Note: This is a reference cited in *AP 42, Compilation of Air Pollutant Emission Factors, Volume I Stationary Point and Area Sources.* AP42 is located on the EPA web site at www.epa.gov/ttn/chief/ap42/

The file name refers to the reference number, the AP42 chapter and section. The file name "ref02_c01s02.pdf" would mean the reference is from AP42 chapter 1 section 2. The reference may be from a previous version of the section and no longer cited. The primary source should always be checked.

Background Report Reference

AP-42 Section Number: 12.20

Background Chapter: 4

Reference Number: 40

Title: Surce Tested: Chromic Plating Tank Exhaust Scrubber. Date Tested: December 11, 1986

January 1987

ENGINEERING-SCIENCE, INC.

Street Address:
75 N. FAIR OAKS
PASADENA, CA 91103

Mailing Address:
P.O. BOX 7107
PASADENA, CA 91109

ELECTROPLATING
REF. 4-40

July 1, 1987

Mr. Desh Jain
South Coast Air Quality Management District
9150 Flair Drive
El Monte, California 91731

Subject: Tarby Inc.
Source test conducted on December 11, 1986

Dear Mr. Jain:

This letter provides an explanation to flow rate discrepancies between source tests conducted on the inlet and outlet of the Chrome Tank Exhaust Scrubber for Tarby Inc., 7601 Woodwind, Hunington Beach, California. It is our understanding that there is no other flow introduced to the scrubber, and inlet and outlet flows should be equal.

Stack gas flow rates were determined using EPA Reference Methods 1, 2 and 3. An S-Type pitot tube and an inclined oil manometer were used for the velocity measurements and a type-K thermocouple (chromel-alumel) with an Omega digital temperature readout were used for determining the stack temperature. Carbon dioxide (CO_2) and oxygen (O_2) were determined from analyzer readings. Moisture content of the stack gases was determined volumetrically by the liquid gain in the impingers and gravimetrically by the weight gain of the silica gel. This procedure is in accordance with EPA Method 4.

One of the requirements for this flow determination method is that stack gas flow must be stable and not excessively turbulent. A factor affecting flow stability and turbulence is sample port location. EPA Method 1 recommends sample ports be located at least eight stack diameters from any up stream flow disturbances. This criteria was met for the inlet sample port. The location of the outlet sample port was restricted to approximately ½ a pipe diameter down stream of the exhaust blower due to short stack length. Flow conditions at this sample point may have been excessively turbulent and flow rates at the scrubber outlet may have been biased

We are fairly confident with the inlet flow rates due to the sampling procedure and sample port location. It is the recommendation of Engineering-Science that stack gas flow rates for the scrubber outlet be based on scrubber inlet flow rate results.

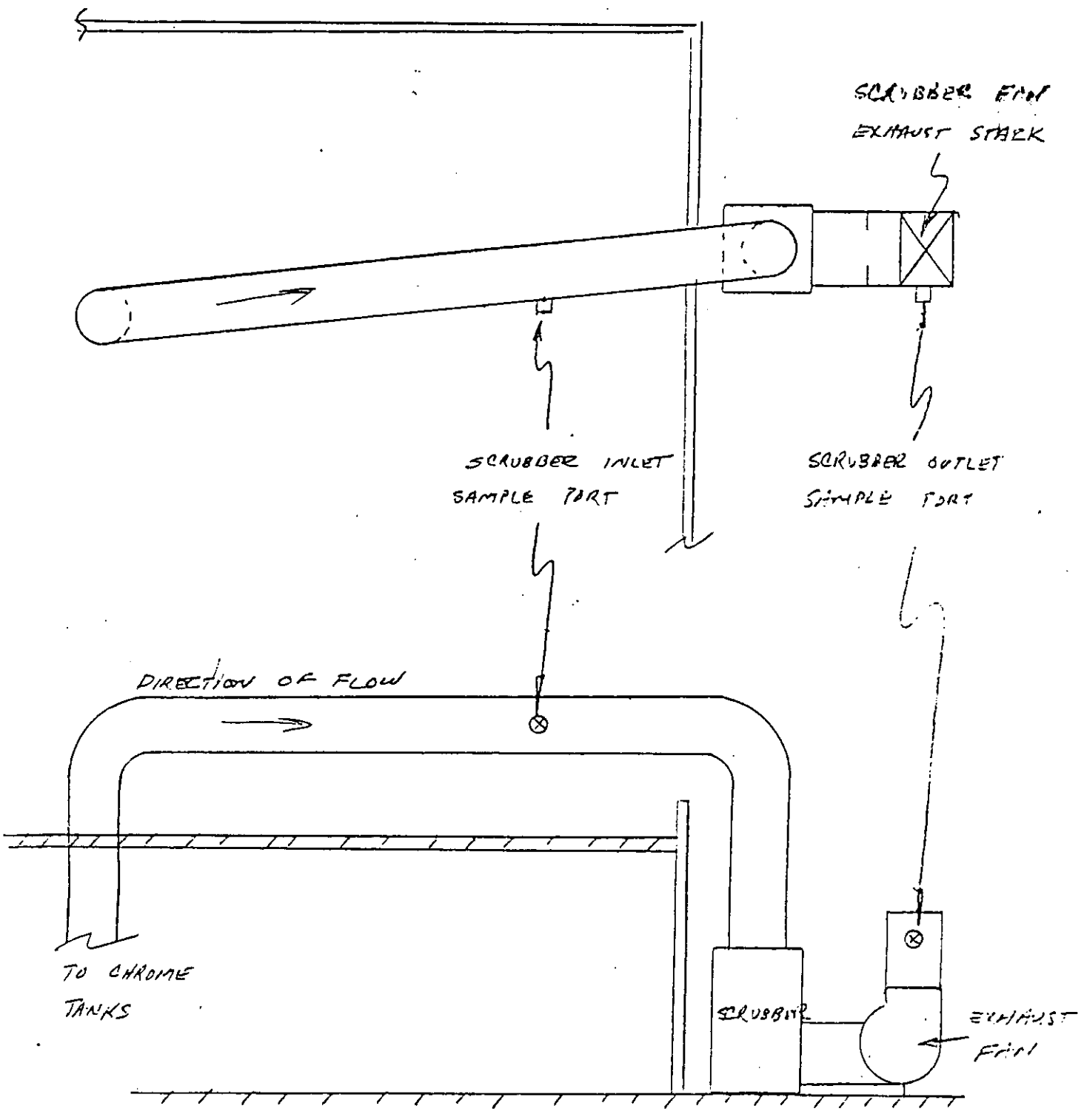
Attached is a sketch of the sample locations used at Tarby Inc.

If we may be of further assistance or if you have any questions please call me at 818/440-6010 or Paul Farmanian at 818/440-6148.

Truly yours

Jeffrey N Yox
Senior Engineer

Attachment



ENGINEERING-SCIENCE
P.O. BOX 7107
PASADENA, CALIFORNIA 91109

PROJECT TARBY INC. JOB NO. ____
DETAIL SAMPLE PORT LOCATION

DATE 1 July 87 SHEET 1
BY PAT OF 1

WA04201/1

EMISSIONS STACK TESTING
TARBY, INCORPORATED
HUNTINGTON BEACH, CALIFORNIA

Source Tested:

Chrome Plating Tank Exhaust Scrubber

Date Tested:

December 11, 1986

Prepared for

TARBY, INCORPORATED
7601 Woodwind
Huntington Beach, California 92647

January 12, 1987

Prepared by

ENGINEERING-SCIENCE
75 N. Fair Oaks Avenue
P.O. Box 7107
Pasadena, California 91109

Mr. Becvar
818/440-6134

REPORT OF STACK TESTING

AT TARBY, INC.

INTRODUCTION

On December 11, 1986, personnel from Engineering-Science (ES), Pasadena, California, conducted air pollution testing at the Tarby, Inc. facility in Huntington Beach, California. The purpose of the tests was to determine the chromium emissions entering and exiting the chrome plating tank exhaust scrubber. The test method employed was CARB Method 425. The testing program was coordinated by Mr. John Alley of Tarby, Inc. Mr. Desh Jain from the SCAQMD was present to observe the testing. The ES testing team was comprised of Messrs. Paul Farmanian (team leader), Kirk Norberg, and Jeffrey Yox. Testing was conducted during the hours 0935 to 1135.

TEST METHODS

The sampling runs were conducted isokinetically. The sampling train consisted of a Teflon probe connected to four impingers in series. The first two impingers were each charged with 100 milliliters of deionized water, the third impinger was dry, and the fourth contained about 400 grams of indicating silica gel. A filter (maintained at ambient conditions) was located between the third and fourth impingers. The first, third, and fourth impingers were straight tube Greenburg-Smith impingers and the second was an orifice tip Greenburg-Smith impinger.

Due to the test train configuration, samples were recovered as front half. Three separate analyses were made on the recovered test samples. One sample aliquot was dryed at 105°C and analyzed gravimetrically for particulates. A second sample aliquot was prepared and analyzed for Cr^{+6} using visible light spectrophotometry. A third sample aliquot was analyzed by graphite furnace atomic absorption spectrophotometry to determine total chromium. The filter was weighed to determine water insoluble particulate fraction and was digested in water for sample recovery and a sample aliquot was analyzed for Cr^{+6} and total chromium.

TABLE 1

SUMMARY OF VOLUMETRIC FLOW DATA

The analytical procedure for determination of Cr^{+6} consisted of sample preparation and analysis. Sample aliquots were prepared by digestion with an alkaline solution of sodium hydroxide and anhydrous sodium carbonate, filtration of digested aliquots, reduction of filtrate pH to 1.0, and reaction with diphenylcarbazide to produce the characteristic red-violet color. The aliquots were analyzed using spectrophotometric comparison with standardized aliquots of known Cr^{+6} concentration, at a wavelength of 540 nm.

Total chromium analysis preparation required addition of concentrated nitric acid to sample aliquots, volatile reduction by refluxed boiling, dilution with distilled water, and filtration. Prepared sample aliquots were aspirated into an air and acetylene flame while recording amount of absorption detected at a wavelength of 357.9 nm.

Blank solutions were prepared and analyzed in the same manner for both tests to eliminate background interference.

RESULTS

The results of the testing program are summarized in Tables 1 and 2. Additional supporting data are presented in the Appendix. Additionally, a discussion of the determination of hexavalent chromium emissions is included in the Appendix.

TABLE 1

SUMMARY OF VOLUMETRIC FLOW DATA

TARBY, INC.
Huntington Beach, CA

December 11, 1986

Parameter	Scrubber Inlet	Scrubber Outlet
Velocity (FPS)	31.72	21.87
Volumetric Flow		
ACFM	8,138	5,611
DSCFM	7,797	5,490
Stack Temperature (°F)	66	57
Moisture Content (%)	1.71	1.34

TABLE 2

SUMMARY OF EMISSIONS DATA

TARBY, INC.
Huntington Beach, CA

December 11, 1986

Parameter	Scrubber Inlet $\frac{lbs}{hr \cdot ft^2}$		Scrubber Outlet $\frac{lbs}{hr \cdot ft^2}$	
Particulates				
gr/DSCF	0.0063		0.0038	
lb/hr	$0.42 \frac{lbs}{hr} \times \frac{1}{50 ft^2} = 0.0084$	0.42	0.0084	0.18	0.0036
Cr^{+6}				
ppm	0.344		0.0162	
lb/hr	0.0220	0.00044	0.0007	0.000014
Cr Total				
ppm	2.28		0.0562	
lb/hr	0.146		$0.0025 \times \frac{7797}{5499} = .0036$	

Total Surface area of fan blades = 50 ft^2

Total current = 3500 + 3500 = 7000 Amps

APPENDIX

ENGINEERING-SCIENCE, ARCADIA, CALIFORNIA

PLANT: TARBY, INC.
SOURCE: OUTLET
DATE: 12-11-86
RUN#: 1 PARTICULATE

FLOW DATA

STACK DIAMETER (INCHES)	28
STACK CROSS-SECTIONAL AREA (SQUARE FT)	4.28
BAROMETRIC PRESSURE (INCHES MERCURY)	29.5
OXYGEN CONTENT (%)	20.8
CARBON DIOXIDE (%)	0
MOISTURE CONTENT (%)	1.34
STACK TEMPERATURE (DEG F)	57
STACK STATIC PRESSURE (INCHES WATER)	.84
DRY STACK GAS MOLECULAR WEIGHT	28.832
VELOCITY PRESSURE (SQ RT INCHES WATER DELTA P)	.39
PITOT TUBE CORRECTION FACTOR	.84
VELOCITY (FEET PER SEC)	21.87
EXHAUST GAS FLOW RATE (ACFM)	5611
EXHAUST GAS FLOW RATE (DSCFM)	5490

SAMPLING DATA

DRY GAS VOLUME SAMPLED (DCF)	55.524
DRY GAS VOLUME SAMPLED (DSCF)	51.473
DRY GAS METER TEMP (DEG F)	83
DRY GAS METER GAMMA	.98
AVERAGE ORIFICE PRESSURE (INCHES H20)	.75
TOTAL RUN TIME (MINUTES)	120
NOZZLE DIAMETER (INCHES)	.25
ISOKINETIC (%)	99.9

LABORATORY DATA

VOLUME OF MOISTURE RECOVERED (MLS)	15
PARTICULATE WEIGHT FROM NOZZLE & PROBE (MG)	12.5
PARTICULATE WEIGHT FROM FILTER (MG)	.01
PARTICULATE WEIGHT FORM IMPINGERS (MG)	0

PARTICULATE DATA

FRONT HALF PART (GR/DSCF)	3.8E-03
FRONT HALF PART (LBS/HR)	.18
BACK HALF PART (GR/DSCF)	0
BACK HALF PART (LBS/HR)	0
TOTAL PART (GR/DSCF)	3.8E-03
TOTAL PART (LBS/HR)	.19

Outlet Chrome corrected to 8075 DSCFM

	PPM	Q_s DSCFM	Lb/hr
Cr^{+6}	0.0162	8075	0.0011
Cr^{T}	0.0562	8075	0.0037

$(PPM)(1.58 \times 10^{-7})(MW)(Q_s) = Lb$

This correction is included
Due to the difference in inlet and outlet
CFM. Since the corrected flow rate is higher,
the emission values are conservative

Date Analyzed 12-12-86 Sample # 861254

Date Finished 12-16-86 Run # 1 Test Date 12-11-86

Technician CM Facility TORBY OUTLET

Book Page		ID #	Gross Wt (g)	Tare Wt (g)	Net (mg)	
W15	Test Filter	80346	29.9919	29.99225	<0.01	
	Test Filter					
	Blank Filter					
				AF = — x Subtotal		<0.01
	Nozzle/Probe	Beaker #				
Y13	H_2O	4132	103.45965	103.4570	2.65	
			AF = 750/375		5.30	
	ACETONE	4133	102.91435	102.91075	3.60	
					7.20	
				AF = 500/250 x Subtotal		12.50
	Umbilical					
				AF = — x Subtotal		
	Impinger					
				AF = — x Subtotal		
				Total Particulate		

Date Analyzed 12-12-96 Sample # 961255

Date Finished 12-16-96 Run # 1 Test Date 12-11-96

Technician CM Facility TMRBY INLET

Book Page		ID #	Gross Wt (g)	Tare Wt (g)	Net (mg)	
W45	Test Filter	850344	38.1077	38.1069	0.80	
	Test Filter					
	Blank Filter					
				AF = — x Subtotal		0.8
	Nozzle/Probe	Beaker #				
Y43	H_2O	4134	102.2957	102.28185	10.35	
				AF = 750/375	21.70	
Y43	ACETONE	4135	103.9183	103.91365	4.65	
				AF = 500/250	9.30	
				AF = 500/250 x Subtotal		31.0
	Umbilical					
				AF = — x Subtotal		
	Impinger					
				AF = — x Subtotal		
				Total Particulate		

Date Analyzed 12-12-96 Sample # BLANK

Date Finished 12-16-96 Run # — Test Date 12-11-96

Technician CM Facility TARDY

Book Page		ID #	Gross Wt (g)	Tare Wt (g)	Net (mg)	
W15	Test Filter	830345	34.9013	34.9013	0.00	
___	Test Filter					
___	Blank Filter					
				AF = —	x Subtotal	0.0
	Nozzle/Probe	Beaker #				
___						
Y13	H20	4136	99.1399	99.1400	<0.01	
___						
___						
Y13	ACETONE	4137	102.7835	102.78355	<0.01	
___						
				AF =	x Subtotal	<0.01
	Umbilical					
___						
___						
___						
___						
___						
___						
				AF =	x Subtotal	
	Impinger					
___						
___						
___						
___						
___						
___						
				AF =	x Subtotal	
				Total Particulate		

TRAIN RECOVERY SHEET

Date 12-11-86 Run # 1 OUT Method # _____

Facility TURBY OUTLET Type CA 5

Technician ER Imp. Solution HW

ESH 861217

	Solution	Vol. (ml)	Volume Marked?	
Nozzle- Probe Rinse			✓	
Umbilical Rinse			✓	
		Final (ml)	Initial (ml)	Net (ml)
Impinger # 1-3		710	700	10
Impinger #				
Impinger #				
Description				
Impinger Rinse				
		Final (g)	Initial (g)	
Silica Gel (Description)		875.6	870.6	5.0
Filter # (Description)	85036	Total Moisture		15.0 ml

Field Blanks _____ _____

_____ _____

_____ _____

Disposition/Comments _____

_____

_____

Engineering-Science
75 N. Fair Oaks Ave.
Pasadena, CA 91109

TRAIN RECOVERY SHEET

Date 12-11-W Run # 1-IN Method # _____

Facility MMM INCT Type √

Technician RR Imp. Solution HW

WH 8/12/87

	Solution	Vol. (ml)	Volume Marked?	
Nozzle- Probe Rinse			√	
Umbilical Rinse			√	
		Final (ml)	Initial (ml)	Net (ml)
Impinger # 1-3		W	W	—
Impinger #				
Impinger #				
Description				
Impinger Rinse				
		Final (g)	Initial (g)	
Silica Gel (Description)	USGI 1/4 USGI	876.10 874.4	851.3 837.7	19.7 10.6
Filter # (Description)		Total Moisture		41.3 ml

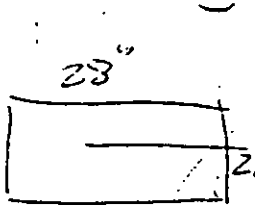
Field Blanks

Disposition/Comments

Engineering-Science
75 N. Fair Oaks Ave.
Pasadena, CA 91109

FIELD DA

PLANT TARRY
DATE 13-11-92
SAMPLING LOCATION 2 STACK
SAMPLE TYPE CR
RUN NUMBER 1
OPERATOR KAI
AMBIENT TEMPERATURE 71
BAROMETRIC PRESSURE [illegible]
STATIC PRESSURE, (P_s) 24
FILTER NUMBER (s) 95023 [illegible]



SCHEMATIC OF TRAVERSE POINT LAYOUT

ES# 861217
PROBE LENGTH AND TYPE 9' SS 4FT
NOZZLE I.D. .257
ASSUMED MOISTURE, %
SAMPLE BOX NUMBER
METER BOX NUMBER 3A
METER $\Delta H_@$ 2.14 / 0.98
C FACTOR
PROBE HEATER SETTING
HEATER BOX SETTING
REFERENCE Δp

K = 4.5

READ AND RECORD ALL DATA EVERY 10 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min	CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
					DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F			
	0	9:35	781.074	0.10	.45	.45	55	70		2"	—	—
	10	9:45	782.45	0.09	.41	.41	56	81		3"	—	—
	20	9:55	783.9	0.09	.41	.41	56	81		3"	—	—
1	30	10:05	791.5	0.09	.41	.41	57	85		3"	—	—
	40	10:15	795.1	0.09	.41	.41	57	85		3"	—	—
	50	10:25	798.9	0.05	.23	.23	58	85		3"	—	—
4	60	10:35	803.0	0.27	1.22	1.22	58	85		5"	—	—
	70	10:45	808.1	0.24	1.08	1.08	58	85		5"	—	—
	80	10:55	812.6	0.24	1.08	1.08	58	85		5"	—	—
4	90	11:05	819.5	0.24	1.08	1.08	58	85		5"	—	—
	100	11:15	825.0	0.25	1.13	1.12	58	83		5"	—	—
	110	11:25	830.8	0.25	1.12	1.12	58	83		5"	—	—
4	120	11:35	836.598	—	—	—	—	—	—	—	—	—

TT= 120 min. V_m= 55.524 $\bar{\Delta p}$= 0.39 $\bar{\Delta H}$= 0.75 $\bar{T}_s$= 57 $\bar{T}_m$= 83 V_{lc} (H2O)= 15.0

COMMENTS:

EPA (Our) 235
4-72

FIELD DA

J# 861255

PLANT A23Y INC.
DATE 11 DEC 86
SAMPLING LOCATION SCRUBBER INLET
SAMPLE TYPE EE Cr
RUN NUMBER 1
OPERATOR
AMBIENT TEMPERATURE 20
BAROMETRIC PRESSURE 29.7
STATIC PRESSURE, (P_s) V
FILTER NUMBER (s) 850344

PROBE LENGTH AND TYPE 5' teflon
NOZZLE I.D. .25
ASSUMED MOISTURE, % 5.0
SAMPLE BOX NUMBER
METER BOX NUMBER #3
METER $\Delta H_@$ 1.93 / 1.92
C FACTOR
PROBE HEATER SETTING NONE
HEATER BOX SETTING NONE
REFERENCE Δp
STACK DIA = 28"

K = 4.1

SCHEMATIC OF TRAVERSE POINT LAYOUT

READ AND RECORD ALL DATA EVERY 10 MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F
				DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F			
	0 9:35	806.954	0.30	1.23	1.27	63	63		3	—	—
	10 945	814.2	0.32	1.31	1.35	64	66		3	—	—
	20 958	821.0	0.34	1.39	1.43	65	65	72	4	—	—
	30 1008	8250	0.34	1.39	1.43	66	77		4	—	—
	40 1015	~~832~~ 834.4	0.31	1.27	1.31	65.6	83		3	—	—
	50 1025	841.0	0.31	1.27	1.31	66.8	86		3		
	60 1035	848.0	0.31	1.27	1.31	66.7	90		3		
	70 1045	854.50									
	80 1055	858.9	0.31	1.27	1.31	67.4	91		4		
	90 1105	865.9	0.31	1.27	1.31	67.1	92		3		
	100 1115	871.5	0.31	1.27	1.31	67.6	92		3		
	110 1125	878.5	0.31	1.27	1.31	69.0	95		3		
	120 1135	887.912									
	TT= 120 min	V_m= 80.958	$\sqrt{\Delta p}$ = 0.56	ΔH=	1.31	T_s= 66	T_m=	82		Vel(Hw) =	129.3

COMMENTS:

EPA (Out) 235-
4-72

The Determination of Hexavalent Chromium Emissions using a Diphenylcarbazide Colorimetric Method

SAMPLE ANALYSIS

The EPA Method 5 sampling trains were recovered in the laboratory. The probe wash and impinger solutions were combined, diluted to 500 mls and stored at room temperature. These samples were analyzed for hexavalent chromium within 24 hours after sampling following the procedure below.

The analytical procedure consisted of three steps. The initial step consisted of digesting the samples with an alkaline solution of sodium hydroxide and anhydrous sodium carbonate. The digested samples were then filtered. The second step involved reacting the digested and filtered samples with the diphenylcarbazide solution to produce the characteristic red-violet color which allowed the colorimetric determination of hexavalent chromium. The third step consisted of analyzing the reacted samples spectrophotometrically.

The samples were prepared for analysis by an initial digestion and filtration step. A 50 ml aliquot of each sample was taken and combined with approximately 40 mls of the digesting solution. This mixture was heated to near boiling with constant stirring for thirty minutes and then allowed to cool. After the solution had cooled, it was filtered through a 47-mm diameter, 3.0-µm pore size Zefluor filter. The filtered solution was then transferred quantitatively into a 100 ml volumetric flask and diluted to the mark. A deionized water blank was prepared for analysis in the same manner.

Then the samples were reacted with a diphenylcarbazide solution. A 50 ml aliquot of the digested and filtered sample was transferred to another 100 ml volumetric flask and diluted with approximately 30 mls of deionized water. The pH of each sample was adjusted to 2 ± 0.5 with the dropwise addition of a 10% (V/V) H_2SO_4 ~~solution~~. Two mls of the diphenylcarbazide solution were added to each volumetric flask which was then diluted to the mark. This step was also carried out to seven calibration standards prepared from a standard potassium dichromate stock solution. The seven calibration standard solutions, ranging in concentration from 0 ug Cr^{+6} to 100 ug Cr^{+6}, were used to obtain the spectrophotometric calibration factor, Kc. The samples and calibration standard solutions were allowed to stand for 15 minutes to allow full color development.

After full color development, the samples and calibration standard solutions were analyzed spectrophotometrically at the predetermined optimum wavelength.

EMISSION CALCULATIONS

~~The seven calibration~~

The spectrophotometric calibration factor, Kc, was calculated from the absorbance values obtained by the spectrophotometric measurement of the seven calibration standard solutions. The spectrophotometric Calibration Factor, Kc, was calculated using the following equation:

$$K_c = 15\ \frac{A_1 + 2A_2 + 5A_3 + 10A_4 + 15A_5 + 20A_6}{A_1^2 + A_2^2 + A_3^2 + A_4^2 + A_5^2 + A_6^2}$$

Where:

K_c = calibration factor
A_1 = absorbance of the 5 ug Cr^{+6} standard
A_2 = " " " 10 ug Cr^{+6} "
A_3 = " " " 25 ug Cr^{+6} "
A_4 = " " " 50 ug Cr^{+6} "
A_5 = " " " 75 ug Cr^{+6} "
A_6 = " " " 100 ug Cr^{+6} "

The total ug Cr^{+6} in each sample, m, was calculated using the following equation:

$$m = \frac{500\ K_c\ A\ F}{V_a}$$

where 500 = volume in ml of total sample
A = absorbance of sample
F = dilution factor (if required)
V_a = volume in ml of aliquot analyzed (50)

TMA Inc. REPORT Work Order # 86-12-082

Received: 12/15/86

12/29/86 08:53:20

REPORT TO: Engineering Science
75 N. Fair Oaks Ave.
P O. Box 7107
Pasadena, CA 91109
ATTEN Mr. Dennis Becvar

CLIENT ENGINEER SCI SAMPLES 9
COMPANY Engineering Science
FACILITY

WORK ID Chromium analyses
TAKEN
TRANS
TYPE Liquids
P. O. # Verbal-D. Becvar
INVOICE under separate cover

PREPARED BY: Thermo Analytical, Inc.
150 Taylor Street
Monrovia, CA 91016
ATTEN
PHONE 818-357-3247

Gerald Dellen
CERTIFIED BY

CONTACT GLD

This report is for the sole and exclusive use of the client to whom it is addressed. Samples not destroyed in testing are retained a maximum of thirty (30) days unless otherwise requested.

SAMPLE IDENTIFICATION

01 861254-A
02 861254-B
03 861254-C
04 861255-A
05 861255-B
06 861255-C
07 Blank-A
08 Blank-B
09 Blank-C

TEST CODES and NAMES used on this report

CR Chromium
CRHGAW Chromium

TMA Inc. REPORT
12/29/86 08:53:20

Work Order # 86-12-082

Engineering Science

Nine water samples were analyzed for chromium content by atomic absorption spectroscopy, according to TMA/ARLI methods 800-08 and 800-09. Three samples were done by flame AA and six samples (those with the +/- signs) were done by graphite furnace AA. Please see the table below for results.

Table 1

Chromium Analyses of Water Samples

Sample #	Chromium, mg/L
861254-A	0.2240 +/- 0.0100
861254-B	0.0340 +/- 0.0030
861254-C	0.0720 +/- 0.0004
861255-A	14.0
861255-B	0.56
861255-C	0.05
Blank-A	0.0130 +/- 0.0004
Blank-B	0.0070 +/- 0.0009
Blank-C	0.0460 +/- 0.0005

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
ENGINEERING DIVISION···FIELD REPORT

NAME OF APPLICANT: TARBY ENGINEERING COMPANY, INC.	DATE OF INSPECTION: 12/11/86
MAILING ADDRESS: 7601 Woodwind Drive, Huntington Beach, California 92649	PERMIT APPL. NO.: 125057 to 59
EQUIPMENT LOCATION (ADDRESS): Same	A.P.C.D. ZONE NO.

REASON PERMIT IS REQUIRED: NEW CONSTRUCTION (X) CHANGE OF OWNERSHIP ( ) CHANGE OF LESSEE ( ) CHANGE OF LOCATION ( ) EQUIPMENT ALTERATION ( )

DATE CONSTRUCTION AUTHORIZED: BY

TIME SPENT MAKING INSPECTION: FROM 9:30 a.m. TO 11:50 a.m.

USUAL OPERATING SCHEDULE FOR THIS EQUIPMENT:

WEATHER	WIND	ESTIMATED COST:	BASIC EQUIPMENT: $	A.P.C. EQUIPMENT: $
Clear	~ 3 mph			

NAMES & TITLES OF PERSONS CONTACTED BY ENGINEER: John Alley-Tarby, Paul Farmanian & Jeffrey Fox-Engrg Science

FOR DUST & FUME PROBLEMS ONLY:	PROCESS* WEIGHT (s)	LBS./HR.	ALLOWED LOSSES:	LBS./HR.	ESTIMATED LOSSES:	LBS./HR.

OFFICIAL EQUIPMENT DESCRIPTION. *CALCULATION OF PROCESS WEIGHT(S). PROCESS DESCRIPTION AND FINDINGS:

EQUIPMENT DESCRIPTION: Air Pollution Control Equipment consisting of:

1. Scrubber, Viron, Packed horizontal cross-flow type, Model No. 115-10HP 5'-3"W. x 7'-4"L. x 6'-6"H., with a 2 H.P. water recirculation pump, 1 feet deep Viro-Pak Packing 8" Deep, Chevron blades mist eliminator, three headers, each with 3 spray nozzles and ½ H.P. sump pump.
2. Exhaust System with a 15 H.P. blower venting two hard chrome plating tanks.

BACKGROUND

The applicant was required by the District to run a Source Test to determine the efficiency of scrubber (venting two hard chrome plating tanks) for PM, hexavalent and total chromium.

The applicant contracted Engineering Science of Pasadena. The test procedure was approved (verbally) by Steve Marinoff of the District on December 9, 1986. I discussed test procedures with Steve. Steve told me that for a Particulate Matter test; the wet impingement method, as given in District's Source Test manual is approved; the only change is the use of a glass probe instead of a metal probe. For hexavalent and total chromium, CARB Method No. 425 was approved.

OBSERVATIONS

The Source Test was conducted on December 11, 1986. Wet impingement method was used for total PM. There were three impingers located in ice-baths followed by a filter and a silica gel container. A glass probe was used to collect the sample. One glass probe was installed at approximately eight diameters from the last 90° bend upstream on the scrubber.

The probe downstream of the scrubber was installed approximately two diameters downstream of the exhaust fan (which is located at the outlet of the scrubber). pH of scrubber solution was between 5.5 & 6.0 water recirculation rate = 95 g.p.m.

RECOMMENDED DISPOSITION: ( ) APPROVE FOR PERMIT. ( ) APPROVE FOR PERMIT SUBJECT TO CONDITIONS LISTED BELOW. (X) HOLD. SEE EXPLANATION BELOW. ( ) DENY PERMIT.

Hold until evaluation is completed

DJF (8H) 5 72-61 16

REVIEWING ENGINEER:
( ) I CONCUR WITH RECOMMENDATIONS
( ) I DO NOT CONCUR WITH RECOMMENDATIONS

SIGNATURE

Desh B. Jain, A.Q. Engineer II

South Coast Air Quality Management District
Engineering Division....Field Report

NAME OF APPLICANT	APPL. NO.	INSPECTION DATE
TARBY ENGINEERING COMPANY, INC.	125057 -59	12/11/86

BASIC EQUIPMENT

Both the chrome plating tanks were operating with normal/above normal load. A 6' high chrome plating tank (A/N 125058) had five parts (from 2' to 5' long) for plating. This was the normal load according to Mr. John Alley. (This was confirmed later from Mr. Mark Dixon, the plater). The rectifier reading was 3500 A, 5.5 V.

The other chrome plating tank (A/N 125059) had one large size part - 9" diameter x 12 feet long (equivalent to at least 4 times the normal size parts). This represented more than the normal load for this tank according to Mr. Dixon. Rectifier reading: 3500 A, 6.6 V.

Mr. Dixon told me that the combined current on the two tanks very rarely exceeds 7000 amps.

There was good suction at both chrome plating tanks.

Note: Total surface area of two tanks = 50 ft^2.

es: 3/3/87

DBT

SIGNATURE _____