS OF STOCK AND LIQUID SAMPLES

Stock Samples		Solids (%)	Turpentine (gal/od ton)
Thick stock to HD (TMP)	12:00PM	7.5	0.038
	1:30PM	9.0	0.043
	17:00PM	7.2	0.031
TMP Primary Refiner Stock	5:00PM	34.0	0.012
Primary TMP Pulp	5:45PM	57.0	0.0009
Wood Chips	12:00PM	50.5	0.57
	1:30PM	51.2	0.56
	17:00PM	12.5	0.46
Liquid Samples			**Turpentine (%)**
TMP Pressate	10:20AM		0.004
	1:25PM		0.008
	5:45PM		<0.001
TMP Sewer	11:00AM		0.001
	1:30PM		<0.001
	5:45PM		0.001
TMP Chip Wash Water	10:50AM		0.003
	1:30PM		0.003
	5:45PM		0.001

SECTION 13

TMP NO. 2 PREHEATER VENT

(CS-TMP2PH)

SECTION 13
TMP NO. 2 PREHEATER VENT
(CS-TMP2PH)

Two grab samples were collected in the morning and the afternoon on 17 September 1992. One sample was analyzed from each time period for volatile organic compounds using Method 18.

The samples from the source were extremely wet, >95% steam. It was not possible to obtain volumetric flow measurements. The results are reported in Table 13.1 as µg/L water.

Sample collection involved pulling a sample from the source through an impinger (in an ice bath) to condense most of the water. The remaining gas was pumped into a Tedlar bag by a diaphragm pump.

The condensate (water plus organics) in the impinger was extracted with a known volume of hexane to remove the non-polar compounds. The hexane extract, the extracted condensate, and the gas in the Tedlar bag were analyzed for VOC using the Method 18 GC-FID. No significant volume of air was in the bag. The mass of each compound in each fraction was calculated from the concentration and the volume. The total mass was obtained from the sum of the three fractions and the concentration in the water condensed was calculated.

Table 13.2 summarizes the operating conditions during the testing. Table 12.3 presents the results from the liquid and stock samples analyzed for turpentine.

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TABLE 13.1
SUMMARY OF VOC RESULTS

Mill: CHAMPION-SHELDON
Source Code: CS-TMP2PH
FIN: 2000 EPN: E9B

Source: TMP No. 2 Preheater Vent
Test Dates: 9/17/92
CIN: -

	MIN	MAX	MEAN
Volumetric Flow Data			
Stack Temperature, °F			
Volumetric Flow Rate, x 10^3 ASCFM			
Process Operating Conditions			
Production Rate, tons/hr.	51.1	51.1	51.1
	CONCENTRATION (µg/L water)		
Method 18 Data	Run 1	Run 2	Mean
Methanol	29	33	31
Ethanol	22	21	22
Acetone	4	4	4
Dimethyl Sulfide	<1	<1	1
Benzene	3	3	3
Cumene	6	5	6
a-Pinene	902	703	803
B-Pinene	679	490	585
3-Carene	7	6	7
p-Cymene	2	2	2

TABLE 13.2. SUMMARY OF PRODUCTION RATE DURING TESTING

T M P UPTIME - TONS - ENERGY

DATE	PRI REFINER HOURS #1	PRI REFINER HOURS #2	PRI REFINER HOURS #3	TOTAL	SEC REFINER HOURS #1	SEC REFINER HOURS #2	SEC REFINER HOURS REJECT	TMP PRI PROD.. TONS #1	TMP PRI PROD.. TONS #2	TMP PRI PROD.. TONS #3	TOTAL	TMP ENERGY HPD/TON #1	TMP ENERGY HPD/TON #2	TMP ENERGY HPD/TON #3	REF	PLANT
09/16/92	13.3	15.6	15.4	44.3	15.6	13.8	15.5	82.0	93.0	92.0	267.0	68.1	66.1	72.9	136.0	152.8
09/17/92	24.0	20.0	24.0	72.0	24.0	24.0	24.0	160.0	160.0	160.0	480.0	59.4	62.9	66.4	125.7	137.0
09/18/92	24.0	24.0	24.0	72.0	24.0	24.0	24.0	160.0	160.0	160.0	480.0	59.4	62.9	62.9	122.2	131.5
AVERAGE	20.4	21.2	21.1	62.8	21.2	20.6	21.2	134.0	137.7	137.3	409.0	62.3	63.9	67.4	128.0	140.6
TOTAL	61.3	63.6	63.4	188.3	63.6	61.8	63.5	402.0	413.0	412.0	1227.0	186.9	191.8	202.1	384.0	421.7

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SECTION 14

TMP CYLCONE VENT

(CS-TMPCV)

14. CS-TMPCV

SECTION 14
TMP CYCLONE VENT
(CS-TMPCV)

Two grab samples were collected in the morning and the afternoon on 17 September 1992. One sample was analyzed from each time period for volatile organic compounds using Method 18.

The samples from the source were extremely wet, >95% steam. It was not possible to obtain volumetric flow measurements. The results are reported in Table 14.1 as µg/L water.

Sample collection involved pulling a sample from the source through an impinger (in an ice bath) to condense most of the water. The remaining gas was pumped into a Tedlar bag by a diaphragm pump.

The condensate (water plus organics) in the impinger was extracted with a known volume of hexane to remove the non-polar compounds. The hexane extract, the extracted condensate, and the gas in the Tedlar bag were analyzed for VOC using the Method 18 GC-FID. Little gas was collected in the bag during the sampling. The mass of each compound in each fraction was calculated from the concentration and the volume. The total mass was obtained from the sum of the three fractions and the concentration in the water condensed was calculated.

Table 14.2 summarizes the process operating conditions during the testing. Table 12.3 presents the results from the liquid and stock samples analyzed for turpentine.

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TABLE 14.1
SUMMARY OF VOC RESULTS

Mill: CHAMPION-SHELDON
Source Code: CS-TMPCV
FIN: 2000 EPN: E10

Source: TMP Cyclone Vent
Test Dates: 9/17/92
CIN: PC2006A

	MIN	MAX	MEAN
Volumetric Flow Data			
Stack Temperature, °F			
Volumetric Flow Rate, x 10^3 ASCFM			
Process Operating Conditions			
Production Rate, tons/hr.	51.1	51.1	51.1
	CONCENTRATION (μg/L water)		
Method 18 Data	Run 1	Run 2	Mean
Methanol	6	6	6
Ethanol	3	3	3
Acetone	<1	<1	1
Dimethyl Sulfide	<1	<1	1
Benzene	3	3	3
a-Pinene	19	8	14
B-Pinene	14	7	11

TABLE 14.2. SUMMARY OF PRODUCTION RATE DURING TESTING

T M P UPTIME - TONS - ENERGY

DATE	PRI REFINER HOURS #1	#2	#3	TOTAL	SEC REFINER HOURS #1	#2	REJECT	TMP PRI PROD., TONS #1	#2	#3	TOTAL	TMP ENERGY HPD/TON #1	#2	#3	REF	PLANT
09/16/92	13.3	15.6	15.4	44.3	15.6	13.8	15.5	82.0	93.0	92.0	267.0	68.1	66.1	72.9	136.0	152.8
09/17/92	24.0	20.0	24.0	72.0	24.0	24.0	24.0	160.0	160.0	160.0	480.0	59.4	62.9	66.4	125.7	137.4
09/18/92	24.0	24.0	24.0	72.0	24.0	24.0	24.0	160.0	160.0	160.0	480.0	59.4	62.9	62.9	122.2	131.5
AVERAGE	20.4	21.2	21.1	62.8	21.2	20.6	21.2	134.0	137.7	137.3	409.0	62.3	63.9	67.4	128.0	140.6
TOTAL	61.3	63.6	63.4	188.3	63.6	61.8	63.5	402.0	413.0	412.0	1227.0	186.9	191.8	202.1	384.0	421.7

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SECTION 15

TMP DEEP WASH WATER DRAIN TANK

(CS-TMPDCW)

15. CS-TMPDCW

SECTION 15
TMP DEEP WASH WATER DRAIN TANK
(CS-TMPDCW)

Two grab samples were collected on 17 September 1992 and analyzed for volatile organic compounds using Method 18. Table 15.1 summarizes the results which are reported as lb/hr.

An induced flow device was used to generate a known volumetric flow of air across the tank vent because the tank had no measurable flow. Samples were collected in Tedlar bags for analysis. The concentration of each compound in the gas stream and volumetric flow of the induced stream were used to calculate the mass emission rate.

Table 15.2 summarizes the process operating conditions during the testing. Table 12.3 presents the results from the liquid and stock samples analyzed for turpentine.

TABLE 15.1
SUMMARY OF VOC RESULTS

Mill: CHAMPION-SHELDON
Source Code: CS-TMPDCW
FIN: 2000 EPN: E9C

Source: TMP Deep Wash Water Drain Tank
Test Dates: 9/17/92
CIN: -

	MIN	MAX	MEAN
Volumetric Flow Data			
Stack Temperature, °F			
Volumetric Flow Rate, x 10^3 ASCFM			
Process Operating Conditions			
Production Rate, tons/hr.	51.1	51.1	51.1
		MASS RATE (lb/hr)	
Method 18 Data	Run 1	Run 2	Mean
Methanol	0.02	0.02	0.02
Ethanol	<0.01	0.01	0.01
Acetone	<0.01	<0.01	0.01
Dimethyl Sulfide	<0.01	<0.01	0.01
Benzene	<0.01	<0.01	0.01
Ethyl Benzene	<0.01	ND	0.01
Cumene	0.02	ND	0.01
a-Pinene	2.99	1.73	2.36
B-Pinene	2.09	0.97	1.53
3-Carene	0.04	<0.01	0.02
p-Cymene	0.01	<0.01	0.01

TABLE 15.2. SUMMARY OF PRODUCTION RATE DURING TESTING

T M P UPTIME - TONS - ENERGY

DATE	PRI REFINER HOURS #1	#2	#3	TOTAL	SEC REFINER HOURS #1	#2	REJECT	TMP PRI PROD., TONS #1	#2	#3	TOTAL	TMP ENERGY HPD/TON #1	#2	#3	REF	PLANT
09/16/92	13.3	15.6	15.4	44.3	15.6	13.8	15.5	82.0	93.0	92.0	267.0	68.1	66.1	72.9	136.0	152.8
09/17/92	24.0	24.0	24.0	72.0	24.0	24.0	24.0	160.0	160.0	160.0	480.0	59.4	62.9	66.4	125.7	137.0
09/18/92	24.0	24.0	24.0	72.0	24.0	24.0	24.0	160.0	160.0	160.0	480.0	59.4	62.9	62.9	122.2	131.5
AVERAGE	20.4	21.2	21.1	62.8	21.2	20.6	21.2	134.0	137.7	137.3	409.0	62.3	63.9	67.0	128.0	140.6
TOTAL	61.3	63.6	63.4	188.3	63.6	61.8	63.5	402.0	413.0	412.0	1227.0	186.9	191.8	202.1	384.0	421.7

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SECTION 16
CHLORINE SCRUBBER VENT
(CS-BPCSV)

16 CS-BPCSV

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SECTION 16
CHLORINE SCRUBBER VENT
(CS-BPCSV)

The Chlorine Scrubber Vent was tested on two different days for volatile organic compounds by M18 and M25A, and for chloroform (adsorption tube) and hydrogen chloride.

Total Hydrocarbons (M25A)

Figures 16.1 and 16.2 present the THC trends for the test periods on 6/2/92 and 6/3/92. THC emissions were higher on 6/2/92 than on the following day, 6/3/92. This drop in emission reflected a decrease in production, from 20 to 16.7 ADT pulp/hr.

Volatile Organic Compounds (M18)

Table 16.1 summarizes the results for the Method 18 target compounds, and Section 16.1 is a tabulation of the data. TRS was not analyzed. The volumetric flow was measured during sampling with a pitot tube. Only traces of chloroform and methanol were detected by M18.

Miscellaneous Parameters

Table 16.2 summarizes the results of testing for aldehydes, hydrogen chloride, chloroform, and sulfuric acid mists. Section 16.2 tabulates the results for each compound. Chloroform, at 0.15 ppm, correlates well with the M18 results. Hydrogen chloride was present at low levels, 0.2 lb/hr.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 16.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 16.4 includes the process operating data as recorded and provided by mill personnel.

FIGURE 16.1

THC TREND ANALYSIS (6/2/92)

CHLORINE SCRUBBER VENT (CS-BPCSV)

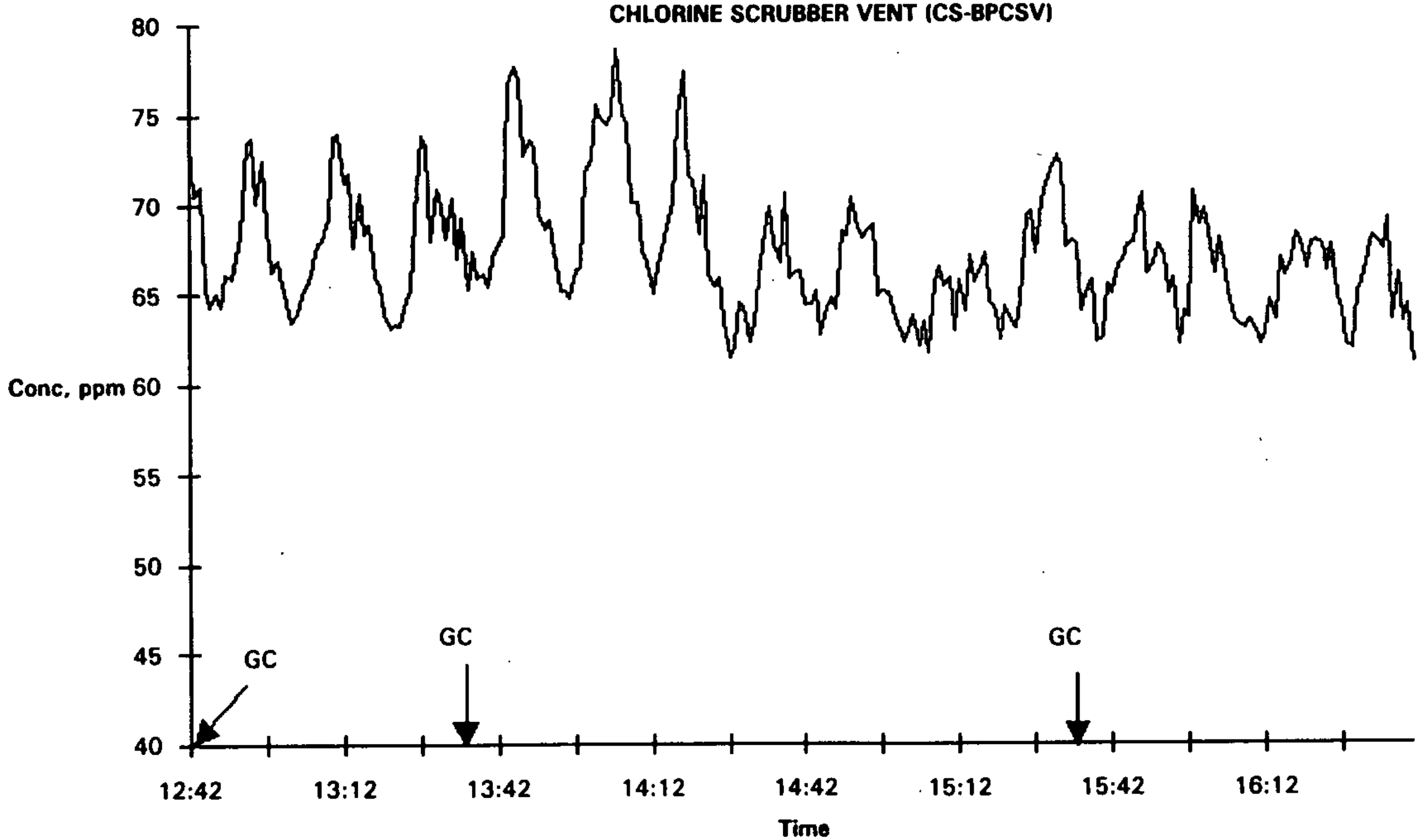

FIGURE 16.2
THC TREND ANALYSIS (6/3/92)
CHLORINE SCRUBBER VENT (CS-BPCSV)

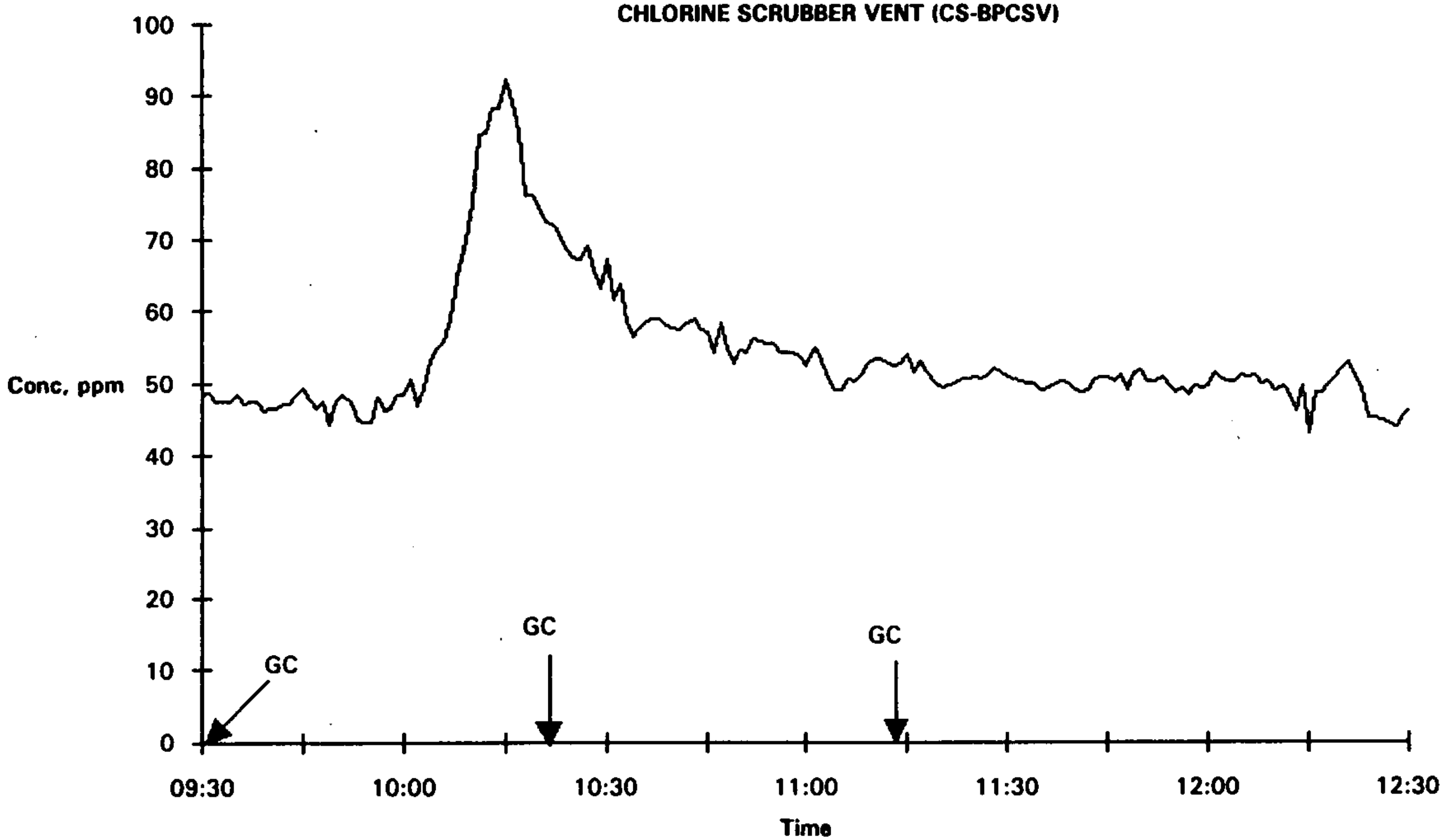

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TABLE 16.1 SUMMARY OF VOC RESULTS

Mill: CHAMPION - SHELDON		Source:	Chlorine Scrubber Vent
Source Code: CS-BPCSV		Test Dates:	6/2/92 6/3/92
FIN: 4500	CIN: EC4	EPN:	FE26A

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	102	105	104	
Volumetric Flow Rate, x10³ DSCFM	2.4	2.5	2.5	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	16.7	20.0	18.4	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	0.5	0.7	0.6	0.1
Ethanol	ND	<0.1	0.1	0.1
Acetone	ND	<0.1	0.1	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	0.1	0.6	0.4	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	<0.1	0.1	0.1
beta-Pinene	ND	<0.1	0.1	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	ND	ND	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	0.2	0.3	0.2	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	0.2	0.4	0.3	0.1

ND=Not Detected
DL=Detection Limit

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TABLE 16.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: CHAMPION-SHELDON
Source Code: CS-BPCSV
FIN: 4500 EPN: FE26A

Source: Chlorine Scrubber Vent
Test Dates: 6/2/92 6/3/92
CIN: EC4

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	102	105	104	
Volumetric Flow Rate, x 10^3 DSCFM	2.4	2.5	2.5	
Process Operating Conditions				
Production Rate, ADT pulp/hr	16.7	16.7	16.7	
Emission Rate, lb/hr				
Chloroform	0.1	0.2	0.2	0.1
Hydrogen chloride	0.2	0.2	0.2	0.1

ND = Not Detected
DL = Detection Limit

Section 16.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON	Source: Chlorine Scrubber Vent		FIN: 4500
Source Code: CS-BPCSV	Date: 6/2/92	EPN: FE26A	CIN: EC4

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1241	1341	1441	
Flow Data				
Stack Temperature, °F			105	105
Moisture Content, %			5.0	5.0
Oxygen Concentration, %			20.8	20.8
Carbon Dioxide Concentration, %			0.0	0.0
Volumetric Flow Rate, x10^3 ACFM			2.8	2.8
Volumetric Flow Rate, x10^3 DSCFM			2.5	2.5
Process Operating Conditions				
Production Rate, ADT pulp/hr	20.0	20.0	20.0	20.0
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	54.0	54.3	55.3	54.6
Emission Rate, lb/hr	0.7	0.7	0.7	0.7
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5	0.6	0.5	0.6
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5	0.5 *	0.4
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON	Source:	Chlorine Scrubber Vent			FIN:	4500
Source Code: CS-BPCSV	Date:	6/2/92	EPN:	FE26A	CIN:	EC4

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	13.6	5.2	12.9	10.5
Emission Rate, lb/hr	0.6	0.2	0.6	0.5
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.7	0.5 *	0.5 *	0.4
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.6	0.5 *	0.5 *	0.4
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Chlorine Scrubber Vent | FIN: 4500
Source Code: CS-BPCSV | Date: 6/2/92 | EPN: FE26A | CIN: EC4

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	74.6	47.2	63.8	61.9
Unknowns as Carbon				
Concentration, ppmvd	4.8	7.3	5.6	5.9
Sum M18 as Carbon, lb/hr	0.4	0.3	0.3	0.3
Unknown Compounds % of Total	6.1%	13.3%	8.0%	9.2%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	71.6	72.6	69.5	71.2
Emission Rate, lb/hr as C	0.3	0.3	0.3	0.3

COMMENTS :

M18 run 3 for 6/3/92 was rejected due to double injection.

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON		Source:	Chlorine Scrubber Vent		FIN:	4500
Source Code:	CS-BPCSV	Date:	6/3/92	EPN: FE26A	CIN:	EC4

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	929	1029	1129	
Flow Data				
Stack Temperature, °F	102			102
Moisture Content, %	5.0			5.0
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	2.7			2.7
Volumetric Flow Rate, x10^3 DSCFM	2.4			2.4
Process Operating Conditions				
Production Rate, ADT pulp/hr	16.7	16.7	16.7	16.7
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	38.8	40.6		39.7
Emission Rate, lb/hr	0.5	0.5		0.5
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.6		0.4
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
2-Propanol				
Concentration, ppmvd	0.5 •	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON	Source:	Chlorine Scrubber Vent		FIN:	4500
Source Code: CS-BPCSV	Date:	6/3/92	EPN: FE26A	CIN:	EC4

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Chloroform				
Concentration, ppmvd	2.6	14.8		8.7
Emission Rate, lb/hr	0.1	0.6		0.4
Benzene				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *		1.1 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
alpha-Pinene				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Chlorine Scrubber Vent | FIN: 4500
Source Code: CS-BPCSV | Date: 6/3/92 | EPN: FE26A | CIN: EC4

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Knowns as Carbon				
Concentration, ppmvd	35.5	45.6		40.5
Unknowns as Carbon				
Concentration, ppmvd	3.9	9.5		6.7
Sum M18 as Carbon, lb/hr	0.2	0.2		0.2
Unknown Compounds % of Total	9.9%	17.2%		13.6%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	61.1	56.8	51.6	56.5
Emission Rate, lb/hr as C	0.3	0.3	0.2	0.2

COMMENTS :

M18 run 3 for 6/3/92 was rejected due to double injection.

* One or more values were less than the detection limit.

Section 16.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - SHELDON	Source:	Chlorine Scrubber Vent		FIN:	4500
Source Code: CS-BPCSV	Date:	6/2/92	EPN: FE26A	CIN:	EC4

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1545			
Flow Data				
Stack Temperature, °F	105			105
Moisture Content, %	5.0			5.0
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	2.8			2.8
Volumetric Flow Rate, x10^3 DSCFM	2.5			2.5
Process Operating Conditions				
Production Rate, ADT pulp/hr	16.7			16.7
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	4.0			4.0
Emission Rate, lb/hr	0.2			0.2
Hydrogen chloride				
Concentration, ppmvd	12.5			12.5
Emission Rate, lb/hr	0.2			0.2

• One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - SHELDON | Source: Chlorine Scrubber Vent | FIN: 4500
Source Code: CS-BPCSV | Date: 6/3/92 | EPN: FE26A | CIN: EC4

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1105			
Flow Data				
Stack Temperature, °F	102			102
Moisture Content, %	5.0			5.0
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	2.7			2.7
Volumetric Flow Rate, x10^3 DSCFM	2.4			2.4
Process Operating Conditions				
Production Rate, ADT pulp/hr	16.7			16.7
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	2.3			2.3
Emission Rate, lb/hr	0.1			0.1
Hydrogen chloride				
Concentration, ppmvd	16.1			16.1
Emission Rate, lb/hr	0.2			0.2

• One or more values were less than the detection limit.

Section 16.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

SOURCE CS-BPCSV

QUALITY CONTROL SUMMARY
METHOD 25A

1. CALIBRATION

THEOR	6/2/92		6/3/92	
ppm	ppm	%ERR	ppm	%ERR
0.0	0.0	0.0	0.0	0.0
36.0	36.0	0.0	35.0	-0.7
91.0	89.0	-1.5	89.0	-1.5
150.0	150.0	0.0	150.0	0.0
CORR COEFF	0.9999		0.9999	

2. PROPANE LINE RECOVERY

	DATE 6/2/92			DATE 6/3/92		
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	154.0	154.0	100.0%	150.0	148.0	98.7%
AFTER	150.0	148.0	98.7%	*		

3. LINE BLANK

	6/2/92	6/3/92
	ppm	ppm
BEFORE	1.0	2.0
AFTER	2.0	*

* Not performed

SOURCE CS-BPCSV

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR	DATE	6/2/92	DATE	6/3/92
	ppm	ppm	%REC	ppm	%REC
ethanol	52.0	49.1	94.4%	45.5	87.4%
acetone	41.6	33.7	81.2%	37.3	89.8%
isopropanol	39.9	43.0	108.0%	33.1	83.1%
dimethyl sulfide	9.1	9.0	98.9%	9.1	100.0%
benzene	34.2	33.7	98.6%	34.2	100.1%
bromodichloromethane	18.8	18.1	96.3%	18.1	96.3%
dimethyl disulfide	33.9	31.2	92.1%	31.2	92.1%
toluene	28.7	26.7	93.1%	27.8	96.8%
ethyl benzene	24.9	21.5	86.3%	24.1	96.6%
m-xylene	49.8	43.8	88.0%	48.0	96.4%
o-xylene	25.0	21.8	87.0%	23.9	95.5%
cumene	21.9	17.5	79.9%	21.0	95.8%
alpha-pinene	19.2	17.5	91.3%	18.4	96.0%
beta-pinene	19.2	16.7	86.7%	18.2	94.5%
3-carene	19.3	14.2	73.5%	17.4	90.4%
p-cymene	19.6	13.0	66.4%	17.7	90.6%

2. PROPANE RESPONSE

	THEOR		%REC		%REC
BEFORE	36.0	37.7	104.7%	37.5	104.2%
AFTER	36.0	37.5	104.2%	37.7	104.7%

3. METHANOL LINE RECOVERY

	6/2/92			6/3/92		
	GC	LINE	%REC	GC	LINE	%REC
BEFORE	9.9	10.2	103.0%	9.6	10.9	113.5%
AFTER	9.6	10.9	113.5%	10.3	10.6	102.9%

4. LINE BLANK

	[-------------FILE REF-------------]	
BEFORE	F2A2005	F2A2012
AFTER	F2A2012	*

* Not performed

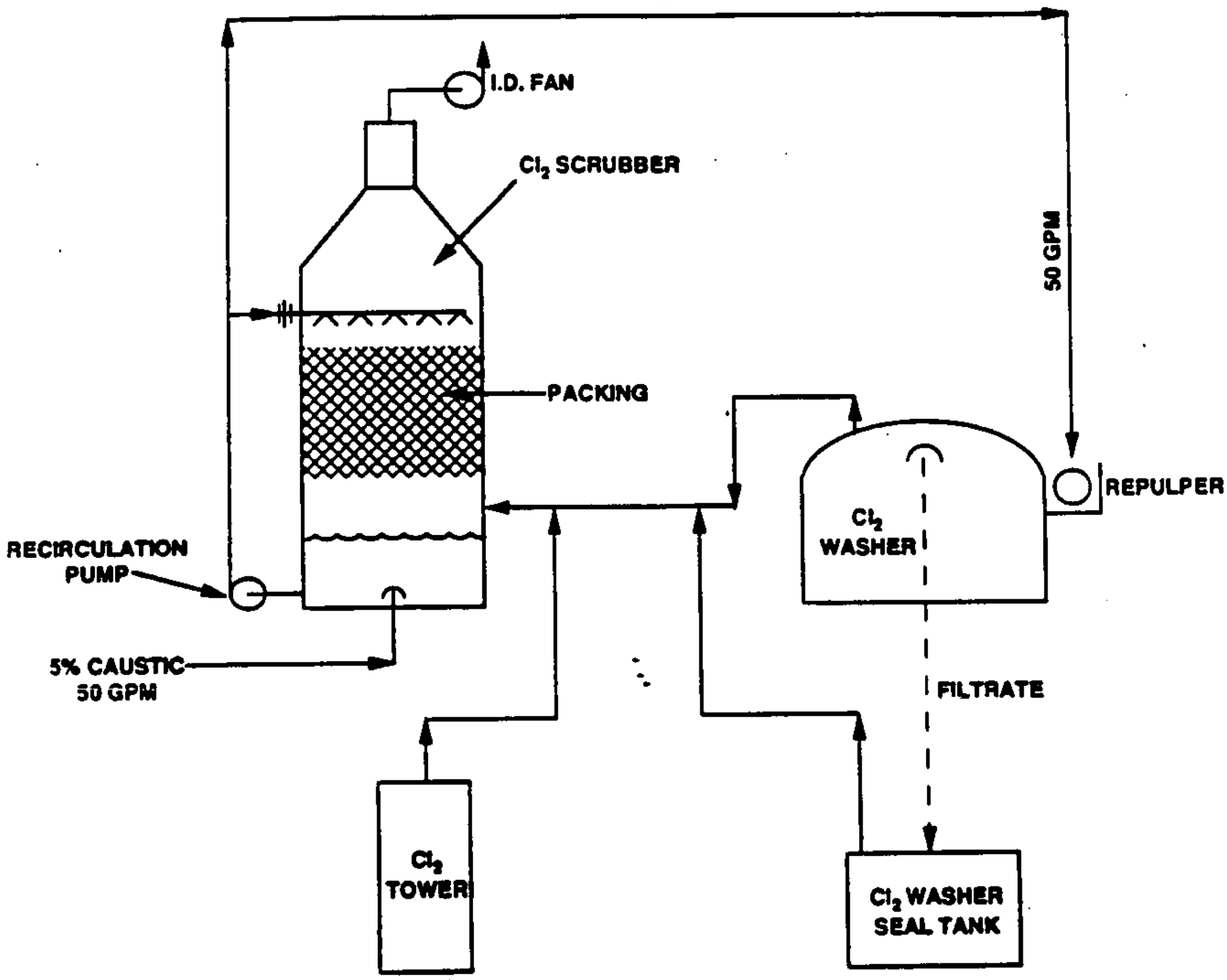
Section 16.4 Process Operating Data

BLEACH PLANT SCRUBBER

At this facility, vent gases from the chlorine stage tower, washer hood and seal tank are collected and transported to a scrubber system for removing Cl_2.

Figure 1 is a schematic of the Cl_2 scrubber system. The gases pass through a countercurrent flow packed tower. The packed tower has a diameter of 4 ft and is 13 ft tall. The tower contains 2 ft of Kimre model 37/47 kynar packing and a mist eliminator consisting of six layers of 16/96 Kimre kynar. Scrubbing solution is sprayed on the packing through spray nozzles located above the wetted packing. The scrubbing solution used in this stage is 5 % caustic. The design makeup flow rate is 50 gpm. The gases leaving this scrubber are vented to the atmosphere through a short stack. The design gas flow rate through this system is 6,300 ACFM at 140°F.

FIGURE 1 BLEACH PLANT SCRUBBING SYSTEM



Representative Process Conditions

Scrubbing medium
(white liquor, weak wash, caustic, etc.) : 5 %caustic
Gas flow rate : 2,500 SCFM
Scrubbing solution recirculation rate : N/A

BLEACH PLANT DIAGRAMS AND PROCESS INFORMATION

A. Bleaching Practice

The mill has one bleach line with C,E,H sequences which produce 400 ton/day bleached kraft softwood pulp to a final G.E. brightness of 68 %. During the trials the bleach plant operated at a rate of 16-17 tons/hour. Figure 2 is a diagram of the bleaching process. Tables 2 and 3 show the bleaching conditions for the bleach plant during the trial. The kappa number of the brownstock ranged from 25 to 30 during the test with an average of 29.

TABLE 2 TYPICAL BLEACHING CONDITIONS

	C	E	H
Consistency, percent	3.2	10	10
Temperature, °F	105	115	115
Time, minutes	30	60	90
Chlorine, lb/ton odbs	115	0	0
Hypochlorite as Cl_2 lb/ton	0	0	44
Caustic, lb/ton	0	90	0
Peroxide, lb/ton	0	0	0
Chlorine dioxide	0	0	0
Residual chlorine, lb/ton	N/A	N/A	N/A
Vat pH	1.6	10.7	9
K number	N/A	4.5	N/A
G.E. Brightness	N/A	N/A	68

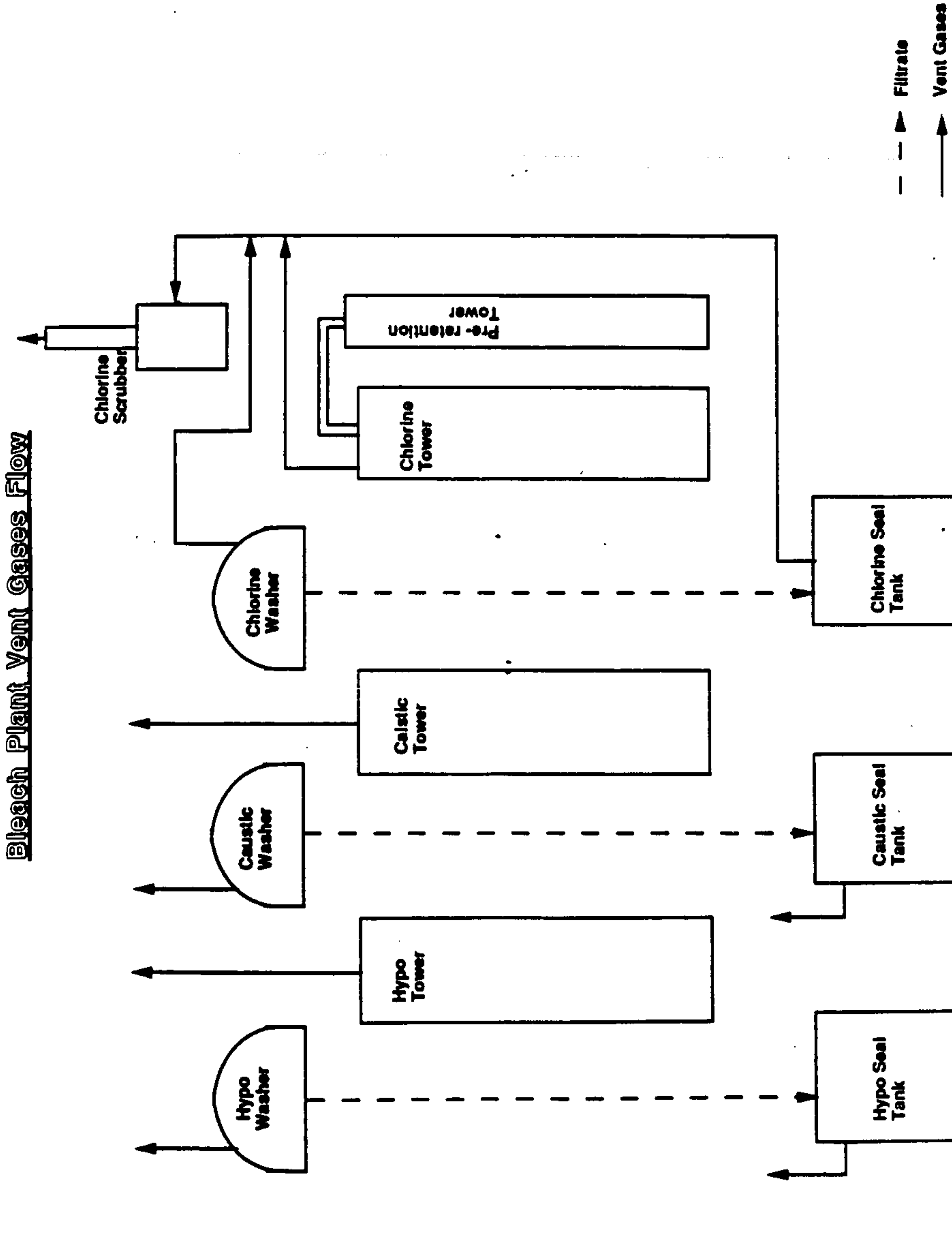
B. Water Reuse - Fresh water is used on the chlorine stage, hypo filtrate and fresh water on the extraction stage and white water on the hypo stage.

C. Bleach Plant Venting - Chlorine stage vents are combined into a single duct for treatment in a scrubber. Vents not collected into the combined vent are individually vented. Figure 2 shows the location of various vents.

Representative Process Conditions

Bleaching sequence : CEH
Wood species : Southern pine
Production rate : 400
Kappa number : 29
Chemical usage : Cl_2, NaOH and NaOCl
Percent ClO_2 substitution : 0
Tower temperatures and retention times : Refer to previous table
CE kappa number : N/A

FIGURE 2


Bleach Plant Vent Gases Flow
Filtrate
Vent Gases
Chlorine Scrubber
Pre-retention Tower
Chlorine Tower
Chlorine Washer
Chlorine Seal Tank
Calstic Tower
Caustic Washer
Caustic Seal Tank
Hypo Tower
Hypo Washer
Hypo Seal Tank

BLEACH PLANTS - PROCESS OPERATING CONDITIONS

Source: Bleach Plant
FIN: 4500

Source: Chlorine Scrubber
Date: 6-02-92
EPN: FE26A
CIN: EC4

INPUT DATA	Units	Run 1	Run 2	Run 3
Beginning Time		12:30	13:30	15:30
Bleaching Sequence		CEH	CEH	CEH
Wood Species		SOFTWOOD	SOFTWOOD	SOFTWOOD
Production Rate		480	480	400
kappa no. ent Bleaching		18.4	18.4	16.6
Tower pH		1.7	1.8	1.8
CE kappa no		5.1	5.0	5.0
C/O2 Substitution	%	0	0	0
Chemical Usage				
Chlorine	lb/ton	91	91	90
Chlorine Dioxide	lb/ton	---	---	---
Sodium Hydroxide	lb/ton	82	81	79
Sodium Hypochlorite	lb/ton	42	42	42
Oxygen	lb/ton	---	---	---
Tower Temperatures				
	degree F	107	107	108
	degree F	---	---	---
	degree F	156	155	156
	degree F	113	113	113
	degree F	---	---	---
Retention Times				
	min	22	22	22
	min	---	---	---
	min	106	106	106
	min	37	37	37
	min	---	---	---
Scrubber Data				
Type		PACKED TOWER	PACKED TOWER	PACKED TOWE
Scrubbing Media		5% CAUSTIC	5% CAUSTIC	5% CAUSTIC
Gas Flow Rate	ACFM			
Liquid Flow Rate	GPM	40	40	40
Pressure Drop	in. H2O	---	---	---

BLEACH PLANTS - PROCESS OPERATING CONDITIONS

Source: Bleach Plant
FIN: 4500

Source: Chlorine Scrubber
Date: 6-03-92
EPN: FE26A
CIN: EC4

INPUT DATA	Units	Run 1	Run 2	Run 3
Beginning Time		21:23	22:18	23:14
Bleaching Sequence		CEH	CEH	CEH
Wood Species		SOFTWOOD	SOFTWOOD	SOFTWOOD
Production Rate		400	400	400
kappa no. ent Bleaching		21.1	21.1	22.7
Tower pH		1.6	1.6	1.6
CE kappa no		4.1	4.1	4.[illegible]
C/O2 Substitution	%	0	0	0
Chemical Usage				
Chlorine	lb/ton	85	91	91
Chlorine Dioxide	lb/ton	---	---	---
Sodium Hydroxide	lb/ton	82	81	84
Sodium Hypochlorite	lb/ton	42	42	42
Oxygen	lb/ton	---	---	---
Tower Temperatures				
	degree F	101	100	101
	degree F	---	---	---
	degree F	143	151	154
	degree F	110	110	110
	degree F	---	---	---
Retention Times				
	min	27	27	27
	min	---	---	---
	min	127	127	127
	min	42	42	42
	min	---	---	---
Scrubber Data				
Type		PACKED TOWER	PACKED TOWER	PACKED TOWER
Scrubbing Media		5% CAUSTIC	5% CAUSTIC	5% CAUSTIC
Gas Flow Rate	ACFM			
Liquid Flow Rate	GPM	40	40	40
Pressure Drop	in. H2O	---	---	---

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SECTION 17
CAUSTIC WASHER HOOD VENT
(CS-BPCWV)

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SECTION 17
CAUSTIC WASHER HOOD VENT
(CS-BPCWV)

The Caustic Washer Hood Vent was tested on two different days for volatile organic compounds by M25A and M18.

Total Hydrocarbons (M25A)

Figures 17.1 and 17.2 present the THC trends for the test periods on 5/19/92 and 5/21/92. THC data for the two days are comparable, ranging from 20-30 ppm.

Volatile Organic Compounds (M18)

Table 17.1 summarizes the results for Method 18 target compounds, and Section 17.1 is a tabulation of the data. TRS was not analyzed. The volumetric flow was measured during sampling with a pitot tube. Only methanol and chloroform were present in all GC analyses. A trace amount of a-Pinene was detected in one of the five analyses.

Miscellaneous Parameters

Table 17.2 summarizes the results of testing for aldehydes, hydrogen chloride, chloroform, and sulfuric acid mists. Section 17.2 tabulates the results for each compound.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 17.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 17.4 includes the process operating data as recorded and provided by mill personnel. Not all process operating data were given for miscellaneous parameters. The data with the closest run time was used.

FIGURE 17.1

THC TREND ANALYSIS (5/19/92)

CAUSTIC WASHER HOOD VENT (CS-BPCWV)

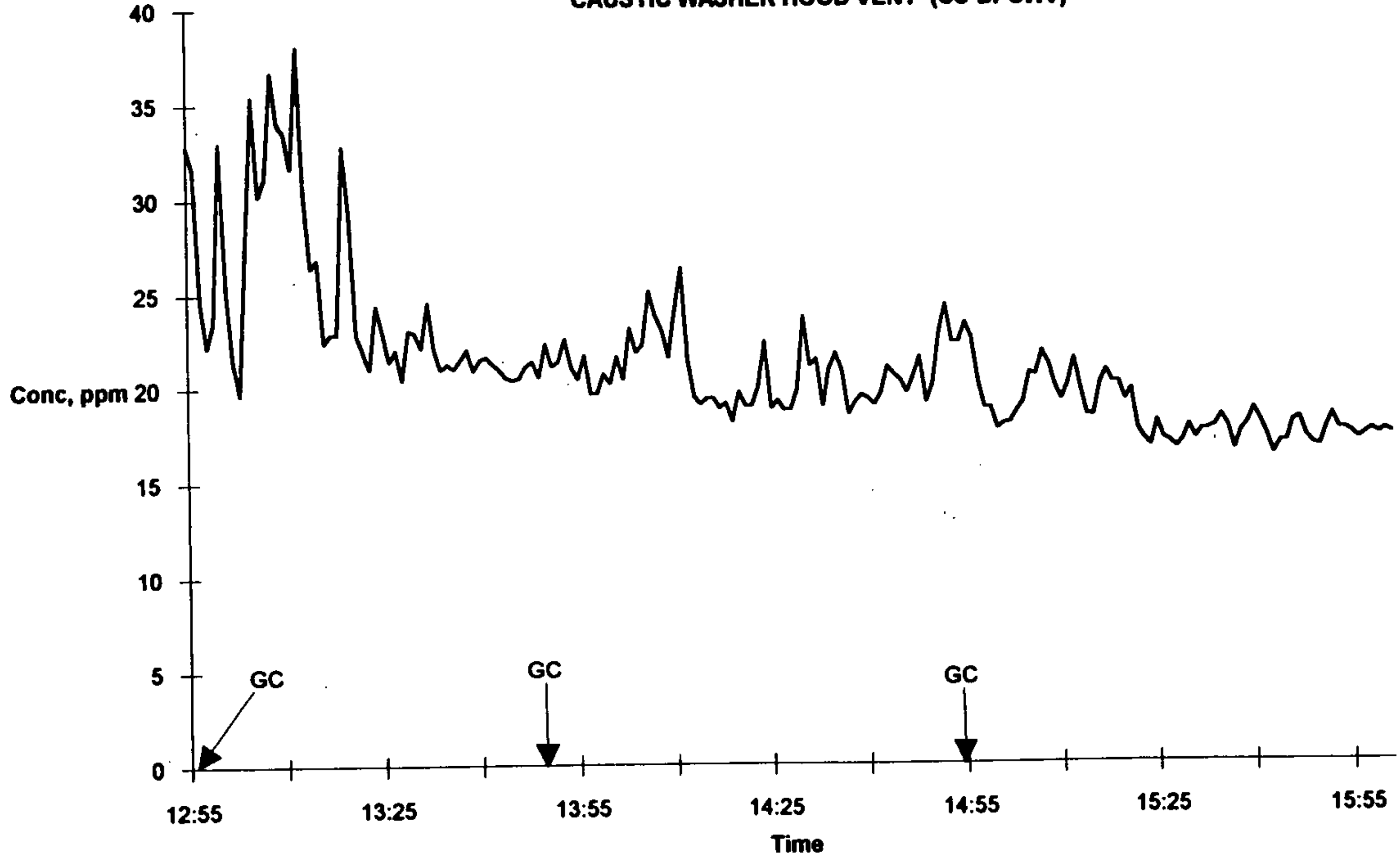

FIGURE 17.2
THC TREND ANALYSIS (5/21/92)
CAUSTIC WASHER HOOD VENT (CS-BPCWV)

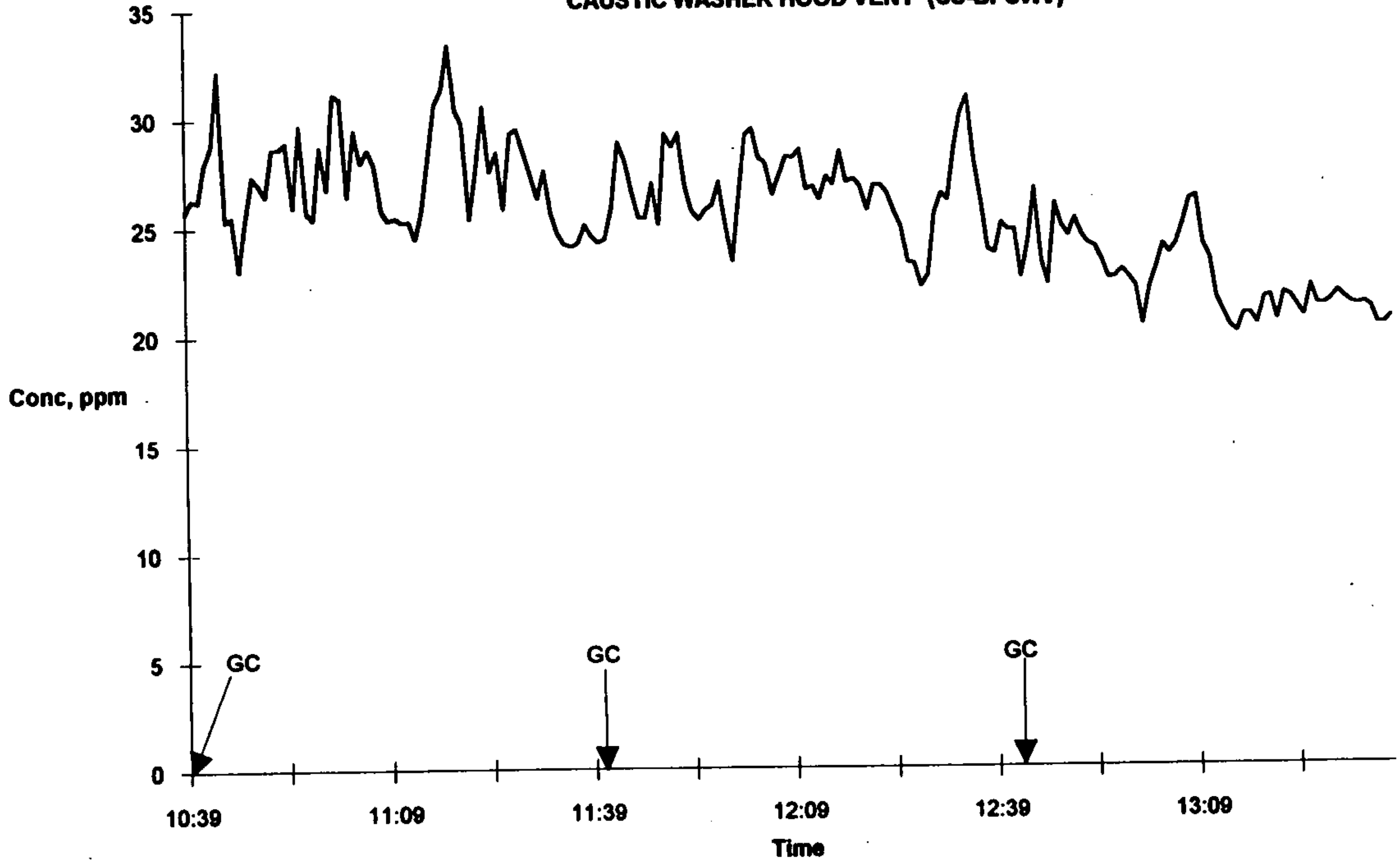

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TABLE 17.1 SUMMARY OF VOC RESULTS

Mill: CHAMPION - SHELDON
Source Code: CS-BPCWV
FIN: 4500 CIN:

Source: Caustic Washer Hood Vent
Test Dates: 5/19/92 5/21/92
EPN: E26B

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	95	98	97	
Volumetric Flow Rate, $x10^3$ DSCFM	3.2	3.7	3.5	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	14.2	17.7	16.0	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	0.1	0.2	0.2	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	0.4	0.5	0.5	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	0.1	0.1	0.1
beta-Pinene	ND	<0.1	0.1	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	ND	ND	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	0.1	0.2	0.2	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	<0.1	0.2	0.2	0.1

ND=Not Detected
DL=Detection Limit

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TABLE 17.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: CHAMPION-SHELDON
Source Code: CS-BPCWV
FIN: 4500 EPN: E26B

Source: Caustic Washer Hood Vent
Test Dates: 5/19/92 5/21/92
CIN:

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	95	98	97	
Volumetric Flow Rate, x 10^3 DSCFM	3.2	3.7	3.5	
Process Operating Conditions				
Production Rate, ADT pulp/hr	14.2	17.7	16.0	
Emission Rate, lb/hr				
Chloroform	0.7	0.7	0.7	0.1
Hydrogen chloride	ND	ND	ND	0.1

ND = Not Detected
DL = Detection Limit

Section 17.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON	Source: Caustic Washer Hood Vent		FIN: 4500
Source Code: CS-BPCWV	Date: 5/19/92	EPN: E26B	CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1254	1333	1433	
Flow Data				
Stack Temperature, °F			98	98
Moisture Content, %			4.8	4.8
Oxygen Concentration, %			20.8	20.8
Carbon Dioxide Concentration, %			0.0	0.0
Volumetric Flow Rate, x10^3 ACFM			4.1	4.1
Volumetric Flow Rate, x10^3 DSCFM			3.7	3.7
Process Operating Conditions				
Production Rate, ADT pulp/hr	17.7	17.7	17.7	17.7
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	7.0	9.2	9.2	8.5
Emission Rate, lb/hr	0.1	0.2	0.2	0.2
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Caustic Washer Hood Vent | FIN: 4500
Source Code: CS-BPCWV | Date: 5/19/92 | EPN: E26B | CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	6.5	7.4	6.4	6.8
Emission Rate, lb/hr	0.4	0.5	0.4	0.5
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.1 *	1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	1.4	0.5 *	0.5 *	0.6
Emission Rate, lb/hr	0.1	0.1 *	0.1 *	0.1
beta-Pinene				
Concentration, ppmvd	0.6	0.5 *	0.5 *	0.4
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON	Source:	Caustic Washer Hood Veht		FIN:	4500
Source Code: CS-BPCWV	Date:	5/19/92	EPN: E26B	CIN:	-

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	29.0	16.3	14.5	19.9
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.2	0.1	0.1 *	0.1
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	28.4	22.1	21.0	23.8
Emission Rate, lb/hr as C	0.2	0.2	0.1	0.2

COMMENTS :

M18 run 1 for 5/21/92 was rejected due to double injection.

17.1 - 3

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Caustic Washer Hood Vent | FIN: 4500
Source Code: CS-BPCWV | Date: 5/21/92 | EPN: E26B | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1038	1138	1238	
Flow Data				
Stack Temperature, °F	95			95
Moisture Content, %	5.5			5.5
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	3.5			3.5
Volumetric Flow Rate, x10^3 DSCFM	3.2			3.2
Process Operating Conditions				
Production Rate, ADT pulp/hr	14.2	14.2	14.2	14.2
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd		10.2	7.4	8.8
Emission Rate, lb/hr		0.2	0.1	0.1
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON		Source:	Caustic Washer Hood Vent	FIN:	4500
Source Code:	CS-BPCWV	Date:	5/21/92 EPN: E26B	CIN:	-

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd		7.9	8.7	8.3
Emission Rate, lb/hr		0.5	0.5	0.5
Benzene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd		1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd		0.8	0.5	0.7
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd		0.6	0.5 *	0.4
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Caustic Washer Hood Vent | FIN: 4500
Source Code: CS-BPCWV | Date: 5/21/92 | EPN: E26B | CIN: -

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd		30.2	25.2	27.7
Unknowns as Carbon				
Concentration, ppmvd		0.0	0.0	0.0
Sum M18 as Carbon, lb/hr		0.2	0.2	0.2
Unknown Compounds % of Total		0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	28.6	28.6	24.3	27.2
Emission Rate, lb/hr as C	0.2	0.2	0.1	0.2

COMMENTS :

M18 run 1 for 5/21/92 was rejected due to double injection.

* One or more values were less than the detection limit.

Section 17.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - SHELDON	Source:	Caustic Washer Hood Vent		FIN:	4500
Source Code: CS-BPCWV	Date:	5/19/92	EPN: E26B	CIN:	-

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	2010			
Flow Data				
Stack Temperature, °F	98			98
Moisture Content, %	4.8			4.8
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	4.1			4.1
Volumetric Flow Rate, x10^3 DSCFM	3.7			3.7
Process Operating Conditions				
Production Rate, ADT pulp/hr	17.7			17.7
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd				
Emission Rate, lb/hr				
Hydrogen chloride				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - SHELDON | Source: Caustic Washer Hood Vent | FIN: 4500
Source Code: CS-BPCWV | Date: 5/21/92 | EPN: E26B | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1141			
Flow Data				
Stack Temperature, °F	95			95
Moisture Content, %	5.5			5.5
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	3.5			3.5
Volumetric Flow Rate, x10^3 DSCFM	3.2			3.2
Process Operating Conditions				
Production Rate, ADT pulp/hr	14.2			14.2
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	11.6			11.6
Emission Rate, lb/hr	0.7			0.7
Hydrogen chloride				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

Section 17.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

SOURCE CS-BPCWV

QUALITY CONTROL SUMMARY
METHOD 25A

1. CALIBRATION

THEOR	5/19/92		5/21/92	
ppm	ppm	%ERR	ppm	%ERR
0.0	0.0	0.0	1.0	0.7
36.0	36.0	0.0	35.0	-0.7
91.0	89.0	-1.5	88.0	-2.0
150.0	151.0	0.7	151.0	0.7
CORR COEFF	0.9998		0.9997	

2. PROPANE LINE RECOVERY

	DATE	5/19/92		DATE	5/21/92	
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	150.0	150.0	100.0%	154.0	151.0	98.1%
AFTER	149.0	134.0	89.9%	142.0	152.0	107.0%

3. LINE BLANK

	5/19/92	5/21/92
	ppm	ppm
BEFORE	*	*
AFTER	*	*

* Not performed

SOURCE CS-BPCWV

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR ppm	DATE 5/19/92 ppm	%REC	DATE 5/21/92 ppm	%REC
ethanol	52.0	44.5	85.5%	45.7	87.8%
acetone	41.6	34.8	83.7%	40.6	97.7%
isopropanol	39.9	39.4	98.8%	39.0	97.9%
dimethyl sulfide	9.1	8.8	96.7%	9.0	98.9%
benzene	34.2	32.7	95.9%	33.3	97.6%
bromodichloromethane	18.8	18.1	96.3%	18.6	98.9%
dimethyl disulfide	33.9	33.1	97.8%	33.4	98.5%
toluene	28.7	28.0	97.5%	29.4	102.2%
ethyl benzene	24.9	24.8	99.6%	24.8	99.5%
m-xylene	49.8	50.6	101.6%	49.0	98.4%
o-xylene	25.0	24.7	98.6%	27.0	107.8%
cumene	21.9	21.4	97.3%	22.0	100.1%
alpha-pinene	19.2	18.8	98.0%	19.8	103.4%
beta-pinene	19.2	18.6	96.5%	19.6	101.7%
3-carene	19.3	17.8	92.2%	19.7	102.4%
p-cymene	19.6	18.0	91.9%	20.0	102.2%

2. PROPANE RESPONSE

	THEOR		%REC		%REC
BEFORE	36.0	39.6	110.0%	39.8	110.6%
AFTER	36.0	35.7	99.2%	39.5	109.7%

3. METHANOL LINE RECOVERY

	5/19/92 GC	LINE	%REC	5/21/92 GC	LINE	%REC
BEFORE	9.4	9.2	97.9%	9.7	9.2	94.8%
AFTER	9.3	9.0	96.8%	12.6	11.2	88.7%

4. LINE BLANK

	[--------------FILE REF--------------]	
BEFORE	*	ELB2005
AFTER	EJB2020	ELB2010

* Not performed

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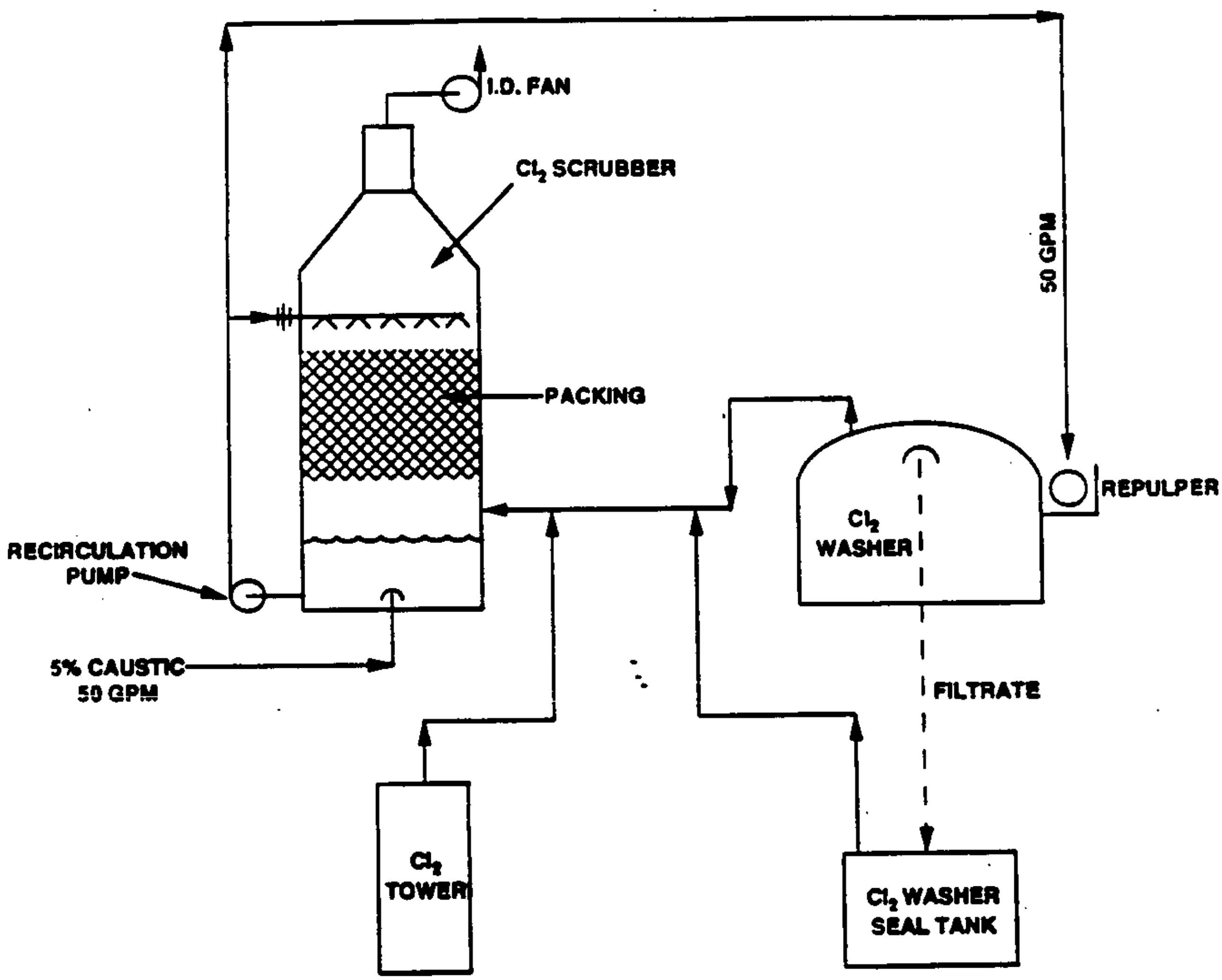
Section 17.4 Process Operating Data

BLEACH PLANT SCRUBBER

At this facility, vent gases from the chlorine stage tower, washer hood and seal tank are collected and transported to a scrubber system for removing Cl_2.

Figure 1 is a schematic of the Cl_2 scrubber system. The gases pass through a countercurrent flow packed tower. The packed tower has a diameter of 4 ft and is 13 ft tall. The tower contains 2 ft of Kimre model 37/47 kynar packing and a mist eliminator consisting of six layers of 16/96 Kimre kynar. Scrubbing solution is sprayed on the packing through spray nozzles located above the wetted packing. The scrubbing solution used in this stage is 5 % caustic. The design makeup flow rate is 50 gpm. The gases leaving this scrubber are vented to the atmosphere through a short stack. The design gas flow rate through this system is 6,300 ACFM at 140°F.

FIGURE 1 BLEACH PLANT SCRUBBING SYSTEM



Representative Process Conditions

Scrubbing medium
(white liquor, weak wash, caustic, etc.) : 5 %caustic
Gas flow rate : 2,500 SCFM
Scrubbing solution recirculation rate : N/A

BLEACH PLANT DIAGRAMS AND PROCESS INFORMATION

A. Bleaching Practice

The mill has one bleach line with C,E,H sequences which produce 400 ton/day bleached kraft softwood pulp to a final G.E. brightness of 68 %. During the trials the bleach plant operated at a rate of 16-17 tons/hour. Figure 2 is a diagram of the bleaching process. Tables 2 and 3 show the bleaching conditions for the bleach plant during the trial. The kappa number of the brownstock ranged from 25 to 30 during the test with an average of 29.

TABLE 2 TYPICAL BLEACHING CONDITIONS

	C	E	H
Consistency, percent	3.2	10	10
Temperature, °F	105	115	115
Time, minutes	30	60	90
Chlorine, lb/ton odbs	115	0	0
Hypochlorite as Cl_2 lb/ton	0	0	44
Caustic, lb/ton	0	90	0
Peroxide, lb/ton	0	0	0
Chlorine dioxide	0	0	0
Residual chlorine, lb/ton	N/A	N/A	N/A
Vat pH	1.6	10.7	9
K number	N/A	4.5	N/A
G.E. Brightness	N/A	N/A	68

B. Water Reuse - Fresh water is used on the chlorine stage, hypo filtrate and fresh water on the extraction stage and white water on the hypo stage.

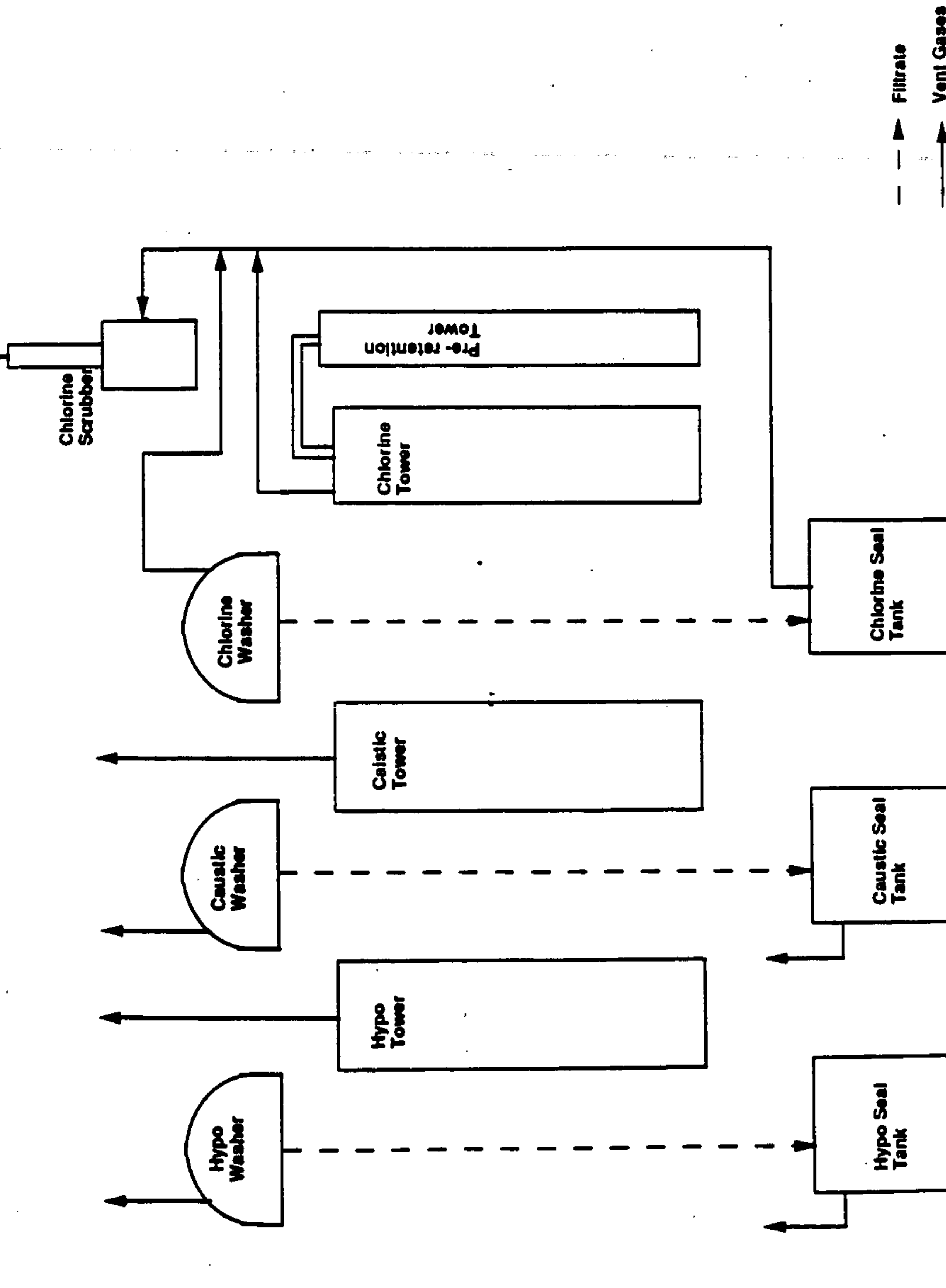
C. Bleach Plant Venting - Chlorine stage vents are combined into a single duct for treatment in a scrubber. Vents not collected into the combined vent are individually vented. Figure 2 shows the location of various vents.

Representative Process Conditions

Bleaching sequence : CEH
Wood species : Southern pine
Production rate : 400
Kappa number : 29
Chemical usage : Cl_2, NaOH and NaOCl
Percent ClO_2 substitution : 0
Tower temperatures and retention times : Refer to previous table
CE kappa number : N/A

FIGURE 2

Bleach Plant Vent Gases Flow



BLEACH PLANTS - PROCESS OPERATING CONDITIONS

Mill: Champion-Sheldon
Source: Bleach Plant
FIN: 4500

Source: Caustic Washer Hood Vent
Date: 5-19-92
EPN: E26B CIN:

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		12:46	13:49	14:54	
Bleaching Sequence		CEH	CEH	CEH	0.00
Wood Species		SOFTWOOD	SOFTWOOD	SOFTWOOD	0.00
Production Rate		425	425	425	0.00
kappa no. ent Bleaching		21.6	22.5	22.5	0.00
Tower pH		8.1	7.7	8.7	0.00
CE kappa no		6.0	6.0	5.6	0.00
C/O2 Substitution	%	0	0	0	0.00
					0.00
Chemical Usage					
Chlorine	lb/ton	133	117	103	0.00
Chlorine Dioxide	lb/ton	---	---	---	0.00
Sodium Hydroxide	lb/ton	125	137	137	0.00
Sodium Hypochlorite	lb/ton	42	42	42	
Oxygen	lb/ton	---	---	---	0.00
Tower Temperatures					
	degree F	102	103	105	
	degree F	---	---	---	
	degree F	154	152	154	
	degree F	114	118	119	0.00
	degree F	---	---	---	0.00
Retention Times					
	min	25	25	25	0.00
	min	---	---	---	0.00
	min	120	120	120	0.00
	min	40	40	40	
	min	---	---	---	0.00
Scrubber Data					
Type					0.00
Scrubbing Media					0.00
Gas Flow Rate	ACFM				0.00
Liquid Flow Rate	GPM				0.00
Pressure Drop	in. H2O				

BLEACH PLANTS - PROCESS OPERATING CONDITIONS

Mill: Champion-Sheldon
Source: Bleach Plant
FIN: 4500

Source: Caustic Washer Hood Vent
Date: 5-21-92
EPN: E26B CIN:

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		10:34	11:40	12:43	
Bleaching Sequence		CEH	CEH	CEH	0.00
Wood Species		SOFTWOOD	SOFTWOOD	SOFTWOOD	0.00
Production Rate		340	340	340	0.00
kappa no. ent Bleaching		19.9	19.9	19.0	0.00
Tower pH		10.8	10.8	10.8	0.00
CE kappa no		5.5	5.7	5.7	0.00
C/O2 Substitution	%	0	0	0	0.00
					0.00
Chemical Usage					
Chlorine	lb/ton	100	107	97	0.00
Chlorine Dioxide	lb/ton	---	---	---	0.00
Sodium Hydroxide	lb/ton	105	102	100	0.00
Sodium Hypochlorite	lb/ton	42	42	42	
Oxygen	lb/ton	---	---	---	0.00
Tower Temperatures					
	degree F	108	109	107	
	degree F	---	---	---	
	degree F	154	156	154	
	degree F	116	116	116	0.00
	degree F	---	---	---	0.00
Retention Times					
	min	32	32	32	0.00
	min	---	---	---	0.00
	min	152	152	152	0.00
	min	51	51	51	
	min	---	---	---	0.00
Scrubber Data					
Type					0.00
Scrubbing Media					0.00
Gas Flow Rate	ACFM				0.00
Liquid Flow Rate	GPM				0.00
Pressure Drop	in. H2O				

SECTION 18

CAUSTIC FILTRATE SEAL TANK VENT

(CS-BPCSTV)

18. CS-BPCSTV

SECTION 18
CAUSTIC FILTRATE SEAL TANK VENT
(CS-BPCSTV)

The Caustic Filtrate Seal Tank Vent was tested on two different days for volatile organic compounds by M25A and M18; chloroform and hydrogen chloride were sampled on only one day.

Total Hydrocarbons (M25A)

Figures 18.1 and 18.2 present the THC trends for the test periods on 6/3/92 and 6/4/92. The production rate for day 1 was 88% of day 2. The emissions reflect this production difference. On 6/3/92, emissions decreased from 80 to 65 ppm over the sampling period. On 6/4/92, emissions increased from 110 to 150 ppm.

Volatile Organic Compounds (M18)

Table 18.1 summarizes the results for Method 18 target compounds, and Section 18.1 is a tabulation of the data. TRS was not analyzed. The volumetric flow was measured during sampling with a pitot tube. Only methanol and chloroform were detected at levels greater than 0.1 lb/hr. A number of other target compounds were detected, but less than 0.1 lb/hr. An unknown was present before and after dimethyl sulfide, ~1.5 ppm as carbon and ~0.4 to 4.0 ppm as carbon, respectively.

Miscellaneous Parameters

Table 18.2 summarizes the results of testing for aldehydes, hydrogen chloride, chloroform, and sulfuric acid mists. Section 18.2 tabulates the results for each compound. Chloroform was present. Hydrogen chloride was nondetectable.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 18.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 18.4 includes the process operating data as recorded and provided by mill personnel. Not all process operating data were given for miscellaneous parameters. The data with the closest run time was used.

FIGURE 18.1
THC TREND ANALYSIS (6/3/92)
CAUSTIC FILTRATE SEAL TANK VENT
(CS-BPCSTV)

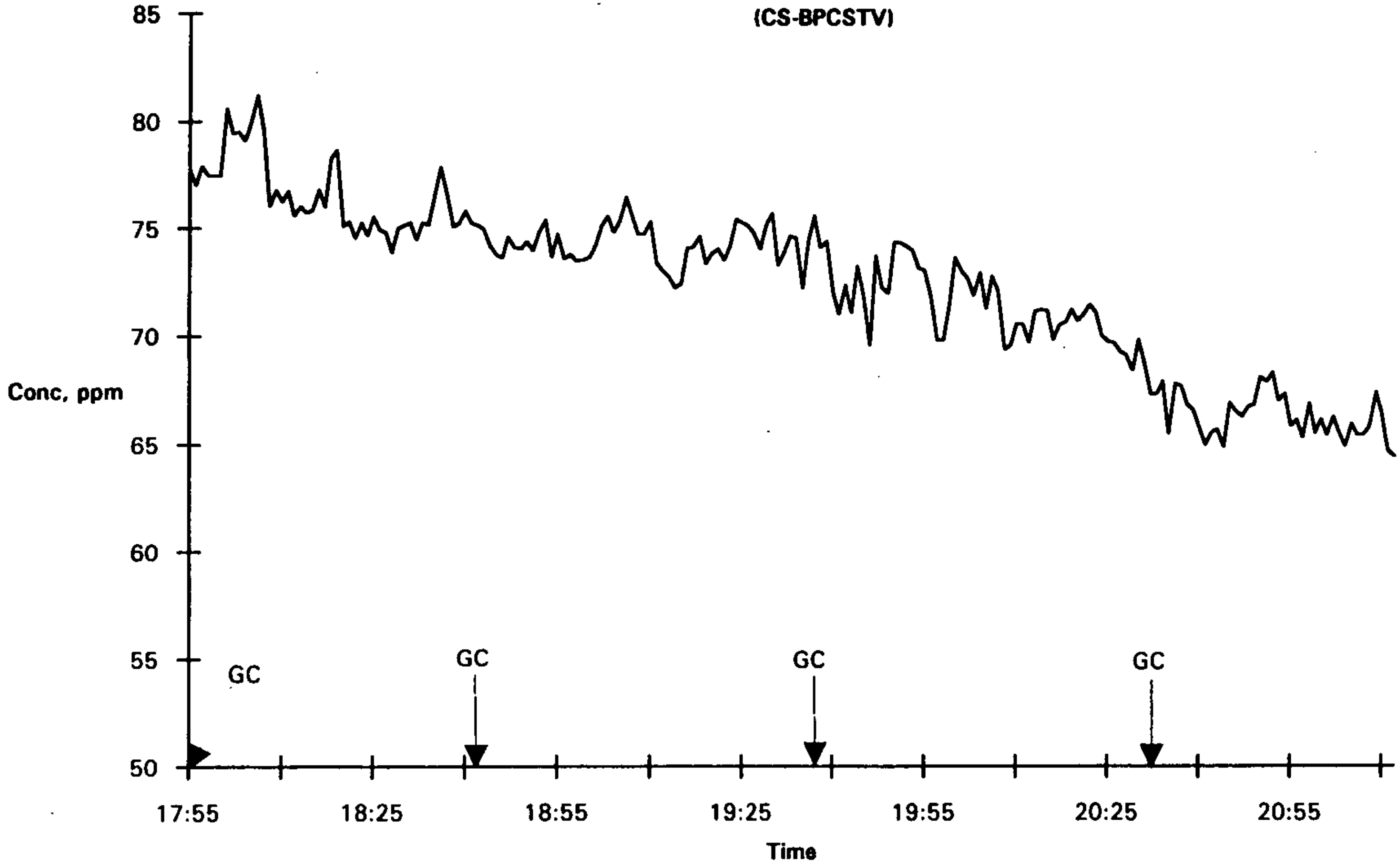


FIGURE 18.2
THC TREND ANALYSIS (6/4/92)
CAUSTIC FILTRATE SEAL TANK VENT
(CS-BPCSTV)

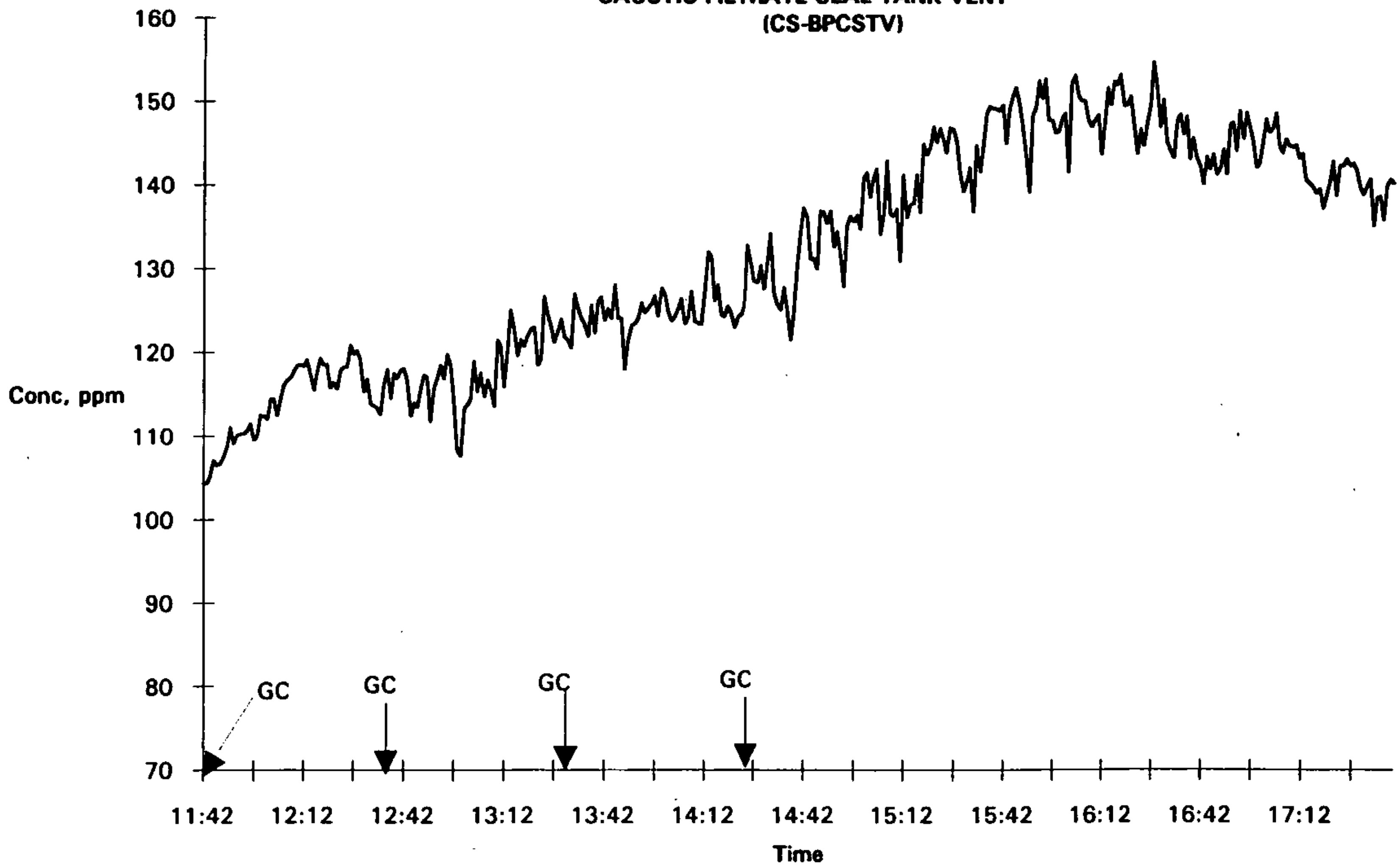


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TABLE 18.1 SUMMARY OF VOC RESULTS

Mill: CHAMPION - SHELDON | Source: Caustic Filtrate Seal Tank Vent
Source Code: CS-BPCSTV | Test Dates: 6/3/92 6/4/92
FIN: 4500 CIN: | EPN: E26F

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	122	130	126	
Volumetric Flow Rate, x10³ DSCFM	0.4	0.4	0.4	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	16.5	18.8	17.7	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	0.1	0.2	0.2	0.1
Ethanol	<0.1	<0.1	0.1	0.1
Acetone	<0.1	<0.1	0.1	0.1
2-Propanol	ND	<0.1	0.1	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	0.4	0.5	0.5	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	<0.1	0.1	0.1
beta-Pinene	ND	<0.1	0.1	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	<0.1	<0.1	0.1	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	0.1	0.1	0.1	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	<0.1	0.1	0.1	0.1

ND=Not Detected
DL=Detection Limit

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TABLE 18.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: CHAMPION-SHELDON
Source Code: CS-BPCSTV
FIN: 4500 EPN: E26F

Source: Caustic Filtrate Seal Tank Vent
Test Dates: 6/4/92
CIN:

	RUN 1	DL
Volumetric Flow Data		
Stack Temperature, °F	130	
Volumetric Flow Rate, x 10^3 DSCFM	0.4	
Process Operating Conditions		
Production Rate, ADT pulp/hr	18.8	
Emission Rate, lb/hr		
Chloroform	0.6	0.1
Hydrogen chloride	ND	0.1

ND = Not Detected
DL = Detection Limit

Section 18.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Caustic Filtrate Seal Tank Vent | FIN: 4500
Source Code: CS-BPCSTV | Date: 6/3/92 | EPN: E26F | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1754	1854	1954	
Flow Data				
Stack Temperature, °F			122	122
Moisture Content, %			14.0	14.0
Oxygen Concentration, %			20.8	20.8
Carbon Dioxide Concentration, %			0.0	0.0
Volumetric Flow Rate, x10^3 ACFM			0.6	0.6
Volumetric Flow Rate, x10^3 DSCFM			0.4	0.4
Process Operating Conditions				
Production Rate, ADT pulp/hr	16.5	16.5	16.5	16.5
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	58.8	57.8	53.0	56.5
Emission Rate, lb/hr	0.1	0.1	0.1	0.1
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.9	0.8	0.8	0.9
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.8	0.8	1.0	0.9
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.7	0.6 *	0.7	0.6
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Caustic Filtrate Seal Tank Vent | FIN: 4500
Source Code: CS-BPCSTV | Date: 6/3/92 | EPN: E26F | CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	60.2	56.7	52.1	56.4
Emission Rate, lb/hr	0.5	0.5	0.4	0.5
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.2 *	1.2 *	1.2 *	1.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.9	0.9	0.9	0.9
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Caustic Filtrate Seal Tank Vent | FIN: 4500

Source Code: CS-BPCSTV | Date: 6/3/92 | EPN: E26F | CIN: -

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	113.8	109.8	104.1	109.2
Unknowns as Carbon				
Concentration, ppmvd	6.3	2.1	3.5	4.0
Sum M18 as Carbon, lb/hr	0.1	0.1 *	0.1 *	0.1
Unknown Compounds % of Total	5.2%	1.9%	3.2%	3.4%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	88.4	86.0	80.2	84.9
Emission Rate, lb/hr as C	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Caustic Filtrate Seal Tank Vent | FIN: 4500
Source Code: CS-BPCSTV | Date: 6/4/92 | EPN: E26F | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1140	1240	1340	
Flow Data				
Stack Temperature, °F	130			130
Moisture Content, %	14.0			14.0
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.5			0.5
Volumetric Flow Rate, x10^3 DSCFM	0.4			0.4
Process Operating Conditions				
Production Rate, ADT pulp/hr	18.8	18.8	18.8	18.8
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	96.6	97.0	96.5	96.7
Emission Rate, lb/hr	0.2	0.2	0.2	0.2
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.7	1.0	0.6	0.8
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	1.2	1.0	1.0	1.1
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Caustic Filtrate Seal Tank Vent | FIN: 4500
Source Code: CS-BPCSTV | Date: 6/4/92 | EPN: E26F | CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	62.8	63.4	66.3	64.2
Emission Rate, lb/hr	0.5	0.5	0.5	0.5
Benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.2 *	1.2 *	1.2 *	1.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.6 *	0.6	1.0	0.6
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.6 *	0.7	1.0	0.7
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	1.2	1.6	1.5	1.4
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Caustic Filtrate Seal Tank Vent | FIN: 4500
Source Code: CS-BPCSTV | Date: 6/4/92 | EPN: E26F | CIN: -

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.6 *	0.6 *	0.6 *	0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	150.8	164.2	174.5	163.2
Unknowns as Carbon				
Concentration, ppmvd	5.3	5.6	4.9	5.3
Sum M18 as Carbon, lb/hr	0.1	0.1	0.1	0.1
Unknown Compounds % of Total	3.4%	3.3%	2.7%	3.1%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	132.6	138.4	146.5	139.1
Emission Rate, lb/hr as C	0.1 *	0.1	0.1	0.1

* One or more values were less than the detection limit.

Section 18.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - MISCELLANEOUS

Mill: CHAMPION - SHELDON | Source: Caustic Filtrate Seal Tank Vent | FIN: 4500
Source Code: CS-BPCSTV | Date: 6/4/92 | EPN: E26F | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1303			
Flow Data				
Stack Temperature, °F	130			130
Moisture Content, %	14.0			14.0
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.5			0.5
Volumetric Flow Rate, x10^3 DSCFM	0.4			0.4
Process Operating Conditions				
Production Rate, ADT pulp/hr	18.8			18.8
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	82.8			82.8
Emission Rate, lb/hr	0.6			0.6
Hydrogen chloride				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

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Section 18.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

SOURCE CS-BPCSTV

QUALITY CONTROL SUMMARY
METHOD 25A

1. CALIBRATION

THEOR ppm	6/3/92 ppm	6/3/92 %ERR	6/4/92 ppm	6/4/92 %ERR
0.0	-5.0	-0.3	0.0	0.0
36.0	39.0	0.2	35.0	-0.7
91.0	93.0	0.1	90.0	-0.8
1506.0	1505.0	-0.1	* 150.	0.0
CORR COEFF	0.9999		0.9999	

2. PROPANE LINE RECOVERY

	DATE 6/3/92 INST	LINE	%REC	DATE 6/4/92 INST	LINE	%REC
BEFORE	1464.0	1434.0	98.0%	150.0	149.0	99.3%
AFTER	150.0	149.0	99.3%	150.0	151.0	100.7%

3. LINE BLANK

	6/3/92 ppm	6/4/92 ppm
BEFORE	2.0	2.0
AFTER	2.0	**

* THEOR = 150ppm

** Not performed

SOURCE CS-BPCSTV

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR ppm	DATE ppm	6/3/92 %REC	DATE ppm	6/4/92 %REC
ethanol	52.0	38.7	74.5%	46.5	89.4%
acetone	41.6	36.4	87.7%	51.3	123.5%
isopropanol	39.9	32.8	82.3%	42.2	105.8%
dimethyl sulfide	9.1	8.1	89.0%	9.4	103.3%
benzene	34.2	34.2	100.0%	19.3	56.6%
bromodichloromethane	18.8	16.9	89.9%	18.7	99.5%
dimethyl disulfide	33.9	29.7	87.7%	33.9	99.9%
toluene	28.7	26.0	90.4%	26.2	91.1%
ethyl benzene	24.9	22.1	88.8%	24.9	100.0%
m-xylene	49.8	44.0	88.4%	49.8	100.0%
o-xylene	25.0	21.8	87.4%	24.9	99.7%
cumene	21.9	19.2	87.4%	21.7	98.9%
alpha-pinene	19.2	17.0	88.9%	18.9	98.5%
beta-pinene	19.2	16.6	86.1%	18.7	97.3%
3-carene	19.3	15.9	82.5%	18.1	94.0%
p-cymene	19.6	16.0	82.0%	18.6	95.1%

2. PROPANE RESPONSE

	THEOR		%REC		%REC
BEFORE	36.0	38.2	106.1%	41.0	113.9%
AFTER	36.0	41.0	113.9%	42.4	117.8%

3. METHANOL LINE RECOVERY

	6/3/92			6/4/92		
	GC	LINE	%REC	GC	LINE	%REC
BEFORE	10.3	10.6	102.9%	9.7 *		
AFTER	9.7 *			9.4	9.4	100.0%

4. LINE BLANK

	[------------FILE REF------------]	
BEFORE	F3A2012	*
AFTER	*	**

* Poor recovery and line blank due to misfired valve

** Not performed

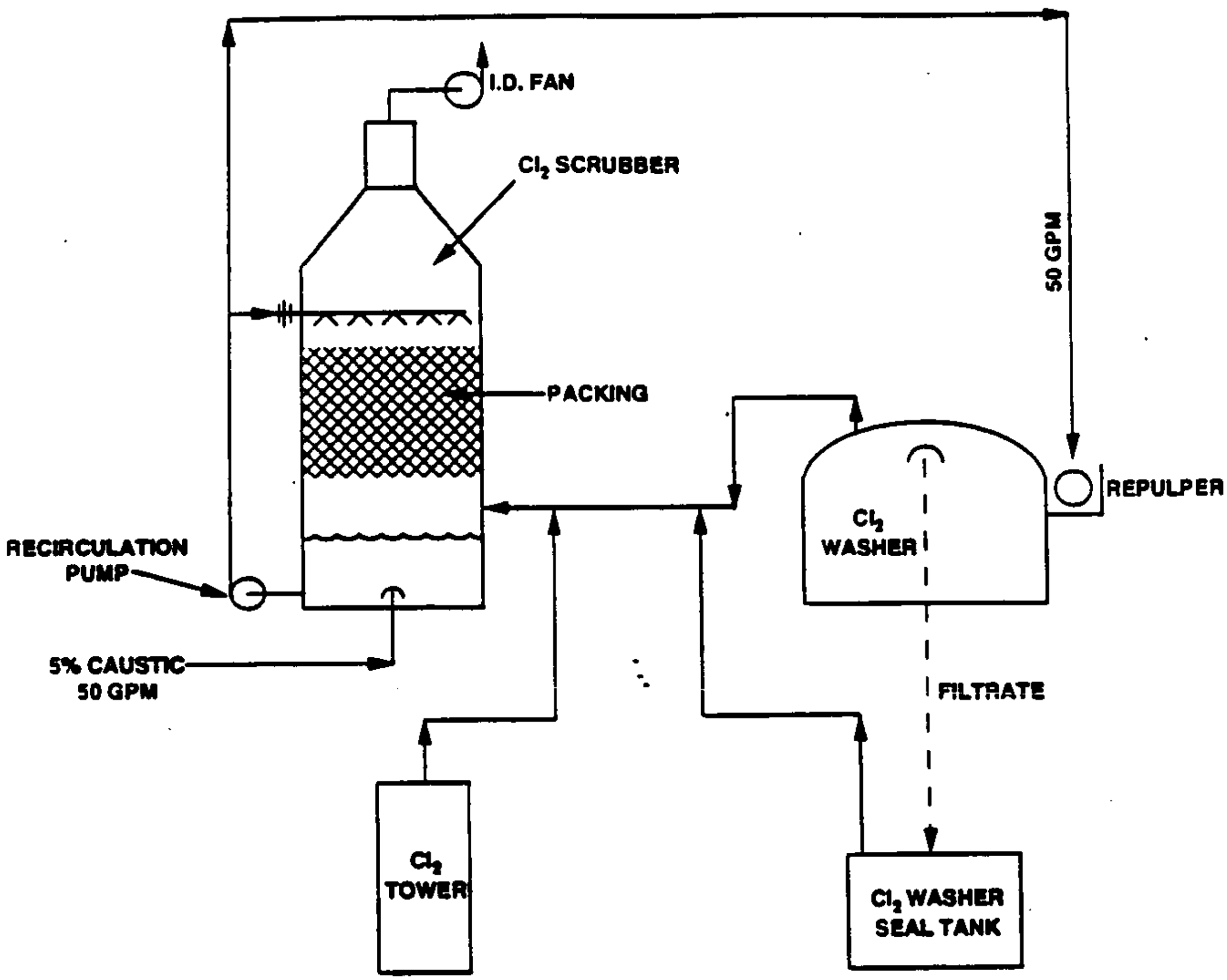
Section 18.4 Process Operating Data

BLEACH PLANT SCRUBBER

At this facility, vent gases from the chlorine stage tower, washer hood and seal tank are collected and transported to a scrubber system for removing Cl_2.

Figure 1 is a schematic of the Cl_2 scrubber system. The gases pass through a countercurrent flow packed tower. The packed tower has a diameter of 4 ft and is 13 ft tall. The tower contains 2 ft of Kimre model 37/47 kynar packing and a mist eliminator consisting of six layers of 16/96 Kimre kynar. Scrubbing solution is sprayed on the packing through spray nozzles located above the wetted packing. The scrubbing solution used in this stage is 5 % caustic. The design makeup flow rate is 50 gpm. The gases leaving this scrubber are vented to the atmosphere through a short stack. The design gas flow rate through this system is 6,300 ACFM at 140°F.

FIGURE 1 BLEACH PLANT SCRUBBING SYSTEM



Representative Process Conditions

Scrubbing medium
(white liquor, weak wash, caustic, etc.) : 5 %caustic
Gas flow rate : 2,500 SCFM
Scrubbing solution recirculation rate : N/A

BLEACH PLANT DIAGRAMS AND PROCESS INFORMATION

A. Bleaching Practice

The mill has one bleach line with C,E,H sequences which produce 400 ton/day bleached kraft softwood pulp to a final G.E. brightness of 68 %. During the trials the bleach plant operated at a rate of 16-17 tons/hour. Figure 2 is a diagram of the bleaching process. Tables 2 and 3 show the bleaching conditions for the bleach plant during the trial. The kappa number of the brownstock ranged from 25 to 30 during the test with an average of 29.

TABLE 2 TYPICAL BLEACHING CONDITIONS

	C	E	H
Consistency, percent	3.2	10	10
Temperature, °F	105	115	115
Time, minutes	30	60	90
Chlorine, lb/ton odbs	115	0	0
Hypochlorite as Cl_2 lb/ton	0	0	44
Caustic, lb/ton	0	90	0
Peroxide, lb/ton	0	0	0
Chlorine dioxide	0	0	0
Residual chlorine, lb/ton	N/A	N/A	N/A
Vat pH	1.6	10.7	9
K number	N/A	4.5	N/A
G.E. Brightness	N/A	N/A	68

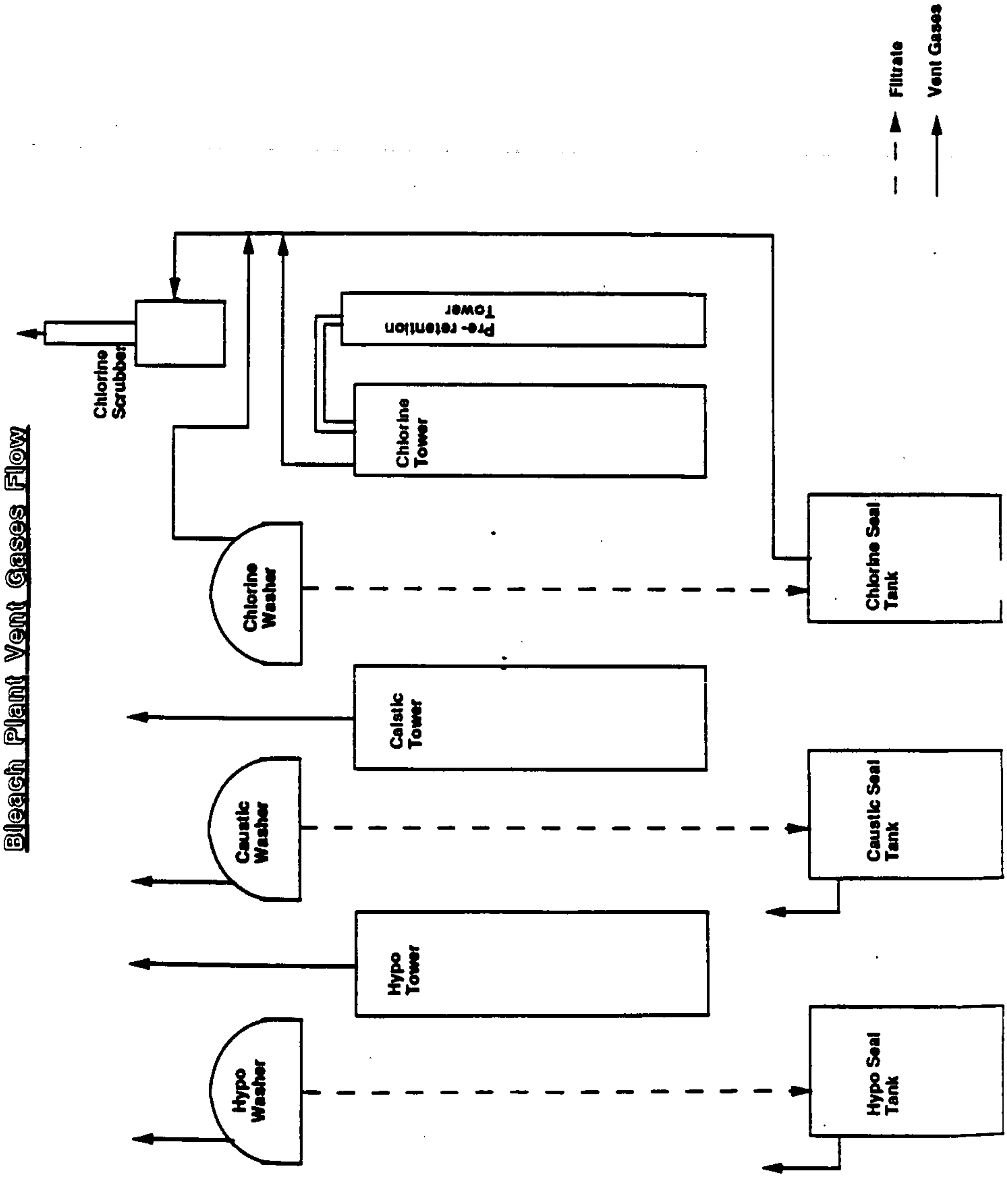
B. Water Reuse - Fresh water is used on the chlorine stage, hypo filtrate and fresh water on the extraction stage and white water on the hypo stage.

C. Bleach Plant Venting - Chlorine stage vents are combined into a single duct for treatment in a scrubber. Vents not collected into the combined vent are individually vented. Figure 2 shows the location of various vents.

Representative Process Conditions

Bleaching sequence : CEH
Wood species : Southern pine
Production rate : 400
Kappa number : 29
Chemical usage : Cl_2, NaOH and NaOCl
Percent ClO_2 substitution : 0
Tower temperatures and retention times : Refer to previous table
CE kappa number : N/A

FIGURE 2



Bleach Plant Vent Gases Flow
Chlorine Scrubber
Pre-retention Tower
Chlorine Tower
Chlorine Washer
Chlorine Seal Tank
Calstic Tower
Caustic Washer
Caustic Seal Tank
Hypo Tower
Hypo Washer
Hypo Seal Tank
Filtrate
Vent Gases

BLEACH PLANTS - PROCESS OPERATING CONDITIONS

Mill: Champion-Sheldon
Source: Bleach Plant
FIN: 4500

Source: Caustic Filtrate Seal Tank Vent
Date: 6-03-92
EPN: E26F CIN:

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		17:45	18:42	19:40	
Bleaching Sequence		CEH	CEH	CEH	0.00
Wood Species		SOFTWOOD	SOFTWOOD	SOFTWOOD	0.00
Production Rate		395	395	395	0.00
kappa no. ent Bleaching		22.8	22.6	22.6	0.00
Tower pH		10.0	10.8	10.8	0.00
CE kappa no		5.0	5.0	3.8	0.00
C/O2 Substitution	%	0	0	0	0.00
					0.00
Chemical Usage					
Chlorine	lb/ton	94	82	76	0.00
Chlorine Dioxide	lb/ton	---	---	---	0.00
Sodium Hydroxide	lb/ton	87	81	87	0.00
Sodium Hypochlorite	lb/ton	42	42	42	
Oxygen	lb/ton	---	---	---	0.00
Tower Temperatures					
	degree F	102	101	104	
	degree F	---	---	---	
	degree F	154	154	154	
	degree F	110	110	109	0.00
	degree F	---	---	---	0.00
Retention Times					
	min	27	27	27	0.00
	min	---	---	---	0.00
	min	128	128	128	0.00
	min	45	48	43	
	min	---	---	---	0.00
Scrubber Data					
Type					0.00
Scrubbing Media					0.00
Gas Flow Rate	ACFM				0.00
Liquid Flow Rate	GPM				0.00
Pressure Drop	in. H2O				

BLEACH PLANTS - PROCESS OPERATING CONDITIONS

Mill: Champion-Sheldon
Source: Bleach Plant
FIN: 4500

Source: Caustic Filtrate Seal Tank Vent
Date: 6-03-92
EPN: E26F CIN:

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		20:30			
Bleaching Sequence		CEH			0.00
Wood Species		SOFTWOOD			0.00
Production Rate		395			0.00
kappa no. ent Bleaching		18.7			0.00
Tower pH		10.9			0.00
CE kappa no		3.8			0.00
C/O2 Substitution	%	0			0.00
					0.00
Chemical Usage					
Chlorine	lb/ton	73			0.00
Chlorine Dioxide	lb/ton	---			0.00
Sodium Hydroxide	lb/ton	87			0.00
Sodium Hypochlorite	lb/ton	42			0.00
Oxygen	lb/ton	---			0.00
Tower Temperatures					
	degree F	104			0.00
	degree F	---			0.00
	degree F	154			0.00
	degree F	109			0.00
	degree F	---			0.00
Retention Times					
	min	27			0.00
	min	---			0.00
	min	123			0.00
	min	43			0.00
	min	---			0.00
Scrubber Data					
Type					0.00
Scrubbing Media					0.00
Gas Flow Rate	ACFM				0.00
Liquid Flow Rate	GPM				0.00
Pressure Drop	in. H2O				0.00

BLEACH PLANTS - PROCESS OPERATING CONDITIONS

Mill: Champion-Sheldon
Source: Bleach Plant
FIN: 4500

Source: Caustic Filtrate Seal Tank Vent
Date: 6-04-92
EPN: E26F CIN:

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		11:39	12:34	13:30	
Bleaching Sequence		CEH	CEH	CEH	0.00
Wood Species		SOFTWOOD	SOFTWOOD	SOFTWOOD	0.00
Production Rate		450	450	450	0.00
kappa no. ent Bleaching		19.2	19.2	19.0	0.00
Tower pH		10.7	10.9	10.8	0.00
CE kappa no		5.7	5.3	5.3	0.00
C/O2 Substitution	%	0	0	0	0.00
					0.00
Chemical Usage					
Chlorine	lb/ton	84	87	90	0.00
Chlorine Dioxide	lb/ton	---	---	---	0.00
Sodium Hydroxide	lb/ton	85	85	85	0.00
Sodium Hypochlorite	lb/ton	42	42	42	
Oxygen	lb/ton	---	---	---	0.00
Tower Temperatures					
	degree F	130	129	130	
	degree F	---	---	---	
	degree F	155	155	156	
	degree F	114	116	116	0.00
	degree F	---	---	---	0.00
Retention Times					
	min	24	24	24	0.00
	min	---	---	---	0.00
	min	113	113	113	0.00
	min	38	38	38	
	min	---	---	---	0.00
Scrubber Data					
Type					0.00
Scrubbing Media					0.00
Gas Flow Rate	ACFM				0.00
Liquid Flow Rate	GPM				0.00
Pressure Drop	in. H2O				

BLEACH PLANTS - PROCESS OPERATING CONDITIONS

Mill: Champion-Sheldon
Source: Bleach Plant
FIN: 4500

Source: Caustic Filtrate Seal Tank Vent
Date: 6-04-92
EPN: E26F
CIN:

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		14:26			
Bleaching Sequence		CEH			0.00
Wood Species		SOFTWOOD			0.00
Production Rate		450			0.00
kappa no. ent Bleaching		19.2			0.00
Tower pH		10.7			0.00
CE kappa no		5.5			0.00
C/O2 Substitution	%	0			0.00
					0.00
Chemical Usage					
Chlorine	lb/ton	90			0.00
Chlorine Dioxide	lb/ton	---			0.00
Sodium Hydroxide	lb/ton	85			0.00
Sodium Hypochlorite	lb/ton	42			0.00
Oxygen	lb/ton	---			0.00
Tower Temperatures					
	degree F	130			0.00
	degree F	---			0.00
	degree F	156			0.00
	degree F	116			0.00
	degree F	---			0.00
Retention Times					
	min	24			0.00
	min	---			0.00
	min	113			0.00
	min	38			0.00
	min	---			0.00
Scrubber Data					
Type					0.00
Scrubbing Media					0.00
Gas Flow Rate	ACFM				0.00
Liquid Flow Rate	GPM				0.00
Pressure Drop	in. H2O				0.00

SECTION 19

HYPO WASHER VENT

(CS-BPHWV)

19. CS-BPHWV

SECTION 19
HYPO WASHER VENT
(CS-BPHWV)

The Hypo Washer Vent was tested on two different days for volatile organic compounds by M25A and M18. This source was also tested for chloroform and hydrogen chloride.

Total Hydrocarbons (M25A)

Figures 19.1 and 19.2 present the THC trends for the test periods on 5/19/92 and 5/21/92. The THC emission profiles were very different on the two days. On 5/19/92, emissions ranged from 15-25 ppm. However, on 5/21/92, while the emissions started out on the 25 ppm level, they rapidly dropped to 10 ppm and less. Instrument problems were noted and may totally account for this discrepancy.

Volatile Organic Compounds (M18)

Table 19.1 summarizes the results for the Method 18 target compounds, and Section 19.1 is a tabulation of the data. TRS was not analyzed. The volumetric flow was measured during sampling with a pitot tube. Chloroform was present in all samples. Traces of methanol, the pinenes, and the terpenes were noted.

Miscellaneous Parameters

Table 19.2 summarizes the results of testing for aldehydes, hydrogen chloride, chloroform, and sulfuric acid mists. Section 19.2 tabulates the results for each compound. Chloroform was determined at 0.5 lb/hr, less than one half the level found by M18. Hydrogen chloride was not detected on either day.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 19.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 19.4 includes the process operating data as recorded and provided by mill personnel. Not all process operating data were given for miscellaneous parameters. The data with the closest run time was used.

FIGURE 19.1
THC TREND ANALYSIS (5/19/92)
HYPO WASHER VENT (CS-BPHWV)

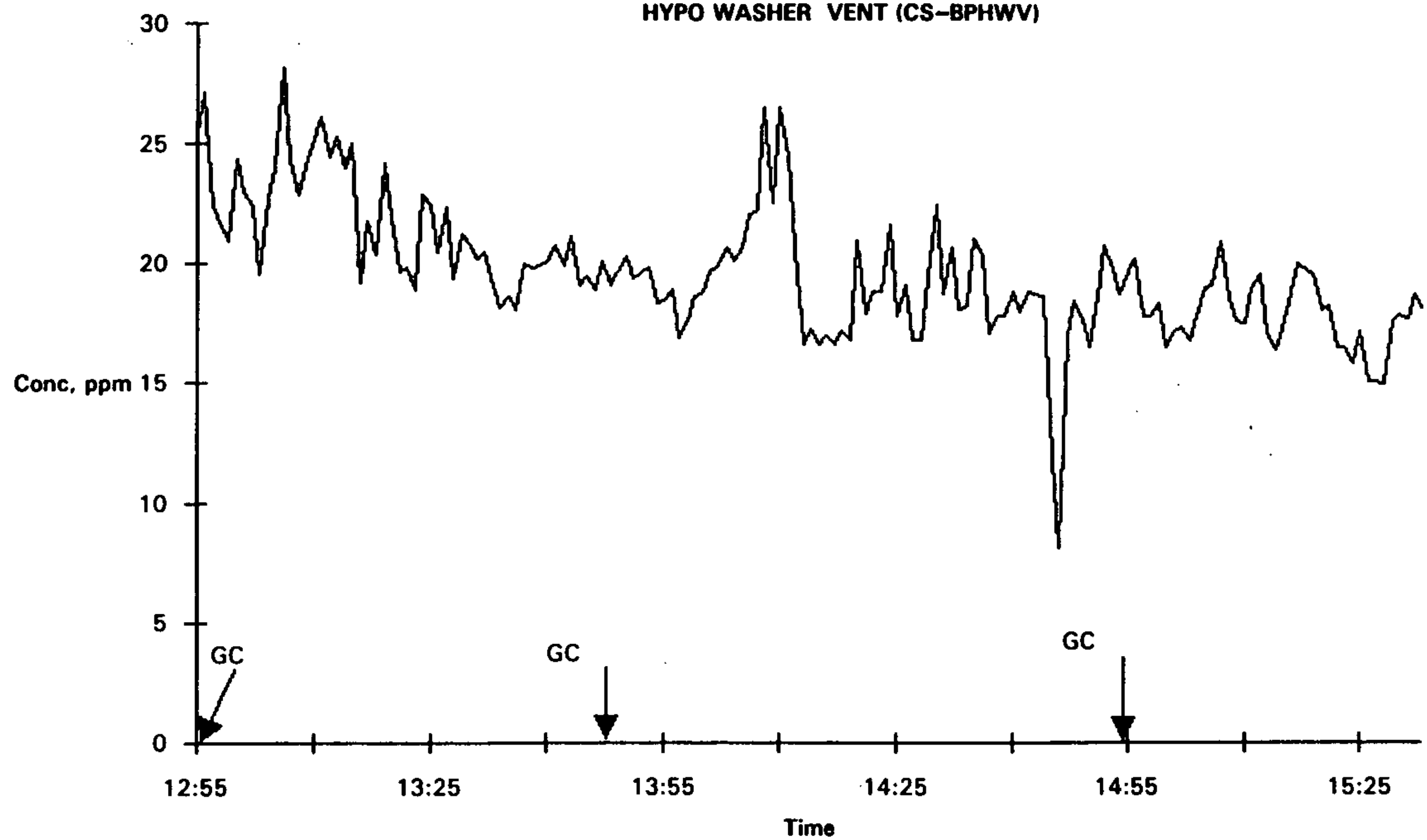


FIGURE 19.2
THC TREND ANALYSIS (5/21/92)
HYPO WASHER VENT (CS-BPHWV)

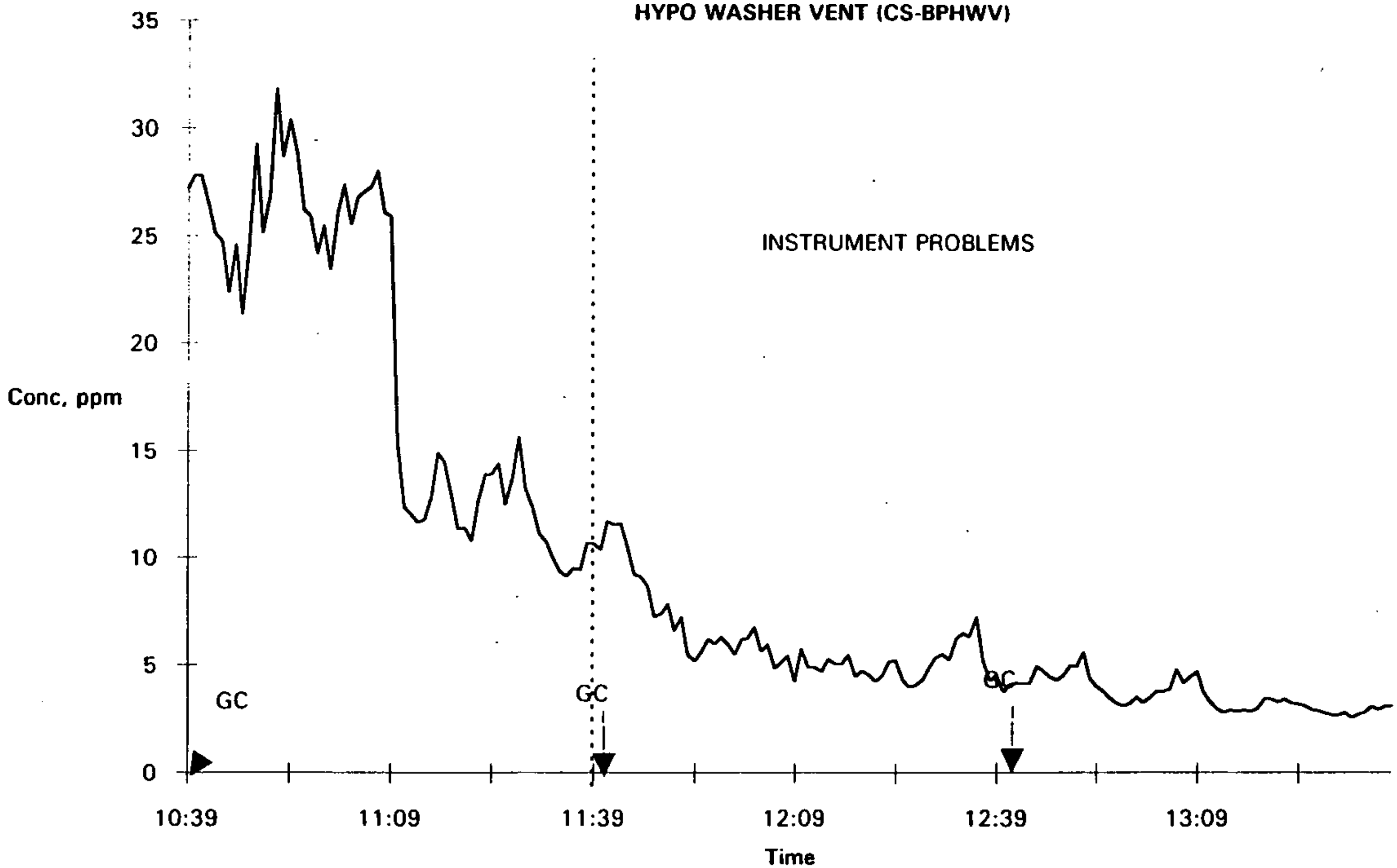


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TABLE 19.1 SUMMARY OF VOC RESULTS

Mill:	CHAMPION - SHELDON	Source:	Hypo Washer Vent
Source Code:	CS-BPHWV	Test Dates:	5/19/92 5/21/92
FIN: 4500	CIN:	EPN:	E26C

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	90	93	92	
Volumetric Flow Rate, x10^5 DSCFM	3.0	4.0	3.5	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	14.2	17.7	16.0	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	<0.1	<0.1	0.1	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	1.1	2.3	1.7	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	<0.1	0.1	0.1
beta-Pinene	ND	<0.1	0.1	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	<0.1	0.1	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	0.2	0.4	0.2	0.1
Unknowns as C, lb/hr	ND	0.1	0.1	0.1
Sum of Compounds as C, lb/hr	0.2	0.4	0.2	0.1

ND=Not Detected
DL=Detection Limit

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TABLE 19.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: CHAMPION-SHELDON
Source Code: CS-BPHWV
FIN: 4500 EPN: E26C

Source: Hypo Washer Vent
Test Dates: 5/19/92 5/21/92
CIN:

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	90	93	92	
Volumetric Flow Rate, x 10^3 DSCFM	3.0	4.0	3.5	
Process Operating Conditions				
Production Rate, ADT pulp/hr	14.2	17.7	16.0	
Emission Rate, lb/hr				
Chloroform	0.5	0.5	0.5	0.1
Hydrogen chloride	ND	ND	ND	0.1

ND = Not Detected
DL = Detection Limit

Section 19.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON	Source: Hypo Washer Vent		FIN: 4500
Source Code: CS-BPHWV	Date: 5/19/92	EPN: E26C	CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1254	1333	1433	
Flow Data				
Stack Temperature, °F	93			93
Moisture Content, %	2.2			2.2
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	4.2			4.2
Volumetric Flow Rate, x10^3 DSCFM	4.0			4.0
Process Operating Conditions				
Production Rate, ADT pulp/hr	17.7	17.7	17.7	17.7
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	3.8	3.8	4.4	4.0
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON	Source:	Hypo Washer Vent		FIN:	4500
Source Code: CS-BPHWV	Date:	5/19/92	EPN: E26C	CIN:	-

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	30.5	26.9	25.3	27.5
Emission Rate, lb/hr	2.2	2.0	1.9	2.0
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.0 *	1.0 *	1.0 *	1.0 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	0.7	0.5 *	0.5 *	0.4
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.5	0.5 *	0.5 *	0.3
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.9	0.5 *	0.5 *	0.5
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON Source: Hypo Washer Vent FIN: 4500
Source Code: CS-BPHWV Date: 5/19/92 EPN: E26C CIN: -

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	50.4	29.9	27.7	36.0
Unknowns as Carbon				
Concentration, ppmvd	9.6	0.5 *	0.5 *	3.5
Sum M18 as Carbon, lb/hr	0.4	0.2	0.2	0.3
Unknown Compounds % of Total	16.0%	1.7%	1.8%	6.5%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	22.5	19.4	18.4	20.1
Emission Rate, lb/hr as C	0.2	0.1	0.1	0.1

COMMENTS :

M18 run 1 for 5/21/92 was rejected due to double injection.
M25A data was not reported for runs 2 and 3 on 5/21/92
due to instrument problems.

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON Source: Hypo Washer Vent FIN: 4500
Source Code: CS-BPHWV Date: 5/21/92 EPN: E26C CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1038	1138	1238	
Flow Data				
Stack Temperature, °F	90			90
Moisture Content, %	4.8			4.8
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	3.2			3.2
Volumetric Flow Rate, x10^3 DSCFM	3.0			3.0
Process Operating Conditions				
Production Rate, ADT pulp/hr	14.2	14.2	14.2	14.2
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd		2.6	2.3	2.5
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON	Source: Hypo Washer Vent	FIN: 4500
Source Code: CS-BPHWV	Date: 5/21/92 EPN: E26C	CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd		20.7	25.2	23.0
Emission Rate, lb/hr		1.1	1.4	1.3
Benzene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd		1.1 *	1.1 *	1.1 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd		0.5	0.5 *	0.4
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *

*One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill:	CHAMPION - SHELDON	Source:	Hypo Washer Vent			FIN:	4500
Source Code:	CS-BPHWV	Date:	5/21/92	EPN:	E26C	CIN:	-

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd		0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr		0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd		29.6	29.1	29.4
Unknowns as Carbon				
Concentration, ppmvd		0.0	0.0	0.0
Sum M18 as Carbon, lb/hr		0.2	0.2	0.2
Unknown Compounds % of Total		0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	21.0			21.0
Emission Rate, lb/hr as C	0.1			0.1

COMMENTS :

M18 run 1 for 5/21/92 was rejected due to double injection.
M25A data was not reported for runs 2 and 3 on 5/21/92
due to instrument problems.

* One or more values were less than the detection limit.

Section 19.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - SHELDON	Source: Hypo Washer Vent			FIN:	4500
Source Code: CS-BPHWV	Date: 5/19/92	EPN:	E26C	CIN:	-

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1912			
Flow Data				
Stack Temperature, °F	93			93
Moisture Content, %	2.2			2.2
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	4.2			4.2
Volumetric Flow Rate, x10^3 DSCFM	4.0			4.0
Process Operating Conditions				
Production Rate, ADT pulp/hr	17.7			17.7
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd				
Emission Rate, lb/hr				
Hydrogen chloride				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - SHELDON | Source: Hypo Washer Vent | FIN: 4500
Source Code: CS-BPHWV | Date: 5/21/92 | EPN: E26C | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1650			
Flow Data				
Stack Temperature, °F	90			90
Moisture Content, %	4.8			4.8
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	3.2			3.2
Volumetric Flow Rate, x10^3 DSCFM	3.0			3.0
Process Operating Conditions				
Production Rate, ADT pulp/hr	14.2			14.2
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	9.7			9.7
Emission Rate, lb/hr	0.5			0.5
Hydrogen chloride				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

*One or more values were less than the detection limit.

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Section 19.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

SOURCE CS-BPHWV

QUALITY CONTROL SUMMARY
METHOD 25A

1. CALIBRATION

THEOR	5/19/92		5/21/92	
ppm	ppm	%ERR	ppm	%ERR
0.0	6.0	4.0	0.0	0.0
36.0	26.0	6.7	35.0	-0.7
91.0	91.0	-0.1	88.0	-2.0
150.0	151.0	0.7	151.0	0.7
CORR COEFF	0.9950		0.9997	

2. PROPANE LINE RECOVERY

	DATE	5/19/92		DATE	5/21/92	
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	150.0	150.0	100.0%	150.0	150.0	100.0%
AFTER	136.0	131.0	96.3%	149.0	149.0	100.0%

3. LINE BLANK

	5/19/92	5/21/92
	ppm	ppm
BEFORE	•	•
AFTER	•	•

• Not performed

SOURCE CS-BPHWV

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR	DATE	5/19/92	DATE	5/21/92
	ppm	ppm	%REC	ppm	%REC
ethanol	52.0	49.3	94.8%	47.8	91.8%
acetone	41.6	39.3	94.5%	38.4	92.3%
isopropanol	39.9	38.1	95.5%	37.1	93.1%
dimethyl sulfide	9.1	8.7	95.6%	8.4	92.3%
benzene	34.2	34.2	100.3%	30.9	90.4%
bromodichloromethane	18.8	16.2	86.2%	16.3	86.7%
dimethyl disulfide	33.9	31.3	92.3%	31.2	92.2%
toluene	28.7	26.5	92.4%	26.0	90.5%
ethyl benzene	24.9	22.9	91.9%	22.7	91.2%
m-xylene	49.8	47.6	95.6%	45.2	90.8%
o-xylene	25.0	22.9	91.5%	22.6	90.5%
cumene	21.9	19.5	89.0%	19.9	90.5%
alpha-pinene	19.2	17.5	91.3%	17.2	90.0%
beta-pinene	19.2	17.3	90.1%	17.4	90.4%
3-carene	19.3	16.1	83.5%	16.4	85.3%
p-cymene	19.6	15.8	80.6%	17.0	86.8%

2. PROPANE RESPONSE

	THEOR		%REC		%REC
BEFORE	36.0	38.7	107.5%	39.0	108.3%
AFTER	36.0	37.7	104.7%	38.7	107.5%

3. METHANOL LINE RECOVERY

	5/19/92			5/21/92		
	GC	LINE	%REC	GC	LINE	%REC
BEFORE	10.8	11.0	101.9%	10.8	10.9	100.9%
AFTER	10.2	11.0	107.8%	13.6	10.4	76.5%

4. LINE BLANK

	[-------------FILE REF-------------]	
BEFORE	EJA2006	ELA2005
AFTER	EJA2016	ELA2010

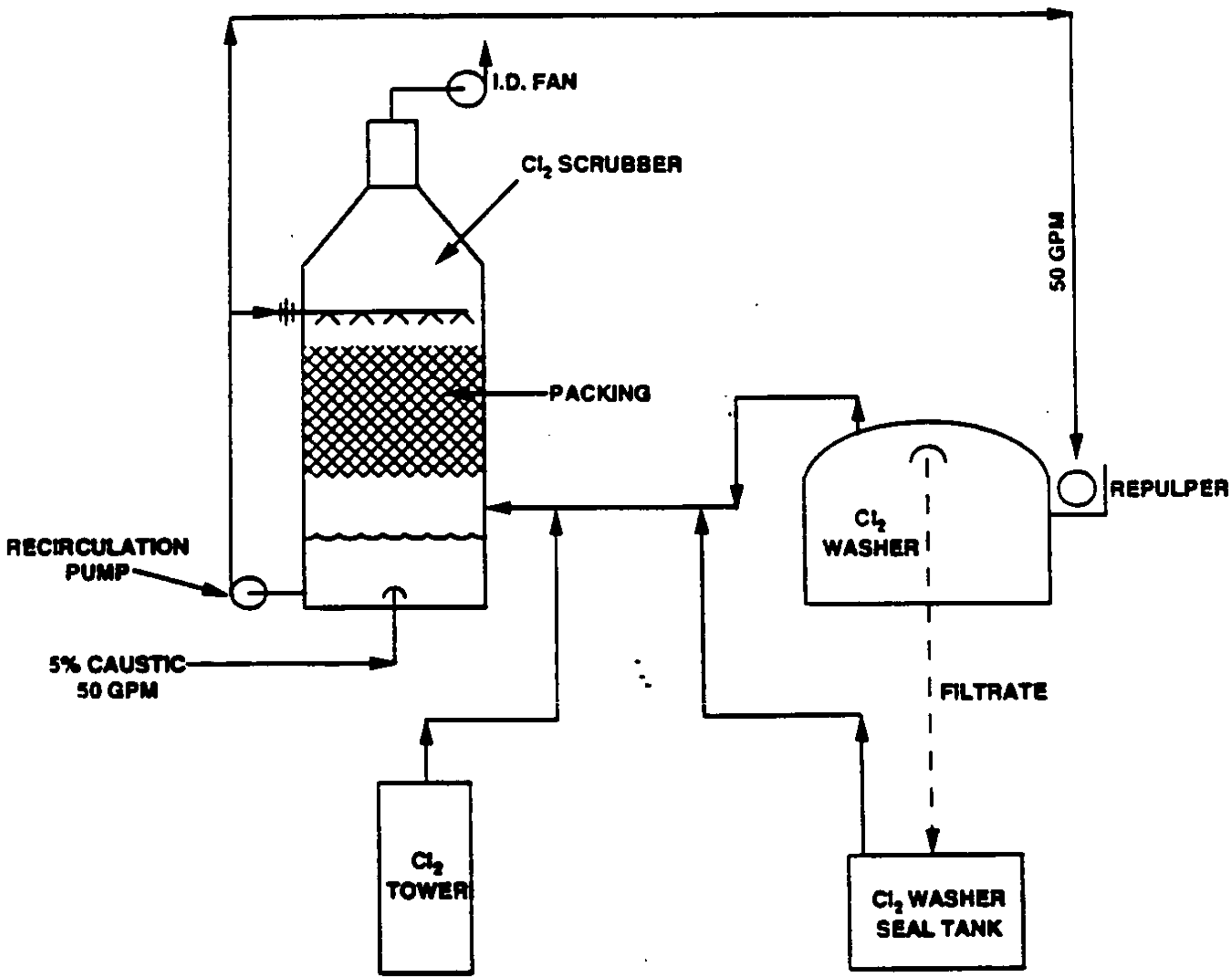
Section 19.4 Process Operating Data

BLEACH PLANT SCRUBBER

At this facility, vent gases from the chlorine stage tower, washer hood and seal tank are collected and transported to a scrubber system for removing Cl_2.

Figure 1 is a schematic of the Cl_2 scrubber system. The gases pass through a countercurrent flow packed tower. The packed tower has a diameter of 4 ft and is 13 ft tall. The tower contains 2 ft of Kimre model 37/47 kynar packing and a mist eliminator consisting of six layers of 16/96 Kimre kynar. Scrubbing solution is sprayed on the packing through spray nozzles located above the wetted packing. The scrubbing solution used in this stage is 5 % caustic. The design makeup flow rate is 50 gpm. The gases leaving this scrubber are vented to the atmosphere through a short stack. The design gas flow rate through this system is 6,300 ACFM at 140°F.

FIGURE 1   BLEACH PLANT SCRUBBING SYSTEM



Representative Process Conditions

Scrubbing medium
(white liquor, weak wash, caustic, etc.) : 5 %caustic
Gas flow rate : 2,500 SCFM
Scrubbing solution recirculation rate : N/A

BLEACH PLANT DIAGRAMS AND PROCESS INFORMATION

A. **Bleaching Practice**

The mill has one bleach line with C,E,H sequences which produce 400 ton/day bleached kraft softwood pulp to a final G.E. brightness of 68 %. During the trials the bleach plant operated at a rate of 16-17 tons/hour. Figure 2 is a diagram of the bleaching process. Tables 2 and 3 show the bleaching conditions for the bleach plant during the trial. The kappa number of the brownstock ranged from 25 to 30 during the test with an average of 29.

TABLE 2 TYPICAL BLEACHING CONDITIONS

	C	E	H
Consistency, percent	3.2	10	10
Temperature, °F	105	115	115
Time, minutes	30	60	90
Chlorine, lb/ton odbs	115	0	0
Hypochlorite as Cl_2 lb/ton	0	0	44
Caustic, lb/ton	0	90	0
Peroxide, lb/ton	0	0	0
Chlorine dioxide	0	0	0
Residual chlorine, lb/ton	N/A	N/A	N/A
Vat pH	1.6	10.7	9
K number	N/A	4.5	N/A
G.E. Brightness	N/A	N/A	68

B. **Water Reuse** - Fresh water is used on the chlorine stage, hypo filtrate and fresh water on the extraction stage and white water on the hypo stage.

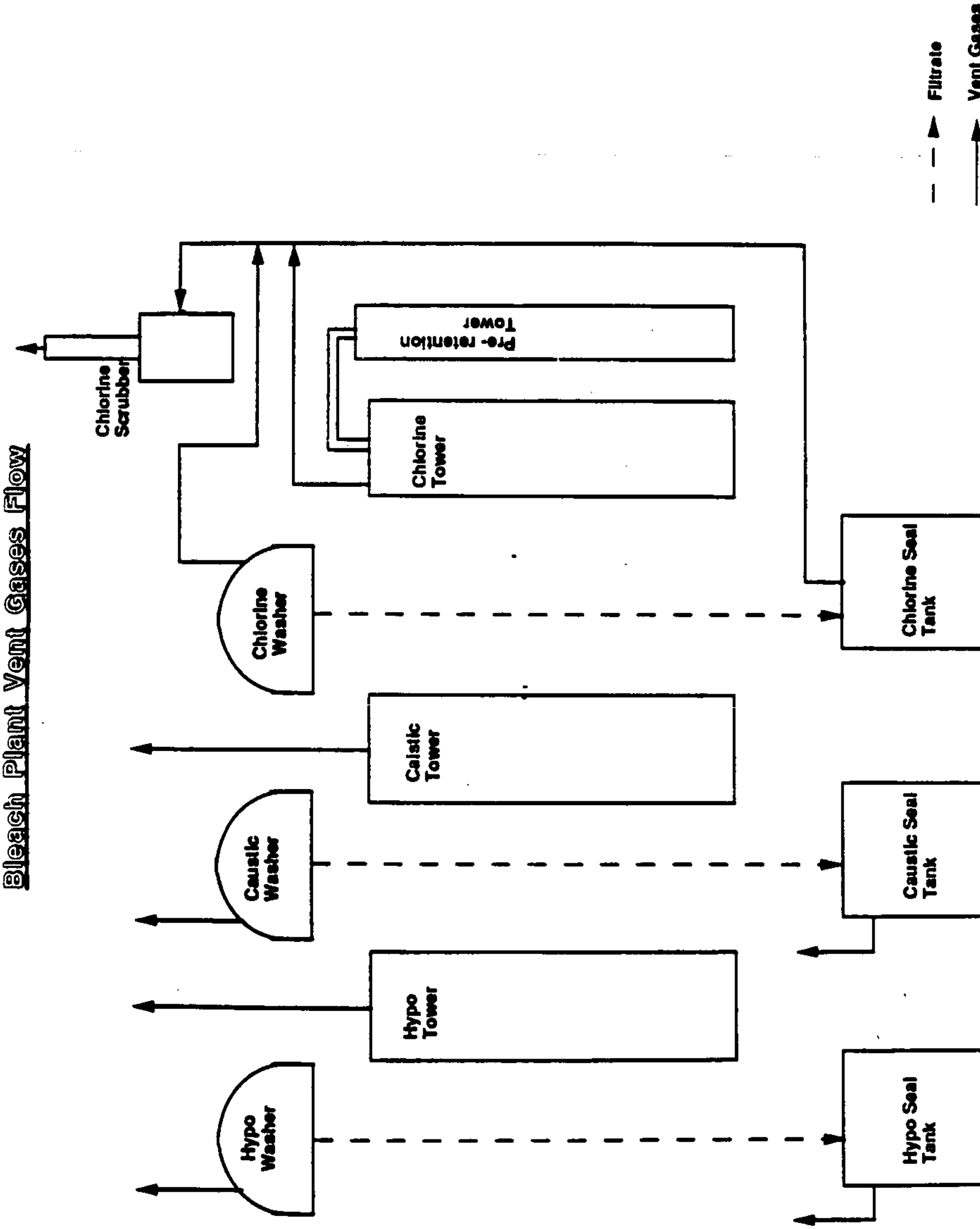
C. **Bleach Plant Venting** - Chlorine stage vents are combined into a single duct for treatment in a scrubber. Vents not collected into the combined vent are individually vented. Figure 2 shows the location of various vents.

Representative Process Conditions

Bleaching sequence : CEH
Wood species : Southern pine
Production rate : 400
Kappa number : 29
Chemical usage : Cl_2, NaOH and NaOCl
Percent ClO_2 substitution : 0
Tower temperatures and retention times : Refer to previous table
CE kappa number : N/A

FIGURE 2

Bleach Plant Vent Gases Flow



BLEACH PLANTS - PROCESS OPERATING CONDITIONS

Mill: Champion-Sheldon
Source: Bleach Plant
FIN: 4500

Source: Hypo Washer Hood Vent
Date: 5-19-92
EPN: E26C
CIN:

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		12:46	13:49	14:54	
Bleaching Sequence		CEH	CEH	CEH	0.00
Wood Species		SOFTWOOD	SOFTWOOD	SOFTWOOD	0.00
Production Rate		425	425	425	0.00
kappa no. ent Bleaching		21.6	22.5	22.5	0.00
Tower pH		8.1	7.7	8.7	0.00
CE kappa no		6.0	6.0	5.6	0.00
C/O2 Substitution	%	0	0	0	0.00
					0.00
Chemical Usage					
Chlorine	lb/ton	133	117	103	0.00
Chlorine Dioxide	lb/ton	---	---	---	0.00
Sodium Hydroxide	lb/ton	125	137	137	0.00
Sodium Hypochlorite	lb/ton	42	42	42	
Oxygen	lb/ton	---	---	---	0.00
Tower Temperatures					
	degree F	102	103	105	
	degree F	---	---	---	
	degree F	154	152	154	
	degree F	114	118	119	0.00
	degree F	---	---	---	0.00
Retention Times					
	min	25	25	25	0.00
	min	---	---	---	0.00
	min	120	120	120	0.00
	min	40	40	40	
	min	---	---	---	0.00
Scrubber Data					
Type					0.00
Scrubbing Media					0.00
Gas Flow Rate	ACFM				0.00
Liquid Flow Rate	GPM				0.00
Pressure Drop	in. H2O				

BLEACH PLANTS - PROCESS OPERATING CONDITIONS

Mill: Champion-Sheldon
Source: Bleach Plant
FIN: 4500

Source: Hypo Washer Hood Vent
Date: 5-21-92
EPN: E26C CIN:

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		10:34	11:40	12:43	
Bleaching Sequence		CEH	CEH	CEH	0.00
Wood Species		SOFTWOOD	SOFTWOOD	SOFTWOOD	0.00
Production Rate		340	340	340	0.00
kappa no. ent Bleaching		19.9	19.9	19.0	0.00
Tower pH		10.8	10.8	10.8	0.00
CE kappa no		5.5	5.7	5.7	0.00
C/O2 Substitution	%	0	0	0	0.00
					0.00
Chemical Usage					
Chlorine	lb/ton	100	107	97	0.00
Chlorine Dioxide	lb/ton	---	---	---	0.00
Sodium Hydroxide	lb/ton	105	102	100	0.00
Sodium Hypochlorite	lb/ton	42	42	42	
Oxygen	lb/ton	---	---	---	0.00
Tower Temperatures					
	degree F	182	109	107	
	degree F	---	---	---	
	degree F	154	156	154	
	degree F	116	116	116	0.00
	degree F	---	---	---	0.00
Retention Times					
	min	32	32	32	0.00
	min	---	---	---	0.00
	min	152	152	152	0.00
	min	51	51	51	
	min	---	---	---	0.00
Scrubber Data					
Type					0.00
Scrubbing Media					0.00
Gas Flow Rate	ACFM				0.00
Liquid Flow Rate	GPM				0.00
Pressure Drop	in. H2O				

SECTION 20

HYPO TOWER VENT

(CS-BPHTV)

Section 20.1 Emission Test Results - VOC

Section 20.2 Emission Test Results - Miscellaneous

Section 20.3 Quality Control Results

Section 20.4 Process Operating Data

SECTION 20
HYPO SEAL TANK VENT
(CS-BPHSTV)

The Hypo Seal Tank Vent was tested on two different days for volatile organic compounds by M18 and M25A. The source was also tested for chloroform (adsorption tubes) and hydrogen chloride (M26).

Total Hydrocarbons (M25A)

Figures 20.1 and 20.2 present the THC trends for the test periods on 6/3/92 and 6/4/92. Emissions varied over the range of 1200-1500 ppm on both days.

Volatile Organic Compounds (M18)

Table 20.1 summarizes the results for Method 18 target compounds, and Section 20.2 is a tabulation of the data. TRS was not analyzed. Sampling was conducted with an external fan to get air flow. Chloroform was the only target compound present at significant levels. Methanol was present in all samples (16-29 ppm). However, this calculated to less than 0.1 lb/hr.

Miscellaneous Parameters

Table 20.2 summarizes the results of testing for aldehydes, hydrogen chloride, chloroform, and sulfuric acid mists. Section 20.2 tabulates the results for each compound. Chloroform was sampled once by the adsorption tube method, yielding a result of 39.1 lb/hr, significantly higher than the M18 results.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 20.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 20.4 includes the process operating data as recorded and provided by mill personnel.

FIGURE 20.1
THC TREND ANALYSIS (6/3/92)
HYPO SEAL TANK VENT (CS-BPHSTV)

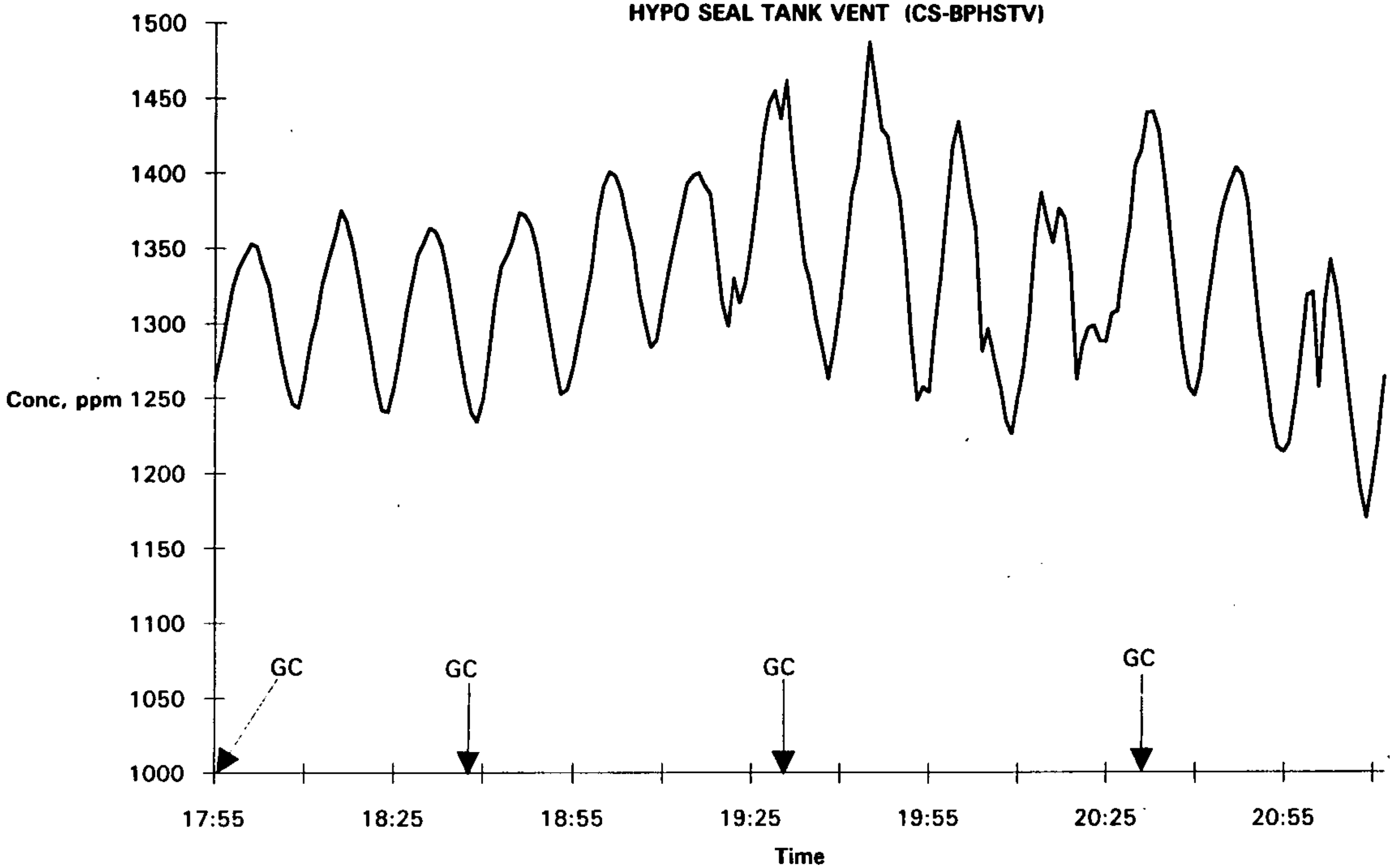


FIGURE 20.2
THC TREND ANALYSIS (6/4/92)
HYPO SEAL TANK VENT (CS-BPHSTV)

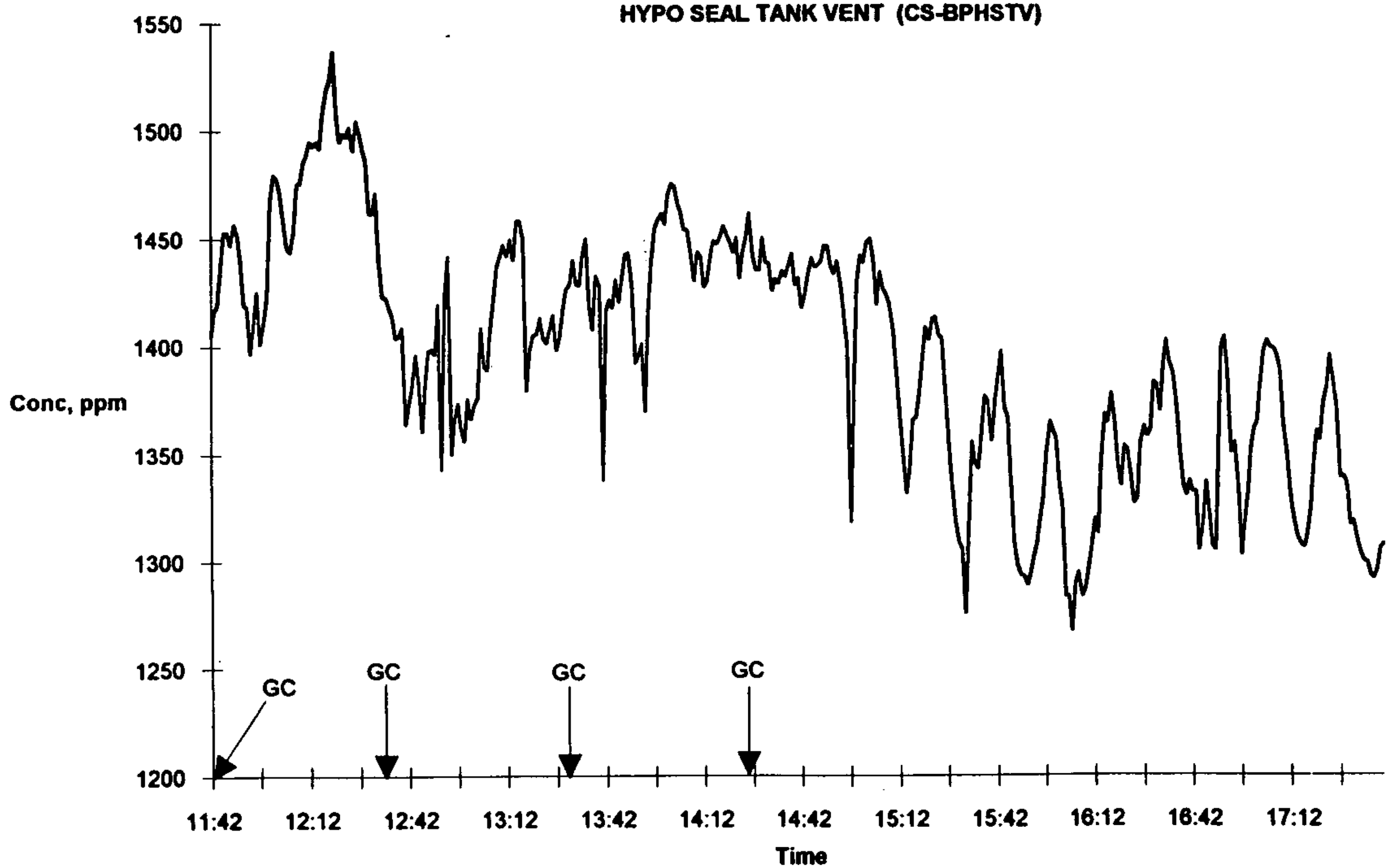


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TABLE 20.1 SUMMARY OF VOC RESULTS

Mill: CHAMPION - SHELDON		Source:	Hypo Seal Tank Vent
Source Code:	CS-BPHSTV	Test Dates:	6/3/92 6/4/92
FIN: 4500	CIN:	EPN:	E26G

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	113	118	116	
Volumetric Flow Rate, x10^3 DSCFM	0.5	0.7	0.6	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	16.5	18.8	17.7	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	<0.1	<0.1	0.1	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	18.3	29.0	23.6	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	ND	ND	0.1
beta-Pinene	ND	ND	ND	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	ND	ND	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	1.7	2.7	2.2	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	1.7	2.7	2.2	0.1

ND=Not Detected
DL=Detection Limit

TABLE 20.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: CHAMPION-SHELDON
Source Code: CS-BPHSTV
FIN: 4500 EPN: E26G

Source: Hypo Seal Tank Vent
Test Dates: 6/3/92 6/4/92
CIN:

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	113	118	116	
Volumetric Flow Rate, x 10^3 DSCFM	0.5	0.7	0.6	
Process Operating Conditions				
Production Rate, ADT pulp/hr	16.5	18.8	17.7	
Emission Rate, lb/hr				
Chloroform	39.1	39.1	39.1	0.1
Hydrogen chloride	<0.1	<0.1	0.1	0.1

ND = Not Detected
DL = Detection Limit

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Section 20.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Hypo Seal Tank Vent | FIN: 4500
Source Code: CS-BPHSTV | Date: 6/3/92 | EPN: E26G | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1754	1854	1954	
Flow Data				
Stack Temperature, °F		113		113
Moisture Content, %		8.0		8.0
Oxygen Concentration, %		20.8		20.8
Carbon Dioxide Concentration, %		0.0		0.0
Volumetric Flow Rate, x10^3 ACFM		0.9		0.9
Volumetric Flow Rate, x10^3 DSCFM		0.7		0.7
Process Operating Conditions				
Production Rate, ADT pulp/hr	16.5	16.5	16.5	16.5
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	17.0	18.2	16.1	17.1
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	2.2 *	2.2 *	2.2 *	2.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	2.2 *	2.2 *	2.2 *	2.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	2.2 *	2.2 *	2.2 *	2.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON
Source Code: CS-BPHSTV

Source: Hypo Seal Tank Vent
Date: 6/3/92 EPN: E26G

FIN: 4500
CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	2.2 *	2.2 *	2.2 *	2.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	1508.4	1558.1	1340.1	1468.9
Emission Rate, lb/hr	20.6	21.3	18.3	20.1
Benzene				
Concentration, ppmvd	2.2 *	2.2 *	2.2 *	2.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	4.3 *	4.3 *	4.3 *	4.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	2.2 *	2.2 *	2.2 *	2.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	2.2 *	2.2 *	2.2 *	2.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	2.2 *	2.2 *	2.2 *	2.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	2.2 *	2.2 *	2.2 *	2.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	2.2 *	2.2 *	2.2 *	2.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	2.2 *	2.2 *	2.2 *	2.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	2.2 *	2.2 *	2.2 *	2.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	2.2 *	2.2 *	2.2 *	2.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	2.2 *	2.2 *	2.2 *	2.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Hypo Seal Tank Vent | FIN: 4500

Source Code: CS-BPHSTV | Date: 6/3/92 | EPN: E26G | CIN: -

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	2.2 *	2.2 *	2.2 *	2.2 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	1396.1	1441.7	1239.1	1359.0
Unknowns as Carbon				
Concentration, ppmvd	2.8	2.6	2.5	2.6
Sum M18 as Carbon, lb/hr	1.9	2.0	1.7	1.9
Unknown Compounds % of Total	0.2%	0.2%	0.2%	0.2%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	1422.8	1477.2	1446.7	1448.9
Emission Rate, lb/hr as C	2.0	2.0	2.0	2.0

COMMENTS :

M18 chloroform value for run 1 on 6/3/92 was saturated,
range was changed on other 5 GC injections.

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON	Source: Hypo Seal Tank Vent		FIN: 4500
Source Code: CS-BPHSTV	Date: 6/4/92	EPN: E26G	CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1140	1240	1340	
Flow Data				
Stack Temperature, °F			118	118
Moisture Content, %			12.0	12.0
Oxygen Concentration, %			20.8	20.8
Carbon Dioxide Concentration, %			0.0	0.0
Volumetric Flow Rate, x10^3 ACFM			0.7	0.7
Volumetric Flow Rate, x10^3 DSCFM			0.5	0.5
Process Operating Conditions				
Production Rate, ADT pulp/hr	18.8	18.8	18.8	18.8
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	27.3	29.0	27.0	27.8
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	2.3 *	2.3 *	2.3 *	2.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	2.3 *	2.3 *	2.3 *	2.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	2.3 *	2.3 *	2.3 *	2.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Hypo Seal Tank Vent | FIN: 4500
Source Code: CS-BPHSTV | Date: 6/4/92 | EPN: E26G | CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	2.3 *	2.3 *	2.3 *	2.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	2462.2	2682.2	2851.4	2665.3
Emission Rate, lb/hr	25.1	27.3	29.0	27.1
Benzene				
Concentration, ppmvd	2.3 *	2.3 *	2.3 *	2.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	4.5 *	4.5 *	4.5 *	4.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	2.3 *	2.3 *	2.3 *	2.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	2.3 *	2.3 *	2.3 *	2.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	2.3 *	2.3 *	2.3 *	2.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	2.3 *	2.3 *	2.3 *	2.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	2.3 *	2.3 *	2.3 *	2.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	2.3 *	2.3 *	2.3 *	2.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	2.3 *	2.3 *	2.3 *	2.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	2.3 *	2.3 *	2.3 *	2.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	2.3 *	2.3 *	2.3 *	2.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON	Source:	Hypo Seal Tank Vent			FIN:	4500
Source Code: CS-BPHSTV	Date:	6/4/92	EPN:	E26G	CIN:	-

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	2.3 *	2.3 *	2.3 *	2.3 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	2276.7	2479.4	2633.3	2463.1
Unknowns as Carbon				
Concentration, ppmvd	3.9	4.1	2.3 *	3.4
Sum M18 as Carbon, lb/hr	2.3	2.5	2.7	2.5
Unknown Compounds % of Total	0.2%	0.2%	0.1%	0.1%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	1658.0	1597.7	1633.0	1629.5
Emission Rate, lb/hr as C	1.7	1.6	1.7	1.7

COMMENTS :

M18 chloroform value for run 1 on 6/3/92 was saturated, range was changed on other 5 GC injections.

* One or more values were less than the detection limit.

Section 20.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - SHELDON | Source: Hypo Seal Tank Vent | FIN: 4500
Source Code: CS-BPHSTV | Date: 6/3/92 | EPN: E26G | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	2010			
Flow Data				
Stack Temperature, °F	113			113
Moisture Content, %	8.0			8.0
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.9			0.9
Volumetric Flow Rate, x10^3 DSCFM	0.7			0.7
Process Operating Conditions				
Production Rate, ADT pulp/hr	16.5			16.5
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd				
Emission Rate, lb/hr				
Hydrogen chloride				
Concentration, ppmvd	14.1			14.1
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - SHELDON	Source: Hypo Seal Tank Vent			FIN:	4500
Source Code: CS-BPHSTV	Date: 6/4/92	EPN:	E26G	CIN:	-

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1545			
Flow Data				
Stack Temperature, °F	118			118
Moisture Content, %	12.0			12.0
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.7			0.7
Volumetric Flow Rate, x10^3 DSCFM	0.5			0.5
Process Operating Conditions				
Production Rate, ADT pulp/hr	18.8			18.8
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	3838.9			3838.9
Emission Rate, lb/hr	39.1			39.1
Hydrogen chloride				
Concentration, ppmvd	22.5			22.5
Emission Rate, lb/hr	0.1 *			0.1 *

*One or more values were less than the detection limit.

Section 20.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

SOURCE CS-BPHSTV

QUALITY CONTROL SUMMARY
METHOD 25A

1. CALIBRATION

THEOR	6/3/92		6/4/92	
ppm	ppm	%ERR	ppm	%ERR
0.0	-8.0	-0.5	-1.0	-0.1
36.0	38.0	0.1	36.0	0.0
91.0	97.0	0.4	92.0	0.1
1506.0	1505.0	-0.1	1505.0	-0.1
CORR COEFF	0.9999		0.9999	

2. PROPANE LINE RECOVERY

	DATE	6/3/92		DATE	6/4/92	
	INST	LINE	%REC	INST	LINE	%REC
BEFORE	1505.0	1442.0	95.8%	1484.0	1476.0	99.5%
AFTER	1484.0	1476.0	99.5%	1490.0	1521.0	102.1%

3. LINE BLANK

	6/3/92	6/4/92
	ppm	ppm
BEFORE	2.0	0.0
AFTER	0.0	*

* Not performed

SOURCE **CS-BPHSTV**

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR ppm	DATE 6/3/92 ppm	%REC	DATE 6/4/92 ppm	%REC
ethanol	52.0	27.4	52.6%	34.9	67.2%
acetone	41.6	28.1	67.7%	34.8	83.6%
isopropanol	39.9	32.0	80.2%	37.5	94.2%
dimethyl sulfide	9.1	7.4	81.3%	8.7	95.6%
benzene	34.2	31.1	91.2%	36.1	105.6%
bromodichloromethane	18.8	16.1	85.6%	18.0	95.7%
dimethyl disulfide	33.9	28.6	84.5%	34.2	100.8%
toluene	28.7	19.0	66.0%	29.3	101.9%
ethyl benzene	24.9	21.2	85.2%	25.5	102.1%
m-xylene	49.8	42.6	85.5%	50.8	102.0%
o-xylene	25.0	21.4	85.6%	25.3	101.2%
cumene	21.9	18.6	84.9%	22.1	101.0%
alpha-pinene	19.2	16.3	85.1%	19.5	101.7%
beta-pinene	19.2	16.1	83.5%	19.2	99.8%
3-carene	19.3	18.5	96.1%	18.7	96.9%
p-cymene	19.6	16.9	86.3%	19.4	99.0%

2. PROPANE RESPONSE

	THEOR		%REC		%REC
BEFORE	36.0	39.3	109.2%	40.4	112.2%
AFTER	36.0	40.4	112.2%	37.8	105.0%

3. METHANOL LINE RECOVERY

	6/3/92 GC	LINE	%REC	6/4/92 GC	LINE	%REC
BEFORE	10.3	9.2	89.3%	10.1	9.3	92.1%
AFTER	10.1	9.3	92.1%	9.9	10.7	108.1%

4. LINE BLANK

	[------------FILE REF------------]	
BEFORE	F3B2012	F4B2003
AFTER	F4B2003	*

* Not performed

Additional QC: CHCL3 (1531ppm) analyzed on range 2 (same as samples) gave 102% recovery

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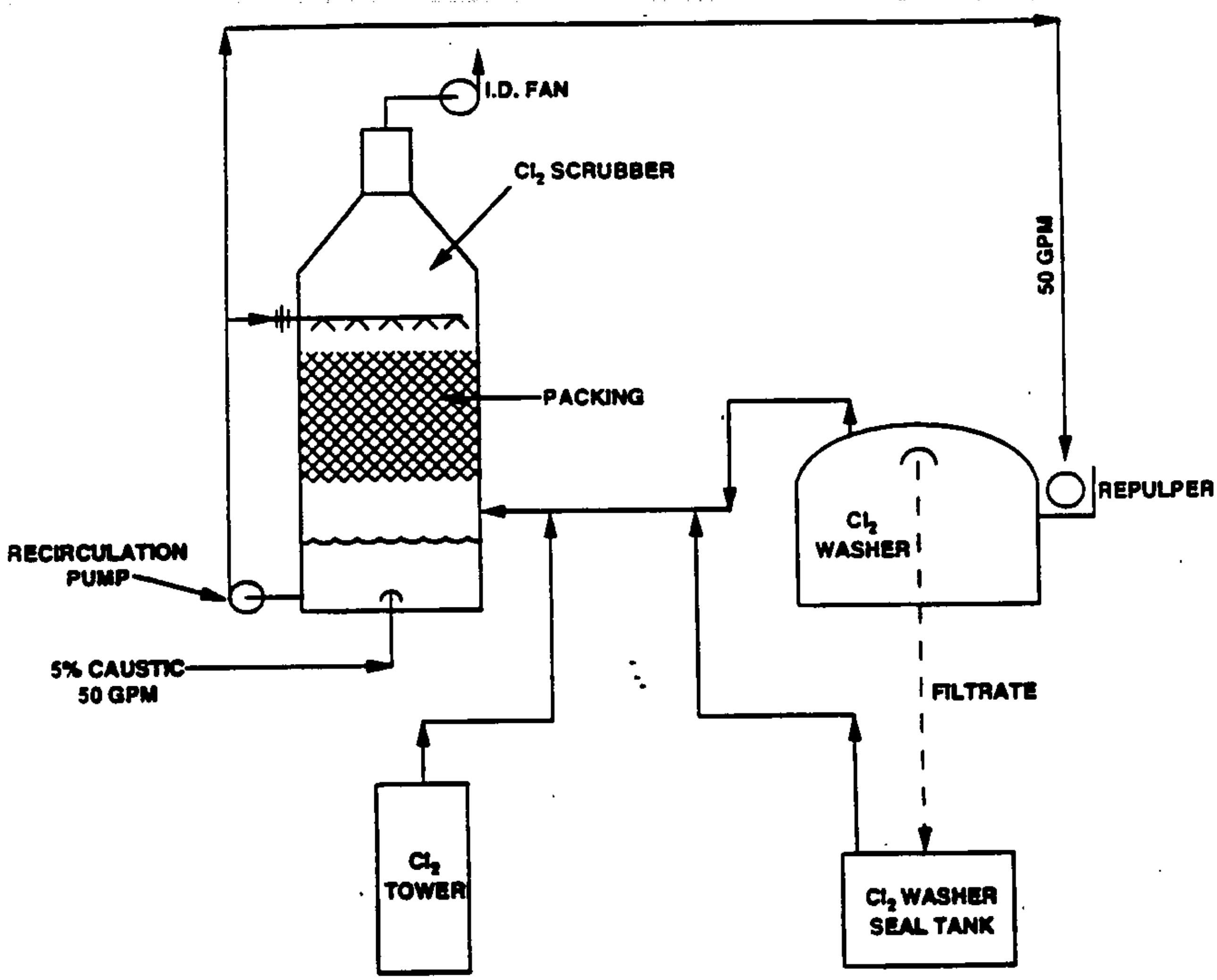
Section 20.4 Process Operating Data

BLEACH PLANT SCRUBBER

At this facility, vent gases from the chlorine stage tower, washer hood and seal tank are collected and transported to a scrubber system for removing Cl_2.

Figure 1 is a schematic of the Cl_2 scrubber system. The gases pass through a countercurrent flow packed tower. The packed tower has a diameter of 4 ft and is 13 ft tall. The tower contains 2 ft of Kimre model 37/47 kynar packing and a mist eliminator consisting of six layers of 16/96 Kimre kynar. Scrubbing solution is sprayed on the packing through spray nozzles located above the wetted packing. The scrubbing solution used in this stage is 5 % caustic. The design makeup flow rate is 50 gpm. The gases leaving this scrubber are vented to the atmosphere through a short stack. The design gas flow rate through this system is 6,300 ACFM at 140°F.

FIGURE 1 BLEACH PLANT SCRUBBING SYSTEM



Representative Process Conditions

Scrubbing medium
(white liquor, weak wash, caustic, etc.) : 5 %caustic
Gas flow rate : 2,500 SCFM
Scrubbing solution recirculation rate : N/A

BLEACH PLANT DIAGRAMS AND PROCESS INFORMATION

A. Bleaching Practice

The mill has one bleach line with C,E,H sequences which produce 400 ton/day bleached kraft softwood pulp to a final G.E. brightness of 68 %. During the trials the bleach plant operated at a rate of 16-17 tons/hour. Figure 2 is a diagram of the bleaching process. Tables 2 and 3 show the bleaching conditions for the bleach plant during the trial. The kappa number of the brownstock ranged from 25 to 30 during the test with an average of 29.

TABLE 2 TYPICAL BLEACHING CONDITIONS

	C	E	H
Consistency, percent	3.2	10	10
Temperature, °F	105	115	115
Time, minutes	30	60	90
Chlorine, lb/ton odbs	115	0	0
Hypochlorite as Cl_2 lb/ton	0	0	44
Caustic, lb/ton	0	90	0
Peroxide, lb/ton	0	0	0
Chlorine dioxide	0	0	0
Residual chlorine, lb/ton	N/A	N/A	N/A
Vat pH	1.6	10.7	9
K number	N/A	4.5	N/A
G.E. Brightness	N/A	N/A	68

B. Water Reuse - Fresh water is used on the chlorine stage, hypo filtrate and fresh water on the extraction stage and white water on the hypo stage.

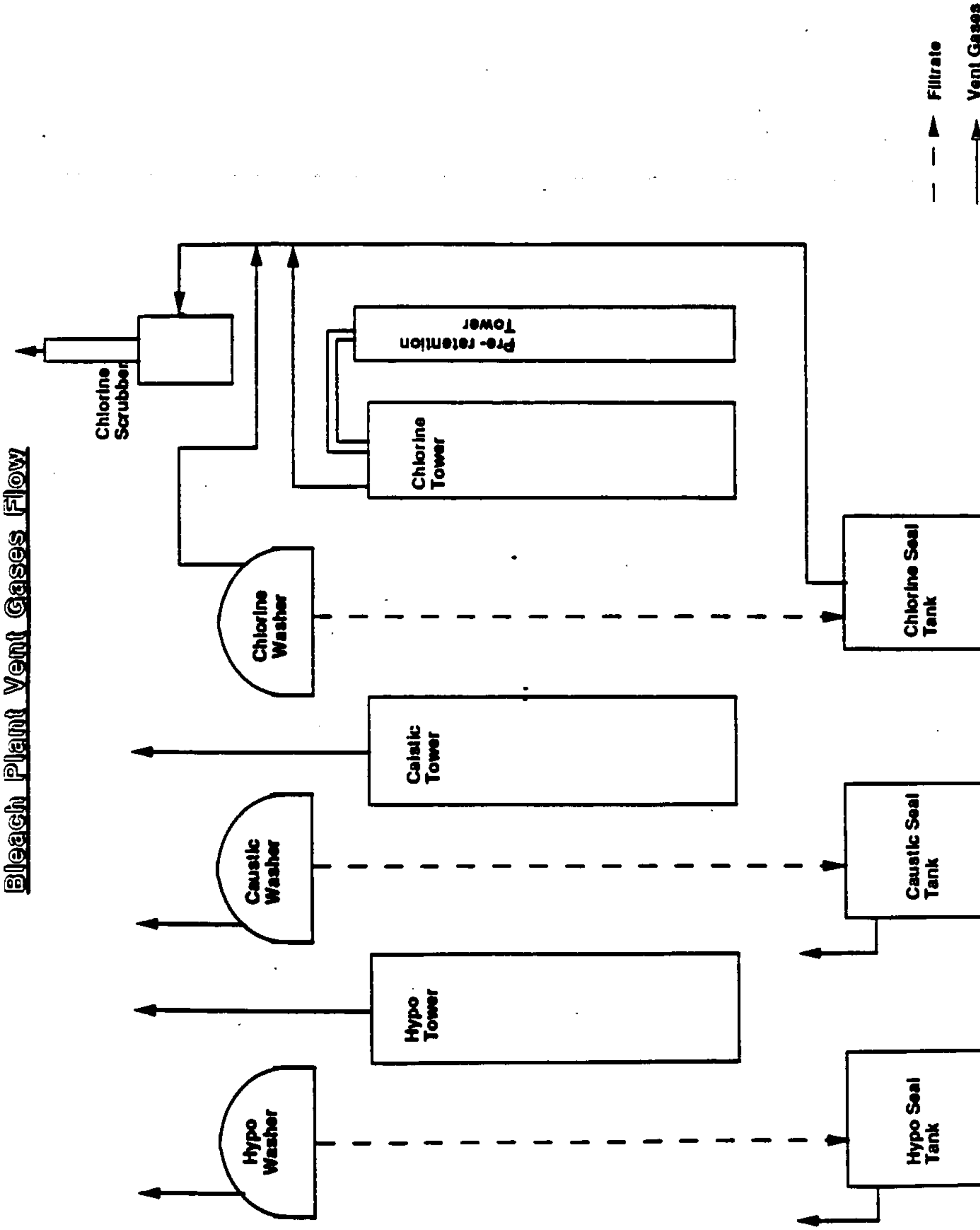
C. Bleach Plant Venting - Chlorine stage vents are combined into a single duct for treatment in a scrubber. Vents not collected into the combined vent are individually vented. Figure 2 shows the location of various vents.

Representative Process Conditions

Bleaching sequence : CEH
Wood species : Southern pine
Production rate : 400
Kappa number : 29
Chemical usage : Cl_2, NaOH and NaOCl
Percent ClO_2 substitution : 0
Tower temperatures and retention times : Refer to previous table
CE kappa number : N/A

FIGURE 2

Bleach Plant Vent Gases Flow



BLEACH PLANTS - PROCESS OPERATING CONDITIONS

Mill: Champion-Sheldon
Source: Bleach Plant
FIN: 4500

Source: Hypo Filtrate Seal Tank Vent
Date: 6-03-92
EPN: E26G CIN:

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		17:45	19:37	20:31	
Bleaching Sequence		CEH	CEH	CEH	0.00
Wood Species		SOFTWOOD	SOFTWOOD	SOFTWOOD	0.00
Production Rate		395	395	395	0.00
kappa no. ent Bleaching		22.8	22.8	22.6	0.00
Tower pH		8.7	9.0	8.6	0.00
CE kappa no		5.3	5.0	5.0	0.00
C/O2 Substitution	%	0	0	0	0.00
					0.00
Chemical Usage					
Chlorine	lb/ton	100	94	82	0.00
Chlorine Dioxide	lb/ton	---	---	---	0.00
Sodium Hydroxide	lb/ton	93	87	87	0.00
Sodium Hypochlorite	lb/ton	42	42	42	
Oxygen	lb/ton	---	---	---	0.00
Tower Temperatures					
	degree F	101	100	101	
	degree F	---	---	---	
	degree F	154	153	145	
	degree F	109	110	110	0.00
	degree F	---	---	---	0.00
Retention Times					
	min	27	27	27	0.00
	min	---	---	---	0.00
	min	128	128	128	0.00
	min	43	43	43	
	min	---	---	---	0.00
Scrubber Data					
Type					0.00
Scrubbing Media					0.00
Gas Flow Rate	ACFM				0.00
Liquid Flow Rate	GPM				0.00
Pressure Drop	in. H2O				

BLEACH PLANTS - PROCESS OPERATING CONDITIONS

Mill: Champion-Sheldon
Source: Bleach Plant
FIN: 4500

Source: Hypo Filtrate Seal Tank Vent
Date: 6-04-92
EPN: E260 CIN:

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		11:39	12:34	13:30	
Bleaching Sequence		CEH	CEH	CEH	0.00
Wood Species		SOFTWOOD	SOFTWOOD	SOFTWOOD	0.00
Production Rate		450	450	450	0.00
kappa no. ent Bleaching		19.2	19.2	19.0	0.00
Tower pH		8.3	8.3	8.4	0.00
CE kappa no		5.7	5.3	5.3	0.00
C/O2 Substitution	•	0	0	0	0.00
					0.00
Chemical Usage					
Chlorine	lb/ton	89	84	87	0.00
Chlorine Dioxide	lb/ton	---	---	---	0.00
Sodium Hydroxide	lb/ton	88	85	85	0.00
Sodium Hypochlorite	lb/ton	42	42	42	
Oxygen	lb/ton	---	---	---	0.00
Tower Temperatures					
	degree F	130	130	130	
	degree F	---	---	---	
	degree F	156	156	157	
	degree F	116	116	116	0.00
	degree F	---	---	---	0.00
Retention Times					
	min	24	24	24	0.00
	min	---	---	---	0.00
	min	113	113	113	0.00
	min	38	38	38	
	min	---	---	---	0.00
Scrubber Data					
Type					0.00
Scrubbing Media					0.00
Gas Flow Rate	ACFM				0.00
Liquid Flow Rate	GPM				0.00
Pressure Drop	in. H2O				

BLEACH PLANTS - PROCESS OPERATING CONDITIONS

Mill: Champion-Sheldon
Source: Bleach Plant
FIN: 4500

Source: Hypo Filtrate Seal Tank Vent
Date: 6-04-92
EPN: E26G CIN:

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		14:26			
Bleaching Sequence		CEH			0.00
Wood Species		SOFTWOOD			0.00
Production Rate		450			0.00
kappa no. ent Bleaching		19.2			0.00
Tower pH		8.2			0.00
CE kappa no		5.5			0.00
C/O2 Substitution	%	0			0.00
					0.00
Chemical Usage					
Chlorine	lb/ton	87			0.00
Chlorine Dioxide	lb/ton	---			0.00
Sodium Hydroxide	lb/ton	85			0.00
Sodium Hypochlorite	lb/ton	42			0.00
Oxygen	lb/ton	---			0.00
Tower Temperatures					
	degree F	130			0.00
	degree F	---			0.00
	degree F	157			0.00
	degree F	116			0.00
	degree F	---			0.00
Retention Times					
	min	24			0.00
	min	---			0.00
	min	113			0.00
	min	38			0.00
	min	---			0.00
Scrubber Data					
Type					0.00
Scrubbing Media					0.00
Gas Flow Rate	ACFM				0.00
Liquid Flow Rate	GPM				0.00
Pressure Drop	in. H2O				0.00

SECTION 21

HYPO TOWER VENT

(CS-BPHTV)

21. CS-BPHTV

SECTION 21
HYPO TOWER VENT
(CS-BPHTV)

The Hypo Tower Vent was tested on two different days for volatile organic compounds by M18 and M25A; chloroform and hydrogen chloride were also monitored.

Total Hydrocarbons (M25A)

Figures 21.1 and 21.2 present the THC trends for the test periods on 5/20/92 and 5/21/92. The THC emissions remained relatively constant throughout the sampling periods on both days except for a few points when the JUM apparently was not operating properly on 5/20/92 (flame out).

Volatile Organic Compounds (M18)

Table 21.1 summarizes the results for the Method 18 target compounds, and Section 21.1 is a tabulation of the data. TRS was not analyzed. A hot wire anemometer was used to determine the air flow. Chloroform was the only target compound detected at significant levels. A number of other compounds were detected at trace levels and are so noted on Table 21.1 as "<0.1".

Miscellaneous Parameters

Table 21.2 summarizes the results of testing for aldehydes, hydrogen chloride, chloroform, and sulfuric acid mists. Section 21.2 tabulates the results for each compound. Chloroform was detected at 0.3 lb/hr, much less than the M18 results.

VOC Quality Control Results

The VOC quality control data are tabulated in Section 21.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 21.4 includes the process operating data as recorded and provided by mill personnel. Not all process operating data were given for VOC and miscellaneous parameter run times. The data with the closest run time was used.

FIGURE 21.1
THC TREND ANALYSIS (5/20/92)
HYPO TOWER VENT (CS-BPHTV)

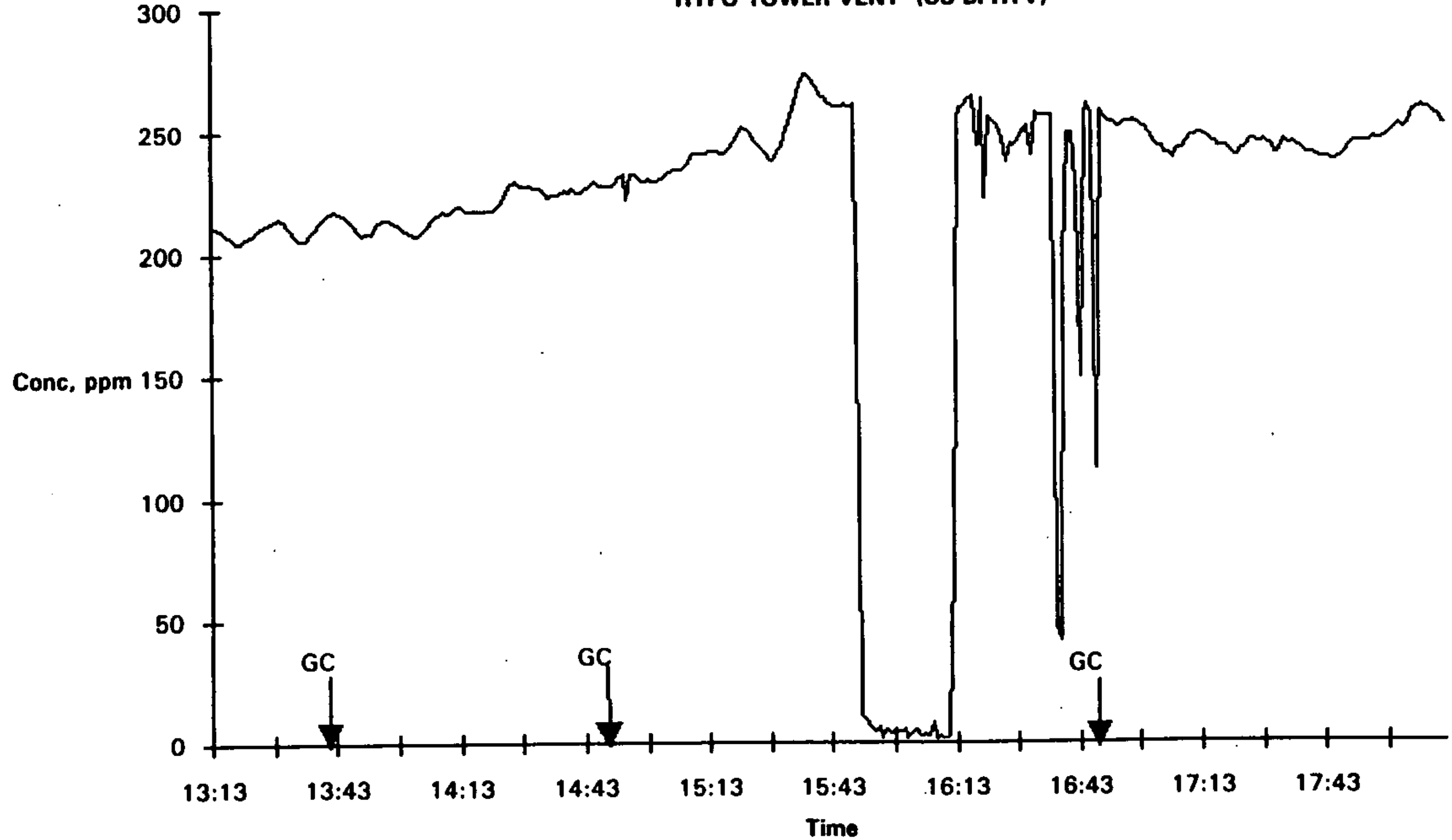


FIGURE 21.2
THC TREND ANALYSIS (5/21/92)
HYPO TOWER VENT (CS-BPHTV)

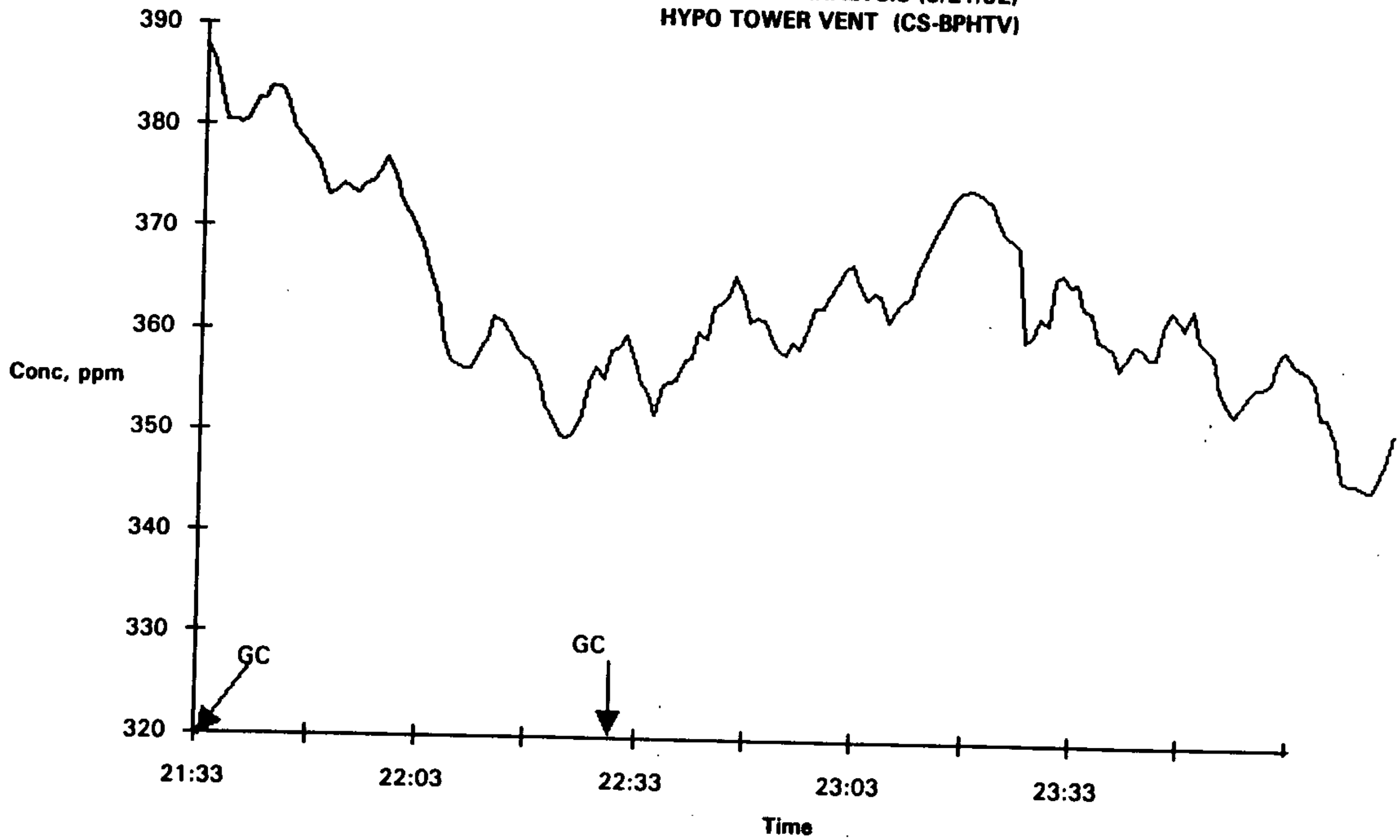


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TABLE 21.1 SUMMARY OF VOC RESULTS

Mill: CHAMPION - SHELDON
Source Code: CS-BPHTV
FIN: 4500 CIN:

Source: Hypo Tower Vent
Test Dates: 5/20/92 5/21/92
EPN: E26B

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	79	109	94	
Volumetric Flow Rate, x10³ DSCFM	0.4	0.5	0.5	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	12.9	16.7	14.8	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	<0.1	<0.1	0.1	0.1
Ethanol	ND	ND	ND	0.1
Acetone	ND	ND	ND	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	2.0	3.1	2.6	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	<0.1	0.1	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	ND	ND	0.1
alpha-Pinene	ND	<0.1	0.1	0.1
beta-Pinene	ND	<0.1	0.1	0.1
3-Carene	ND	ND	ND	0.1
Terpenes (Unspecified)	ND	<0.1	0.1	0.1
p-Cymene	ND	ND	ND	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	0.2	0.3	0.3	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	0.2	0.3	0.3	0.1

ND=Not Detected
DL=Detection Limit

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TABLE 21.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: CHAMPION-SHELDON
Source Code: CS-BPHTV
FIN: 4500 EPN: E26E

Source: Hypo Tower Vent
Test Dates: 5/21/92
CIN:

	RUN 1	DL
Volumetric Flow Data		
Stack Temperature, °F	109	
Volumetric Flow Rate, x 10^3 DSCFM	8.4	
Process Operating Conditions		
Production Rate, ADT pulp/hr	12.9	
Emission Rate, lb/hr		
Chloroform	0.3	0.1
Hydrogen chloride	ND	0.1

ND = Not Detected
DL = Detection Limit

Section 21.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON	Source:	Hypo Tower Vent			FIN:	4500
Source Code: CS-BPHTV	Date:	5/20/92	EPN:	E26E	CIN:	-

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1312	1412	1612	
Flow Data				
Stack Temperature, °F	79			79
Moisture Content, %	3.3			3.3
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.5			0.5
Volumetric Flow Rate, x10^3 DSCFM	0.5			0.5
Process Operating Conditions				
Production Rate, ADT pulp/hr	16.7	16.7	16.7	16.7
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	24.1	25.4	27.0	25.5
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Hypo Tower Vent | FIN: 4500
Source Code: CS-BPHTV | Date: 5/20/92 | EPN: E26E | CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	306.8	344.8	351.8	334.5
Emission Rate, lb/hr	2.7	3.0	3.1	2.9
Benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.0	1.0	1.1	1.1
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	1.0	1.8	3.2	2.0
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
beta-Pinene				
Concentration, ppmvd	0.6	1.1	1.4	1.1
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5	0.5 *	0.3
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

*One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Hypo Tower Vent | FIN: 4500
Source Code: CS-BPHTV | Date: 5/20/92 | EPN: E26E | CIN: -

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *	0.5 *	0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	305.5	352.9	375.2	344.5
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0	0.0	0.0
Sum M18 as Carbon, lb/hr	0.3	0.3	0.3	0.3
Unknown Compounds % of Total	0.0%	0.0%	0.0%	0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	218.2	235.8	246.1	233.4
Emission Rate, lb/hr as C	0.2	0.2	0.2	0.2

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON	Source:	Hypo Tower Vent		FIN:	4500
Source Code: CS-BPHTV	Date:	5/21/92	EPN: E26E	CIN:	

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	2132	2232	2332	
Flow Data				
Stack Temperature, °F	109			109
Moisture Content, %	3.2			3.2
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.4			0.4
Volumetric Flow Rate, x10^3 DSCFM	0.4			0.4
Process Operating Conditions				
Production Rate, ADT pulp/hr	12.9	12.9	12.9	12.9
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	19.2	20.0		19.6
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Acetone				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
2-Propanol				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON	Source: Hypo Tower Vent		FIN: 4500
Source Code: CS-BPHTV	Date: 5/21/92	EPN: E26E	CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Chloroform				
Concentration, ppmvd	306.1	289.9		298.0
Emission Rate, lb/hr	2.2	2.0		2.1
Benzene				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.0 *	1.0 *		1.0 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Ethyl benzene				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
o-Xylene				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Cumene				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
alpha-Pinene				
Concentration, ppmvd	0.6	0.5 *		0.4
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
beta-Pinene				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
3-Carene				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *

21.1 - 5

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON	Source:	Hypo Tower Vent			FIN:	4500
Source Code: CS-BPHTV	Date:	5/21/92	EPN:	E26E	CIN:	-

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.5 *	0.5 *		0.5 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Knowns as Carbon				
Concentration, ppmvd	294.8	280.0		287.4
Unknowns as Carbon				
Concentration, ppmvd	0.0	0.0		0.0
Sum M18 as Carbon, lb/hr	0.2	0.2		0.2
Unknown Compounds % of Total	0.0%	0.0%		0.0%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	380.2	376.0	367.8	374.7
Emission Rate, lb/hr as C	0.3	0.3	0.3	0.3

* One or more values were less than the detection limit.

Section 21.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - SHELDON Source: Hypo Tower Vent FIN: 4500
Source Code: CS-BPHTV Date: 5/21/92 EPN: E26E CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1105			
Flow Data				
Stack Temperature, °F	109			109
Moisture Content, %	3.2			3.2
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.4			0.4
Volumetric Flow Rate, x10^3 DSCFM	0.4			0.4
Process Operating Conditions				
Production Rate, ADT pulp/hr	12.9			12.9
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	47.7			47.7
Emission Rate, lb/hr	0.3			0.3
Hydrogen chloride				
Concentration, ppmvd	0.5 *			0.5 *
Emission Rate, lb/hr	0.1 *			0.1 *

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Section 21.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

SOURCE CS-BPHTV

QUALITY CONTROL SUMMARY
METHOD 25A

1. CALIBRATION

THEOR ppm	5/20/92 ppm	%ERR	5/21/92 ppm *	%ERR
0.0	-8.0	2.1	-33.0	2.2
91.0	92.0	0.3	38.0	0.1
150.0	165.0	3.8	124.0	2.2
308.0	300.0	2.1	1503.0	-0.2
CORR COEFF	0.9963		0.9993	

* THEOR ppm
0
36
91
1506

2. PROPANE LINE RECOVERY

	DATE 5/20/92 INST	LINE	%REC	DATE 5/21/92 INST	LINE	%REC
BEFORE	165.0	171.0	103.6%	156.0	154.0	98.7%
AFTER	156.0	154.0	98.7%	*		

3. LINE BLANK

	5/20/92 ppm	5/21/92 ppm
BEFORE	*	*
AFTER	*	*

* Not performed

SOURCE CS-BPHTV

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR	DATE	5/20/92	DATE	5/21/92
	ppm	ppm	%REC	ppm	%REC
ethanol	52.0	48.7	93.7%	47.8	91.8%
acetone	41.6	39.2	94.4%	38.4	92.3%
isopropanol	39.9	38.1	95.6%	37.1	93.1%
dimethyl sulfide	9.1	8.8	96.7%	8.4	92.3%
benzene	34.2	24.6	72.0%	30.9	90.4%
bromodichloromethane	18.8	16.3	86.7%	16.3	86.7%
dimethyl disulfide	33.9	31.9	94.1%	31.2	92.2%
toluene	28.7	26.8	93.4%	26.0	90.5%
ethyl benzene	24.9	23.5	94.3%	22.7	91.2%
m-xylene	49.8	47.0	94.4%	45.2	90.8%
o-xylene	25.0	23.4	93.5%	22.6	90.5%
cumene	21.9	20.6	93.7%	19.9	90.5%
alpha-pinene	19.2	17.8	93.1%	17.2	90.0%
beta-pinene	19.2	17.9	92.9%	17.4	90.4%
3-carene	19.3	16.7	86.5%	16.4	85.3%
p-cymene	19.6	17.4	88.9%	17.0	86.8%

2. PROPANE RESPONSE

	THEOR		%REC		%REC
BEFORE	36.0	40.7	113.1%	38.9	108.1%
AFTER	36.0	39.1	108.6%	38.2	106.1%

3. METHANOL LINE RECOVERY

	5/20/92			5/21/92		
	GC	LINE	%REC	GC	LINE	%REC
BEFORE	10.6	10.3	97.2%	13.8	14.0	101.4%
AFTER	14.1	13.5	95.7%	10.6	10.4	98.1%

4. LINE BLANK

	[-------------FILE REF-------------]	
BEFORE	EKA2003	ELA2005
AFTER	ELA2005	ELA2010

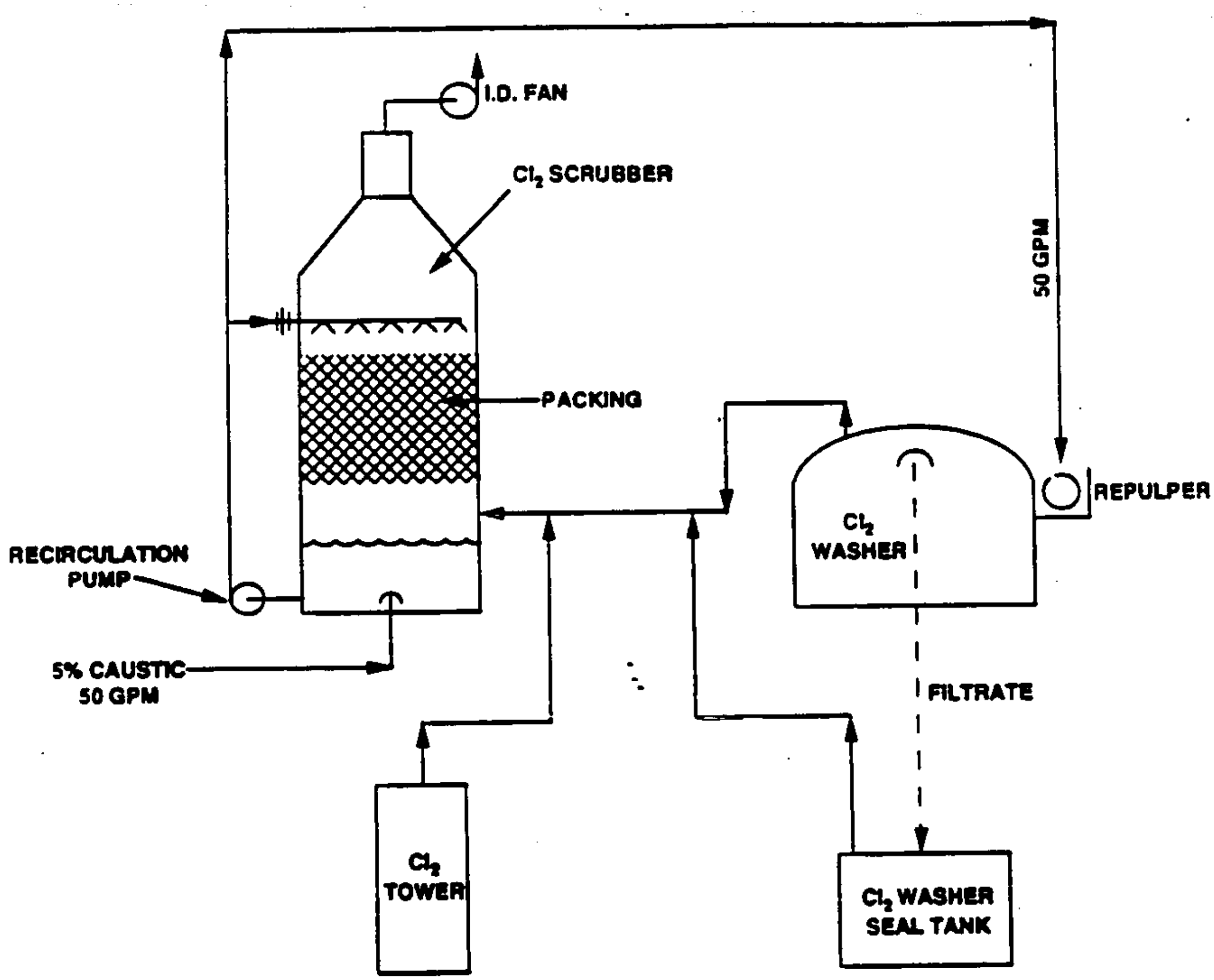
Section 21.4 Process Operating Data

BLEACH PLANT SCRUBBER

At this facility, vent gases from the chlorine stage tower, washer hood and seal tank are collected and transported to a scrubber system for removing Cl_2.

Figure 1 is a schematic of the Cl_2 scrubber system. The gases pass through a countercurrent flow packed tower. The packed tower has a diameter of 4 ft and is 13 ft tall. The tower contains 2 ft of Kimre model 37/47 kynar packing and a mist eliminator consisting of six layers of 16/96 Kimre kynar. Scrubbing solution is sprayed on the packing through spray nozzles located above the wetted packing. The scrubbing solution used in this stage is 5 % caustic. The design makeup flow rate is 50 gpm. The gases leaving this scrubber are vented to the atmosphere through a short stack. The design gas flow rate through this system is 6,300 ACFM at 140°F.

FIGURE 1 BLEACH PLANT SCRUBBING SYSTEM



Representative Process Conditions

Scrubbing medium
(white liquor, weak wash, caustic, etc.) : 5 %caustic
Gas flow rate : 2,500 SCFM
Scrubbing solution recirculation rate : N/A

BLEACH PLANT DIAGRAMS AND PROCESS INFORMATION

A. Bleaching Practice

The mill has one bleach line with C,E,H sequences which produce 400 ton/day bleached kraft softwood pulp to a final G.E. brightness of 68 %. During the trials the bleach plant operated at a rate of 16-17 tons/hour. Figure 2 is a diagram of the bleaching process. Tables 2 and 3 show the bleaching conditions for the bleach plant during the trial. The kappa number of the brownstock ranged from 25 to 30 during the test with an average of 29.

TABLE 2 TYPICAL BLEACHING CONDITIONS

	C	E	H
Consistency, percent	3.2	10	10
Temperature, °F	105	115	115
Time, minutes	30	60	90
Chlorine, lb/ton odbs	115	0	0
Hypochlorite as Cl_2 lb/ton	0	0	44
Caustic, lb/ton	0	90	0
Peroxide, lb/ton	0	0	0
Chlorine dioxide	0	0	0
Residual chlorine, lb/ton	N/A	N/A	N/A
Vat pH	1.6	10.7	9
K number	N/A	4.5	N/A
G.E. Brightness	N/A	N/A	68

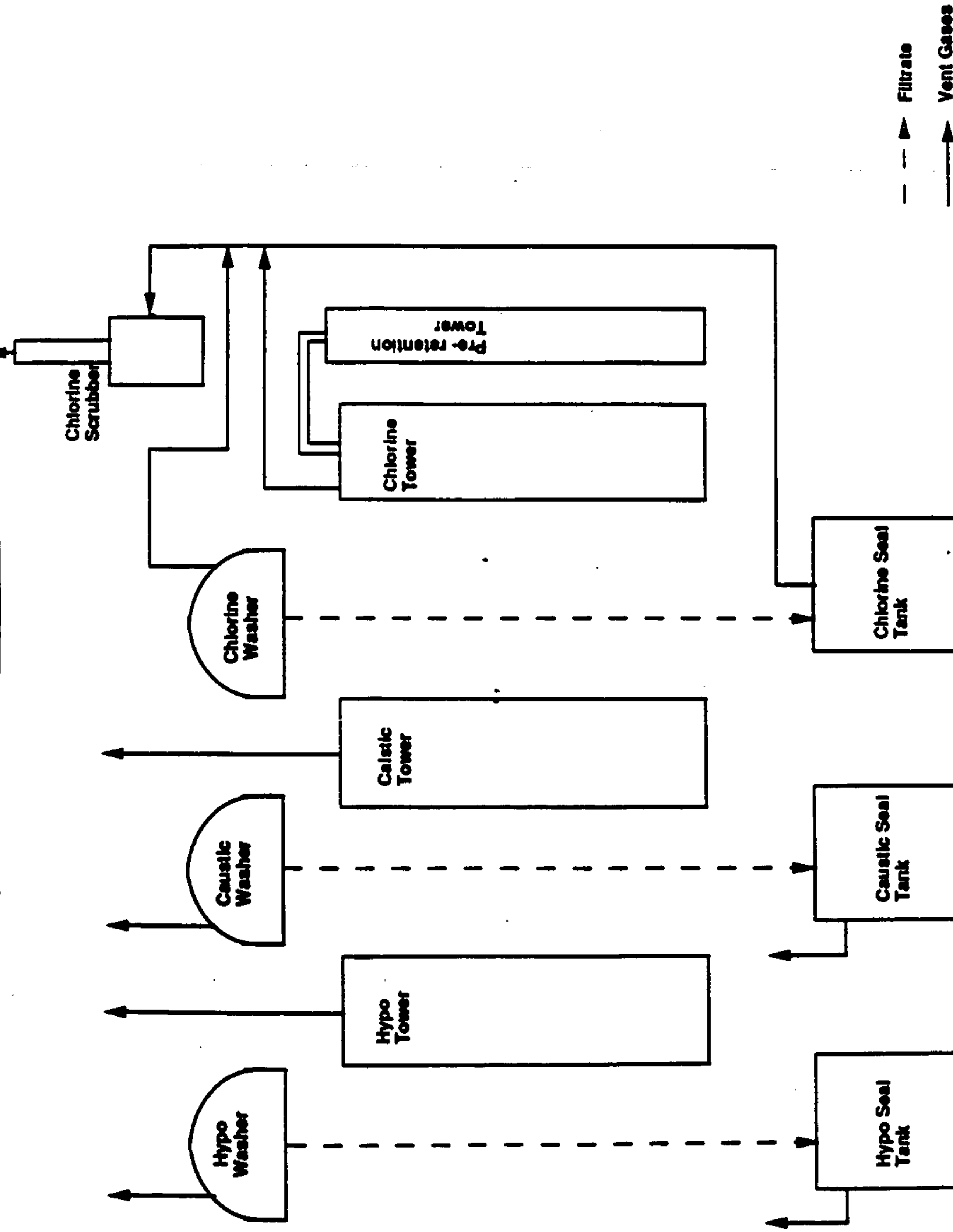
B. Water Reuse - Fresh water is used on the chlorine stage, hypo filtrate and fresh water on the extraction stage and white water on the hypo stage.

C. Bleach Plant Venting - Chlorine stage vents are combined into a single duct for treatment in a scrubber. Vents not collected into the combined vent are individually vented. Figure 2 shows the location of various vents.

Representative Process Conditions

Bleaching sequence : CEH
Wood species : Southern pine
Production rate : 400
Kappa number : 29
Chemical usage : Cl_2, NaOH and NaOCl
Percent ClO_2 substitution : 0
Tower temperatures and retention times : Refer to previous table
CE kappa number : N/A

Bleach Plant Vent Gases Flow



BLEACH PLANTS - PROCESS OPERATING CONDITIONS

Mill: Champion-Sheldon
Source: Bleach Plant
FIN: 4500

Source: Hypo Tower Vent
Date: 5-20-92
EPN: E26E CIN:

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		12:38	13:41	14:46	
Bleaching Sequence		CEH	CEH	CEH	0.00
Wood Species		SOFTWOOD	SOFTWOOD	SOFTWOOD	0.00
Production Rate		400	400	400	0.00
kappa no. ent Bleaching		17.9	18.0	18.0	0.00
Tower pH		8.1	8.1	8.4	0.00
CE kappa no		5.4	5.4	5.6	0.00
C/O2 Substitution	%	0	0	0	0.00
					0.00
Chemical Usage					
Chlorine	lb/ton	100	100	108	0.00
Chlorine Dioxide	lb/ton	---	---	---	0.00
Sodium Hydroxide	lb/ton	113	107	104	0.00
Sodium Hypochlorite	lb/ton	40	40	40	
Oxygen	lb/ton	---	---	---	0.00
Tower Temperatures					
	degree F	103	103	103	
	degree F	---	---	---	
	degree F	155	155	157	
	degree F	114	114	114	0.00
	degree F	---	---	---	0.00
Retention Times					
	min	25	25	25	0.00
	min	---	---	---	0.00
	min	120	120	120	0.00
	min	40	40	40	
	min	---	---	---	0.00
Scrubber Data					
Type					0.00
Scrubbing Media					0.00
Gas Flow Rate	ACFM				0.00
Liquid Flow Rate	GPM				0.00
Pressure Drop	in. H2O				

BLEACH PLANTS - PROCESS OPERATING CONDITIONS

Mill: Champion-Sheldon
Source: Bleach Plant
FIN: 4500

Source: Hypo Tower Vent
Date: 5-21-92
EPN: E26E CIN:

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		19:00	20:00	21:00	
Bleaching Sequence		CEH	CEH	CEH	0.00
Wood Species		SOFTWOOD	SOFTWOOD	SOFTWOOD	0.00
Production Rate		310	310	310	0.00
kappa no. ent Bleaching		19.4	19.4	19.4	0.00
Tower pH		10.9	105.0	10.6	0.00
CE kappa no		5.4	507.0	5.7	0.00
C/O2 Substitution	%	0	0.000	0	0.00
					0.00
Chemical Usage					
Chlorine	lb/ton	88	96	89	0.00
Chlorine Dioxide	lb/ton	---	---	---	0.00
Sodium Hydroxide	lb/ton	91	91	91	0.00
Sodium Hypochlorite	lb/ton	42	42	42	
Oxygen	lb/ton	---	---	—	0.00
Tower Temperatures					
	degree F	105	105	105	
	degree F	---	---	---	
	degree F	140	139	139	
	degree F	113	113	113	0.00
	degree F	---	---	---	0.00
Retention Times					
	min	32	32	32	0.00
	min	---	---	---	0.00
	min	152	152	152	0.00
	min	51	51	51	
	min	---	---	---	0.00
Scrubber Data					
Type					0.00
Scrubbing Media					0.00
Gas Flow Rate	ACFM				0.00
Liquid Flow Rate	GPM				0.00
Pressure Drop	in. H2O				

SECTION 22
CAUSTIC VENT
(CS-BPCV)

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SECTION 22
CAUSTIC VENT
(CS-BPCV)

The Caustic Vent was tested on two different days for volatile organic compounds by M25A and M18. Chloroform and hydrogen chloride were also tested.

Total Hydrocarbons (M25A)

Figures 22.1 and 22.2 present the THC trends for the test periods on 5/20/92 and 5/21/92. THC emissions were much higher on 5/20/92 (600-700 ppm) than on 5/21/92 (150-200 ppm). Any difference in production rates does not appear to account for this vast difference in emissions.

Volatile Organic Compounds (M18)

Table 22.1 summarizes the results for Method 18 target compounds, and Section 22.1 is a tabulation of the data. TRS was not analyzed. The volumetric flow was measured during sampling with a pitot tube. A number of compounds were identified at low levels (0.2-1 lb/hr). A number of others appeared at trace levels in one or more GC analyses (<0.1 lb/hr).

Miscellaneous Parameters

Table 22.2 summarizes the results of testing for aldehydes, hydrogen chloride, chloroform, and sulfuric acid mists. Section 22.2 tabulates the results for each compound. Chloroform was measured at 0.5 lb/hr. This was in excellent agreement with the M18 results (Average = 0.5 lb/hr). Hydrogen chloride was present at trace levels (<0.1 lb/hr).

VOC Quality Control Results

The VOC quality control data are tabulated in Section 22.3. An explanation of the data is included in the section. Quality control results for other parameters are included with the data summary in the section referenced.

Process Description and Operating Conditions

Section 22.4 includes the process operating data as recorded and provided by mill personnel.

FIGURE 22.1
THC TREND ANALYSIS (5/20/92)
CAUSTIC VENT (CS-BPCV)

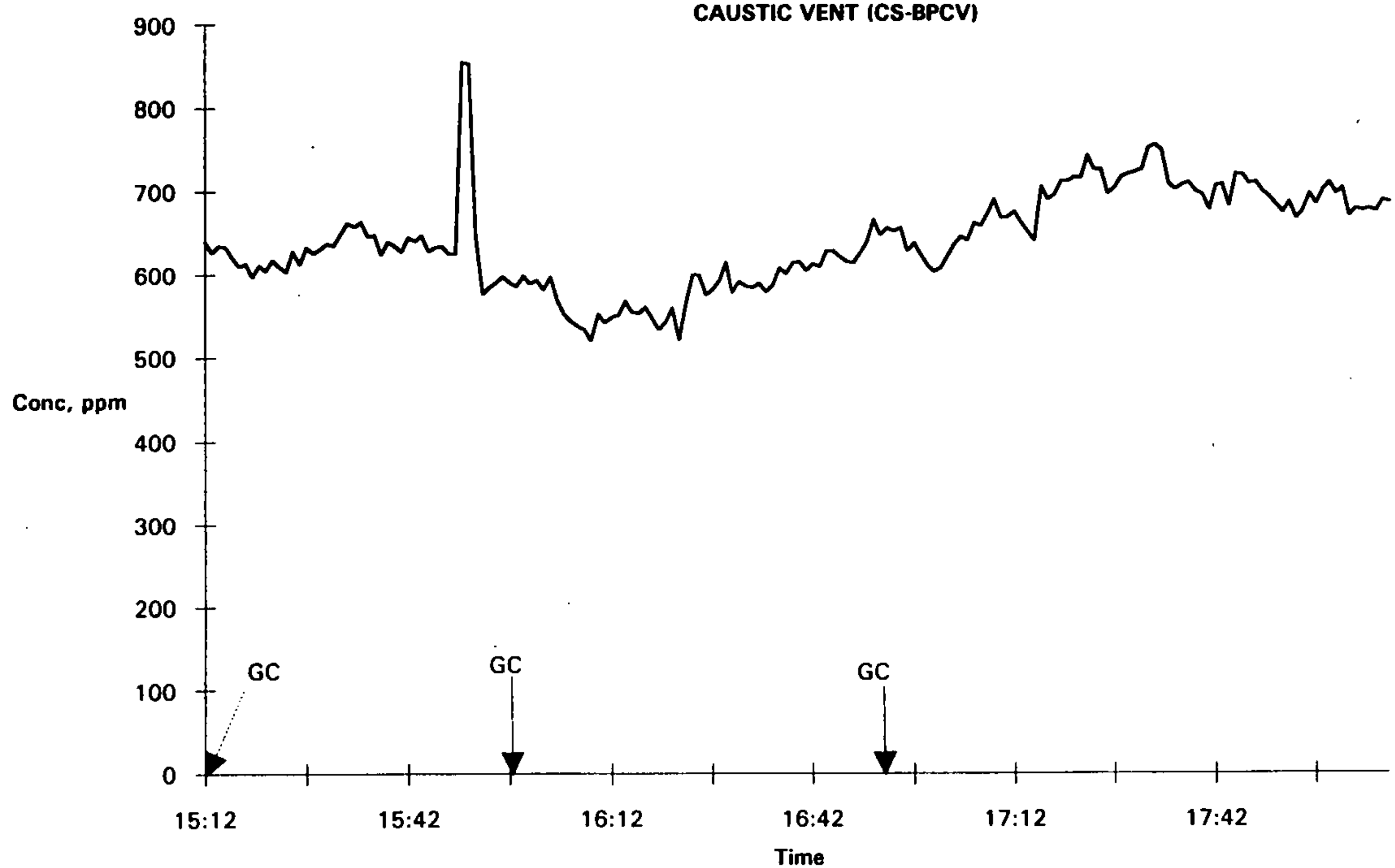

FIGURE 22.2
THC TREND ANALYSIS (5/21/92)
CAUSTIC VENT (CS-BPCV)

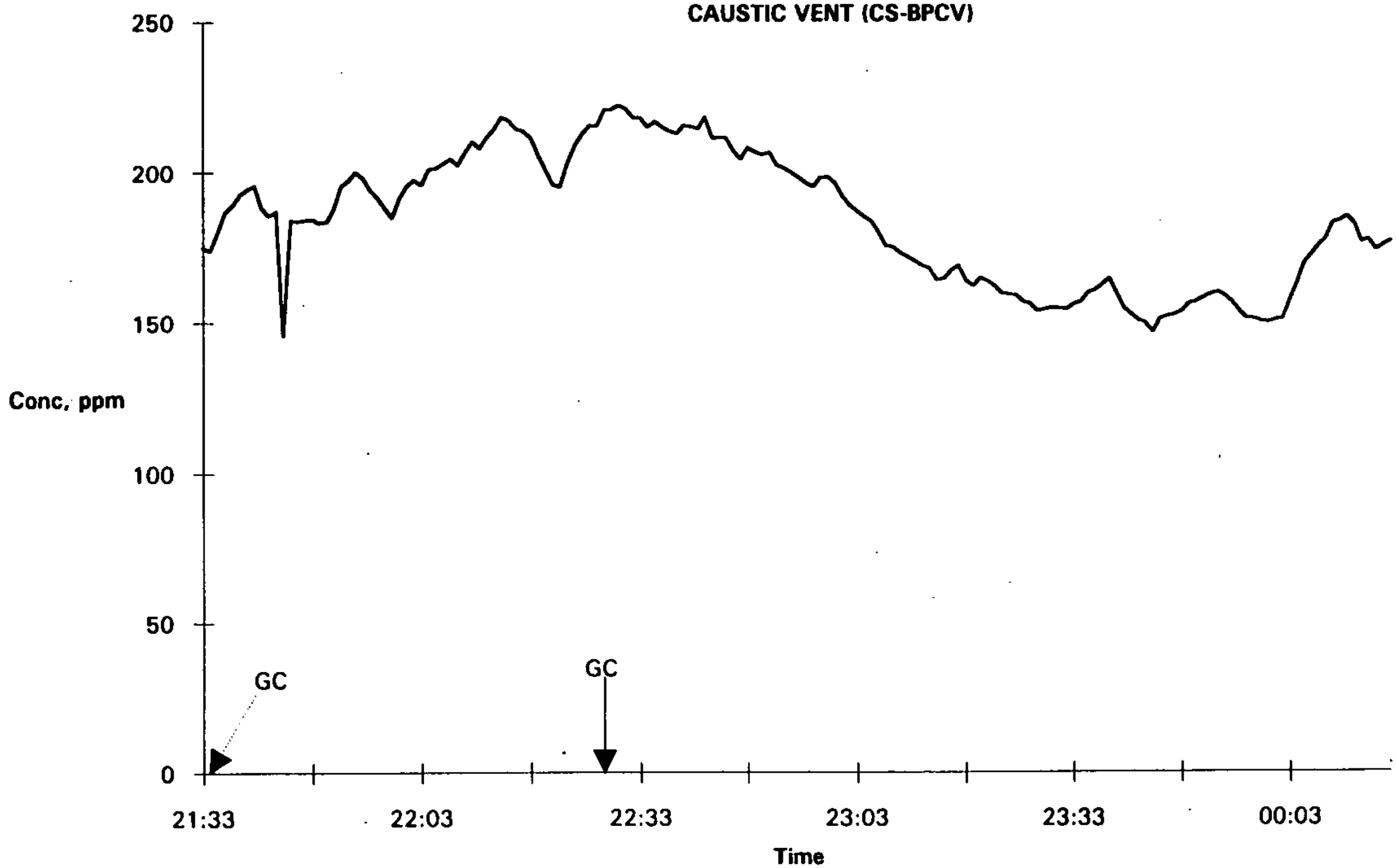

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TABLE 22.1 SUMMARY OF VOC RESULTS

Mill: CHAMPION - SHELDON | Source: Caustic Vent
Source Code: CS-BPCV | Test Dates: 5/20/92 5/21/92
FIN: 4500 CIN: | EPN: E26D

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	152	153	153	
Volumetric Flow Rate, x10^3 DSCFM	0.2	0.4	0.3	
Process Operating Conditions				
Production Rate, ADT Pulp/hr	12.9	16.7	14.8	
Method 16 Data, lb/hr				
Hydrogen sulfide				0.1
Methyl mercaptan				0.1
Dimethyl sulfide				0.1
Carbon disulfide				0.1
Dimethyl disulfide				0.1
Method 18 Data, lb/hr				
Methanol	0.2	0.7	0.5	0.1
Ethanol	<0.1	<0.1	0.1	0.1
Acetone	ND	<0.1	0.1	0.1
2-Propanol	ND	ND	ND	0.1
2-Butanone	ND	ND	ND	0.1
Chloroform	0.2	0.8	0.5	0.1
Benzene	ND	ND	ND	0.1
Bromodichloromethane	ND	ND	ND	0.1
Toluene	ND	ND	ND	0.1
Ethyl benzene	ND	ND	ND	0.1
m-, p-Xylene	ND	ND	ND	0.1
o-Xylene	ND	ND	ND	0.1
Cumene	ND	<0.1	0.1	0.1
alpha-Pinene	<0.1	0.7	0.4	0.1
beta-Pinene	<0.1	0.6	0.3	0.1
3-Carene	ND	<0.1	0.1	0.1
Terpenes (Unspecified)	<0.1	0.6	0.3	0.1
p-Cymene	<0.1	<0.1	0.1	0.1
Method 16 Plus Method 18 Data				
Knowns as C, lb/hr	0.2	1.6	1.0	0.1
Unknowns as C, lb/hr	ND	ND	ND	0.1
Sum of Compounds as C, lb/hr	0.2	1.6	1.0	0.1

ND=Not Detected
DL=Detection Limit

TABLE 22.2 SUMMARY OF MISCELLANEOUS RESULTS

Mill: CHAMPION-SHELDON
Source Code: CS-BPCV
FIN: 4500 EPN: E26D

Source: Caustic Vent
Test Dates: 5/20/92 5/21/92
CIN:

	MIN	MAX	MEAN	DL
Volumetric Flow Data				
Stack Temperature, °F	152	153	153	
Volumetric Flow Rate, x 10^3 DSCFM	0.2	0.4	0.3	
Process Operating Conditions				
Production Rate, ADT pulp/hr	12.9	16.7	15.4	
Emission Rate, lb/hr				
Chloroform	0.3	0.6	0.5	0.1
Hydrogen chloride	<0.1	<0.1	0.1	0.1

ND = Not Detected
DL = Detection Limit

Section 22.1 Emission Test Results - VOC

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON	Source:	Caustic Vent			FIN:	4500
Source Code: CS-BPCV	Date:	5/20/92	EPN:	E26D	CIN:	-

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1512	1612	1712	
Flow Data				
Stack Temperature, °F			152	152
Moisture Content, %			26.6	26.6
Oxygen Concentration, %			20.8	20.8
Carbon Dioxide Concentration, %			0.0	0.0
Volumetric Flow Rate, x10^3 ACFM			0.6	0.6
Volumetric Flow Rate, x10^3 DSCFM			0.4	0.4
Process Operating Conditions				
Production Rate, ADT pulp/hr	16.7	16.7	16.7	16.7
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	352.9	390.3	389.0	377.4
Emission Rate, lb/hr	0.6	0.7	0.7	0.7
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	3.0	3.7	4.2	3.6
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Acetone				
Concentration, ppmvd	1.0	1.6	1.6	1.4
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
2-Propanol				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Caustic Vent | FIN: 4500
Source Code: CS-BPCV | Date: 5/20/92 | EPN: E26D | CIN: -

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Chloroform				
Concentration, ppmvd	110.5	116.9	94.6	107.3
Emission Rate, lb/hr	0.7	0.8	0.6	0.7
Benzene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.4 *	1.4 *	1.4 *	1.4 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Ethyl benzene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
o-Xylene				
Concentration, ppmvd	0.7 *	0.7 *	0.7 *	0.7 *
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Cumene				
Concentration, ppmvd	1.0	1.6	0.7 *	1.0
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
alpha-Pinene				
Concentration, ppmvd	86.0	60.6	64.6	70.4
Emission Rate, lb/hr	0.7	0.5	0.5	0.5
beta-Pinene				
Concentration, ppmvd	77.7	54.9	59.7	64.1
Emission Rate, lb/hr	0.6	0.4	0.5	0.5
3-Carene				
Concentration, ppmvd	1.6	2.0	1.6	1.8
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	56.8	84.1	81.7	74.2
Emission Rate, lb/hr	0.4	0.6	0.6	0.6

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON   Source: Caustic Vent   FIN: 4500
Source Code: CS-BPCV   Date: 5/20/92   EPN: E26D   CIN: -

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	2.3	4.8	3.7	3.6
Emission Rate, lb/hr	0.1 *	0.1 *	0.1 *	0.1 *
Knowns as Carbon				
Concentration, ppmvd	2379.3	2194.7	2218.7	2264.2
Unknowns as Carbon				
Concentration, ppmvd	14.3	15.7	12.7	14.2
Sum M18 as Carbon, lb/hr	1.6	1.5	1.5	1.5
Unknown Compounds % of Total	0.6%	0.7%	0.6%	0.6%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	840.6	829.7	919.6	863.3
Emission Rate, lb/hr as C	0.6	0.6	0.6	0.6

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Caustic Vent | FIN: 4500
Source Code: CS-BPCV | Date: 5/21/92 | EPN: E26D | CIN: -

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	2132	2232	2332	
Flow Data				
Stack Temperature, °F	153			153
Moisture Content, %	21.5			21.5
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.4			0.4
Volumetric Flow Rate, x10^3 DSCFM	0.2			0.2
Process Operating Conditions				
Production Rate, ADT pulp/hr	12.9	12.9	12.9	12.9
Method 16 Data				
Hydrogen sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Carbon disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Method 18 Data				
Methanol				
Concentration, ppmvd	224.8	138.6		181.7
Emission Rate, lb/hr	0.3	0.2		0.2
Methyl mercaptan				
Concentration, ppmvd				
Emission Rate, lb/hr				
Ethanol				
Concentration, ppmvd	1.3	2.5		1.9
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Acetone				
Concentration, ppmvd	0.6 *	1.7		1.0
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
2-Propanol				
Concentration, ppmvd	0.6 *	0.6 *		0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON		Source:	Caustic Vent			FIN:	4500
Source Code:	CS-BPCV	Date:	5/21/92	EPN:	E26D	CIN:	-

	Run 1	Run 2	Run 3	Average
Dimethyl sulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
2-Butanone				
Concentration, ppmvd	0.6 *	0.6 *		0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Chloroform				
Concentration, ppmvd	63.6	40.3		51.9
Emission Rate, lb/hr	0.3	0.2		0.2
Benzene				
Concentration, ppmvd	0.6 *	0.6 *		0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Bromodichloromethane				
Concentration, ppmvd	1.3 *	1.3 *		1.3 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Dimethyl disulfide				
Concentration, ppmvd				
Emission Rate, lb/hr				
Toluene				
Concentration, ppmvd	0.6 *	0.6 *		0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Ethyl benzene				
Concentration, ppmvd	0.6 *	0.6 *		0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
m-, p-Xylene				
Concentration, ppmvd	0.6 *	0.6 *		0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
o-Xylene				
Concentration, ppmvd	0.6 *	0.6 *		0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Cumene				
Concentration, ppmvd	0.6 *	0.6 *		0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
alpha-Pinene				
Concentration, ppmvd	2.0	5.0		3.5
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
beta-Pinene				
Concentration, ppmvd	2.0	7.0		4.5
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
3-Carene				
Concentration, ppmvd	0.6 *	0.6 *		0.6 *
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Terpenes (Unspecified)				
Concentration, ppmvd	6.6	11.1		8.9
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - VOC

Mill: CHAMPION - SHELDON | Source: Caustic Vent | FIN: 4500
Source Code: CS-BPCV | Date: 5/21/92 | EPN: E26D | CIN: -

	Run 1	Run 2	Run 3	Average
p-Cymene				
Concentration, ppmvd	0.8	0.6		0.7
Emission Rate, lb/hr	0.1 *	0.1 *		0.1 *
Knowns as Carbon				
Concentration, ppmvd	353.8	386.8		370.3
Unknowns as Carbon				
Concentration, ppmvd	7.5	5.2		6.4
Sum M18 as Carbon, lb/hr	0.2	0.2		0.2
Unknown Compounds % of Total	2.1%	1.3%		1.7%
Method 25A Data				
Total Hydrocarbons				
Concentration, ppmvd as C	252.2	236.9	206.4	231.8
Emission Rate, lb/hr as C	0.1	0.1	0.1 *	0.1

* One or more values were less than the detection limit.

Section 22.2 Emission Test Results - Miscellaneous

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill:	CHAMPION - SHELDON	Source:	Caustic Vent			FIN:	4500
Source Code:	CS-BPCV	Date:	5/20/92	EPN:	E26D	CIN:	-

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1950	2019		
Flow Data				
Stack Temperature, °F	152			152
Moisture Content, %	26.6			26.6
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.6			0.6
Volumetric Flow Rate, x10^3 DSCFM	0.4			0.4
Process Operating Conditions				
Production Rate, ADT pulp/hr	16.7	16.7		16.7
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	94.3	47.3		70.8
Emission Rate, lb/hr	0.6	0.3		0.5
Hydrogen chloride				
Concentration, ppmvd	3.9			3.9
Emission Rate, lb/hr	0.1 *			0.1 *

* One or more values were less than the detection limit.

EMISSION TEST RESULTS - OTHER MISCELLANEOUS

Mill: CHAMPION - SHELDON   Source: Caustic Vent   FIN: 4500
Source Code: CS-BPCV   Date: 5/21/92   EPN: E26D   CIN: .

	Run 1	Run 2	Run 3	Average
CALCULATED RESULTS				
Beginning Time	1753			
Flow Data				
Stack Temperature, °F	153			153
Moisture Content, %	21.5			21.5
Oxygen Concentration, %	20.8			20.8
Carbon Dioxide Concentration, %	0.0			0.0
Volumetric Flow Rate, x10^3 ACFM	0.4			0.4
Volumetric Flow Rate, x10^3 DSCFM	0.2			0.2
Process Operating Conditions				
Production Rate, ADT pulp/hr	12.9			12.9
Miscellaneous Parameters				
Chloroform (Adsorption Tube)				
Concentration, ppmvd	100.2			100.2
Emission Rate, lb/hr	0.5			0.5
Hydrogen chloride				
Concentration, ppmvd	1.5			1.5
Emission Rate, lb/hr	0.1 *			0.1 *

22.2 - 2

* One or more values were less than the detection limit.

Section 22.3 Quality Control Results

QUALITY CONTROL DATA

The quality control results summarized on the following pages were collected before, during and after the VOC testing on the source. The source test results have not been corrected for calibration error, sample line loss or other QC results. The reader should interpret the emission data in light of the emission quality control.

The VOC testing included reduced sulfur compounds by EPA Method 16, total hydrocarbons by EPA Method 25A, and speciated volatile organic compounds by EPA Method 18. The following paragraphs summarize the normal quality control for each type of analysis. QC data are summarized in tabular form on the following pages.

Total Hydrocarbon (THC) by M25A

Calibration was performed using certified propane concentrations (reported as methane) in nitrogen. The calculated calibration curve was then used to recalculate the concentration of each standard. The percent error is the percent of span for the analyzer. The correlation coefficient is presented even though it is somewhat meaningless with so few data points.

A line study was performed by introducing propane in nitrogen from a Tedlar bag at the probe tip and then directly to the analyzer. The ratio of the two measured concentrations is presented as a percent recovery. Zero grade nitrogen was also pulled from the probe tip through the entire sampling systems to the analyzer to demonstrate the cleanliness as a nitrogen blank.

Volatile Organic Compounds by M18

The calibration curve was verified by analyzing a check standard containing a number of compounds. The percent recovery was calculated based on the theoretical concentration. The retention times of the compounds were verified from the check standard.

A line study was performed by introducing methanol in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as a percent recovery. The gas chromatograph was allowed to run for the duration of the analysis time, and the absence of peaks was used to demonstrate a line blank.

Total Reduced Sulfur by M16

A calibration curve was prepared from three standards generated from gravimetrically certified permeation devices. The concentration of each standard was recalculated from the calibration to evaluate the linearity of the curve.

A line study was performed by introducing hydrogen sulfide in air from a Tedlar bag at the probe tip and then directly to the GC. The ratio of the two measured concentrations is presented as the percent recovery.

SOURCE CS-BPCV

QUALITY CONTROL SUMMARY
METHOD 25A

1. CALIBRATION

THEOR ppm	5/20/92 ppm	5/20/92 %ERR	5/21/92 ppm *	5/21/92 %ERR
0.0	-133.0	8.9	0.0	0.0
250.0	335.0	5.7	40.0	0.3
900.0	1055.0	10.0	86.0	-0.3
1500.0	1392.0	7.2	1506.0	0.0
CORR COEFF	0.9785		0.9999	

* THEOR ppm
0
36
91
1506

2. PROPANE LINE RECOVERY

	DATE 5/20/92 INST	LINE	%REC	DATE 5/21/92 INST	LINE	%REC
BEFORE	162.0	163.0	100.6%	158.0	169.0	107.0%
AFTER	158.0	169.0	107.0%	**		

3. LINE BLANK

	5/20/92 ppm	5/21/92 ppm
BEFORE	**	**
AFTER	**	**

** Not performed

SOURCE CS-BPCV

QUALITY CONTROL SUMMARY
METHOD 18

1. CHECK STANDARD

ANALYTE	THEOR ppm	DATE 5/20/92 ppm	%REC	DATE 5/21/92 ppm	%REC
ethanol	52.0	45.8	88.0%	45.7	87.8%
acetone	41.6	33.6	80.9%	40.6	97.7%
isopropanol	39.9	37.5	94.0%	39.0	97.9%
dimethyl sulfide	9.1	8.6	94.5%	9.0	98.9%
benzene	34.2	34.0	99.6%	33.3	97.6%
bromodichloromethane	18.8	17.9	95.2%	18.6	98.9%
dimethyl disulfide	33.9	32.0	94.5%	33.4	98.5%
toluene	28.7	27.4	95.5%	29.4	102.2%
ethyl benzene	24.9	23.9	96.0%	24.8	99.5%
m-xylene	49.8	47.8	96.0%	49.0	98.4%
o-xylene	25.0	24.0	96.1%	27.0	107.8%
cumene	21.9	20.9	95.2%	22.0	100.1%
alpha-pinene	19.2	18.4	96.1%	19.8	103.4%
beta-pinene	19.2	18.1	94.2%	19.6	101.7%
3-carene	19.3	17.6	91.2%	19.7	102.4%
p-cymene	19.6	18.2	93.0%	20.0	102.2%

2. PROPANE RESPONSE

	THEOR		%REC		%REC
BEFORE	36.0	39.5	109.7%	39.8	110.6%
AFTER	36.0	39.5	109.7%	37.6	104.4%

3. METHANOL LINE RECOVERY

	5/20/92 GC	LINE	%REC	5/21/92 GC	LINE	%REC
BEFORE	9.9	8.9	89.9%	12.5	12.3	98.4%
AFTER	12.0	12.3	102.5%	*		

4. LINE BLANK

	[-------------FILE REF-------------]	
BEFORE	EKB2003	ELB2010
AFTER	ELB2010	*

* Not performed

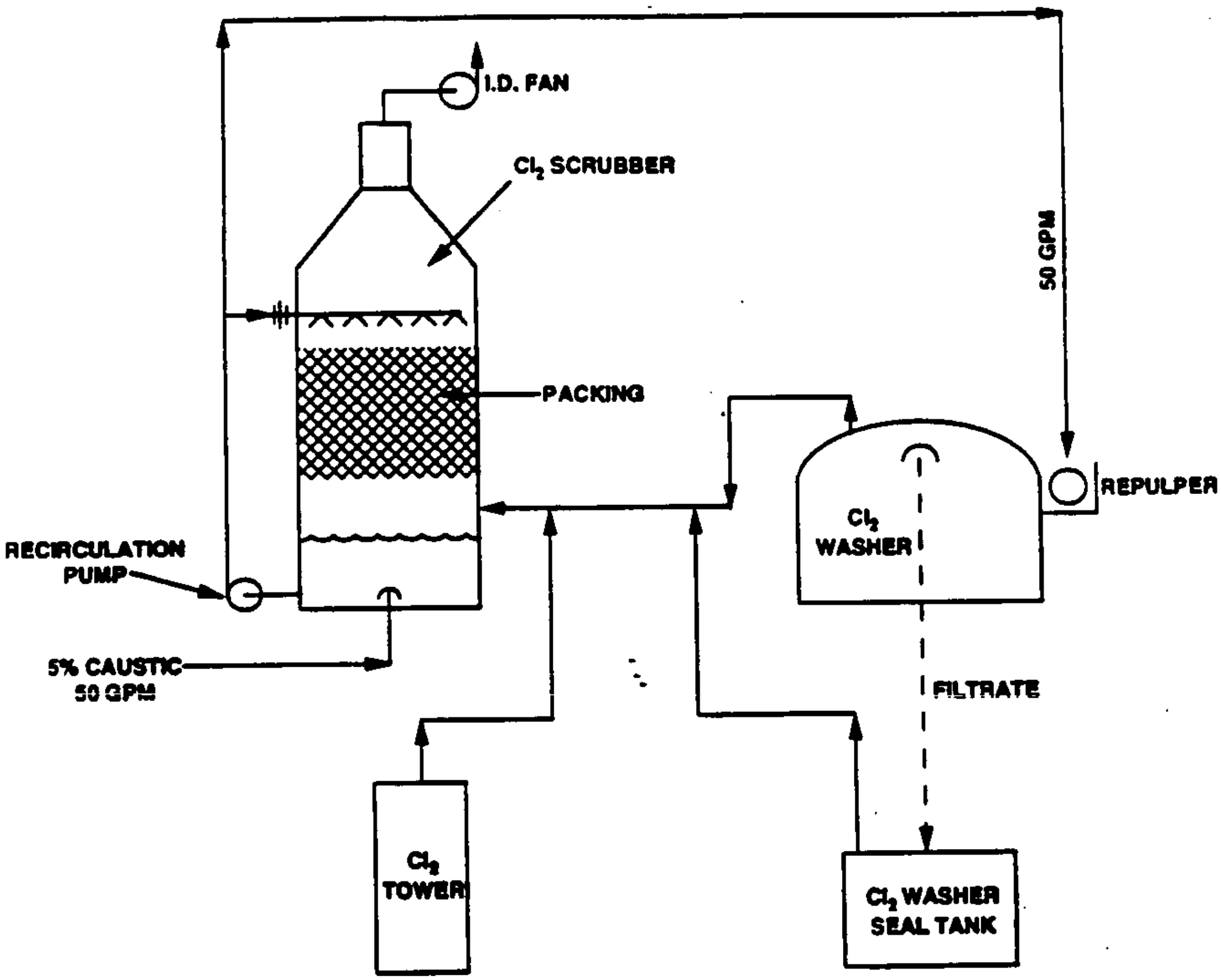
Section 22.4 Process Operating Data

BLEACH PLANT SCRUBBER

At this facility, vent gases from the chlorine stage tower, washer hood and seal tank are collected and transported to a scrubber system for removing Cl_2.

Figure 1 is a schematic of the Cl_2 scrubber system. The gases pass through a countercurrent flow packed tower. The packed tower has a diameter of 4 ft and is 13 ft tall. The tower contains 2 ft of Kimre model 37/47 kynar packing and a mist eliminator consisting of six layers of 16/96 Kimre kynar. Scrubbing solution is sprayed on the packing through spray nozzles located above the wetted packing. The scrubbing solution used in this stage is 5 % caustic. The design makeup flow rate is 50 gpm. The gases leaving this scrubber are vented to the atmosphere through a short stack. The design gas flow rate through this system is 6,300 ACFM at 140°F.

FIGURE 1 BLEACH PLANT SCRUBBING SYSTEM



Representative Process Conditions

Scrubbing medium
(white liquor, weak wash, caustic, etc.) : 5 %caustic
Gas flow rate : 2,500 SCFM
Scrubbing solution recirculation rate : N/A

BLEACH PLANT DIAGRAMS AND PROCESS INFORMATION

A. Bleaching Practice

The mill has one bleach line with C,E,H sequences which produce 400 ton/day bleached kraft softwood pulp to a final G.E. brightness of 68 %. During the trials the bleach plant operated at a rate of 16-17 tons/hour. Figure 2 is a diagram of the bleaching process. Tables 2 and 3 show the bleaching conditions for the bleach plant during the trial. The kappa number of the brownstock ranged from 25 to 30 during the test with an average of 29.

TABLE 2 TYPICAL BLEACHING CONDITIONS

	C	E	H
Consistency, percent	3.2	10	10
Temperature, °F	105	115	115
Time, minutes	30	60	90
Chlorine, lb/ton odbs	115	0	0
Hypochlorite as Cl_2 lb/ton	0	0	44
Caustic, lb/ton	0	90	0
Peroxide, lb/ton	0	0	0
Chlorine dioxide	0	0	0
Residual chlorine, lb/ton	N/A	N/A	N/A
Vat pH	1.6	10.7	9
K number	N/A	4.5	N/A
G.E. Brightness	N/A	N/A	68

B. Water Reuse - Fresh water is used on the chlorine stage, hypo filtrate and fresh water on the extraction stage and white water on the hypo stage.

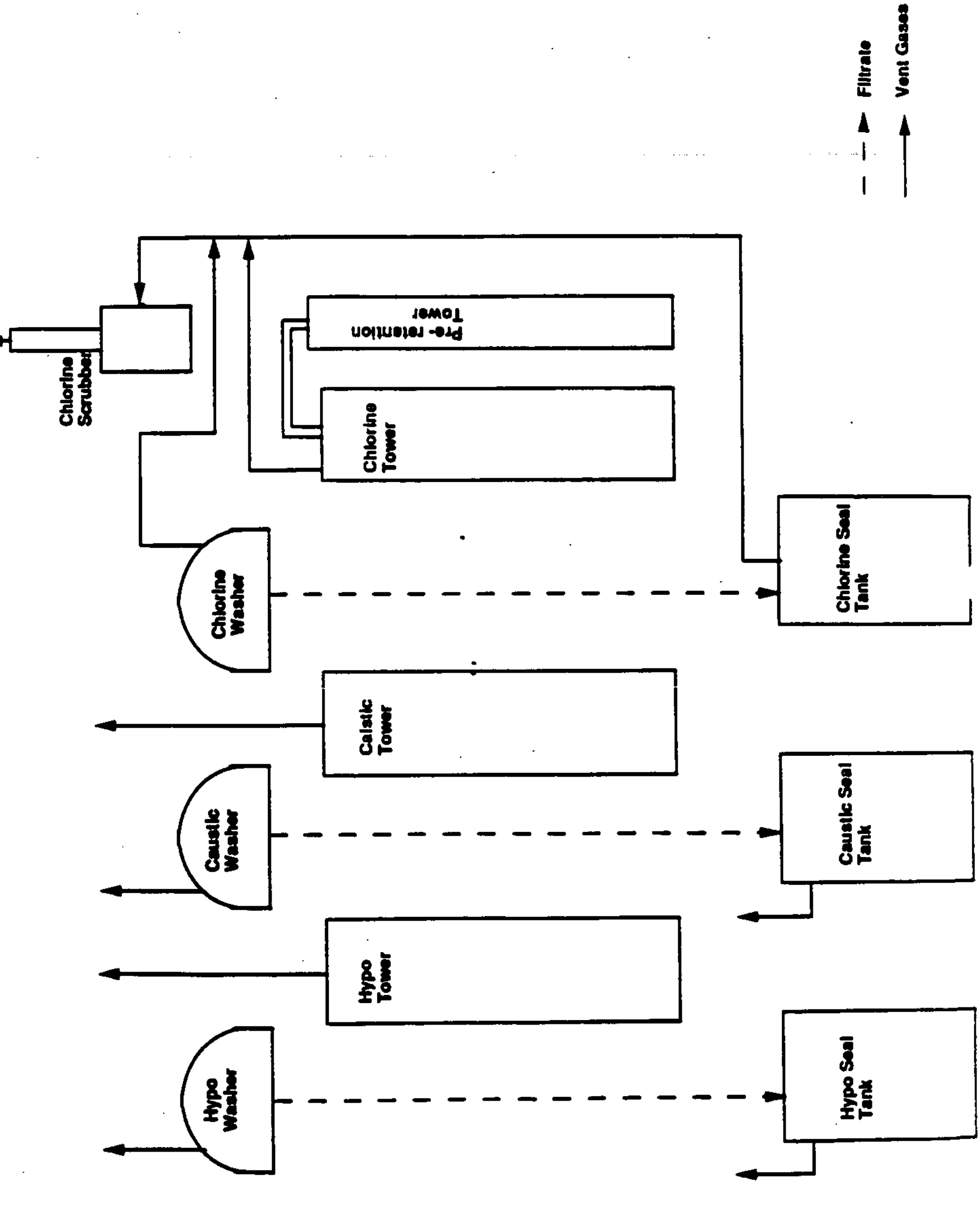
C. Bleach Plant Venting - Chlorine stage vents are combined into a single duct for treatment in a scrubber. Vents not collected into the combined vent are individually vented. Figure 2 shows the location of various vents.

Representative Process Conditions

Bleaching sequence : CEH
Wood species : Southern pine
Production rate : 400
Kappa number : 29
Chemical usage : Cl_2, NaOH and NaOCl
Percent ClO_2 substitution : 0
Tower temperatures and retention times : Refer to previous table
CE kappa number : N/A

FIGURE 2

Bleach Plant Vent Gases Flow



BLEACH PLANTS - PROCESS OPERATING CONDITIONS

Mill: Champion-Sheldon
Source: Bleach Plant
FIN: 4500

Source: Caustic Tower Vent
Date: 5-20-92
EPN: E26D CIN:

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		12:38	13:41	14:46	
Bleaching Sequence		CEH	CEH	CEH	0.00
Wood Species		SOFTWOOD	SOFTWOOD	SOFTWOOD	0.00
Production Rate		400	400	400	0.00
kappa no. ent Bleaching		18.0	18.0	18.0	0.00
Tower pH		10.3	10.3	10.4	0.00
CE kappa no		5.4	5.6	5.6	0.00
C/O2 Substitution	%	0	0	0	0.00
					0.00
Chemical Usage					
Chlorine	lb/ton	100	100	108	0.00
Chlorine Dioxide	lb/ton	---	---	---	0.00
Sodium Hydroxide	lb/ton	100	100	102	0.00
Sodium Hypochlorite	lb/ton	40	40	40	
Oxygen	lb/ton	---	---	---	0.00
Tower Temperatures					
	degree F	103	103	103	
	degree F	---	---	---	
	degree F	155	155	154	
	degree F	114	114	113	0.00
	degree F	---	---	---	0.00
Retention Times					
	min	25	25	25	0.00
	min	---	---	---	0.00
	min	120	120	120	0.00
	min	40	40	40	
	min	---	---	---	0.00
Scrubber Data					
Type					0.00
Scrubbing Media					0.00
Gas Flow Rate	ACFM				0.00
Liquid Flow Rate	GPM				0.00
Pressure Drop	in. H2O				

BLEACH PLANTS - PROCESS OPERATING CONDITIONS

Mill: Champion-Sheldon
Source: Bleach Plant
FIN: 4500

Source: Caustic Tower Vent
Date: 5-20-92
EPN: E26D CIN:

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		15:15	16:51		
Bleaching Sequence		CEH	CEH		0.00
Wood Species		SOFTWOOD	SOFTWOOD		0.00
Production Rate		400	400		0.00
kappa no. ent Bleaching		18.3	18.3		0.00
Tower pH		10.1	10.6		0.00
CE kappa no		5.3	5.3		0.00
C/O2 Substitution	•	0	0		0.00
					0.00
Chemical Usage					
Chlorine	lb/ton	109	114		0.00
Chlorine Dioxide	lb/ton	---	---		0.00
Sodium Hydroxide	lb/ton	108	108		0.00
Sodium Hypochlorite	lb/ton	40	40		0.00
Oxygen	lb/ton	---	---		0.00
Tower Temperatures					
	degree F	104	105		0.00
	degree F	---	---		0.00
	degree F	156	154		0.00
	degree F	114	114		0.00
	degree F	---	---		0.00
Retention Times					
	min	25	25		0.00
	min	---	---		0.00
	min	120	120		0.00
	min	40	40		0.00
	min	---	---		0.00
Scrubber Data					
Type					0.00
Scrubbing Media					0.00
Gas Flow Rate	ACFM				0.00
Liquid Flow Rate	GPM				0.00
Pressure Drop	in. H2O				0.00

BLEACH PLANTS - PROCESS OPERATING CONDITIONS

Mill: Champion-Sheldon
Source: Bleach Plant
FIN: 4500

Source: Caustic Tower Vent
Date: 5-21-92
EPN: E26D CIN:

INPUT DATA	Units	Run 1	Run 2	Run 3	Average
Beginning Time		19:00	20:00	21:00	
Bleaching Sequence		CEH	CEH	CEH	0.00
Wood Species		SOFTWOOD	SOFTWOOD	SOFTWOOD	0.00
Production Rate		310	310	310	0.00
kappa no. ent Bleaching		19.4	19.4	19.4	0.00
Tower pH		10.9	105.0	10.6	0.00
CE kappa no		5.4	507.0	5.7	0.00
C/O2 Substitution	%	0	0.000	0	0.00
					0.00
Chemical Usage					
Chlorine	lb/ton	88	96	89	0.00
Chlorine Dioxide	lb/ton	---	---	---	0.00
Sodium Hydroxide	lb/ton	91	91	91	0.00
Sodium Hypochlorite	lb/ton	42	42	42	
Oxygen	lb/ton	---	---	___	0.00
Tower Temperatures					
	degree F	105	105	105	
	degree F	---	---	---	
	degree F	140	139	139	
	degree F	113	113	113	0.00
	degree F	---	---	---	0.00
Retention Times					
	min	32	32	32	0.00
	min	---	---	---	0.00
	min	152	152	152	0.00
	min	51	51	51	
	min	---	---	---	0.00
Scrubber Data					
Type					0.00
Scrubbing Media					0.00
Gas Flow Rate	ACFM				0.00
Liquid Flow Rate	GPM				0.00
Pressure Drop	in. H2O				

APPENDIX A PROCESS STREAM SAMPLE RESULTS

APPENDIX A

WEST COAST REGIONAL CENTER
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Corvallis, OR 97339
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ncasi

NATIONAL COUNCIL OF THE PAPER INDUSTRY FOR AIR AND STREAM IMPROVEMENT, INC.

November 11, 1992

MEMO TO: Mr. James W. Cutbirth, Champion International Corp.

FROM: Alex R. Gholson, NCASI ARG

SUBJECT: Corrected Results of Method 25D and Method 305 Analysis for the TACB Emissions Speciation Study, Champion Sheldon Mill

In support of the TACB Emissions Speciation Study, NCASI analyzed selected samples using EPA Draft Method 25D. As part of a method development effort the samples were also analyzed for specific volatile organic compounds using an experimental method referred to as Method 305. This memo is an been updated from previous memos issued on September 10, 1992 and October 21, 1992 to clarify the discussion of the analytical methods and reporting procedures.

Samples were collected by the contractor Roy F. Weston and sent to NCASI's West Coast Regional Center in Corvallis. Volatile organic sampling procedures were used to collect the samples instead of the sampling procedures specified by Method 25D so that compositing of the samples would be easier. I feel that the Method 25D sample procedures are prone to contamination from the outside environment during storage and shipment of sample containers half filled with polyethylene glycol (PEG) and a bias due to spillage of sample/PEG during sample collection. Samples were composited at NCASI and then carefully transferred to vials containing PEG in the laboratory. Table 1 list the samples received and how they were combined to form the samples analyzed.

The composited samples were analyzed as described by the draft Method 25D proposed in the Federal Register with the modifications mentioned above. Method 25D was proposed to determine if a sample has a total volatile organic emission potential below a specified limit (500 ppmwVO). The samples analyzed from Champion Sheldon were found to be below that limit. However, for this study it was desired to use the method to provide an estimate of the actual level of volatile organic in each sample collected. Because this objective differs slightly from the define purpose of the method, a brief discussion of the method and the method results are in order. In Method 25D a sample is purged under specified conditions to remove the volatile compounds. The removed compounds are then analyzed for total organic carbon using a flame ionization detector (FID) resulting in a value expressed as parts-per-million carbon (as CH_4) by weight (ppmwC) or µgC/g. The total purged chlorine is measured with an electrolytic conductivity detector and reported as ppm chlorine by weight (ppmwCl) or µgCl/g. Method 25D then calculates a total volatile organic by summing the total organic carbon and the total organic chlorine and reports the total as parts-per-million volatile organic (ppmwVO). Because the method was designed to show that a value is below a level well within its standard working range, no guidance is provided for reporting values near or below the limit of detection (LOD) or adding values when one or both are below the LOD. For this study the American Chemical Society definition of LOD which is defined as three standard deviations of the measurement above the blank response was used. All Method 25D values are blank corrected so the blank level is well characterized and the standard deviation of multiple blank measurements is used to determine the LOD. The LOD for the total carbon value was 12.4 ppmwC for a 15 gram sample and 5.8 ppmwCl total chlorine value for a 15 gram sample. Actual LODs were dependant on the sample size which varied from 10.8 to 17.1 grams. When measured concentration values are below the LOD, they are reported as not detected (ND) and the LOD is then listed in parentheses. The total volatile organic which is the sum of two measure values was not reported for this study. Because proper guidance for handling values below the LOD is not provided by the method, the data user should choose the most appropriate method for determining the total which is consistent with the users data objectives and his best professional judgement. For example, in the case of an evaporator condensate, a non-detect for chlorine could be considered as a zero when determining a total. Likewise, for a bleach plant sewer, it might be prudent to assume the LOD as the best estimate of the chlorine level.

The experimental modifications made to speciate the volatile organics (Method 305) purged using Method 25D included removing a third slip stream from the sample purge line at approximately 100 mL/min through an ice cold aqueous impinger and into a Tenax/charcoal adsorbent trap. The aqueous impinger solution was analyzed for methanol, ethanol, acetone, 2-propanol, and 2-butanone by microdistillation followed by GC-FID analysis. The Tenax/charcoal trap was thermally desorbed and analyzed by GC/MS for a list of 28 compounds. Table 2 list the results of the Method 25D and Method 305 analyses. All Method 305 values are reported in the units of microgram of compound per gram of sample (µg/g). No effort was made to determine the LOD for this method because of the lack of historical data needed to characterize the background level or the analytical variance. Not detected (ND) was reported for all compounds not found or found but below a level generally considered reliable based on professional judgment of a limited database. This level was chosen to be 1.0 µg/g for the impinger values and 0.1 µg/g for the trap values.

The quality assurance checks of Method 25D for this program included two sets of sample duplicate analyses and a matrix spike duplicate. Only volatile carbon was detected by Method 25D in the duplicates and the difference between duplicates relative to the average expressed as a percent or relative percent difference (RPD) between duplicate samples were 8.1 and 5.6 percent indicating good precision. Only one set of duplicates were obtained using the experimental Method 305. Methanol duplicate results were found to have a RPD or 1.3 percent. Values of other compounds detected at lower levels and analyzed using the adsorbent trap and GC/MS were of lower precision. RPDs for compounds detected ranged from 112 percent for dimethyl sulfide to 10.2 percent for ß-pinene.

The matrix spike duplicate provided both recovery and precision information for the two methods. For Method 25D the total carbon average recovery was 61.6 percent with a RPD of 0.3 percent. This indicates good recovery because typical recovery for a QC spike in reagent water is 70 percent. The less than 100 percent recovery found is due to the large percentage of methanol in the spiking solution which is only 80 percent purged by Method 25D and has a poor FID response. The chlorine spike was near the LOD for chlorine and an average recovery of 47.8 percent with a RPD of 13.7 percent. It is believed the low recovery of the chlorine spike is due to the low concentration level spiked. The average recovery of methanol by Method 305 was found to be 82.6 percent with a RPD of 10.8 percent while acetone and 2-butanone had approximately 50 percent recoveries with 10 percent RPDs. Trap recoveries of compound more volatile than chloroform were generally less than 10 percent including dimethyl sulfide. Chloroforms recovery was 71 percent with a RPD of 58 percent. Recoveries of the other compounds ranged from 33 percent for ß-pinene to 134 percent for limonene with RPDs ranging from 8.9 percent to 56.8 percent. In summary, the Method 25D QA results are within an acceptable range while the Method 305 results other than the methanol values should be considered semi-quantitative at this time. More development of Method 305 is currently being performed to improve the overall data quality for Method 305.

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TABLE 1. SAMPLES COMPOSITED AND THEIR ANALYTICAL CODE NUMBERS

Analytical code #	Composited sample code #
CS-BPHW/1/H2O/0519	CS-BPHW/1/H2O/0519/2 CS-BPHW/1/H2O/0519/3
CS-BPCWV/1/H2O/0519	CS-BPCWV/1/H2O/0519/2 CS-BPCWV/1/H2O/0519/3
CS-SDTV/1/H2O/0519	CS-SDTV/1/H2O/0519 CLIENT UPPERSHOWER CS-SDTV/1/H2O/0519 CLIENT BOTTOMWASHER
CS-BPCHWV/H2O/0521	CS-BPCHWV/H2O/0521/1/2 CS-BPCHWV/H2O/0521/2/2 CS-BPCHWV/H2O/0521/3/2
CS-BPHWV/H2O/0521	CS-BPHWV/H2O/0521/1/2 CS-BPHWV/H2O/0521/2/2 CS-BPHWV/H2O/0521/3/2
CS-BPCSV1/H2O/0602	CS-BPCSV1/H2O/0602/1
CS-BB1/1/H2O/0606	CS-BB1/1/H2O/0606/1
CS-SDTV/H2O/0609	CS-SDTV/H2O/0609/1
CS-TORV/SCBR/0620	CS-TORV/SCBR/0620/1

TABLE 2. RESULTS OF METHOD 305 SPECIATION FOR CHAMPION'S SHELDON MILL

Compound	Concentration (μg/g)			
	CS-BPHW/1/H2O/0519	CS-BPCWV/1/H2O/0519	CS-SDTV/1/H2O/0519	CS-BPCHWV/H2O/0521
Method 25D				
Total Carbon (ppmwC)	ND (13.5)	15.7	13.8	22.6
Total Chlorine (ppmwCl)	ND (6.4)	ND (5.1)	ND (5.7)	ND (5.7)
Method 305				
Impinger analysis				
Methanol	7.7	31.8	14.0	21.5
Ethanol	3.9	ND	ND	ND
Impinger + Trap				
Acetone	ND	ND	ND	ND
2-Butanone	ND	ND	ND	ND
Trap analysis				
Dimethyl sulfide	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND
Chloroform	0.215	ND	ND	0.654
Benzene	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND
Dimethyl disulfide	ND	ND	ND	ND
Toluene	ND	ND	ND	ND
α-Pinene	ND	ND	ND	ND
β-Pinene	ND	ND	ND	ND
Limonene	ND	ND	ND	ND

ND is not detected. The limit of detection is given in parenthesis when available (see text for explanation).

TABLE 2. RESULTS OF METHOD 305 SPECIATION FOR CHAMPION'S SHELDON MILL (Continued)

Compound	Concentration ($\mu g/g$) CS-BPHWV /H2O/0521	CS-BPCSV1 /H2O/0602	CS-BB1 /H2O/0606	CS-SDTV /H2O/0609	CS-TORV /SCBR/0620
Method 25D					
Total Carbon (ppmwC)	22.6	ND (15.9)	275.1	ND (12.5)	ND (11.3)
Total Chlorine (ppmwCl)	ND (5.7)	ND (7.5)	ND (5.8)	ND (5.9)	ND (5.3)
Method 305					
Impinger analysis					
Methanol	27.5	8.8	582.5	ND	8.3
Ethanol	2.1	ND	10.5	ND	ND
Impinger + Trap					
Acetone	1.1	ND	ND	ND	1.2
2-Butanone	ND	ND	ND	ND	ND
Trap analysis					
Dimethyl sulfide	ND	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND
Dimethyl disulfide	ND	ND	0.889	ND	ND
Toluene	ND	ND	ND	ND	ND
α-Pinene	ND	ND	ND	ND	ND
β-Pinene	ND	ND	ND	ND	ND
Limonene	ND	ND	ND	ND	ND

ND is not detected. The limit of detection is given in parenthesis when available (see text for explanation).

APPENDIX B COMPARISON OF CHLOROFORM RESULTS

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COMPARISON OF CHLOROFORM RESULTS

CHAMPION-SHELDON

Source	Date	ppm Method 18			ppm Sorbent Tube
BPCSV	6/2/92	13.6	5.2	12.9	4
	6/3/92	2.6	14.8	rejected	16.7
BPCWV	5/19/92	6.5	7.4	6.4	
	5/21/92	rejected	7.9	8.7	11.6
BPHSTV	6/3/92	1508.4	1558.1	1340.1	
	6/4/92	2462.2	2682.2	2851.4	
BPHWV	5/19/92	30.5	26.9	25.3	