AP42 Section:	9.9.3
Related	1
Title:	Doane Products Dryer Cyclone AB 2588 Toxic Hot Spots and Particulate Emissions Test Program January 8, 1993 Best Environmental, Inc Inactive section – Pet Foods

Particulate - front ½
metals
No Process Data

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March 17, 1993

SLAKEY AND ASSOCIATES
375 Village Square
Orinda, CA 94563

To: Mr. Philip Slakey

Subject: **Doane Products Dryer Cyclone AB 2588 Toxic "Hot Spots" and Particulate Emissions Test Program.**

Test Date: January 8, 1993.

Sampling Location: Outlets of the two dryer hot gas discharge cyclone stacks Doane Products facility located at 450 East Grant Line Road in Tracy, California.

Sampling Personnel: Regan Best, Dan Cartner, Jeff Mesloh, Dan Ashlin and Mike Wiley of BEST ENVIRONMENTAL.

Observing Personnel: Galen Flinn of the San Joaquin Unified Air Pollution Control District.

Process Description: Doane Products operates a facility for the production of dry pet food at the Tracy, California location. The raw materials consist of mixed grains (mainly corn, soy meal, and wheat midds) and a small quantity of animal fats. The grains are milled, mixed with animal fats and "cooked" by steam and pressure in an extruder. The product is forced through small holes in the end of the extruder and cut into chunks by high speed rotary knives. The wet chunks are pneumatically conveyed to two pass natural gas fired dryers. The exhaust from the dryers passes through cyclones before exiting to atmosphere thru outlet stacks on the roof.

Test Program: Triplicate 96 minute tests for particulate and multiple metals were performed at the cyclone stack outlets. Run 3 was shortened due to inclement weather. Duplicate spiked filters provided by CARB were submitted with the multiple metals train samples as part of the ongoing CARB multiple metals verification study. All laboratory analysis for metals was performed by Curtis & Tompkins of Berkeley, California. Front half particulate analysis was performed by Best Environmental.

Both stack outlets showed substantial cyclonic flow conditions at all test points. While the flow conditions did not meet the specifications in Method 1, no other more suitable test location was available. Stack volumetric flowrates were corrected as shown in the calculation section of the Appendix.

Sampling Methods: The following Source Test Methods of the California Air Resources Board (CARB) were used:

Method 1&2	Stack Gas Volumetric Flowrate
Method 3	Stack Gas Molecular Weight
Method 4	Stack Gas Moisture Content
Method 436	Multiple Metals (Draft)

Instrumentation & Equipment:

Method 5 sampling probes
LSI PM-100 Control Modules
Borosilicate glass filter holders, glass fiber filters
Glass Nozzles, Glass Probe liners, Teflon Sample Line
HPLC Grade Reagents and HPLC Grade Water

Test Results: Tables 1 and 2 present the particulate results of the emissions tests on the winger and hawk cyclone outlets, respectively. Average particulate concentration and emission rate for the winger outlet was 0.0057 gr/dscf and 0.505 lbs/hr. Average particulate concentration and emission rate for the hawk outlet was 0.0007 gr/dscf and 0.101 lbs/hr. Runs 2 and 3 at both test locations were almost identical and approximately three times higher than run 1. This was probably related to plant process operation.

Tables 3 and 4 present the results of the multiple metals train tests on the winger and hawk outlets, respectively. Test results were calculated using uncorrected results from the sample analyses. Results for each compound are shown in micrograms per dry standard cubic meter (ug/dscm) and part per billion concentration and grams per hour (gm/hr) emission rate. No beryllium or selenium was detected in any of the samples for both locations. The majority of the other metal compounds were present in amounts which were slightly below, slightly above or the same as that found in the sample blank train.

Tables 3A and 4A presents the multiple metals test results corrected for the field blank train analytical results. Corrected test results show cadmium to be the only significantly detected compound present in the emissions tests with small amounts of chromium, copper and manganese also present.

Comparison of mercury results for Run 3 using two KMnO4 impingers with Runs 1 and 2 which used a single KMnO4 impinger showed no difference at the winger test location although a higher value had to be used to calculate emission results due to the higher detection limit resulting from larger impinger volume. Run 3 impinger results at the hawk test location showed 3.7 ug of mercury. However this is most likely the result of field or

laboratory contamination in light of the absence of mercury in the front [redacted] fraction [redacted] results. Mercury emissions were calculated using the additional fractions B and C detection limits or results.

Calculations, field data sheets, equipment calibrations, chain of custody forms and laboratory analytical reports are contained in the separate Appendices to this report.

If there are any questions concerning this report, please contact me at (510) 278-4011.

Submitted by,

Regan Best
Source Test Manager

Reviewed by,

for Guy Worthington
Project Manager

TABLE 1
Winger Cyclone Outlet
Particulate Emissions Results

TEST #	1	2	3	AVERAGE
TEST DATE	1-08-93	1-08-93	1-08-93	
TEST TIME	0812-0951	1127-1321	1457-1650	
SAMPLE VOLUME (SDCF)	73.208	76.628	57.039	
SAMPLE WT. (mg)	10.7	37.2	27.2	
VELOCITY (ft/sec)	25.38	25.04	24.49	24.97
ISOKINETIC (%)	95.7	100.9	101.1	99.2
DUCT TEMP. (degrees F)	158.3	161.7	158.8	159.60
FLOWRATE (SDCFM)	10532	10412	10207	10,384
FLOWRATE (ACFM)	14650	14454	14137	14,413
H20 (volume %)	13.88	13.23	13.44	13.51
F.H. Particulate (Cs) (gr/dscf)	0.0023	0.0075	0.0074	0.0057
F.H. Particulate E.R. (lbs/hr)	0.204	0.668	0.644	0.505 .512

WHERE,

Sample Volume = Standard dry cubic feet
Sample Weight = Particulate collected in milligrams
Temperature = Degrees fahrenheit
Velocity = Stack gas velocity in feet per second
SDCFM = Standard dry cubic feet per minute
ACFM = Actual cubic feet per minute
H2O, volume % = Stack gas percent water vapor
Cs = Particulate concentration in grains per SDCF
E.R. = Emission rate in pounds per hour
F.H. = Front Half (filterable)

Calculations,

Cs = 15.432 * Sample Wt./ Sample Volume

Emissions = 0.00857 * Cs * SDCFM

TABLE 2
Hawk Cyclone Outlet
Particulate Emissions Results

TEST #	1	2	3	AVERAGE
TEST DATE	1-08-93	1-08-93	1-08-93	
TEST TIME	0942-1122	1249-1429	1541-1652	
SAMPLE VOLUME (SDCF)	62.873	58.353	45.050	
SAMPLE WT. (mg)	1.3	3.2	2.7	
VELOCITY (ft/sec)	32.78	31.53	32.70	32.34
ISOKINETIC (%)	102.7	100.7	106.3	103.2
DUCT TEMP. (degrees F)	178.8	185.9	187.8	184.17
FLOWRATE (SDCFM)	17493	16545	16977	17,005
FLOWRATE (ACFM)	23694	22796	23639	23,376
H20 (volume %)	8.69	9.23	9.92	9.28
F.H. Particulate (Cs) (gr/dscf)	0.0003	0.0008	0.0009	0.0007
F.H. Particulate E.R. (lbs/hr)	0.048	0.120	0.135	0.101

WHERE,

Sample Volume = Standard dry cubic feet
Sample Weight = Particulate collected in milligrams
Temperature = Degrees fahrenheit
Velocity = Stack gas velocity in feet per second
SDCFM = Standard dry cubic feet per minute
ACFM = Actual cubic feet per minute
H2O, volume % = Stack gas percent water vapor
Cs = Particulate concentration in grains per SDCF
E.R. = Emission rate in pounds per hour
F.H. = Front Half (filterable) particulate

Calculations,

Cs = 15.432 * Sample Wt./ Sample Volume

Emissions = 0.00857 * Cs * SDCFM

TABLE 3
Winger Cyclone Outlet
Multiple Metals Test Results

TEST	1	2	3	AVERAGE
DATE	1-08-93	1-08-93	1-08-93	
TEST TIME	0812-0951	1127-1321	1457-1650	
SAMPLE VOLUME (DSCF)	74.334	77.807	57.917	70.019
SAMPLE VOLUME (DSCM)	2.1052	2.2035	1.6402	1.9830
VELOCITY, (ft/sec)	25.38	25.04	24.49	24.97
FLOWRATE (SDCFM)	10,532	10,412	10,207	10,384
Arsenic, total ug	< 0.30	1.20	1.40	~~0.97~~
Arsenic, (ug/dscm)	< 0.14	0.54	0.85	~~0.51~~
Arsenic, (gm/hr)	< 0.003	0.010	0.015	~~0.009~~
Arsenic, (ppb)	< 0.05	0.17	0.27	~~0.16~~
Beryllium, total ug	< 0.1	< 0.1	< 0.1	< 0.10
Beryllium, (ug/dscm)	< 0.05	< 0.05	< 0.06	< 0.05
Beryllium, (gm/hr)	< 0.001	< 0.001	< 0.001	< 0.001
Beryllium, (ppb)	< 0.13	< 0.12	< 0.16	< 0.137
Cadmium, total ug	< 0.30	19.00	16.00	11.77
Cadmium, (ug/dscm)	< 0.14	8.62	9.75	6.17
Cadmium, (gm/hr)	< 0.003	0.153	0.169	0.108
Cadmium, (ppb)	< 0.03	1.85	2.09	1.32
Total Chromium, total ug	2.30	2.5	3.10	2.70
Total Chromium, (ug/dscm)	1.09	1.13	1.89	[redacted]
Total Chromium, (gm/hr)	0.020	0.020	0.033	0.024
Total Chromium, (ppb)	0.51	0.52	0.87	0.63

Note: Less than (<) signs precede the method detection limit.

TABLE 3 (CONT.)
Winger Cyclone Outlet
Multiple Metals Test Results

Copper, total ug	5.10	4.80	7.70	6.40	5.867
Copper, (ug/dscm)	2.42	2.18	4.69	3.56	3.099
Copper, (gm/hr)	0.043	0.04	0.081	0.06	.0545
Copper, (ppb)	0.92	0.82	1.78	1.35	1.174
Lead, total ug	2.9	2.70	3.00	3.0	2.867
Lead, (ug/dscm)	1.4	1.23	1.83	1.6	1.477
Lead, (gm/hr)	0.025	0.022	0.032	0.028	.026
Lead, (ppb)	0.16	0.14	0.21	0.186	.172
Manganese, total ug	2.40	3.20	2.30	2.35	2.623
Manganese, (ug/dscm)	1.14	1.45	1.40	1.27	1.332
Manganese, (gm/hr)	0.020	0.026	0.024	0.022	.024
Manganese, (ppb)	0.50	0.64	0.61	0.56	.583
Mercury, total ug	< 1.30	< 1.20	< 1.40	< 1.30	✓
Mercury, (ug/dscm)	< 0.62	< 0.54	< 0.85	< 0.67	✓
Mercury, (gm/hr)	< 0.011	< 0.010	< 0.015	< 0.012	.012
Mercury, (ppb)	< 0.27	< 0.24	< 0.37	< 0.29	.086
Nickel, total ug	4.00	< 2.0	2.00	< 3.00	2.667
Nickel, (ug/dscm)	1.90	< 0.91	1.22	< 1.56	1.34
Nickel, (gm/hr)	0.034	< 0.016	0.021	< 0.03	.024
Nickel, (ppb)	0.78	< 0.37	0.50	< 0.64	.054

Note: Less than (<) signs precede the method detection limit.

TABLE 3 (CONT.)
Winger Cyclone Outlet
Multiple Metals Test Results

Selenium, total ug	< 0.30	< 11.00	< 3.00	< 4.77 ✓
Selenium, (ug/dscm)	< 0.14	< 4.99	< 1.83	< 2.32 ✓
Selenium, (gm/hr)	< 0.003	< 0.088	< 0.032	< 0.041 ✓
Selenium, (ppb)	< 0.04	< 1.52	< 0.56	< 0.71 ✓
Zinc, total ug	27.0	18.00	18.0	22.5 21.0
Zinc, (ug/dscm)	12.8	8.17	11.0	11.9 10,66
Zinc, (gm/hr)	0.230	0.14	0.190	0.2 .187
Zinc, (ppb)	4.72	3.01	4.04	4.38 3.92

Note: Less than (<) signs precede the method detection limit.

Where,

< = Less Than
Sample Volume = Standard dry cubic meters
Velocity = Stack gas velocity in feet per second
SDCFM = Standard dry cubic feet per minute
ug/dscm = micrograms per dry standard cubic meter
gm/hr = Emission rate, grams per hour

Calculations,

$$gm/hr = 1.70 \times 10^{-6} \times SDCFM \times (ug/dscm)$$

ppb = total micrograms per DSCF times (849.37/Mol. Weight)

TABLE 3A
Winger Cyclone Outlet
Multiple Metals Test Results
(Corrected with Field Blank Train)

TEST	1	2	3	AVERAGE
DATE	1-08-93	1-08-93	1-08-93	
TEST TIME	0812-0951	1127-1321	1457-1650	
SAMPLE VOLUME (DSCF)	74.334	77.807	57.917	70.019
SAMPLE VOLUME (DSCM)	2.1052	2.2035	1.6402	1.9830
VELOCITY, (ft/sec)	25.38	25.04	24.49	24.97
FLOWRATE (SDCFM)	10,532	10,412	10,207	10,384
Arsenic, total ug	< 0.30	< 0.30	< 0.30	< 0.30
Arsenic, (ug/dscm)	< 0.14	< 0.14	< 0.18	< 0.15
Arsenic, (gm/hr)	< 0.003	< 0.002	< 0.003	< 0.003
Arsenic, (ppb)	< 0.05	< 0.04	< 0.06	< 0.05
Beryllium, total ug	< 0.1	< 0.1	< 0.1	< 0.10
Beryllium, (ug/dscm)	< 0.05	< 0.05	< 0.06	< 0.05
Beryllium, (gm/hr)	< 0.001	< 0.001	< 0.001	< 0.001
Beryllium, (ppb)	< 0.13	< 0.12	< 0.16	< 0.137
Cadmium, total ug	< 0.30	18.40	15.40	< 11.37
Cadmium, (ug/dscm)	< 0.14	8.35	9.39	< 5.96
Cadmium, (gm/hr)	< 0.003	0.148	0.163	< 0.104
Cadmium, (ppb)	< 0.03	1.79	2.01	< 1.28
Total Chromium, total ug	< 0.60	0.2	0.80	< 0.70
Total Chromium, (ug/dscm)	< 0.29	0.09	0.49	< 0.39
Total Chromium, (gm/hr)	< 0.005	0.002	0.008	< 0.01
Total Chromium, (ppb)	< 0.13	0.04	0.23	< 0.18

Note: Less than (<) signs precede the method detection limit.

TABLE 3A (CONT.)
Winger Cyclone Outlet
Multiple Metals Test Results
(Corrected with Field Blank Train)

Copper, total ug	0.60	0.30	2.20	1.40
Copper, (ug/dscm)	0.29	0.14	1.34	0.81
Copper, (gm/hr)	0.005	0.00	0.023	0.01
Copper, (ppb)	0.11	0.05	0.51	0.31
Lead, total ug	< 0.20	< 0.20	< 0.20	< 0.20
Lead, (ug/dscm)	< 0.10	< 0.09	< 0.12	< 0.11
Lead, (gm/hr)	< 0.002	< 0.002	< 0.002	< 0.002
Lead, (ppb)	< 0.01	< 0.01	< 0.01	< 0.013
Manganese, total ug	0.90	1.70	0.80	0.85
Manganese, (ug/dscm)	0.43	0.77	0.49	0.46
Manganese, (gm/hr)	0.008	0.014	0.008	0.008
Manganese, (ppb)	0.19	0.34	0.21	0.20
Mercury, total ug	< 1.30	< 1.20	< 1.40	< 1.30
Mercury, (ug/dscm)	< 0.62	< 0.54	< 0.85	< 0.67
Mercury, (gm/hr)	< 0.011	< 0.010	< 0.015	< 0.012
Mercury, (ppb)	< 0.27	< 0.24	< 0.37	< 0.29
Nickel, total ug	2.00	< 2.00	< 2.00	< 2.00
Nickel, (ug/dscm)	0.95	< 0.91	< 1.22	< 1.08
Nickel, (gm/hr)	0.017	< 0.016	< 0.021	< 0.02
Nickel, (ppb)	0.39	< 0.37	< 0.50	< 0.44

Note: Less than (<) signs precede the method detection limit.

TABLE 3A (CONT.)
Winger Cyclone Outlet
Multiple Metals Test Results
(Corrected with Field Blank Train)

Selenium, total ug	< 0.30	< 11.00	< 3.00	< 4.77
Selenium, (ug/dscm)	< 0.14	< 4.99	< 1.83	< 2.32
Selenium, (gm/hr)	< 0.003	< 0.088	< 0.032	< 0.041
Selenium, (ppb)	< 0.04	< 1.52	< 0.56	< 0.71
Zinc, total ug	4.00	< 1.00	< 1.00	< 2.50
Zinc, (ug/dscm)	1.90	< 0.45	< 0.61	< 1.25
Zinc, (gm/hr)	0.034	< 0.01	< 0.011	< 0.02
Zinc, (ppb)	0.70	< 0.17	< 0.22	< 0.46

Note: Less than (<) signs precede the method detection limit.

Where,

< = Less Than
Sample Volume = Standard dry cubic meters
Velocity = Stack gas velocity in feet per second
SDCFM = Standard dry cubic feet per minute
ug/dscm = micrograms per dry standard cubic meter
gm/hr = Emission rate, grams per hour

Calculations,

$$gm/hr = 1.70 \times 10^{-6} \times SDCFM \times (ug/dscm)$$

ppb = total micrograms per DSCF times (849.37/Mol. Weight)

TABLE 4
Hawk Cyclone Outlet
Multiple Metals Test Results

TEST	1	2	3	AVERAGE
DATE	1-08-93	1-08-93	1-08-93	
TEST TIME	0942-1122	1249-1429	1541-1652	
SAMPLE VOLUME (DSCF)	63.840	59.251	45.743	56.278
SAMPLE VOLUME (DSCM)	1.8080	1.6780	1.2955	1.5938
VELOCITY, (ft/sec)	32.78	31.53	32.70	32.34
FLOWRATE (SDCFM)	17,493	16,545	16,977	17,005
Arsenic, total ug	1.30	1.60	1.40	1.43 ✓
Arsenic, (ug/dscm)	0.72	0.95	1.08	0.92 ✓
Arsenic, (gm/hr)	0.021	0.027	0.031	0.026 .0265
Arsenic, (ppb)	0.23	0.31	0.35	0.29 ✓
Beryllium, total ug	< 0.1	< 0.1	< 0.1	< 0.10 ✓
Beryllium, (ug/dscm)	< 0.06	< 0.06	< 0.08	< 0.06 .084
Beryllium, (gm/hr)	< 0.002	< 0.002	< 0.002	< 0.002 .0018
Beryllium, (ppb)	< 0.15	< 0.16	< 0.21	< 0.171 ✓
Cadmium, total ug	3.50	19.00	17.00	13.17 13.167
Cadmium, (ug/dscm)	1.94	11.32	13.12	8.79 ✓
Cadmium, (gm/hr)	0.058	0.318	0.379	0.252 ✓
Cadmium, (ppb)	0.41	2.42	2.81	1.88 ✓
Total Chromium, total ug	4.90	2.90	4.20	4.55 4.0
Total Chromium, (ug/dscm)	2.71	1.73	3.24	2.98 2.56
Total Chromium, (gm/hr)	0.081	0.049	0.094	0.087 .0743
Total Chromium, (ppb)	1.25	0.80	1.50	1.38 1.18

Note: Less than (<) signs precede the method detection limit.

TABLE 4 (CONT.)
Hawk Cyclone Outlet
Multiple Metals Test Results

Copper, total ug	8.70	4.70	6.40	7.55	6.60
Copper, (ug/dscm)	4.81	2.80	4.94	4.88	4.184
Copper, (gm/hr)	0.143	0.08	0.143	0.14	.122
Copper, (ppb)	1.82	1.06	1.87	1.85	659
Lead, total ug	3.6	3.30	3.90	3.8	3.6
Lead, (ug/dscm)	2.0	1.97	3.01	2.5	2.32
Lead, (gm/hr)	0.059	0.055	0.087	0.073	.067
Lead, (ppb)	0.23	0.23	0.35	0.290	.280
Manganese, total ug	2.00	2.10	1.80	1.90	1.967
Manganese, (ug/dscm)	1.11	1.25	1.39	1.25	1.249
Manganese, (gm/hr)	0.033	0.035	0.040	0.036	✓
Manganese, (ppb)	0.48	0.55	0.61	0.55	547
Mercury, total ug	< 1.10	< 1.10	< 4.50	< 2.23	✓
Mercury, (ug/dscm)	< 0.61	< 0.66	< 3.47	< 1.58	✓
Mercury, (gm/hr)	< 0.018	< 0.018	< 0.100	< 0.046	✓
Mercury, (ppb)	< 0.27	< 0.29	< 1.52	< 0.69	1894
Nickel, total ug	< 2.00	< 2.0	3.00	< 2.50	2.333
Nickel, (ug/dscm)	< 1.11	< 1.19	2.32	< 1.71	1.538
Nickel, (gm/hr)	< 0.033	< 0.034	0.067	< 0.050	.0494
Nickel, (ppb)	< 0.45	< 0.49	0.95	< 0.70	.620

Note: Less than (<) signs precede the method detection limit.

TABLE 4 (CONT.)
Hawk Cyclone Outlet
Multiple Metals Test Results

Selenium, total ug	< 3.00	< 3.00	< 3.00	< 3.00 ✓
Selenium, (ug/dscm)	< 1.66	< 1.79	< 2.32	< 1.92 ✓
Selenium, (gm/hr)	< 0.049	< 0.050	< 0.067	< 0.055 ✓
Selenium, (ppb)	< 0.51	< 0.54	< 0.71	< 0.59 ✓
Zinc, total ug	22.0	20.00	14.0	18.0 18.667
Zinc, (ug/dscm)	12.2	11.92	10.8	11.5 11.63
Zinc, (gm/hr)	0.362	0.335	0.312	0.337 .336
Zinc, (ppb)	4.48	4.39	3.98	4.23 4.28

Note: Less than (<) signs precede the method detection limit.

Where,

< = Less Than
Sample Volume = Standard dry cubic meters
Velocity = Stack gas velocity in feet per second
SDCFM = Standard dry cubic feet per minute
ug/dscm = micrograms per dry standard cubic meter
gm/hr = Emission rate, grams per hour

Calculations,

$$gm/hr = 1.70 \times 10^{-6} \times SDCFM \times (ug/dscm)$$

ppb = total micrograms per DSCF times (849.37/Mol. Weight)

TABLE 4A
Hawk Cyclone Outlet
Multiple Metals Test Results
(Corrected with Field Blank Train)

TEST DATE	1 1-08-93	2 1-08-93	3 1-08-93	AVERAGE
TEST TIME	0942-1122	1249-1429	1541-1652	
SAMPLE VOLUME (DSCF)	63.840	59.251	45.743	56.278
SAMPLE VOLUME (DSCM)	1.8080	1.6780	1.2955	1.5938
VELOCITY, (ft/sec)	32.78	31.53	32.70	32.34
FLOWRATE (SDCFM)	17,493	16,545	16,977	17,005
Arsenic, total ug	< 0.30	< 0.30	< 0.30	< 0.30
Arsenic, (ug/dscm)	< 0.17	< 0.18	< 0.23	< 0.19
Arsenic, (gm/hr)	< 0.005	< 0.005	< 0.007	< 0.006
Arsenic, (ppb)	< 0.05	< 0.06	< 0.07	< 0.06
Beryllium, total ug	< 0.1	< 0.1	< 0.1	< 0.10
Beryllium, (ug/dscm)	< 0.06	< 0.06	< 0.08	< 0.06
Beryllium, (gm/hr)	< 0.002	< 0.002	< 0.002	< 0.002
Beryllium, (ppb)	< 0.15	< 0.16	< 0.21	< 0.171
Cadmium, total ug	2.90	18.40	16.40	12.57
Cadmium, (ug/dscm)	1.60	10.97	12.66	8.41
Cadmium, (gm/hr)	0.048	0.308	0.365	0.240
Cadmium, (ppb)	0.34	2.35	2.71	1.80
Total Chromium, total ug	2.60	0.60	1.60	2.10
Total Chromium, (ug/dscm)	1.44	0.36	1.24	1.34
Total Chromium, (gm/hr)	0.043	0.010	0.036	0.04
Total Chromium, (ppb)	0.67	0.17	0.57	0.62

Note: Less than (<) signs precede the method detection limit.

TABLE 4A (CONT.)
Hawk Cyclone Outlet
Multiple Metals Test Results
(Corrected with Field Blank Train)

Copper, total ug	4.20	0.20	1.90	3.05
Copper, (ug/dscm)	2.32	0.12	1.47	1.89
Copper, (gm/hr)	0.069	0.00	0.042	0.06
Copper, (ppb)	0.88	0.05	0.56	0.72
Lead, total ug	< 0.2	< 0.20	< 0.20	< 0.2
Lead, (ug/dscm)	< 0.1	< 0.12	< 0.15	< 0.1
Lead, (gm/hr)	< 0.003	< 0.003	< 0.004	< 0.004
Lead, (ppb)	< 0.01	< 0.01	< 0.02	< 0.015
Manganese, total ug	0.50	0.60	0.30	0.40
Manganese, (ug/dscm)	0.28	0.36	0.23	0.25
Manganese, (gm/hr)	0.008	0.010	0.007	0.007
Manganese, (ppb)	0.12	0.16	0.10	0.11
Mercury, total ug	< 1.10	< 1.10	< 4.40	< 2.20
Mercury, (ug/dscm)	< 0.61	< 0.66	< 3.40	< 1.55
Mercury, (gm/hr)	< 0.018	< 0.018	< 0.098	< 0.045
Mercury, (ppb)	< 0.27	< 0.29	< 1.49	< 0.68
Nickel, total ug	< 2.00	< 2.0	1.00	< 1.50
Nickel, (ug/dscm)	< 1.11	< 1.19	0.77	< 0.94
Nickel, (gm/hr)	< 0.033	< 0.034	0.022	< 0.03
Nickel, (ppb)	< 0.45	< 0.49	0.32	< 0.38

Note: Less than (<) signs precede the method detection limit.

TABLE 4A (CONT.)
Hawk Cyclone Outlet
Multiple Metals Test Results
(Corrected with Field Blank Train)

Selenium, total ug	< 3.00	< 3.00	< 3.00	< 3.00
Selenium, (ug/dscm)	< 1.66	< 1.79	< 2.32	< 1.92
Selenium, (gm/hr)	< 0.049	< 0.050	< 0.067	< 0.055
Selenium, (ppb)	< 0.51	< 0.54	< 0.71	< 0.59
Zinc, total ug	< 1.00	< 1.00	< 1.00	< 1.00
Zinc, (ug/dscm)	< 0.6	< 0.60	< 0.8	< 0.7
Zinc, (gm/hr)	< 0.016	< 0.02	< 0.022	< 0.0
Zinc, (ppb)	< 0.20	< 0.22	< 0.28	< 0.24

Note: Less than (<) signs precede the method detection limit.

Where,

< = Less Than
Sample Volume = Standard dry cubic meters
Velocity = Stack gas velocity in feet per second
SDCFM = Standard dry cubic feet per minute
ug/dscm = micrograms per dry standard cubic meter
gm/hr = Emission rate, grams per hour

Calculations,

$$gm/hr = 1.70 \times 10^{-6} \times SDCFM \times (ug/dscm)$$

ppb = total micrograms per DSCF times (849.37/Mol. Weight)

APPENDICES

CALCULATIONS

BEST ENVIRONMENTAL
PARTICULATE EMISSION CALCULATIONS

DATE	1-08-93	TEST METHOD	M436	CLIENT	Doane
TEST No.	1	METER BOX	LSI 2	LOCATION	Winger Outlet
TEST TIME	0812-0951			FUEL	Gas

Pitot Factor (Kp)	0.840	Meter temp. (Tm)	69.2	Total condensate (Vw)	254.5
Barom. press. (Pb)	29.65	Meter press. (^H)	1.95	Total particulate (mg)	10.7
Static Press.	0.65	Vel.AvgSQRT(P)	0.9310	Sample vol. uncorr. (Vm)	76.770
Stack press.	29.70	Stack Area (As)	9.620	Stack gas CO2%	0.04
Stack temp. (Ts)	158.3	Nozzle dia. (d)	0.241	Stack gas O2%	20.90
Sample time (O)	96.0	Meter factor (Yd)	0.9746	Stack gas N2%	79.06
F.H. Particulate(mg)	10.7	Std. Temp.(Tstd)	60.00	Vel.Avg corr@cyclonics	0.405

A. Gas Volume (Vm)std = (Tstd+460)*Vm*Yd*(Pb+H/13.6)/((Tm+460)*29.92) — 73.208 Vm std

B. Volume H2O collected (Vw)std = 8.9148×10^{-5} *(Tstd+460)*Vw = — 11.798 Vw std

C. Total Sample Volume (Vt) = (Vm)std + (Vw)std = — 85.006 Vt std

D. Moisture Content (%H2O) = (Vw std/Vt std) x 100 = — 13.879 %

E. Stack Gas Velocity (Vs) = 85.49 Kp (P) SQRT(Ts +460/Ms Ps) = — 25.381 ft/sec
58.345 ft/sec

F. Stack Gas Molecular Wgt.= — 27.338 M.W.s
((CO2%x0.44 + O2%x0.32 + N2%x0.28)(1-H2O%/100)) + 18(H2O%/100)

G. Stack Gas Volumetric Flowrate = — 10,532 SDCFM
(Vs)(As)((Tstd+460)/(Ts+460))(Ps)(1-%H2O/100)*2.005 =

H. Tot. Particulate Concentration (Cs) = s/Vm x 0.01543 = — 0.0023 gr/dscf

I. Tot. Particulate Emission Rate = 0.00857 x Cs x SDCFM = — 0.204 Lbs/hr

J. % Isokinetic (I) = 9142.88(Vt)(Ts+460)/(dxd)(O)(Ps)(Vs)(Tstd+460) — 95.653 %

K. ACFM = (Vs)(As) x 60 = — 14650 ACFM

CYCLONICS

Doane Products/Winger Stack Run 1

POINT	^ P	SQRT ^P	ANGLE	COSINE	Cos. SQRT ^P
W-1	1.100	1.049	35.0	0.819	0.859
W-2	1.200	1.095	50.0	0.643	0.704
W-3	1.300	1.140	45.0	0.707	0.806
W-4	1.000	1.000	50.0	0.643	0.643
W-5	0.750	0.866	60.0	0.500	0.433
W-6	0.350	0.592	65.0	0.423	0.250
W-7	0.200	0.447	80.0	0.174	0.078
W-8	0.650	0.806	75.0	0.259	0.209
W-9	0.850	0.922	75.0	0.259	0.239
W-10	0.900	0.949	80.0	0.174	0.165
W-11	0.900	0.949	70.0	0.342	0.324
W-12	0.850	0.922	65.0	0.423	0.390
S-1	1.000	1.000	45.0	0.707	0.707
S-2	1.200	1.095	50.0	0.643	0.704
S-3	1.300	1.140	60.0	0.500	0.570
S-4	1.200	1.095	50.0	0.643	0.704
S-5	1.100	1.049	65.0	0.423	0.443
S-6	0.550	0.742	70.0	0.342	0.254
S-7	0.350	0.592	85.0	0.087	0.052
S-8	0.900	0.949	85.0	0.087	0.083
S-9	0.900	0.949	75.0	0.259	0.246
S-10	1.000	1.000	70.0	0.342	0.342
S-11	1.000	1.000	75.0	0.259	0.259
S-12	1.000	1.000	75.0	0.259	0.259
AVERAGE	0.898	0.931	64.8	0.413	0.405

WHERE,

^P = Differential Pressure
ANGLE = Degrees from vertical
New ^P = Cosine of angle x ^p

BEST ENVIRONMENTAL
PARTICULATE EMISSION CALCULATIONS

DATE	1-08-93	TEST METHOD	M436	CLIENT	Doane
TEST No.	2	METER BOX	LSI 2	LOCATION	Winger Outlet
TEST TIME	1127-1321			FUEL	Gas

Pitot Factor (Kp)	0.840	Meter temp. (Tm)	77.1	Total condensate (Vw)	252.0
Barom. press. (Pb)	29.65	Meter press. (^H)	2.17	Total particulate (mg)	37.2
Static Press.	0.65	Vel.AvgSQRT(P)	0.9210	Sample vol. uncorr. (Vm)	81.512
Stack press.	29.70	Stack Area (As)	9.620	Stack gas CO2%	0.04
Stack temp. (Ts)	161.7	Nozzle dia. (d)	0.241	Stack gas O2%	20.90
Sample time (O)	96.0	Meter factor (Yd)	0.9746	Stack gas N2%	79.06
F.H. Particulate(mg)	37.2	Std. Temp.(Tstd)	60.0	Vel.Avg corr@cyclonics	0.399

A. Gas Volume (Vm)std = (Tstd+460)*Vm*Yd*(Pb+H/13.6)/((Tm+460)*29.92) — 76.628 Vm std

B. Volume H2O collected (Vw)std = $8.9148*10^{-5}$ *(Tstd+460)*Vw = — 11.682 Vw std

C. Total Sample Volume (Vt) = (Vm)std + (Vw)std = — 88.310 Vt std

D. Moisture Content (%H2O) = (Vw std/Vt std) x 100 = — 13.228 %

E. Stack Gas Velocity (Vs) = 85.49 Kp (P) SQRT(Ts +460/Ms Ps) = — 25.041 ft/sec / 57.802 ft/sec

F. Stack Gas Molecular Wgt.= ((CO2%x0.44 + O2%x0.32 + N2%x0.28)(1-H20%/100)) + 18(H20%/100) — 27.408 M.W.s

G. Stack Gas Volumetric Flowrate = (Vs)(As)((Tstd+460)/(Ts+460))(Ps)(1-%H2O/100)*2.005 = — 10,412 SDCFM

H. Tot. Particulate Concentration (Cs) = s/Vm x 0.01543 = — 0.0075 gr/dscf

I. Tot. Particulate Emission Rate = 0.00857 x Cs x SDCFM = — 0.668 Lbs/hr

J. % Isokinetic (I) = 9142.88(Vt)(Ts+460)/(dxd)(O)(Ps)(Vs)(Tstd+460) — 100.856 %

K. ACFM = (Vs)(As) x 60 = — 14454 ACFM

CYCLONICS

Doane Products/Winger Stack Run 2

POINT	^ P		ANGLE	COSINE	New ^P
W-1	1.150	1.072	35.0	0.819	0.878
W-2	1.150	1.072	50.0	0.643	0.689
W-3	1.200	1.095	45.0	0.707	0.775
W-4	1.050	1.025	50.0	0.643	0.659
W-5	0.800	0.894	60.0	0.500	0.447
W-6	0.250	0.500	65.0	0.423	0.211
W-7	0.500	0.707	80.0	0.174	0.123
W-8	0.700	0.837	75.0	0.259	0.217
W-9	0.950	0.975	75.0	0.259	0.252
W-10	0.900	0.949	80.0	0.174	0.165
W-11	0.750	0.866	70.0	0.342	0.296
W-12	0.850	0.922	65.0	0.423	0.390
S-1	1.000	1.000	45.0	0.707	0.707
S-2	1.200	1.095	50.0	0.643	0.704
S-3	1.100	1.049	60.0	0.500	0.524
S-4	1.100	1.049	50.0	0.643	0.674
S-5	0.850	0.922	65.0	0.423	0.390
S-6	0.450	0.671	70.0	0.342	0.229
S-7	0.300	0.548	85.0	0.087	0.048
S-8	0.750	0.866	85.0	0.087	0.075
S-9	1.000	1.000	75.0	0.259	0.259
S-10	1.000	1.000	70.0	0.342	0.342
S-11	1.000	1.000	75.0	0.259	0.259
S-12	1.000	1.000	75.0	0.259	0.259
AVERAGE	0.875	0.921	64.8	[redacted]	0.399

C. .426

WHERE,

^P = Differential Pressure
ANGLE = Degrees from vertical
New ^P = Cosine of angle x ^p

BEST ENVIRONMENTAL
PARTICULATE EMISSION CALCULATIONS

DATE	1-08-93	TEST METHOD	M436	CLIENT	Doane
TEST No.	3	METER BOX	LSI 2	LOCATION	Winger Outlet
TEST TIME	1457-1650			FUEL	Gas

Pitot Factor (Kp)	0.840	Meter temp. (Tm)	76.0	Total condensate (Vw)	191.0
Barom. press. (Pb)	29.650	Meter press. (^H)	1.75	Total particulate (mg)	27.2
Static Press.	0.65	Vel.AvgSQRT(P)	0.9120	Sample vol. uncorr. (Vm)	60.613
Stack press.	29.70	Stack Area (As)	9.620	Stack gas CO2%	0.04
Stack temp. (Ts)	158.8	Nozzle dia. (d)	0.241	Stack gas O2%	20.9
Sample time (O)	72.0	Meter factor (Yd)	0.9746	Stack gas N2%	79.1
F.H. Particulate(mg)	27.2	Std. Temp.(Tstd)	60.000	Vel.Avg corr@cyclonics	0.391

A. Gas Volume (Vm)std = ((Tstd+460)*Vm*Yd*(Pb+H/13.6))/((Tm+460)*29.92) = 57.039 Vm std

B. Volume H2O collected (Vw)std = 8.9148×10^{-5} *(Tstd+460)*Vw = 8.854 Vw std

C. Total Sample Volume (Vt) = (Vm)std + (Vw)std = 65.894 Vt std

D. Moisture Content (%H2O) = (Vw std/Vt std) x 100 = 13.437 %

E. Stack Gas Velocity (Vs) = 85.49 Kp (P) SQRT(Ts +460/Ms Ps) = 24.492 ft/sec
57.127 ft/sec

F. Stack Gas Molecular Wgt.= 27.385 M.W.s
((CO2%x0.44 • O2%x0.32 • N2%x0.28)(1-H20%/100)) + 18(H20%/100)

G. Stack Gas Volumetric Flowrate = 10,207 SDCFM
(Vs)(As)((Tstd+460)/(Ts+460))(Ps)(1-%H2O/100)*2.005 =

H. Tot. Particulate Concentration (Cs) = s/Vm x 0.01543 = 0.0074 gr/dscf

I. Tot. Particulate Emission Rate = 0.00857 x Cs x SDCFM = 0.644 Lbs/hr

J. % Isokinetic (I) = 9142.88(Vt)(Ts+460)/(dxd)(O)(Ps)(Vs)(Tstd+460) 101.051 %

K. ACFM = (Vs)(As) x 60 = 14137 ACFM

CYCLONICS

Doane Products/Winger Stack Run 3

POINT	^ P		ANGLE	COSINE	New ^P
W-1	1.050	1.025	35.0	0.819	0.839
W-2	1.050	1.025	50.0	0.643	0.659
W-3	1.100	1.049	45.0	0.707	0.742
W-4	1.050	1.025	50.0	0.643	0.659
W-5	0.750	0.866	60.0	0.500	0.433
W-6	0.300	0.548	65.0	0.423	0.231
W-7	0.500	0.707	80.0	0.174	0.123
W-8	0.700	0.837	75.0	0.259	0.217
W-9	0.850	0.922	75.0	0.259	0.239
W-10	0.800	0.894	80.0	0.174	0.155
W-11	0.850	0.922	70.0	0.342	0.315
W-12	0.850	0.922	65.0	0.423	0.390
S-1	0.900	0.949	45.0	0.707	0.671
S-2	1.000	1.000	50.0	0.643	0.643
S-3	1.100	1.049	60.0	0.500	0.524
S-4	1.050	1.025	50.0	0.643	0.659
S-5	0.900	0.949	65.0	0.423	0.401
S-6	0.500	0.707	70.0	0.342	0.242
S-7	0.350	0.592	85.0	0.087	0.052
S-8	0.800	0.894	85.0	0.087	0.078
S-9	0.950	0.975	75.0	0.259	0.252
S-10	1.000	1.000	70.0	0.342	0.342
S-11	1.000	1.000	75.0	0.259	0.259
S-12	1.000	1.000	75.0	0.259	0.259
AVERAGE	0.850	0.912	64.8	0.413	0.391

WHERE,

^P = Differential Pressure
ANGLE = Degrees from vertical
New ^P = Cosine of angle x ^p

BEST ENVIRONMENTAL
PARTICULATE EMISSION CALCULATIONS

DATE	1-08-93	TEST METHOD	M436	CLIENT	Doane
TEST No.	1	METER BOX	LSI 1	LOCATION	Hawk Outlet
TEST TIME	0942-1122			FUEL	Gas

Pitot Factor (Kp)	0.840	Meter temp. (Tm)	73.3	Total condensate (Vw)	129.0
Barom. press. (Pb)	29.65	Meter press. (^H)	1.76	Total particulate (mg)	1.3
Static Press.	0.90	Vel.AvgSQRT(P)	1.1850	Sample vol. uncorr. (Vm)	64.297
Stack press.	29.72	Stack Area (As)	12.048	Stack gas CO2%	0.04
Stack temp. (Ts)	178.8	Nozzle dia. (d)	0.188	Stack gas O2%	20.90
Sample time (O)	96.0	Meter factor (Yd)	1.0076	Stack gas N2%	79.06
F.H. Particulate(mg)	1.3	Std. Temp.(Tstd)	60.00	Vel.Avg corr@cyclonics	0.520

A. Gas Volume (Vm)std = (Tstd+460)*Vm*Yd*(Pb+H/13.6)/((Tm+460)*29.92) — 62.873 Vm std

B. Volume H2O collected (Vw)std = 8.9148×10^{-5} *(Tstd+460)*Vw = — 5.980 Vw std

C. Total Sample Volume (Vt) = (Vm)std + (Vw)std = — 68.853 Vt std

D. Moisture Content (%H2O) = (Vw std/Vt std) x 100 = — 8.685 %

E. Stack Gas Velocity (Vs) = 85.49 Kp (P) SQRT(Ts +460/Ks Ps) = — 32.778 ft/sec / 74.695 ft/sec

F. Stack Gas Molecular Wgt.= — 27.901 M.W.s
((CO2%x0.44 + O2%x0.32 + N2%x0.28)(1-H2O%/100)) + 18(H2O%/100)

G. Stack Gas Volumetric Flowrate = — 17,493 SDCFM
(Vs)(As)((Tstd+460)/(Ts+460))(Ps)(1-%H2O/100)*2.005 =

H. Tot. Particulate Concentration (Cs) = s/Vm x 0.01543 = — 0.0003 gr/dscf

I. Tot. Particulate Emission Rate = 0.00857 x Cs x SDCFM = — 0.048 Lbs/hr

J. % Isokinetic (I) = 9142.88(Vt)(Ts+460)/(dxd)(O)(Ps)(Vs)(Tstd+460) — 102.683 %

K. ACFM = (Vs)(As) x 60 = — 23694 ACFM

CYCLONICS

Doane Products/HAWK Stack Run 1

POINT	^ P	SQRT ^P	ANGLE	COSINE	Cos. SQRT ^P
W-1	2.050	1.432	35.0	0.819	1.173
W-2	2.000	1.414	50.0	0.643	0.909
W-3	2.100	1.449	45.0	0.707	1.025
W-4	1.900	1.378	50.0	0.643	0.886
W-5	1.300	1.140	60.0	0.500	0.570
W-6	0.700	0.837	65.0	0.423	0.354
W-7	0.500	0.707	80.0	0.174	0.123
W-8	1.000	1.000	75.0	0.259	0.259
W-9	1.500	1.225	75.0	0.259	0.317
W-10	1.600	1.265	80.0	0.174	0.220
W-11	1.600	1.265	70.0	0.342	0.433
W-12	1.600	1.265	65.0	0.423	0.535
S-1	2.100	1.449	45.0	0.707	1.025
S-2	2.000	1.414	50.0	0.643	0.909
S-3	1.850	1.360	60.0	0.500	0.680
S-4	1.500	1.225	50.0	0.643	0.787
S-5	1.100	1.049	65.0	0.423	0.443
S-6	0.500	0.707	70.0	0.342	0.242
S-7	0.550	0.742	85.0	0.087	0.065
S-8	1.000	1.000	85.0	0.087	0.087
S-9	1.600	1.265	75.0	0.259	0.327
S-10	1.700	1.304	70.0	0.342	0.446
S-11	1.600	1.265	75.0	0.259	0.327
S-12	1.650	1.285	75.0	0.259	0.332
AVERAGE	1.458	1.185	64.8	0.413	0.520

WHERE,

^P = Differential Pressure
ANGLE = Degrees from vertical
New ^P = Cosine of angle x ^p

BEST ENVIRONMENTAL
PARTICULATE EMISSION CALCULATIONS

DATE	1-08-93	TEST METHOD	M436	CLIENT	Doane
TEST No.	2	METER BOX	LSI 1	LOCATION	Hawk Outlet
TEST TIME	1249-1429			FUEL	Gas

Pitot Factor (Kp)	0.840	Meter temp. (Tm)	81.5	Total condensate (Vw)	128.0
Barom. press. (Pb)	29.65	Meter press. (^H)	1.57	Total particulate (mg)	3.2
Static Press.	0.90	Vel.AvgSQRT(P)	1.1330	Sample vol. uncorr. (Vm)	60.621
Stack press.	29.72	Stack Area (As)	12.048	Stack gas CO2%	0.04
Stack temp. (Ts)	185.9	Nozzle dia. (d)	0.188	Stack gas O2%	20.90
Sample time (O)	96.0	Meter factor (Yd)	1.0076	Stack gas N2%	79.06
F.H. Particulate(mg)	3.2	Std. Temp.(Tstd)	60.0	Vel.Avg corr@cyclonics	0.497

A. Gas Volume (Vm)std = (Tstd+460)*Vm*Yd*(Pb+H/13.6)/((Tm+460)*29.92) 58.353 Vm std

B. Volume H2O collected (Vw)std = $8.9148 * 10^{-5}$ *(Tstd+460)*Vw = 5.934 Vw std

C. Total Sample Volume (Vt) = (Vm)std + (Vw)std = 64.287 Vt std

D. Moisture Content (%H2O) = (Vw std/Vt std) x 100 = 9.230 %

E. Stack Gas Velocity (Vs) = 85.49 Kp (P) SQRT(Ts +460/Ms Ps) = 31.535 ft/sec
71.889 ft/sec

F. Stack Gas Molecular Wgt.= 27.842 M.W.s
((CO2%x0.44 + O2%x0.32 + N2%x0.28)(1-H2O%/100)) + 18(H2O%/100)

G. Stack Gas Volumetric Flowrate = 16,545 SDCFM
(Vs)(As)((Tstd+460)/(Ts+460))(Ps)(1-%H2O/100)*2.005 =

H. Tot. Particulate Concentration (Cs) = s/Vm x 0.01543 = 0.0008 gr/dscf

I. Tot. Particulate Emission Rate = 0.00857 x Cs x SDCFM = 0.120 Lbs/hr

J. % Isokinetic (I) = 9142.88(Vt)(Ts+460)/(dxd)(O)(Ps)(Vs)(Tstd+460) 100.722 %

K. ACFM = (Vs)(As) x 60 = 22796 ACFM

CYCLONICS

Doane Products/HAWK Stack Run 2

POINT	^ P		ANGLE	COSINE	New ^P
W-1	2.100	1.449	35.0	0.819	1.187
W-2	2.200	1.483	50.0	0.643	0.953
W-3	1.750	1.323	45.0	0.707	0.935
W-4	1.300	1.140	50.0	0.643	0.733
W-5	0.950	0.975	60.0	0.500	0.487
W-6	0.500	0.707	65.0	0.423	0.299
W-7	0.300	0.548	80.0	0.174	0.095
W-8	0.750	0.866	75.0	0.259	0.224
W-9	1.300	1.140	75.0	0.259	0.295
W-10	1.250	1.118	80.0	0.174	0.194
W-11	1.200	1.095	70.0	0.342	0.375
W-12	1.350	1.162	65.0	0.423	0.491
S-1	2.000	1.414	45.0	0.707	1.000
S-2	1.900	1.378	50.0	0.643	0.886
S-3	1.600	1.265	60.0	0.500	0.632
S-4	1.600	1.265	50.0	0.643	0.813
S-5	1.100	1.049	65.0	0.423	0.443
S-6	0.500	0.707	70.0	0.342	0.242
S-7	0.600	0.775	85.0	0.087	0.068
S-8	1.000	1.000	85.0	0.087	0.087
S-9	1.600	1.265	75.0	0.259	0.327
S-10	1.700	1.304	70.0	0.342	0.446
S-11	1.900	1.378	75.0	0.259	0.357
S-12	1.900	1.378	75.0	0.259	0.357
AVERAGE	1.348	1.133	64.8	0.413	0.497

WHERE,

^P = Differential Pressure
ANGLE = Degrees from vertical
New ^P = Cosine of angle x ^p

BEST ENVIRONMENTAL
PARTICULATE EMISSION CALCULATIONS

DATE	1-08-93	TEST METHOD	M436	CLIENT	Doane
TEST No.	3	METER BOX	LSI 1	LOCATION	Hawk Outlet
TEST TIME	1541-1652			FUEL	Gas

Pitot Factor (Kp)	0.840	Meter temp. (Tm)	82.8	Total condensate (Vw)	107.0
Barom. press. (Pb)	29.650	Meter press. (^H)	1.79	Total particulate (mg)	2.7
Static Press.	0.90	Vel.AvgSQRT(P)	1.1910	Sample vol. uncorr. (Vm)	46.887
Stack press.	29.72	Stack Area (As)	12.048	Stack gas CO2%	6.0
Stack temp. (Ts)	187.8	Nozzle dia. (d)	0.188	Stack gas O2%	12.3
Sample time (O)	68.0	Meter factor (Yd)	1.0076	Stack gas N2%	81.7
F.H. Particulate(mg)	2.7	Std. Temp.(Tstd)	60.00	Vel.Avg corr@cyclonics	0.519

A. Gas Volume (Vm)std = (Tstd+460)*Vm*Yd*(Pb+H/13.6)/((Tm+460)*29.92) — 45.050 Vm std

B. Volume H2O collected (Vw)std = $8.9148 * 10^{-5} * (Tstd+460) * Vw$ = — 4.960 Vw std

C. Total Sample Volume (Vt) = (Vm)std + (Vw)std = — 50.010 Vt std

D. Moisture Content (%H2O) = (Vw std/Vt std) x 100 = — 9.918 %

E. Stack Gas Velocity (Vs) = 85.49 Kp (P) SQRT(Ts +460/Ms Ps) = — 32.702 ft/sec
75.044 ft/sec

F. Stack Gas Molecular Wgt.= — 28.316 M.W.s
((CO2%x0.44 + O2%x0.32 + N2%x0.28)(1-H2O%/100)) + 18(H2O%/100)

G. Stack Gas Volumetric Flowrate = — 16,977 SDCFM
(Vs)(As)((Tstd+460)/(Ts+460))(Ps)(1-%H2O/100)*2.005 =

H. Tot. Particulate Concentration (Cs) = s/Vm x 0.01543 = — 0.0009 gr/dscf

I. Tot. Particulate Emission Rate = 0.00857 x Cs x SDCFM = — 0.135 Lbs/hr

J. % Isokinetic (I) = 9142.88(Vt)(Ts+460)/(dxd)(O)(Ps)(Vs)(Tstd+460) — 106.278 %

K. ACFM = (Vs)(As) x 60 = — 23639 ACFM

CYCLONICS

Doane Products/HAWK Stack Run 3

POINT	^ P		ANGLE	COSINE	New ^P
W-1	2.100	1.449	35.0	0.819	1.187
W-2	2.200	1.483	50.0	0.643	0.953
W-3	2.100	1.449	45.0	0.707	1.025
W-4	1.600	1.265	50.0	0.643	0.813
W-5	1.200	1.095	60.0	0.500	0.548
W-6	0.500	0.707	65.0	0.423	0.299
W-7	0.500	0.707	80.0	0.174	0.123
W-8	1.000	1.000	75.0	0.259	0.259
W-9	1.600	1.265	75.0	0.259	0.327
W-10	1.700	1.304	80.0	0.174	0.226
W-11	1.700	1.304	70.0	0.342	0.446
W-12	1.800	1.342	65.0	0.423	0.567
S-1	2.000	1.414	45.0	0.707	1.000
S-2	2.000	1.414	50.0	0.643	0.909
S-3	1.800	1.342	60.0	0.500	0.671
S-4	1.500	1.225	50.0	0.643	0.787
S-5	1.200	1.095	65.0	0.423	0.463
S-6	0.500	0.707	70.0	0.342	0.242
S-7	0.600	0.775	85.0	0.087	0.068
S-8	1.000	1.000	85.0	0.087	0.087
S-9	1.600	1.265	75.0	0.259	0.327
S-10	1.700	1.304	70.0	0.342	0.446
S-11	1.800	1.342	75.0	0.259	0.347
S-12	1.800	1.342	75.0	0.259	0.347
AVERAGE	1.479	1.191	64.8	0.413	0.519

WHERE,

^P = Differential Pressure
ANGLE = Degrees from vertical
New ^P = Cosine of angle x ^p

FIELD DATA SHEETS

BEST ENVIRONMENTAL Particulate Field Data Sheet

Run # 1 Method # 436

Plant Doane	ΔH@ 1.05	%H2O Assum. 16%	Filter # 141	F.H. Wt. (mg)	
Date 7-8-93	Meter Yd 7726	Pitot Cp .96	Pitot # 1	R.H. Wt. (mg)	
Location Winger Stack	PBar. 29.65	Noz. Diam. .241	Net Imp Vol 239	Gel Wt. (mg) 15-Sep
Port Dim. D	Stat Press 30.65	Noz I.D. 313	Tot Imp Vol	%CO2 Actual	
Stack I.D. 42"	%O2 Assum 19.6	Meter # 2512	Sample Time 96	%O2 Actual	
Stack Area 9.62 ft2	%CO2 Assum 1.5	Probe # 6' GLASS	Sort ΔP Ave .95	Tot. Moisture 25%.5
Personnel RB / MH	Pre leak ck .010 cfm 15 "Hg	Post leak ck .008 cfm 8 "Hg	Std Vm	

Sort	Sample Point	Clock Time	Vel. ΔP	M.R. cfm	Orif. ΔH	Gas Meter Volume ft2	Gas Meter In	Gas Meter Out	Temperatures F Stack	Imp.	Filter	Probe	Pump Vac.	Comments
12	1	0817	1.1	.87	2.30	4[illegible]4.034	44	48	159	40	275	213	0	35° 1.049
11	2	0816	1.2	.93	2.56	4[illegible]5.1	64	48	159		255	240	6	50° 1.045
10	3	0820	1.3	.97	2.78	4[illegible]8.9	72	50	159		258	259	8	45° 1.10
9	4	0824	1.0	.86	2.14	492.9	77	51	160		265	256	7	52° 1.00
8	5	0828	.75	.75	1.42	496.7	80	52	160		285	257	6	60° .86
7	6	0832	.35	.51	.76	499.4	82	52	160		262	246	3	65° .59
6	7	0836	.20	.29	.43	501.5	82	54	161		299	236	2	60° .54
5	8	0840	.6	.70	1.41	503.1	83	54	161		309	250	4	70° .86
4	9	0844	.85	.80	1.85	505.8	83	54	159		325	256	3	80° .95
3	10	0848	.90	.83	1.96	509.6	85	56	158		291	249	3	80 .96
2	11	0852	.90	.83	1.96	512.2	86	56	159		287	246	3	70 .96
1	12	0856	.85	.80	1.85	515.5	86	56	159		281	243		65° .92
	13	0900												
500	14	0903	1.0	.86	2.16	515.61	74	56	158		231	213	6	45° 1.00
	15	0907	1.2	.95	2.6	521.8	84	56	158		233	244	7	50° 1.08
	16	0911	1.3	1.0	2.85	525.6	88	58	158		241	256	7	60° 1.14
	17	0915	1.2	.96	2.64	529.4	89	59	158		238	255	7	50° 1.08
	18	0919	1.1	.90	2.42	533.3	90	59	158		231	251	7	65° 1.00
	19	0923	0.95	.83	2.12	536.8	90	60	158	-	225	252	4	70° .88
	20	0927	.35	.52	.77	537.9	89	60	158		240	227	5	55° .33
	21	0931	.90	.83	1.97	542.1	87	59	158		203	190	6	65° .90
	22	0935	.90	.83	1.98	545.3	90	59	151		222	160	6	75° .94
	23	0939	1.00	.88	2.21	548.6	90	60	155		296	206	6	70° 1.00
	24	0943	1.0	.88	2.21	552.4	90	61	155		303	223	6	75° 1.00
	25	0947	1.0	.88	2.21	555.5	90	60	155		272	226	6	75° 1.00
	26	0951				558.804								
	27													
	28	Average				(1.85)	(76.770)	(69.2)			(158.3)			

Notes: Pitot leak check O.K.

Ms =
Ave. Vs =
Sample I.D. # =

	#1	#2
Final Imp Vol =		
Initial Imp Vol =		

1

BEST ENVIRONMENTAL Particulate Field Data Sheet

Run # 2 Method # 5 3 6

B-147

Plant Doyon | ΔH 1.652 | %H2O Assum. 14 | Filter # [illegible] | F. wt. (mg) ____
Date 4-8-93 | Meter Yd .9706 | Pitot Cp .84 | Pitot # 1 | B.H. Wt. (mg) ____
Location Wing Stack | PBar. 29.63 | Noz. Diam. .241 | Net Imp Vol 547 | Gel Wt. (mg) 15.0gr
Port Dia. ____ | Stat Press -.65 | Noz I.D. .313 | Tot Imp Vol ____ | %CO2 Actual ____
Stack I.D. 48" | %O2 Assum 20.9 | Meter # 4512 | Sample Time 96 | %O2 Actual ____
~~Stack Area 57.67 ft2~~ | %CO2 Assum 0.04 | Probe # 6' | ~~Sqrt ΔP Ave .921~~ | ~~Tot. Moisture 2.52~~
Personnel RB / MH | Pre leak ck .014 cfm 10 "Hg | Post leak ck .00 cfm 10 "hg | Std Vw 78.079

Sample Point	Clock Time	Vel. ΔP	M.R. cfm	Orif. ΔH	Gas Meter Volume ft3	Gas Meter In	Gas Meter Out	Temperatures F: Stack	Imp.	Filter	Probe	Pump Vac.	Comments	
1	12	1127	1.6	.86	2.38	561.230	56	56	161		242	183	5	45°	1.000
2	11	1131	1.2	.96	2.93	564.8	60	56	160		244	210	7	50°	1.095
3	10	1134	1.1	.91	2.63	568.7	64	58	[illegible]		251	230	6	60°	[illegible]
4	9	1138	1.1	.93	2.68	572.8	83	60	166		253	226	6	50°	1.079
5	8	1142	.85	.82	2.10	576.6	89	61	160		256	206	5	65°	.922
6	7	1147	1.45	.60	1.11	580.1	92	62	164		253	225	3	70°	.671
7	6	1153	.30	.49	.74	582.6	92	62	161		254	225	2	85°	.548
8	5	1155	.75	.78	1.87	585.6	92	62	157		247	217	5	85°	.866
9	4	1159	1.0	.90	2.49	587.8	96	63	162		252	203	6	75°	1.000
10	3	1203	1.0	.90	2.49	591.5	96	64	162		242	207	6	70°	1.000
11	2	1207	1.0	.90	2.49	595.2	97	64	162		257	205	6	75°	1.000
12	1	1211	1.0	.90	2.49	598.9	97	64	163		221	208	6	75°	1.000
13	[illegible]	1215			2.80										
1 (New)	12	1233	1.15	.99	[illegible]	602.535	72	64	162		238	208	6	55°	1.072
15	11	1237	1.15	.96	2.80	606.3	92	66	161		255	225	7	40°	1.072
16	10	1241	1.20	.85	3.00	610.2	95	65	162		245	223	7	45°	
17	9	1245	1.05	.92	2.63	614.1	96	65	163		257	224	6	40°	1.005
18	8	1249	.80	.805	1.99	617.9	97	66	164		236	217	5	[illegible]	.894
19	7	1253	.35	.45	0.62	621.5	98	66	164		248	208	2	[illegible]	.500
20	6	1257	.50	.64	1.25	623.5	96	67	162		285	221	4	80°	.707
21	5	1301	.70	.76	1.75	626.0	98	68	162		282	235	4	75°	.837
22	4	1305	.95	.88	2.38	627.1	98	68	161		259	231	5.5	75°	.978
23	3	1309	.90	.86	2.26	632.6	98	68	161		262	235	5	80°	.949
24	2	1313	.75	.77	1.89	636.2	98	68	159		264	234	4	70°	.866
25	1	1317	.85	.855	2.14	639.4	98	68	159		263	235	5	65°	.922
26	End	1321				642.742									
27															
28	Average				(2.17)	(81.512)	(77.1)		(161.7)						

Notes: Stop 1135 - Restart 1147

Ms =
Ave. Vs =
Sample I.D. # =

#1 #2

Final Ion Vol =

BEST ENVIRONMENTAL Particulate Field Data Sheet

Run # 3 Method # 436

Plant Doone | ΔH 1.652 | %H2O Assum. 14% | Filter # B-142 | F... wt. (mg) _____
Date 1-8-93 | Meter Yd .9776 | Pitot Cp .84 | Pitot # 1 | R.H. Wt. (mg) _____
Location Winger | Pbar. 29.65 | Noz. Diam. .241 | Net Imp Vol 178 | Gel Wt. (mg) 13.0
Port Dia. 6 | Stat Press 1.65 | Noz I.D. .3B | Tot Imp Vol _____ | %CO2 Actual _____
Stack I.D. 42" | %O2 Assum 20.9 | Meter # L5I | Sample Time 960 | %O2 Actual _____
~~Stack Area~~ 9.62 ft2 | %CO2 Assum 0.0 | Probe # C'Glass | Sqrt ΔP Ave .91 | Tot. Moisture 19.0
Personnel RB/JM | Pre leak ck .00 cfm 16 "Hg | Post leak ck .018 cfm 15 "Hg | Std Vn _____

Sample Point	Clock Time	Vel. ΔP	M.R. cfm	Orif. ΔH	Gas Meter Volume ft2	Gas Meter In	Gas Meter Out	Temperatures F Stack	Imp.	Filter	Probe	Pump Vac.	Comments	
val 1	12	1457	1.05	.90	2.57	645.038	65	65	164		262	325	20	40°	1.025
2	11	1539	1.05	.89	2.91	646.5	70	62	186		254	304	18	45°	1.026
3	10	1544	1.10	.92	2.65	650.1	82	63	177		302	347	15	45°	1.049
4	9	1548	1.05	.91	2.56	654.7	85	63	170		258	296	13	45°	1.025
5	8	1552	.75	.77	1.87	658.4	96	64	168		259	296	9	70°	.866
6	7	1556	.30	.44	.79	661.7	92	69	170		250	279	8.5	70°	.547
7	6	1600	.51	.63	1.23	663.6	93	65	171		245	282	8.5	80°	.707
8	5	1604	.72	.75	1.73	666.0	94	65	170		281	321	7	85°	.837
9	4	1608	.85	.83	2.00	669.0	97	66	169		268	321	10	90°	.932
10	3	1612	.81	.80	1.77	672.3	96	66	168		263	316	10	90°	.894
11	2	1616	.85	.83	2.11	675.7	96	66	169		266	321	10	70°	.923
12	1	1620	.85	.83	2.11	679.1	96	66	168		266	251	10	65°	.923
13		1624													
with 14	12	1626	.70	.69	2.21	682.4	82	64	166		281	354	11	45°	.949
15	11	1630	1.0	.875	2.98	685.7	92	64	166		254	337	12	50°	1.00
16	10	1634	1.1	1.0	3.32	689.5	97	64	166		261	358	14	60°	1.04
17	9	1638	1.05	.91	3.01	693.5	87	64	166		252	337	14	60°	1.025
18	8	1642	.90	.84	2.32	697.0	86	64	166		257	337	13	65°	.949
19	7	1646	.50		1.20	"	88	63	165					70°	.707
20	6	1650	0.35											65°	.593
21	5	1654	0.60											65°	.894
22	4	1658	0.95											75°	.975
23	3	1702	1.0											70°	1.0
24	2	1706	1.0											75°	1.0
25	1	1710	1.0											75°	1.0
26	End	1714													
27															
28	Average				(1.75)	(60.6)	(3)	(760)		(158.8)					

Notes: 2 Hg impingers Stop 1580 - 1538 Start

Ms =
Ave. Vs =
Sample I.D. # =

B1 B2
Final Imp Vol =

BEST ENVIRONMENTAL Particulate Field Data Sheet

Run # 1 Method # 436

Plant: Doane-Slakey
Date: [illegible]8-92
Location: Hawk Dryer
Port Dia.: ______ "
Stack I.D.: 47"
Stack Area: 12.048 ft2
Personnel: DA, MW, RB, JM, DC

ΔH@: 2.1039
Meter Yd: 1.0276
PBar.: 29.65
Stat Press: [illegible]
%O2 Assum: 19
%CO2 Assum: 1
Pre leak ck: .004 cfm 17 "Hg

%H2O Assum.: 6
Pitot Cp: .84
Noz. Diam.: .188
Noz I.D.: 18
Meter #: 157-1
Probe #: 4
Post leak ck: .004 cfm 10 "Hg

Filter #: B 148
Pitot #: 4
Net Imp Vol: 114
Tot Imp Vol: ______
Sample Time: 96
Sqrt ΔP Ave: 1.185
F.H. Wt. (mg): ______
B.H. Wt. (mg): ______
Gel Wt. (mg): ~15.9
%CO2 Actual: .04
%O2 Actual: 20.9
Tot. Moisture: 129
Std Vm: 64.069

ISO 103.1 H_2O % 8.2

	Sample Point	Clock Time	Vel. ΔP	N.R. cfm	Orif. ΔH	Gas Meter Volume ft2	Gas Meter In	Gas Meter Out	Temperatures F Stack	Imp.	Filter	Probe	Pump Vac.	Comments
1	SE 1	942	2.1	.813	2.5	546.675	58	52	165		254	245	8	
2	2	946	2.0	.801	2.401	549.811	70	52	167				1	
3	3	950	[illegible]	.775	2.281	552.989	76	54	1[illegible]					
4	4	954	1.5	.701	1.831	556.002	80	56	171				6	
5	5	958	1.1	.602	1.354	558.645	84	57	172					
6	6	1002	[illegible]	.407	.607	561.009	85	57	172				3	
7	7	1006	.55	.427	[illegible]	562.666	55	58	172					
8	8	1010	1.0	.575	1.213	564.801	85	58	173				4	40°
9	9	1014	1.6	.728	1.936	566.682	88	59	177				4	30°
10	10	1018	1.72	.755	2.080	569.400	90	60	179					40°
11	11	1022	1.6	.729	1.935	572.422	90	60	179					
12	12	1026	1.65	.741	1.996	575.199	92	60	180					
13	STOP	1030	[illegible]	[illegible]	[illegible]	577.692	[illegible]	[illegible]	181					
14	W 1	1034	2.05	.815	2.446	—	79	61	181					25
15	2	1038	2.0	.812	2.405	581.247	89	61	182					25
16	3	1042	2.1	.84	2.53	584.6	92	62	184	49	246	254	9	
17	4	1046	1.9	.80	2.29	588.0	92	63	184	49	251	252	8	
18	5	1050	1.3	.66	1.57	590.8	94	63	184	49	265	255	5	
19	6	1054	0.7	.48	0.84	593	93	63	184	49	268	249	3	
20	7	1058	0.5	.41	.60	595.5	91	64	185	49	254	241	2	
21	8	1102	1.0	.58	1.20	597.20	92	64	185	49	240	251	5	
22	9	1106	1.5	.71	1.81	599.51	93	64	186	49	235	254	7	
23	10	1110	1.6	.73	1.93	602.33	94	64	186	49	230	250	7	
24	11	1114	1.6	.73	1.93	605.18	94	64	187	49	231	257	7	
25	12	1118	1.6	.73	1.93	607.89	94	64	186	49	228	248	7	
26	Stop	1122				610.972								
27														
28	Average													

⟨1.758⟩ ⟨64.297⟩ ⟨73.3⟩ ⟨178.8⟩

Notes:

Ms =
Ave. Vs =
Sample I.D. # =

MW - 28.26
VS 74.232
SCFM 41,412

#1 #2
Final Imp Vol =
Initial Imp Vol =

BEST ENVIRONMENTAL Particulate Field Data Sheet

Run # 2 Method # 436

Plant Doane - Slakey
Date 12-9-92
Location Hawk Dryer
Port Dia. ·
Stack I.D. 49" ·
Stack Area 13.048 ft2
Personnel DC, DA, KB, ST, AW

Cnr 2.1039
Meter Yd 1.0078
PBar. 29.65
Stat Press -.90
%O2 Assum 20.9
%CO2 Assum .04
Pre leak ck. .005 cfm 12 "Hg

%H2O Assum. 8.2
Pitot Cp .84
Noz. Diam. .188
Noz I.D. 10
Meter # 152.1
Probe # 4

Filter # 8148
Pitot # 4
Net Imp Vol 113
Tot Imp Vol
Sample Time 96
Sqrt ΔP Ave 1.133
Post leak ck. .006 cfm 8 "Hg

F.H. Wt. (mg)
B.H. Wt. (mg)
Gel Wt. (mg) ~15gm
%CO2 Actual
%O2 Actual
Tot. Moisture 12.8
Std Vm 59.465

%I SO 102.2 K_2O %.10.02

	Sample Point	Clock Time	Vel. ΔP	N.R. cfm	Orif. ΔH	Gas Meter Volume ft2	Gas Meter In	Gas Meter Out	Temperatures F Stack	Imp.	Filter	Probe	Pump Vac.	Comments
1	N 1	1249	2.1	.814	2.945	615.514	84	67	194		242	247	6	50° L
2	2	1257	2.2	.845	2.566	618.720	97	66	185		242	250		40°
3	3	1254	1.75	.755	2.095	621.892	99	66	185		244	252	5	70°
4	4	1301	1.3	.651	1.514	624.900	99	66	185		250	260	9	80°
5	5	1305	.95	.556	1.110	626.821	98	67	185		252	251	2.5	80°
6	6	1309	.50	.404	.584	629.461	99	68	185		263	248	2.5	80°
7	7	1313	.30	.312	.350	631.000	98	67	184		255	242	1	90° R
8	8	1317	.35	.342	.392	632.156	93	66	185		243	240	3	80°
9	9	1321	1.3	.649	1.515	634.003	96	66	185		244	249	5	70°
10	10	1325	.25	.628	.461	636.684	98	67	185		240	248	3	60°
11	11	1329	.20	.625	.400	639.080	99	67	186		247	249	5	60
12	12	1333	1.35	.662	1.504	641.482	98	68	186		239	248	5	60
13	STP	1337				644.330								
14	S 1	1341	3.00	.798	2.907	644.330	97	64	185		273	244	6	40
15	2	1345	1.9	.745	2.211	647.897	96	68	187		266	235	6	60
16	3	1349	1.6	.722	1.87	650.51	98	68	187		251	236	6	60
17	4	1353	1.6	.721	1.87	653.7	98	67	189		254	251	5	70
18	5	1357	1.1	.598	1.28	656.51	98	67	188		262	263	4	70
19	6	14:01	0.5	.402	0.58	658.87	97	67	188		276	283	1	80
20	7	14:05	0.6	.444	0.90	660.44	96	67	187		342	264	1	70
21	8	14:09	1.0	.568	1.16	661.6	95	66	187		244	243	3	40
22	9	14:13	1.6	.721	1.89	664.51	97	67	185		248	244	5	30
23	10	14:17	1.7	.745	1.99	667.08	98	68	186		244	247	6	40
24	11	14:21	1.9	.798	2.22	670.28	99	68	186		345	250	7	60
25	12	14:25	1.9	.798	2.22	673.00	100	68	189		241	248	7	70
26	End.	14:29				676.135								
27														
28	Average													

⟨1.570⟩ 60.621 ⟨81.5⟩ ⟨185.9⟩

Notes:

MW- 27.95
VS= 71.726
SCFM= 38,646.1

As =
Ave. Vs =
Sample I.D. # =

B1 B2

Final Imp Vol =
Initial Imp Vol =

BEST ENVIRONMENTAL Particulate Field Data Sheet

Run # 3 Method # 436

Plant Doane-Slaken
Date 12-8-92
Location Hawk Draw
Port Dia.
Stack I.D. 47
Stack Area 12.048 ft2
Personnel MW, DH, DC, RB, SM

Cp# 2.1039
Meter Yd 1.0076
Bar. 29.65
Stat Press -.90
%O2 Assum 20.9
%CO2 Assum 0.0
Pre leak ck .007 cfm 15 "Hg

%H2O Assum. 9.0
Pitot Cp .84
Noz. Diam. .188
Noz. I.D. 10
Meter # 451-1
Probe # 4

Post leak ck .018 cfm 5 "Hg

Filter # 146
Pitot # 4
Net Imp Vol 91
Tot Imp Vol
Sample Time
Sqrt ΔP Ave 1.227

Final wt. (mg)
B.H. wt. (mg)
Gel Wt. (mg) 167
%CO2 Actual
%O2 Actual
Tot. Moisture 10.7
Std Vm

	Sample Point	Clock Time	Vel. ΔP	M.R. cfm	Orif. ΔH	Gas Meter Volume ft2	Gas Meter In	Gas Meter Out	Temperatures F Stack	Imp.	Filter	Probe	Pump Vac.	Comments
1	W 1	1541	2.1	.803	2.3	676.990	92	68	185	51	254	243	5	
2	2	1545	2.2	.84	2.5		90	70	186	51	252	250	6	
3	3	1549	2.1		2.4	683.01	96	70	186	51	251	252	5	
4	4	1553	1.6		1.8		100	70	186	51	240	251	4	
5	5	1557	1.2		1.4	688.9	100	70	188	51	230	254	3	
6	6	1601	0.5		.58	691.6	100	69	187	51	236	245	2	
7	7	1605	0.5		.58	693.45	98	68	187	51	250	239	2	
8	8	09	1.0		1.2	695.1	98	68	189	51	229	245	3	
9	9	13	1.6		1.8	697.2	99	70	189	51	235	248	5	
10	10	17	1.7		1.9	699.9	100	70	189	51	236	252	5	
11	11	21	1.7		1.9	702.77	100	70	189	51	241	250	5	
12	12	25	1.8		2.1		100	69	189	51	242	249	5	
13	stop	1629				709.0								
14		1632	2.0		2.3	—	92	70	188	51	268	244	5	
15		36	2.0		2.3	712.2	98	70	188	51	270	252	5	
16		40	1.8		2.1		99	68	189	51	252	253	5	
17		44	1.5		1.7	718.22	99	68	189	51	251	250	6	
18		48	1.2		1.4		99	68	189	51	253	248	5	
19	stop	52				723.657								
20		56												
21		1700												
22														
23					1.79	46.887		82.8	187.8					
24														
25														
26														
27														
28	Average													

Notes: Have Allan make a probe to bottle adapter. / Set up Leak Area

Ms =
Ave. Vs =
Sample I.D. # =

01 02

Final Imp Vol =

LAB REPORTS

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

DATE RECEIVED: 01/27/93
DATE REPORTED: 03/08/93

LABORATORY NUMBER: 109870

CLIENT: BEST ENVIRONMENTAL

PROJECT ID: SLAKEY/DOANE

LOCATION: WINGER/HAWK OUTLET

RESULTS: SEE ATTACHED

Reviewed by

Reviewed by

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 109870-2
CLIENT: BEST ENVIRONMENTAL
PROJECT ID: SLAKEY/DOANE
LOCATION: SINGER/HAWK OUTLET
SAMPLE ID: M436R1-WINGER

DATE SAMPLED: 01/08/93
DATE RECEIVED: 01/27/93
DATE REPORTED: 03/08/93

CARB 436 FRACTION A ANALYSIS SUMMARY

METAL	RESULT ug/Train	MDL ug/Train	ANALYSIS METHOD
Arsenic	ND	3	EPA 7060 MSA
Beryllium	ND	0.1	EPA 6010
Cadmium	ND	0.3	EPA 6010
Chromium (total)	2.3	0.6	EPA 6010
Copper	5.1	0.6	EPA 6010
Lead	2.9	0.2	EPA 7421 MSA
Manganese	2.4	0.8	EPA 6010
Nickel	4	2	EPA 6010
Selenium	ND	0.3	EPA 7740 MSA
Zinc	27	1	EPA 6010

ND = Not detected at or above MDL.

QA/QC SUMMARY

	RPD,%	RECOVERY,%		RPD,%	RECOVERY,%
Beryllium	NC	78	Manganese	1	81
Cadmium	5	69	Nickel	NC	76
Chromium	<1	79	Zinc	<1	72
Copper	1	98			

NC = Not calculable.

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 109870-4
CLIENT: BEST ENVIRONMENTAL
PROJECT ID: SLAKEY/DOANE
LOCATION: SINGER/HAWK OUTLET
SAMPLE ID: M436R2-WINGER

DATE SAMPLED: 01/08/93
DATE RECEIVED: 01/27/93
DATE REPORTED: 03/08/93

CARB 436 FRACTION A ANALYSIS SUMMARY

METAL	RESULT ug/Train	MDL ug/Train	ANALYSIS METHOD
Arsenic	1.2	0.3	EPA 7060 MSA
Beryllium	ND	0.1	EPA 6010
Cadmium	19	0.3	EPA 6010
Chromium (total)	2.5	0.6	EPA 6010
Copper	4.8	0.6	EPA 6010
Lead	2.7	0.2	EPA 7421 MSA
Manganese	3.2	0.8	EPA 6010
Nickel	ND	2	EPA 6010
Selenium	ND	11	EPA 7740 MSA
Zinc	18	1	EPA 6010

ND = Not detected at or above MDL.

QA/QC SUMMARY

	RPD,%	RECOVERY,%		RPD,%	RECOVERY,%
Beryllium	NC	78	Manganese	1	81
Cadmium	5	69	Nickel	NC	76
Chromium	<1	79	Zinc	<1	72
Copper	1	98			

NC = Not calculable.

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 109870-6
CLIENT: BEST ENVIRONMENTAL
PROJECT ID: SLAKEY/DOANE
LOCATION: SINGER/HAWK OUTLET
SAMPLE ID: M436R3-WINGER

DATE SAMPLED: 01/08/93
DATE RECEIVED: 01/27/93
DATE REPORTED: 03/08/93

CARB 436 FRACTION A ANALYSIS SUMMARY

METAL	RESULT ug/Train	MDL ug/Train	ANALYSIS METHOD
Arsenic	1.4	0.3	EPA 7060 MSA
Beryllium	ND	0.1	EPA 6010
Cadmium	16	0.3	EPA 6010
Chromium (total)	3.1	0.6	EPA 6010
Copper	7.7	0.6	EPA 6010
Lead	3.0	0.2	EPA 7421 MSA
Manganese	2.3	0.8	EPA 6010
Nickel	2	2	EPA 6010
Selenium	ND	3	EPA 7740 MSA
Zinc	18	1	EPA 6010

ND = Not detected at or above MDL.

QA/QC SUMMARY

	RPD,%	RECOVERY,%		RPD,%	RECOVERY,%
Beryllium	NC	78	Manganese	1	81
Cadmium	5	69	Nickel	NC	76
Chromium	<1	79	Zinc	<1	72
Copper	1	98			

NC = Not calculable.

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 109870-1
CLIENT: BEST ENVIRONMENTAL
PROJECT ID: SLAKEY/DOANE
LOCATION: SINGER/HAWK OUTLET
SAMPLE ID: M436R1-HAWK

DATE SAMPLED: 01/08/93
DATE RECEIVED: 01/27/93
DATE REPORTED: 03/08/93

CARB 436 FRACTION A ANALYSIS SUMMARY

METAL	RESULT ug/Train	MDL ug/Train	ANALYSIS METHOD
Arsenic	1.3	0.3	EPA 7060 MSA
Beryllium	ND	0.1	EPA 6010
Cadmium	3.5	0.3	EPA 6010
Chromium (total)	4.9	0.6	EPA 6010
Copper	8.7	0.6	EPA 6010
Lead	3.6	0.2	EPA 7421 MSA
Manganese	2.0	0.8	EPA 6010
Nickel	ND	2	EPA 6010
Selenium	ND	3	EPA 7740 MSA
Zinc	22	1	EPA 6010

ND = Not detected at or above MDL.

QA/QC SUMMARY

	RPD,%	RECOVERY,%		RPD,%	RECOVERY,%
Beryllium	NC	78	Manganese	1	81
Cadmium	5	69	Nickel	NC	76
Chromium	<1	79	Zinc	<1	72
Copper	1	98			

NC = Not calculable.

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 109870-3
CLIENT: BEST ENVIRONMENTAL
PROJECT ID: SLAKEY/DOANE
LOCATION: SINGER/HAWK OUTLET
SAMPLE ID: M436R2-HAWK

DATE SAMPLED: 01/08/93
DATE RECEIVED: 01/27/93
DATE REPORTED: 03/08/93

CARB 436 FRACTION A ANALYSIS SUMMARY

METAL	RESULT ug/Train	MDL ug/Train	ANALYSIS METHOD
Arsenic	1.6	0.3	EPA 7060 MSA
Beryllium	ND	0.1	EPA 6010
Cadmium	19	0.3	EPA 6010
Chromium (total)	2.9	0.6	EPA 6010
Copper	4.7	0.6	EPA 6010
Lead	3.3	0.2	EPA 7421 MSA
Manganese	2.1	0.8	EPA 6010
Nickel	ND	2	EPA 6010
Selenium	ND	3	EPA 7740 MSA
Zinc	20	1	EPA 6010

ND = Not detected at or above MDL.

QA/QC SUMMARY

	RPD,%	RECOVERY,%		RPD,%	RECOVERY,%
Beryllium	NC	78	Manganese	1	81
Cadmium	5	69	Nickel	NC	76
Chromium	<1	79	Zinc	<1	72
Copper	1	98			

NC = Not calculable.

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 109870-5
CLIENT: BEST ENVIRONMENTAL
PROJECT ID: SLAKEY/DOANE
LOCATION: SINGER/HAWK OUTLET
SAMPLE ID: M436R3-HAWK

DATE SAMPLED: 01/08/93
DATE RECEIVED: 01/27/93
DATE REPORTED: 03/08/93

CARB 436 FRACTION A ANALYSIS SUMMARY

METAL	RESULT ug/Train	MDL ug/Train	ANALYSIS METHOD
Arsenic	1.4	0.3	EPA 7060 MSA
Beryllium	ND	0.1	EPA 6010
Cadmium	17	0.3	EPA 6010
Chromium (total)	4.2	0.6	EPA 6010
Copper	6.4	0.6	EPA 6010
Lead	3.9	0.2	EPA 7421 MSA
Manganese	1.8	0.8	EPA 6010
Nickel	3	2	EPA 6010
Selenium	ND	3	EPA 7740 MSA
Zinc	14	1	EPA 6010

ND = Not detected at or above MDL.

QA/QC SUMMARY

	RPD,%	RECOVERY,%		RPD,%	RECOVERY,%
Beryllium	NC	78	Manganese	1	81
Cadmium	5	69	Nickel	NC	76
Chromium	<1	79	Zinc	<1	72
Copper	1	98			

NC = Not calculable.

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 109870-7
CLIENT: BEST ENVIRONMENTAL
PROJECT ID: SLAKEY/DOANE
LOCATION: SINGER/HAWK OUTLET
SAMPLE ID: M436R4

DATE SAMPLED: 01/08/93
DATE RECEIVED: 01/27/93
DATE REPORTED: 03/08/93

CARB 436 FRACTION A ANALYSIS SUMMARY

METAL	RESULT ug/Train	MDL ug/Train	ANALYSIS METHOD
Arsenic	1.8	0.3	EPA 7060 MSA
Beryllium	ND	0.1	EPA 6010
Cadmium	0.6	0.3	EPA 6010
Chromium (total)	2.3	0.6	EPA 6010
Copper	4.5	0.6	EPA 6010
Lead	4.0	0.2	EPA 7421 MSA
Manganese	1.5	0.8	EPA 6010
Nickel	2	2	EPA 6010
Selenium	ND	3	EPA 7740 MSA
Zinc	23	1	EPA 6010

ND = Not detected at or above MDL.

QA/QC SUMMARY

	RPD,%	RECOVERY,%		RPD,%	RECOVERY,%
Beryllium	NC	78	Manganese	1	81
Cadmium	5	69	Nickel	NC	76
Chromium	<1	79	Zinc	<1	72
Copper	1	98			

NC = Not calculable.

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 109870-8
CLIENT: BEST ENVIRONMENTAL
PROJECT ID: SLAKEY/DOANE
LOCATION: SINGER/HAWK OUTLET
SAMPLE ID: L-24

DATE RECEIVED: 01/27/93
DATE REPORTED: 03/08/93

CARB 436 ANALYSIS SUMMARY

METAL	RESULT ug/Filter	ANALYSIS METHOD
Arsenic	6	EPA 7060 MSA
Beryllium	4.0	EPA 6010
Cadmium	7.8	EPA 6010
Chromium (total)	11	EPA 6010
Copper	12	EPA 6010
Lead	71	EPA 7421 MSA
Manganese	9	EPA 6010
Mercury	0.3	EPA 7470
Nickel	21	EPA 6010
Selenium	<10	EPA 7740 MSA
Zinc	82	EPA 6010

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 109870
CLIENT: BEST ENVIRONMENTAL
PROJECT ID: SLAKEY/DOANE
LOCATION: WINGER/HAWK OUTLET

DATE SAMPLED: 01/08/93
DATE RECEIVED: 01/27/93
DATE DIGESTED: 02/18/93
DATE ANALYZED: 02/26/93
DATE REPORTED: 03/08/93

ANALYSIS: MERCURY
FRACTION: B
PREPARATION METHOD: CARB 436
ANALYSIS METHOD: EPA 7470

LAB ID	SAMPLE ID	RESULT	UNITS	MDL
109870-1	M436R1 HAWK	ND	ug/Fraction	0.8
109870-2	M436R1 WINGER	ND	ug/Fraction	1
109870-3	M436R2 HAWK	ND	ug/Fraction	0.8
109870-4	M436R2 WINGER	1	ug/Fraction	1
109870-5	M436R3 HAWK	ND	ug/Fraction	0.7
109870-6	M436R3 WINGER	ND	ug/Fraction	1
109870-7	M436R4	0.6	ug/Fraction	0.5
109870-PREP BLANK		ND	ug/Fraction	0.5

ND = Not Detected at or above MDL.

QA/QC SUMMARY

RPD, %	NC
RECOVERY, %	90

NC = Not calculable.

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 109870
CLIENT: BEST ENVIRONMENTAL
PROJECT ID: SLAKEY/DOANE
LOCATION: WINGER/HAWK OUTLET

DATE SAMPLED: 01/08/93
DATE RECEIVED: 01/27/93
DATE DIGESTED: 01/29/93
DATE ANALYZED: 01/29/93
DATE REPORTED: 02/03/93

ANALYSIS: MERCURY (KMnO4)
FRACTION: C
PREPARATION METHOD: CARB 436
ANALYSIS METHOD: EPA 7470

LAB ID	SAMPLE ID	RESULT	UNITS	MDL
109870-1	M436R1 HAWK	0.3	ug/Fraction	0.2
109870-2	M436R1 WINGER	0.3	ug/Fraction	0.2
109870-3	M436R2 HAWK	ND	ug/Fraction	0.3
109870-4	M436R2 WINGER	ND	ug/Fraction	0.2
109870-5	M436R3 HAWK	3.7	ug/Fraction	0.4
109870-6	M436R3 WINGER	ND	ug/Fraction	0.4
109870-7	M436R4	ND	ug/Fraction	0.2
109870-PREP BLANK		ND	ug/Fraction	0.02

ND = Not Detected at or above MDL.

QA/QC SUMMARY

RPD, %	1
RECOVERY, %	92

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 109870-9
CLIENT: BEST ENVIRONMENTAL
PROJECT ID: SLAKEY/DOANE
LOCATION: SINGER/HAWK OUTLET
SAMPLE ID: H-24

DATE RECEIVED: 01/27/93
DATE REPORTED: 03/08/93

CARB 436 ANALYSIS SUMMARY

METAL	RESULT ug/Filter	ANALYSIS METHOD
Arsenic	24	EPA 7060 MSA
Beryllium	59	EPA 6010
Cadmium	60	EPA 6010
Chromium (total)	67	EPA 6010
Copper	76	EPA 6010
Lead	590	EPA 7421 MSA
Manganese	63	EPA 6010
Mercury	0.6	EPA 7470
Nickel	260	EPA 6010
Selenium	7.8	EPA 7740 MSA
Zinc	150	EPA 6010

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 109870-PREP BLANK DATE REPORTED: 03/08/93
CLIENT: BEST ENVIRONMENTAL
PROJECT ID: SLAKEY/DOANE
LOCATION: SINGER/HAWK OUTLET

CARB 436 FRACTION A ANALYSIS SUMMARY

METAL	RESULT ug/Train	MDL ug/Train	ANALYSIS METHOD
Arsenic	1.1	0.3	EPA 7060 MSA
Beryllium	ND	0.1	EPA 6010
Cadmium	ND	0.3	EPA 6010
Chromium (total)	ND	0.6	EPA 6010
Copper	0.6	0.6	EPA 6010
Lead	0.9	0.2	EPA 7421 MSA
Manganese	ND	0.8	EPA 6010
Nickel	ND	2	EPA 6010
Selenium	ND	0.3	EPA 7740 MSA
Zinc	3	1	EPA 6010

ND = Not detected at or above MDL.

QA/QC SUMMARY

	RPD,%	RECOVERY,%		RPD,%	RECOVERY,%
Beryllium	NC	78	Manganese	1	81
Cadmium	5	69	Nickel	NC	76
Chromium	<1	79	Zinc	<1	72
Copper	1	98			

NC = Not calculable.

1618 + 3

BEST ENVIRONMENTAL
15890 Foothill Boulevard
San Leandro, CA 94578
Phone (510) 276-4011 Fax (510) 276-4018

P.O.#=

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST Pg. 1 of 1

CUSTODY RECORD

Project Manager: R. Best

Lab Name: Curtis & Tompkins

Client: Slacky/Doane

location: Winger/Hawk outlet

I attest that the proper field sampling procedures were used during the collection of these samples.

Sampler Name (Print): Michael J. Wiley

Field Sample ID	Volume	# CONTAINERS	Matrix: WATER	SOIL/SLUDGE	AIR	OTHER	[redacted]	Sampling: DATE	TIME
M436R1 Filter/Hawk	B142	1				✓		1/18/93	
M436R2 Filter Hawk	B149	1				✓		1/18	
M436R3 Filter Hawk	B146	1				✓		1/18	
M436R1 Probe Winger		1					HNO3 ✓	1/18	
M436R2 Probe Winger		1					HNO3 ✓	1/18	
M436R3 Probe Winger		1					HNO3 ✓	1/18	
M436R1IMP#2 Winger	510 ml	1		✓				1/18	
M436R2IMP#2 Winger	446 ml	1		✓				1/18	
M436R3IMP#2 Winger	434 ml	1		✓				1/18	
M436R1IMP4(Hg) Winger	225 ml	1				✓		1/18	
M436R2IMP4(Hg) Winger	225 ml	1				✓		1/18	
M436R3IMP4(Hg) Winger	250 ml	1				✓		1/18	

ANALYSIS REQUEST

Field Sample ID	(PAHs)	(Dioxins)	4108 (Benzene)	(Aldehydes)	(HCl)	(C1 C6)	(Hg, Cr, Ni)	(Viral Culture)	EPA 6010 (Ba, Cd (Other metals, chlorides)	CARB 426 (Cyanide)	CARB 423 (Arsenic)	CARB 427 (Asbestos)	CARB 436
CARB 429													✓
CARB 428													✓
CARB 410A													✓
CARB 430													✓
CARB 421													✓
CARB 425													✓
CARB 422													✓
CARB 106													✓

CUSTODY RECORD

	Received by:	Time	Received by:	Time	Received by Laboratory:	Time
Relinquished by Sampler:	Date 1/27/93		Date		Date	
Relinquished by:						
Relinquished by:						

Way bill #

SPECIAL HANDLING

24 HOURS ☐
EXPEDITED 48 Hours ☐
NTAT ☐
OTHER _____(#) BUSINESS DAYS

Return tedlars ____
Return coolers ____
Return bottles ____

SPECIAL DETECTION LIMITS (Specify)

SPECIAL REPORTING REQUIREMENTS

Air samples- total qty. to be reported

REMARKS:

10[illegible]870

BEST ENVIRONMENTAL
15890 Foothill Boulevard
San Leandro, CA 94578
Phone (510) 278-4011 Fax (510) 278-4018

P.O.#=

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST Pg. 2 of 4

Project Manager: R. Best

Lab Name: Curtis & Tomkins

Client: Slacky / Doane   location: Winger/Hawk outlet

I attest that the proper field sampling procedures were used during the collection of these samples.

Sampler Name (Print): Michael J. Wiley

ANALYSIS REQUEST

- CARB 429 (PAH's)
- CARB 428 (Dioxins)
- CARB 410A 410B (Benzene)
- CARB 430 (Aldehydes)
- CARB 421 (HCl)
- CARB 425 (Cr+6)
- CARB 422 (Halog. Org.'s)
- CARB 106 (Vinyl Chloride)
- EPA 6010 [Pb] (Select metals, chlorides)
- CARB 426 (Cyanide)
- CARB 423 (Arsenic)
- CARB 427 (Asbestos)
- CARB 436

Field Sample ID	Volume	# Containers	Matrix: WATER	Matrix: H2O2/HNO3	Matrix: AIR	Matrix: KMnO4/H2SO4	Matrix: OTHER	[redacted]: HCl	HNO3	H2SO4	ICE	NONE	OTHER	Sampling: DATE	TIME	CARB 436
M436R1 Probe Hawk		1							✓					1/8/93		✓
M436R2 Probe Hawk		1							✓					1/8		✓
M436R3 Probe Hawk		1							✓					1/8		✓
M436R1 IMP1/2 Hawk	357ml	1		✓										1/8		✓
M436R2 IMP1/2 Hawk	350ml	1		✓										1/8		✓
M436R3 IMP1/2 Hawk	328ml	1		✓										1/8		✓
M436R1 IMP4 (Hg) Hawk	123ml	1				✓								1/8		✓
M436R2 IMP4 (Hg) Hawk	125ml	1				✓								1/8		✓
M436R3 IMP4 (Hg) Hawk	205ml	1				✓								1/8		✓
M436R1 IMP4 (HCl) Hawk	223	1						✓						1/8		✓
M436R2 IMP4 (HCl) Hawk	225	1						✓						1/8		✓
M436R3 IMP4 (HCl) Hawk	286	1						✓						1/8		✓

SPECIAL HANDLING

24 HOURS ☐
EXPEDITED 48 Hours ☐
NEAT ☐
OTHER ______(#) BUSINESS DAYS

Return tedlars ____
Return cooler ____
Return bottles ____

SPECIAL DETECTION LIMITS (Specify)

SPECIAL REPORTING REQUIREMENTS
Air samples- total qty. to be reported

REMARKS:

CUSTODY RECORD

Relinquished by:	Date	Time	Received by:
Relinquished by Sampler: [signature]	1/27/93		Received by: [signature] 1-27-93
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by Laboratory:

Way bill #

10487U

BEST ENVIRONMENTAL
15890 Foothill Boulevard
San Leandro, CA 94578
Phone (510) 278-4011 Fax (510) 278-4018

P.O.#=

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST Pg. 3 of 4

Project Manager: R. Best.

Lab Name: Curtis & Tomkins

Client: Slacky Doane

location: Winger/Hawk outlet

I attest that the proper field sampling procedures were used during the collection of these samples.

Sampler Name (Print): Michael J. Wiley

Field Sample ID	Volume	# CONTAINERS	Matrix: WATER	Matrix: SOIL	Matrix: AIR	Matrix: OTHER	HCl	HNO3	H2SO4	ICE	NONE	OTHER	Sampling: DATE	Sampling: TIME
M436R1IMP4(HCl)Winger	225	1					✓						1/18/93	
M436R2IMP4(HCl)Winger	225	1					✓						1/18	
M436R3IMP4(HCl)Winger	250	1					✓						1/18	
M436R1Filter Winger	B141	1				✓							1/18	
M436R2Filter Winger	B147	1				✓							1/18	
M436R3Filter Winger	B143	1				✓							1/18	
M436R4Probe		1						✓					1/18	
M436R4IMP1&2		1		✓				✓					1/18	
M436R4IMP4(HCl)		1			✓								1/18	
M436R4IMP4(HCl)		1					✓						1/18	
M436R4 Filter	B140	1				✓							1/18	

ANALYSIS REQUEST

CARB 429 (PAH's)	CARB 428 (Dioxins)	CARB 410A 410B (Benzene, Aldehydes)	CARB 430 (HCl)	CARB 421 (Cr & Cr 6)	CARB 425 (Alkyl Cyanides)	CARB 422 (Vinyl Chloride)	CARB 106	EPA 600 (Total (Other metals, Sulfides)	CARB 426 (Cyanide)	CARB 423 (Arsenic)	CARB 427 (Asbestos)	CARB 436
												✓
												✓
												✓
												✓
												✓
												✓
												✓
												✓
												✓
												✓
												✓

SPECIAL HANDLING

24 HOURS ☐
EXPEDITED 48 Hours ☐
NTAT ☐
OTHER _____(#) BUSINESS DAYS

Return tedlars ____
Return cooler ____
Return bottles ____

SPECIAL DETECTION LIMITS (Specify)

SPECIAL REPORTING REQUIREMENTS

Air samples- total qty. to be reported

REMARKS:

CUSTODY RECORD

	Relinquished by Sampler	Relinquished by:	Relinquished by:
Received by:			
Time			
Date	1/27/93		

	Received by:	Received by:	Received by Laboratory:
Time			
Date	1-27-93		

Way bill #

12 18 1V

BEST ENVIRONMENTAL
15890 Foothill Boulevard
San Leandro, CA 94578
Phone (510) 278-4011 Fax (510) 278-4018

P.O.#=

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST Pg. 4 of 4

Project Manager: R. Best

Lab Name: Curtis & Tomkins

Client: Slacky / Doane

location: Winger / Hawk athlet

I attest that the proper field sampling procedures were used during the collection of these samples.

Sampler Name (Print):

Field Sample ID	Volume	# CONTAINERS	Matrix: WATER	AIR	OTHER	Additional Information: HCl	HNO3	H2SO4	ICE	NONE	OTHER	Sampling: DATE	TIME
M436 RS Filt	L-24					L							
M436RG Filt	H-24					L							

ANALYSIS REQUEST

CARB 429 (PAH's)	CARB 428 (Dioxins)	CARB 410A 410B (Benzene)	CARB 430 (Aldehydes)	CARB 421 (HCl)	CARB 425 (Cr & Cr 6)	CARB 422 (Halogen. Org.'s)	CARB 106 (Vinyl Chloride)	EPA 600 [8.1] (Other metals, chlorides)	CARB 426 (Cyanide)	CARB 423 (Arsenic)	CARB 427 (Mercuries)	CARB 436
											L	
											L	

CUSTODY RECORD

Received by: Michael Mang 1-27-93	Received by:	Received by Laboratory:
Time	Time	Time
Date 1/27/93	Date	Date
Relinquished by Sampler:	Relinquished by:	Relinquished by:

Way bill #

SPECIAL HANDLING

24 HOURS ☐

EXPEDITED 48 Hours ☐

NTAT ☐

OTHER _____(#) BUSINESS DAYS

Return tedlars ____

Return cooler ____

Return bottles ____

SPECIAL DETECTION LIMITS (Specify)

SPECIAL REPORTING REQUIREMENTS

Air samples- total qty. to be reported

REMARKS:

110130

BEST ENVIRONMENTAL
15890 Foothill Boulevard
San Leandro, CA 94578
Phone (510) 278-4011 Fax (510) 278-4018

P.O.#= 8547

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST Pg. 1 of 1

Project Manager: Craig Thiry

Lab Name: Curtis & Tompkins, Ltd.

Client: Chem. Pigment location: outlet

I attest that the proper field sampling procedures were used during the collection of these samples.

Sampler Name (Print): Michael J. Wiley

	Field Sample ID	[redacted]	# CONTAINERS	Matrix: WATER	AIR	OTHER	Method Preserved: HCl	HNO3	H2SO4	ICE	NONE	OTHER	Sampling: DATE	TIME
1	R-1 M436 Filter	B150	-								✓		2/5	
2	R-2 M436 Filter	B152	1								✓		2/5	
3	R-3 M436 Filter	B151	1								✓		2/5	
4	R-4 M436 Filter	B153	1								✓		2/5	

ANALYSIS REQUEST

	(PAHs)	(Dioxins)	410B (Boron)	(Aldehydes)	(HCl)	(Cr, EC6)	(Alkyl. Amines)	(Vinyl Chloride)		EPA 600 Full (other metals, chlorides)	CARB 426 (Cyanide)	CARB 423 (Arsenic)	CARB 427 (Asbestos)	Modified 436 - PM2.5 Weight Determination	Zinc, Nickel, Copper, Lead, Bromine, Cadmium	
CARB 429														X	X	
CARB 428														X	X	
CARB 410A														X	X	
CARB 430														X	X	
CARB 421																
CARB 425																
CARB 422																
CARB 106																

CUSTODY RECORD

Received by:	Received by:	Received by Laboratory: 2-17-93 1050
Time	Time	Time
Date 2/16/93	Date	Date
Relinquished by Sampler:	Relinquished by:	Relinquished by:

Way bill #

SPECIAL HANDLING
24 HOURS ☐
EXPEDITED 48 Hours ☐
NTAT ☒
OTHER _____(#) BUSINESS DAYS

Return tedlars ____
Return cooler ____
Return bottles ____

SPECIAL DETECTION LIMITS (Specify)

SPECIAL REPORTING REQUIREMENTS
Air samples- total qty. to be reported

REMARKS:
As per conversation with John Goyette. Please fax results as soon as they are available.
CT

BEST ENVIRONMENTAL

Analytical Report

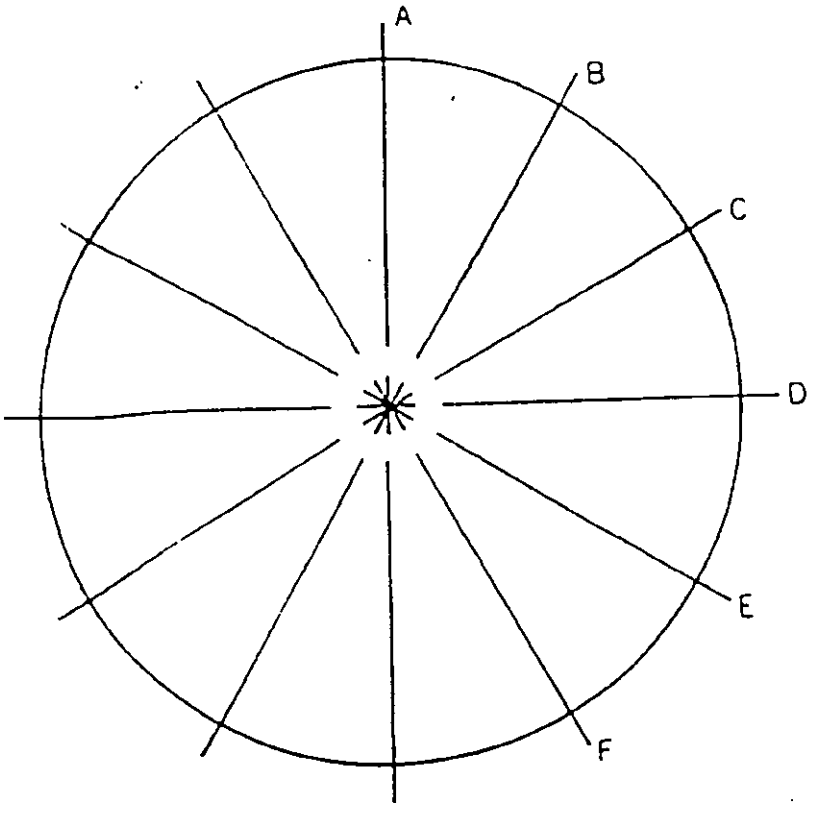
Job Name: SLAKEY/DOANE
Sample Date: 1/8/93
Requested By: R. Best
Analytical Method: Method 5 mod. (CARB)
Date of Analysis: 1/12/93 **Analyst:** Michael J. Wiley

Lab ID Number	Parameter	Analytical Result	Unit
R1M5 Winger (filter)	Particulate	10.7	mg
R2M5 Winger (filter)	Particulate	37.2	mg
R3M5 Winger (filter)	Particulate	27.2	mg
R1M5 Hawk (filter)	Particulate	1.3	mg
R2M5 Hawk (filter)	Particulate	3.2	mg
R3M5 Hawk (filter)	Particulate	2.7	mg
Filter Blank	Particulate	0.3	mg

Comments: results represent the net weight gain in sample minus the blank.

EQUIPMENT CALIBRATION RECORDS

NOZZLE MEASUREMENT



DIAMETER DIMENSION

A 0.240
B 0.240
C 0.241
D 0.242
E 0.241
F 0.241

AVG 0.241

NOZZLE SERIAL 3B

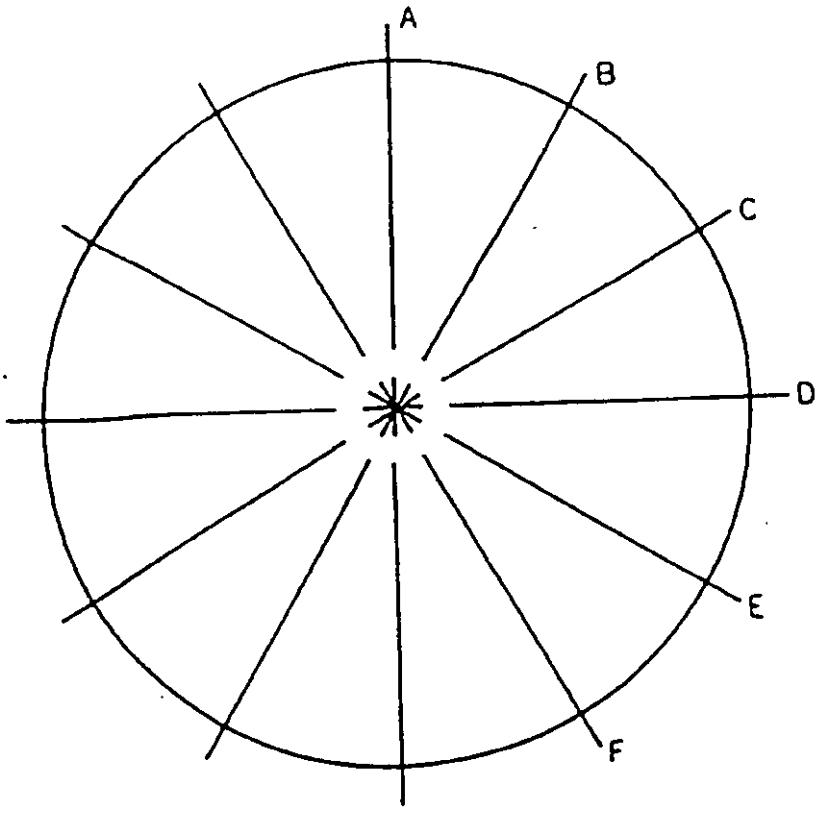
M-5 (EPA)
6L25J

DATE 2/12/93

RECORDED BY MW

✓ 2/2/93

NOZZLE MEASUREMENT



DIAMETER DIMENSION

A	.190
B	.187
C	.186
D	.185
E	.188
F	.190

AVG. .188

NOZZLE SERIAL

12

QUARTZ

n-S

DATE

8/13/90

RECORDED BY

SB

✓ 2/2/93

METER BOX FULL TEST CALIBRATION

DATE: 4/20/92
OPERATOR: MW

METER BOX Yd: 0.9746
METER BOX ΔH@: 1.652

ΔH@: _____
METER BOX: LSI #2
BAROMETRIC PRESSURE (Pb): 29.99

Q	1 ΔH	2 ΔP	3 Yds	Standard Meter Gas Volume (ft³) Initial	Final	4 (Vds) Net	Meter Box Gas Volume (ft³) Initial	Final	5 (Vd) Net	Standard Meter Temperature In	Out	6 Tds Avg	Meter Box Temperature In	Out	7 Td Avg	8 θ	ΔH@	Yd
.40	0.5	.64	1.000	1038.001	1042.499	4.998	386.541	391.854	5.313	70.7		70.7	105	77	91	12.31	1.639	0.9740
.46	0.5	-.64	1.000	1042.998	1047.998	5.000	391.854	397.191	5.337	70.7		70.7	106	78	92	12.34	1.642	0.9717
.57	1.0	-1.2	1.0000	1053.00	1063.00	10.000	401.463	412.149	10.686	71.0		71.0	109	79	94	17.47	1642	0.9711
.57	1.0	-1.2	1.000	63.000	72.999	9.999	412.149	422.855	10.706	71.5		71.5	111	80	95.5	17.49	1.643	0.9710
.97	3.0	-3.35	1.000	1074.000	1084.000	10.000	431.365	441.930	10.565	71.7		71.7	118	82	100	10.22	1.672	0.9815
.97	3.0	-3.35	1.000	1084.000	1094.000	10.000	441.930	452.525	10.595	72		72	118	82	100	10.21	1.671	0.9782

Q = Flow Rate (cfm)
ΔH = Orifice Pressure Differential (in. H O)
ΔP = Inlet Pressure Differential Standard Meter (in. H O)
Yds = Standard Meter Correction Factor (Unitless)
Yd = Meter Box Correction Factor (Unitless)
ΔH@ = Orifice Pressure Differential that gives 0.75 cfm of air at 70°F and 29.92" Hg (in. H O)

$$Yd = (Yds)\left(\frac{Vds}{Vd}\right)\left(\frac{Td + 460}{Tds + 460}\right)\left(\frac{Pb + \Delta P/13.6}{Pb + \Delta H/13.6}\right)$$

$$\Delta H@ = \frac{0.0317 \cdot \Delta H}{Pb\ (Td + 460)}\left[\frac{(Tds + 460)\ \theta}{Vds \cdot Yds}\right]^2$$

$$Q = \frac{17.64 \cdot Vds \cdot Pb}{(Tds + 460)\ \theta}$$

METER BOX FULL TEST CALIBRATION

DATE: 2/15/93 METER BOX Yd: 0.9742 ΔH@: _____

OPERATOR: MW METER BOX ΔH@: 1.659 METER BOX: LSE #2

BAROMETRIC PRESSURE (Pb): 29.92 (10)

				Standard Meter Gas Volume (ft³)			Meter Box Gas Volume (ft³)			Standard Meter Temperature			Meter Box Temperature			Time (Min.)		
Q	1 ΔH	2 ΔP	3 Yds	Initial	Final	4 (Vds) Net	Initial	Final	5 (Vd) Net	In	Out	6 Tds Avg	In	Out	07 Td Avg	08 θ	ΔH@	Yd
0.41	0.5	-.08	1.0000	528.000	533.005	5.005	845.243	850.664	5.421	65.0	66.0	65.5	106.6	78.6	92.6	12.33	1.659	0.9686
0.41	0.5	-.08	1.0000	533.005	538.000	4.995	850.664	856.078	5.414	64.0	65.0	64.5	106.8	78.0	92.4	12.30	1.599	0.9703
0.69	1.5	-.11	1.0000	540.000	547.000	7.000	858.232	865.800	7.568	63.7	64.7	64.2	110.0	78.0	94.0	10.20	1.674	0.9737
0.69	1.5	-.11	1.0000	547.000	554.000	7.000	865.800	873.369	7.569	63.5	64.5	64.0	110.6	78.0	94.3	10.20	1.672	0.9744
0.97	3.0	-.12	1.0000	559.000	569.000	10.000	878.757	889.515	10.758	63.3	64.3	63.8	113.8	78.0	95.9	10.42	1.763	0.9790
0.97	3.0	-.12	1.0000	569.000	579.000	10.000	889.515	900.285	10.770	63.0	64.0	63.5	113.8	79.0	96.4	10.42	1.700	0.9793

Q = Flow Rate (cfm)
ΔH - Orifice Pressure Differential (in. H O)
ΔP - Inlet Pressure Differential Standard Meter (in. H O)
Yds - Standard Meter Correction Factor (Unitless)
Yd - Meter Box Correction Factor (Unitless)
ΔH@ - Orifice Pressure Differential that gives 0.75 cfm of air at 70°F and 29.92" Hg (in. H O)

$$Yd = (Yds)\left(\frac{Vds}{Vd}\right)\left(\frac{Td + 460}{Tds + 460}\right)\left(\frac{Pb + \Delta P/13.6}{Pb + \Delta H/13.6}\right)$$

$$\Delta H@ = \frac{0.0317\ \Delta H}{Pb\ (Td + 460)}\left[\frac{(Tds + 460)\ \theta}{Vds \cdot Yds}\right]^2$$

$$Q = \frac{17.64 \cdot Vds \cdot Pb}{(Tds + 460)\ \theta}$$

METER BOX FULL TEST CALIBRATION

DATE: 9-15-92 | METER BOX Yd: 1.0076 | ΔH@: | METER BOX: LSI #1

OPERATOR: MJN | METER BOX ΔH@: 2.1039 | BAROMETRIC PRESSURE (Pb): 29.92

Q	1 ΔH	2 ΔP	3 Yds	Standard Meter Gas Volume (ft³) Initial	Final	4 (Vds) Net	Meter Box Gas Volume (ft³) Initial	Final	5 (Vd) Net	Standard Meter Temperature In	Out	6 Tds Avg	Meter Box Temperature In	Out	07 Td Avg	08 Time (Min.) θ	ΔH@	Yd
0.36	0.5	0.5	1.000	1814.5	1818.5	4.0	307.108	311.287	4.179			75.5	114	84	99	11.04	2.0701	.9992
0.35	0.5	0.5		1818.5	1824.5	6.0	311.287	317.563	6.276			75.5	114	84	99	16.70	2.1053	.9980
0.35	0.5	0.5		1824.5	1828.5	4.0	317.563	321.744	4.181			75.0	114	84	99	11.14	2.1038	.9996
				1828.5	1832.5	4.0	321.744	325.927	4.183			75.5	114	84	99	11.31	2.1726	.9982
0.62	1.5	1.5		1832.5	1847.5	15.0	325.927	341.558	15.631									
0.64	1.6	1.5		1847.5	1874.5	27.0	341.558	369.740	28.182			76.0	118	86	102	23.98	2.023	1.0062
0.63	1.6	1.5		1874.5	1881.5	7.0	369.740	377.052	7.312			76.5	119	86	103	41.45	2.0625	1.0051
0.64	1.6	1.5		1881.5	1888.5	7.0	377.052	384.380	7.328			76.5	119	87	103	10.97	2.1285	1.0044
	1.65	1.5		1913.5	1920.5	7.0	410.018	417.				77.0	120	87	104	10.80	2.0632	1.0030
0.65	1.65	1.5		1920.5	1932.5	12.0	417.283	429.768	12.481									
0.91	3.4	3.0		1932.5	~~1940.5~~ ~~429.764~~	8.0	429.769	438.017	8.253			20.5	113	80	97	18.438	2.0853	1.0091
0.92	3.4	3.0		1940.5	1951.5	11.0	438.017	449.374	11.357			70.5	116	80	98	8.703	2.1542	1.0186
0.92	3.4	3.0		1951.5	1966.5	15.0	449.374	464.882	15.508			70.5	116	81	99	11.87	2.1118	1.0196
0.92	3.4	3.0		1966.5	1983.5	17.0	464.882	482.457	17.575			70.5	116	82	99	16.21	2.1180	1.0182
												71.0	117	82	100	18.39	2.1225	1.0191

Q - Flow Rate (cfm)
ΔH - Orifice Pressure Differential (in. H 0)
ΔP - Inlet Pressure Differential Standard Meter (in. H 0)
Yds - Standard Meter-Correction Factor (Unitless)
Yd - Meter Box Correction Factor (Unitless)
ΔH@ - Orifice Pressure Differential that gives 0.75 cfm of air at 70°F and 29.92" Hg (in. H 0)

$$Yd = (Yds)\left(\frac{Vds}{Vd}\right)\left(\frac{Td + 460}{Tds + 460}\right)\left(\frac{Pb + \Delta P/13.6}{Pb + \Delta H/13.6}\right)$$

$$\Delta H@ = \frac{0.0317\ \Delta H}{Pb\ (Td + 460)}\left[\frac{(Tds + 460)\ \theta}{Vds \cdot Yds}\right]^2$$

$$Q = \frac{17.64 \cdot Vds \cdot Pb}{(Tds + 460)\ \theta}$$

CT 9/14/92

POST TEST CALIBRATION CHECK

DATE: 3-3-93

METER BOX VACUUM: 10.5"

RETURNED FROM: Tosco

OPERATOR: CT, DA

METER BOX $\overline{Yd}$: .9940

METER BOX: LSI-1

BAROMETRIC PRESSURE (Pb): 30.26

Q	ΔH	ΔP	Yds	Standard Meter Gas Volume (ft^3) Initial	Final	(Vds) Net	Meter Box Gas Volume (ft^3) Initial	Final	(Vd) Net	Standard Meter Temperature (°F) In	Out	Tds Avg.	Meter Box Temperature (°F) In	Out	Td Avg.	Time (Min.) θ	Yd	ΔH@
.62	1.46	-.09	1.0000	9.92	20.00	10.479	875.605	885.996	10.991			63.1			87.1	17.25	.9934	2.073
.62	1.45	-.09	1.0000	20.00	30.00	10.000	886.023	896.519	10.496			63.0			87.4	16.51	.9935	2.069
.62	1.45	-.09	1.0000	30.00	40.00	10.000	896.519	907.020	10.500			63.0			88.5	16.55	.995	2.075

Q - Flow Rate (cfm)
ΔH - Orifice Pressure Differential (in. H O)
ΔP - Inlet Pressure Differential Standard Meter (in. H O)
Yds - Standard Meter Correction Factor (Unitless)
Yd - Meter Box Correction Factor (Unitless)
ΔH@ - Orifice Pressure Differential that gives 0.75 cfm of air at 70°F and 29.92" Hg (in. H O)

$$Yd = (Yds)\left(\frac{Vds}{Vd}\right)\left(\frac{Td + 460}{Tds + 460}\right)\left(\frac{Pb + \Delta P/13.}{Pb + \Delta H/13.}\right)$$

$$\Delta H@ = \frac{0.0317\ \Delta H}{Pb\ (Td + 460)}\left[\frac{(Tds + 460)\ \theta}{Vds.\ Yds}\right]$$

BEST ENVIRONMENTAL INC., San Leandro, CA

THERMOMETER CALIBRATION (Spring Type)

Reference Thermometer: ASTM Mercury in Glass
Method Reference: EPA QA Handbook Vol. III: Stationary Source Specific Methods, Sect. 3.5.2.2
Tolerance Limits: ±5.4°F at ambient temp and in hot water bath.

Thermometer ID	Reference Thermometer °F	Test Thermometer °F	°F Difference
16A to LSI #2	33	36	+3.0
	71	71	+0.0
	119	118	+1.0
16B to LSI #2	33	35	+2.0
	70	70	0.0
	126	124	−2.0

ANALYST: Michael J. Wiley
DATE: 3/30/93

Date: 3-9-92 Pitot Number: 1

TYPE S PITOT TUBE INSPECTION DATA

Pitot tube assembly level? ____ yes ✓ no

Pitot tube openings damaged? ____ yes (explain below) ✓ no

α_1 = 2.0° (<10°), α_2 = 4.0° (<10°), β_1 = 1.5° (<5°)

β_2 = 6.5° (<5°)

Y = 2.5°, θ = ~~0~~°, A = 1.074cm (in.)

Z = A sin Y = 0.03 cm (in.); < 0.32 cm (< 1/8 in.),

W = A sin θ = ~~0~~ cm (in.); < 0.08 cm (< 1/32 in.)

P_a _____ cm (in.) P_b _____ cm (in.)

D_t = _____ cm (in.) $\frac{\bar{P}}{D_t} = \frac{}{P_a = P_b = P}$ (≥1.05 and≤1.50)

COMMENTS: 6' NAPP M-5 Glass Probe

Calibration required? ____ yes ✓ no

Calibrated by: MW

BEST ENVIRONMENTAL, INC.
27343 Industrial Boulevard, Unit E.
Hayward, California 94545
(415) 784-0706

DIFFERENTIAL PRESSURE GAUGE CALIBRATION DATA FORM

Gauge type Magnehelic Serial or ID number R890712CA113
LSJ#1

Scale 0 - 5" H_2O

Gauge-oil manometer Δp	Differential pressure gauge Δp	Pressure difference %
4.41	4.41	0
3.60	3.60	0
2.38	2.35	-1.6%
1.40	1.40	-0.7%
0.55	0.53	-3.6%

Calibration: _____ initial ✓ posttest

Date calibrated 3/29/93 by MW / JM

BEST ENVIRONMENTAL, INC.
27343 Industrial Boulevard, Unit E.
Hayward, California 94545
(415) 784-0706

DIFFERENTIAL PRESSURE GAUGE CALIBRATION DATA FORM

Gauge type Magnehelic Serial or ID number R8909050631
LSI 91

Scale 0 - 3" H_2O

Gauge-oil manometer Δp	Differential pressure gauge Δp	Pressure difference %
2.50	2.51	+0.4
+ 1.52	1.52	0
043	042	
		-2.3
2.7	2.7	0
2.0	1.9	-5.0
0.96		
	0.90	-6.3

Calibration: _____ initial ✓ posttest

Date calibrated 3/29/93 by MW / JM

BEST ENVIRONMENTAL, INC.
27343 Industrial Boulevard, Unit E
Hayward, California 94545
(415) 784-0706

DIFFERENTIAL PRESSURE GAUGE CALIBRATION DATA FORM

LSI #2.

Gauge type Magnehelic Serial or ID number 6120G56

Scale 0-5"H2O

Gauge-oil manometer Δp	Differential pressure gauge Δp	Pressure difference %
+ 4.60	4.50	-2.1
3.60	3.69	-1.4
2.90	2.75	-5.2
0.94	0.89	-5.3
~~4.00~~	~~4.05~~	
4.32	4.15	-3.9
3.52	3.40	-3.4
2.51	2.40	-4.4
0.76	0.75	-1.3

Calibration: _____ initial ✓ posttest

Date calibrated 3/29/93 by MW / JM

BEST ENVIRONMENTAL, INC.
27343 Industrial Boulevard, Unit E.
Hayward, California 94545
(415) 784-0706

DIFFERENTIAL PRESSURE GAUGE CALIBRATION DATA FORM

25 I#-2

Gauge type Magnehelic Serial or ID number R30318C558 (S)?

Scale 0 - 2" H_2O

Gauge-oil manometer Δp	Differential pressure gauge Δp	Pressure difference %
1.51	1.53	+1.3
0.85	0.85	0
0.39	0.41	+5.1
1.50	1.53	+1.3
0.59	0.63	+6.8
0.23	0.25	+8.7

Calibration: _____ initial ✓ posttest

Date calibrated 3/29/93 by MW/JM

Date: 3-9-92 Pitot Number: 4

TYPE S PITOT TUBE INSPECTION DATA

Pitot tube assembly level? ____ yes ✓ no

Pitot tube openings damaged? ____ yes (explain below) ✓ no

α_1 = 6.0° (<10°), α_2 = 1.0° (<10°), β_1 = 0.5° (<5°)

β_2 = 1.0° (<5°)

Y = 0.75°, θ = 0.5°, A = 0.726 cm (in.)

Z = A sin Y = 0.01 cm (in.); < 0.32 cm (<1/8 in.),

W = A sin θ = 0.01 cm (in.); < 0.08 cm (<1/32 in.)

P_a 0.252 cm (in.) P_b 0253 cm (in.)

D_t = 0.726 cm (in.) $\frac{\ddot{P}}{D_t} = \frac{1.44}{P_a - P_b - P}$ (≥1.05 and≤1.50)

COMMENTS: 5' RMC M-5 Glass Probe

Calibration required? ____ yes ✓ no

Calibrated by: MW

PERMIT TO OPERATE

SAN JOAQUIN COUNTY AIR POLLUTION CONTROL DISTRICT

PERMIT TO OPERATE

PREMISE: DOANE PRODUCTS COMPANY
450 E GRANTLINE ROAD TRACY
PET FOOD MANUFACTURING PLANT; 2 EXTRUSION & DRYING PROCESS;
424 HP - 4,000,000 BTU/HR

POST ON PREMISE OR
NEAR PERMITTED EQUIPMENT.
PERMIT IS SUBJECT TO
CONDITIONS OF PERMIT NO.(S)
77-109 b 91-179 b
(ON FILE). EXPIRES: 09/30/93

DOA450TR

DOANE PRODUCTS COMPANY
450 E GRANTLINE ROAD
TRACY CA 95376

JOEL KHANNA, M.D., M.P.H.
AIR POLLUTION CONTROL OFFICER

1601 E. HAZELTON AVE. • PHONE 468-8600
P.O. BOX 2009 • STOCKTON, CA 95201

SAN JOAQUIN COUNTY AIR POLLUTION CONTROL DISTRICT

PERMIT TO OPERATE

PREMISE: DOANE PRODUCTS COMPANY
450 E GRANTLINE ROAD TRACY
6-HMM MIX HAMMM MILL SER. BY A CYCLONE (EAST) 6-HOM MILL
HAMMER MILL SER. BY A CYCLONE WEST;
219 HP EACH

POST ON PREMISE OR
NEAR PERMITTED EQUIPMENT.
PERMIT IS SUBJECT TO
CONDITIONS OF PERMIT NO.(S)
93-174ab
(ON FILE). EXPIRES: 09/30/93

DOA450TR

DOANE PRODUCTS COMPANY
450 E GRANTLINE ROAD
TRACY CA 95376

JOEL KHANNA, M.D., M.P.H.
AIR POLLUTION CONTROL OFFICER

THIS PERMIT MAY BE SUSPENDED OR REVOKED FOR CAUSE

1601 E. HAZELTON AVE. • PHONE 468-8600
P.O. BOX 2009 • STOCKTON, CA 95201

SAN JOAQUIN COUNTY AIR POLLUTION CONTROL DISTRICT

PERMIT TO OPERATE

PREMISE: DOANE PRODUCTS COMPANY
450 E GRANTLINE ROAD TRACY
PET FOOD MANUFACTURING PLANT; RECEIVING, CONVEYING TO
STORAGE;
MISC 3 MIX SILOS

POST ON PREMISE OR
NEAR PERMITTED EQUIPMENT.
PERMIT IS SUBJECT TO
CONDITIONS OF PERMIT NO.(S)
77-109 a
(ON FILE). EXPIRES: 09/30/93

DOA460TR

DOANE PRODUCTS COMPANY
450 E GRANTLINE ROAD
TRACY CA 95376

JOEL KHANNA, M.D., M.P.H.
AIR POLLUTION CONTROL OFFICER

THIS PERMIT MAY BE SUSPENDED OR REVOKED FOR CAUSE
FROM DOANE/PRODUCTS/CO.

1601 E. HAZELTON AVE. • PHONE 468-8600
P.O. BOX 2009 • STOCKTON, CA 95201

SAN JOAQUIN COUNTY AIR POLLUTION CONTROL DISTRICT

PERMIT TO OPERATE

PREMISE: DOANE PRODUCTS COMPANY
450 E GRANTLINE ROAD TRACY
PET FOOD MANUFACTURING PLANT; FAT APPLICATION REEL PROCESS & CONVEYING TO STORAGE:
58,870 GALLONS - 6 PKG BINS - 47,096 GALLONS - 4 PKG BINS

DOA450TR

POST ON PREMISE OR NEAR PERMITTED EQUIPMENT. PERMIT IS SUBJECT TO CONDITIONS OF PERMIT NO.(S) 77-109 cd (ON FILE). EXPIRES: 09/30/93

DOANE PRODUCTS COMPANY
450 E GRANTLINE ROAD
TRACY CA 95376

JOGI KHANNA, M.D., M.P.H.
AIR POLLUTION CONTROL OFFICER

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1601 E. HAZELTON AVE. • PHONE 462-9620
P.O. BOX 2009 • STOCKTON, CA 95201

SAN JOAQUIN COUNTY AIR POLLUTION CONTROL DISTRICT

PERMIT TO OPERATE

PREMISE: DOANE PRODUCTS COMPANY
450 E GRANTLINE ROAD TRACY
PET FOOD MANUFACTURING PLANT: PACKAGING SYSTEMS #1 AND #2:

11 HP EACH

DOA450TR

POST ON PREMISE OR NEAR PERMITTED EQUIPMENT. PERMIT IS SUBJECT TO CONDITIONS OF PERMIT NO.(S) 77-109 cf (ON FILE). EXPIRES: 09/30/93

DOANE PRODUCTS COMPANY
450 E GRANTLINE ROAD
TRACY CA 95376

JOGI KHANNA, M.D., M.P.H.
AIR POLLUTION CONTROL OFFICER

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P.O. BOX 2009 • STOCKTON, CA 95201

I believe the papers forwarded to Damon on 09-08-92 were regarding these permits, should received sometime this week.