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Air



Hot Mix Asphalt Plants Kiln Dryer Stack Manual Methods Testing

Asphalt Plant A
Clayton, North Carolina
Volume 1 of 2



FINAL REPORT

**EMISSIONS TEST AT AN ASPHALT CONCRETE PRODUCTION PLANT:
ASPHALT PLANT "A" - CLAYTON, NORTH CAROLINA**

VOLUME I OF II
REPORT TEXT
APPENDICES A & B

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Prepared for:

Mr. Michael L. Toney (MD-19)
Work Assignment Manager
SCGA, EMC, OAQPS
U.S. Environmental Protection Agency
Research Triangle Park, NC 27711

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Submitted by

PACIFIC ENVIRONMENTAL SERVICES, INC.
5001 S. Miami Blvd., Suite 300
Post Office Box 12077
Research Triangle Park, NC 27709-2077
(919) 941-0333
FAX (919) 941-0234

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1.0 INTRODUCTION

The United States Environmental Protection Agency (USEPA) is investigating the asphalt concrete production source category to identify and quantify emissions of hazardous air pollutants (HAPs) from rotary aggregate dryers used at these facilities. There are two types of rotary drum dryers in use at asphalt concrete production plants; parallel flow, wherein the direction of travel of the drying aggregate is the same as the direction of travel of the burner exhaust gases, and counter flow, wherein the aggregate and exhaust gas flows are opposite to each other. On May 7, 1997, a work assignment was issued by EPA's Office of Air Quality Planning and Standards, Emissions Measurement Center, (OAQPS, EMC) to Pacific Environmental Services, Inc. (PES), of Research Triangle Park, North Carolina. The work assignment specified that emissions testing for HAPs be conducted on one of each type of aggregate dryer. Two candidate facilities were therefore identified and selected as host facilities for the testing program.

This document describes the test procedures, results, and quality assurance procedures that were employed during the testing of a counter flow rotary drum aggregate dryer, which was located at Asphalt Plant "A" in Clayton, North Carolina. The facility was identified as a candidate by EPA due to its location close to EPA facilities in Research Triangle Park, North Carolina, and because it is typical of counter flow rotary dryers in the asphalt production source category. The results of the emissions testing program conducted at a facility employing a parallel flow rotary aggregate dryer are presented in a separate report.

The scope of the work assignment was to plan and conduct an air emissions testing program to quantify emission rates of HAPs from the rotary aggregate drier located at Asphalt Plant "A". The planning and testing phase of the program was conducted under EPA Contract No. 68D20162, Work Assignment No. 4-13. Because the period of performance of the contract expired on September 30, 1997, PES was issued a second work assignment to complete the data reduction, a portion of the analysis, and the preparation of the draft report, which was completed under EPA Contract No. 68D70002, Work Assignment No. 0-005. This final report incorporates comments from EPA and the National Asphalt Pavement Association, and includes a process description and process data collected by EPA's Emission Standards Division (ESD) contractor. The final report was prepared under EPA Contract No. 68D70069, Work Assignment No. 2-09.

The primary objective of the test program was to obtain data on the controlled and uncontrolled emissions of polychlorinated dibenzo-*p*-dioxins (PCDDs or "dioxins") and polychlorinated dibenzofurans (PCDFs or "furans"), particulate matter (PM), and metallic HAP and non-HAP compounds from rotary drum dryers. A secondary objective of the test program was to observe and record plume opacity. The data will be used by ESD to determine whether

HAPs are emitted at levels that would justify regulation under the Maximum Achievable Control Technology (MACT) program.

The test program at Asphalt Plant "A" was completed during the week of August 18, 1997. The basic test methods that were employed were EPA Test Methods 1 (sample point location), 2 (gas velocity), 3 (gas molecular weight), 4 (gas moisture volume content), 5 (particulate matter concentration), 9 (plume opacity), 23 (dioxin and furan concentration) and 29 (metals concentrations). PM concentrations were determined by using tared filters in the Method 29 sampling train. The work assignment issued by EMC called for testing to be conducted during the production of asphalt with Reclaimed Asphalt Pavement, or RAP. At the request of EPA, an additional sampling run was conducted while the makeup material consisted solely of virgin aggregate. The results of all four of the test runs are presented in Section 2.0 of this report. The work assignment also specified testing to quantify both controlled and uncontrolled emissions. However, during the initial stages of testing of the uncontrolled dryer exhaust, sampling had to be discontinued due to extremely high grain loading conditions which far exceeded the sampling capacity of the Method 23 and Method 29 sampling trains. After telephone consultations with personnel from ESD and EMC, testing activities of the uncontrolled emissions were deleted from the scope of work.

PES used three subcontractors to assist in the completion of this testing effort. Deeco, Inc. (DEECO) of Raleigh, North Carolina; Triangle Laboratories, Inc. (TLI) of Durham, North Carolina, and Atlantic Technical Services, Inc. (ATS) of Chapel Hill, North Carolina. DEECO provided source testing support at the inlet locations (prior to cancellation of these testing activities), visual emissions observations of controlled emissions, and sample recovery support. TLI provided analytical services for the quantification of PCDDs/PCDFs and metals in the collected samples, and ATS provided on-site sampling support as well as support during preparation of the site test plan, draft report and calculation of the emissions test results.

The test program organization and major lines of communication are presented in Figure 1.1. The PES Project Manager communicated directly with the EPA Work Assignment Manager (WAM) and coordinated all of the on-site testing activities. The sampling locations at Asphalt Plant "A" are shown in Figure 1.2.

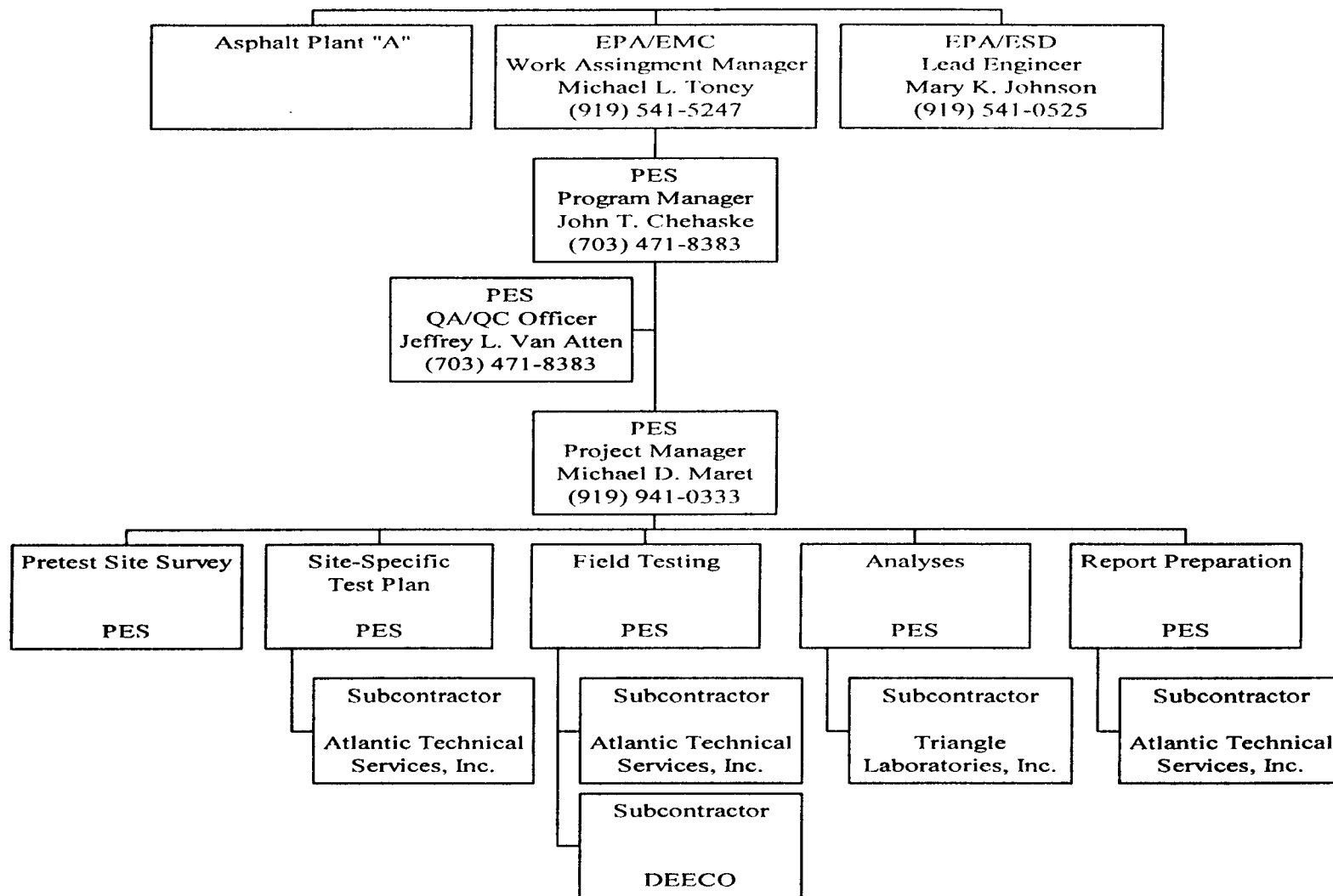


Figure 1.1 Key Personnel and Responsibility for Testing - Asphalt Plant "A", Clayton, NC

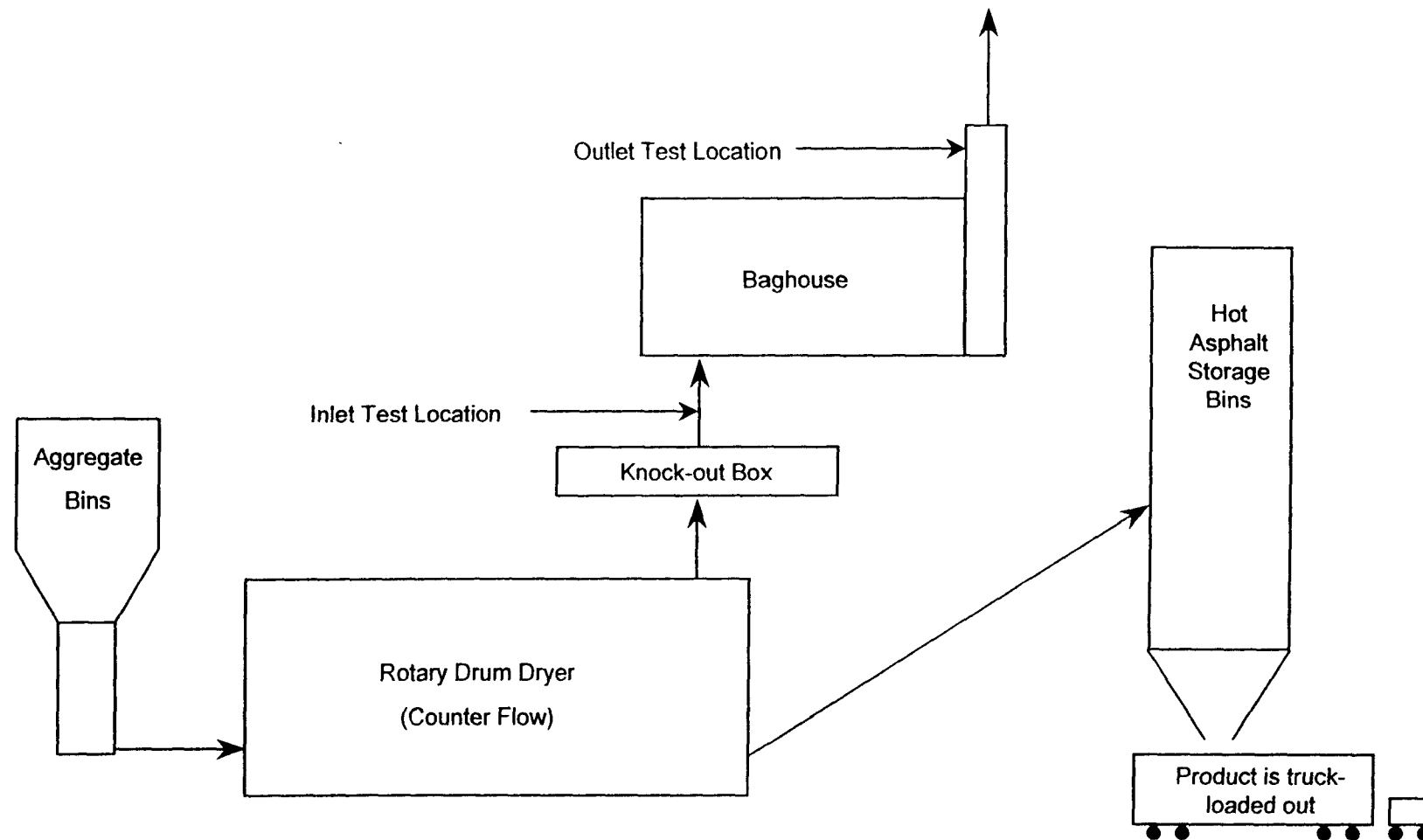


Figure 1.2 Sampling Locations - Asphalt Plant "A", Clayton, NC

2.0 SUMMARY OF RESULTS

This section summarizes the results of the testing program at the Asphalt Plant "A". The following pages present the times and durations of each of the sampling runs that were conducted, the sampling parameters during each run, the effluent gas parameters, and the concentrations and mass emission rates of the target HAPs. Sampling of emissions was conducted on three consecutive days from August 19, 1997 through August 21, 1997, during which time four sampling runs for both dioxins and furans (PCDDs/PCDFs) and metals were conducted. Table 2.1 presents the "Emissions Test Log" which summarizes clock times, target pollutants, and downtime due to filter and port changes for each of the Method 23 and Method 29 sampling runs attempted. The results of the PCDDs/PCDFs sampling during asphalt production with RAP are presented in Tables 2.2 through 2.7, and the results of the PCDDs/PCDFs sampling conducted during production with virgin aggregate are presented in Tables 2.8 through 2.10. The results of the particulate matter (PM) and metals sampling runs conducted during RAP addition are presented in Tables 2.11 through 2.16, and the results of the PM and metals runs conducted during asphalt production with virgin aggregate are presented in Tables 2.17 through 2.19.

2.1 OXYGEN AND CARBON DIOXIDE MEASUREMENTS

Concurrent with the Method 23 and Method 29 sampling at the baghouse outlet, bag samples of the effluent gas were collected and analyzed using an Orsat[®] apparatus to determine oxygen (O₂) and carbon dioxide (CO₂) concentrations for the purpose of calculating stack gas molecular weight. The O₂ and CO₂ concentrations presented for the first sampling run are the average of the O₂ and CO₂ concentrations measured during runs two and three. The diluent concentrations are presented in this manner because the results of the analyses from the first run were misplaced during the field testing portion of the test program and were not recovered. The diluent concentrations measured during the second and third runs should be representative of the concentrations during the first run, because the operating conditions were essentially unchanged.

2.2 PCDDs/PCDFs MEASUREMENTS

PCDDs/PCDFs results are presented as 1) actual concentrations and mass emission rates, 2) concentrations adjusted to 7 % O₂, and 3) concentrations adjusted to 7 % O₂ and 2378 tetrachlorinated dibenzo-*p*-dioxin (TCDD) toxic equivalent basis. Adjustment of the congeners to a 2378 toxic equivalent basis was accomplished using the Toxic Equivalency Factor (TEF) values developed by the NATO Committee on the Challenges of Modern Society, August 1988.

TABLE 2.1

**EMISSIONS SAMPLING TEST LOG
ASPHALT PLANT "A" - CLAYTON, NC**

| Run ID | Date | Target Pollutant | Run Time (24-hr clock) | Down Period(s) | Comment |
|------------------------|---------|------------------|------------------------|---|---|
| Baghouse Inlet | | | | | |
| S-M23-I-1* | 8/19/97 | PCDDs/PCDFs | 0915-1010 | 0930-1005 | Probe & filter plug |
| S-M29-I-1* | 8/19/97 | PM & Metals | 0915-1010 | 0930-1005 | Probe & filter plug |
| Baghouse Outlet | | | | | |
| S-M23-O-1 | 8/19/97 | PCDDs/PCDFs | 0915-1456 | 0930-1104 | Inlet sampling issues |
| S-M29-O-1 | 8/19/97 | PM & Metals | 0915-1454 | 0930-1104 | Inlet sampling issues |
| S-M23-O-2 | 8/20/97 | PCDDs/PCDFs | 0822-1240 | 0902-0904 0946-0952 1031-1042 1114-1119 1201-1206 | Port change Port change Port change Port change Port change |
| S-M29-O-2 | 8/20/97 | PM & Metals | 0822-1240 | 0904-0909 0946-0951 1031-1036 1114-1119 1200-1205 | Port change Port change Port change Port change Port change |
| S-M23-O-3 | 8/20/97 | PCDDs/PCDFs | 1405-1730 | 1447-1452 1527-1529 1604-1613 1648-1655 | Port change Port change Port change Port change |
| | | | | Run stopped due to lightning | |
| S-M29-O-3 | 8/20/97 | PM & Metals | 1405-1735 | 1447-1452 1529-1534 1613-1618 1655-1700 | Port change Port change Port change Port change |
| | | | | Run stopped due to lightning | |

TABLE 2.1 (Concluded)

**EMISSIONS SAMPLING TEST LOG
ASPHALT PLANT "A" - CLAYTON, NC**

| Run ID | Date | Target Pollutant | Run Time (24-hr clock) | Down Period(s) | Comment |
|---------------|-------------|-------------------------|-------------------------------|---|---|
| S-M23-O-4 | 8/21/97 | PCDDs/PCDFs | 0741-1148 | 0821-0823 0903-0905 0945-0948 1028-1030 1110-1113 | Port change Port change Port change Port change Port change |
| S-M29-O-4 | 8/21/97 | PM & Metals | 0741-1153 | 0823-0828 0905-0910 0948-0953 1030-1035 1113-1118 | Port change Port change Port change Port change Port change |

* Test runs were aborted due to high grain loading conditions at the baghouse inlet sampling location. Subsequent test runs canceled.

The Method 23 sample fractions consisted of a sample train front-half solvent rinse, a particulate filter, a back-half solvent rinse, and an XAD®-2 sorbent resin module. During analysis, each of the sample fractions was extracted, concentrated, combined, and analyzed using a Gas Chromatograph with a Mass Spectrometer detector (GC/MS), according the procedures outlined in Method 23. During analysis, the combined sample extract was separated with a DB-5 capillary column. Where the results of that analysis indicated the presence of 2378 TCDF congeners, the analysis was repeated using a DB-225 capillary column so that the TCDF congeners could be more readily separated and quantified.

The results of the analyses indicated the presence of several congeners that were qualified as Estimated Maximum Possible Concentrations, or EMPCs. From time to time during the Method 23 analyses, a peak elutes at the position expected for a particular congener, but the peak fails validation based on the theoretical split of chlorine isotopes. That is to say that the number of Cl³⁵ isotopes and the number of Cl³⁷ isotopes attached to the PCDDs/PCDFs congeners should agree with the Cl³⁵/Cl³⁷ ratio found in nature. For each congener, this ratio must agree within 15%. If the mass ratio of chlorine isotopes does not agree with the natural chlorine isotope ratio, then the peak is flagged as an EMPC.

The values presented as "Total PCDDs" are the sum of the "12346789 OCDD" polychlorinated dibenzo-p-dioxin and all of the dioxins labeled "Total"; "Total PCDFs" values are the sum of the "12346789 OCDF" polychlorinated dibenzofuran and all of the furans labeled

“Total”. “Total PCDDs + Total PCDFs” values are the sum of the “Total PCDDs” and “Total PCDFs” values. Values that have been qualified as being EMPC have been included in the sums. Concentrations and emission rates based on or including EMPC values are denoted by braces ({ }).

2.2.1 Baghouse Inlet - Asphalt Production with RAP

Table 2.2 summarizes the PCDDs/PCDFs emissions sampling and stack gas parameters at the baghouse inlet. For reasons stated previously, only one sampling run was conducted at this location. Sampling was aborted approximately 10 minutes into the sample run when the isokinetic sampling rate could not be maintained due to blockage of the sampling nozzle and the probe liner with particulate matter. Sampling was halted at both the inlet and the outlet locations, the sample train was disassembled, and large amounts of particulate matter were removed from the sample nozzle, glass liner, and front half of the filter housing into a pre-cleaned glass sample jar. The sample train was then reassembled, leak checked, and the attempt was made to continue sampling. After approximately 10 more minutes of sampling, the sample train plugged again, and the decision was made by the EPA WAM to cancel testing of the uncontrolled dryer emissions.

Although the test cannot be considered to be valid due to the low sample volume of 10.94 dry standard cubic feet (dscf), which is equivalent to 0.310 dry standard cubic meters (dscm), PES, at the direction of EPA, recovered the sample fractions and submitted them for analysis by the subcontracting laboratory. The inlet gas temperature was 230°F and contained 5.3% by volume CO₂, 13.1% by volume O₂, and 26.5% by volume moisture. The inlet gas volumetric flow rate was 30,119 actual cubic feet per minute (acfm) which is equivalent to 16,819 dry standard cubic feet per minute (dscfm) or 476.3 dry standard cubic meters per minute (dscmm).

Table 2.3 presents the PCDDs/PCDFs concentrations of the baghouse inlet gas stream. The concentration of total PCDDs was 151 nanograms per dry standard cubic meter (ng/dscm), and the concentration of total PCDFs was 2.9 ng/dscm. The concentration of total PCDDs/PCDFs was 154 ng/dscm. The total PCDDs mass emission rate was 4,305 micrograms per hour (µg/hr) and the total PCDFs mass emission rate was 83.9 µg/hr. The mass emission rate of total PCDDs/PCDFs was 4,389 µg/hr.

The PCDDs/PCDFs 2378 toxic equivalent concentrations at the baghouse inlet are presented in Table 2.4. Each PCDDs/PCDFs congener has been corrected to a reference O₂ concentration of 7%, and then multiplied by the appropriate NATO 2378 TCDD toxic equivalent factor. Because the measured oxygen concentration was 13.1% by volume, the corrected concentrations are greater than the actual concentrations. The concentration of total PCDDs was 268 ng/dscm, corrected to 7% O₂ and the concentration of total PCDFs was 5.23 ng/dscm corrected to 7% O₂, therefore the total PCDDs/PCDFs concentration was 274 ng/dscm, corrected to 7% O₂. The total PCDDs concentration was 0.398 ng/dscm corrected to 7% O₂ and 2378-TCDD equivalents, and the total concentration of PCDFs was 0.143 ng/dscm corrected to 7% O₂ and 2378-TCDD equivalents. The concentration of total PCDDs/PCDFs corrected to 7%

TABLE 2.2

**PCDDs/PCDFs EMISSIONS SAMPLING AND INLET GAS PARAMETERS
ROTARY DRUM DRYER - BAGHOUSE INLET
ASPHALT PRODUCTION WITH RAP
ASPHALT PLANT "A" - CLAYTON, NC**

| Run Number | S-M23-I-1 |
|---|------------------|
| Date | 8/19/97 |
| Time | 0915-1010 |
| Total Sampling Duration, minutes | 20 |
| Average Sampling Rate, dscfm ^a | 0.55 |
| Sample Volume: | |
| dscf ^b | 10.94 |
| dscm ^c | 0.310 |
| Inlet Gas Temperature, °F | 230 |
| O ₂ Concentration, % by volume | 13.1 |
| CO ₂ Concentration, % by volume | 5.3 |
| Moisture, % by volume | 26.5 |
| Inlet Gas Volumetric Flow Rate: | |
| acfm ^d | 30,119 |
| dscfm ^a | 16,819 |
| dscmm ^e Isokinetic Sampling Ratio, % | 476.3 |
| | 77.0 |

^a Dry standard cubic feet per minute at 68°F and 1 atm

^b Dry standard cubic feet at 68°F and 1 atm

^c Dry standard cubic meters at 20°C and 1 atm

^d Actual cubic feet per minute

^e Dry standard cubic meters per minute at 20°C and 1 atm

TABLE 2.3

**PCDDs/PCDFs CONCENTRATIONS AND EMISSION RATES
ROTARY DRUM DRYER - BAGHOUSE INLET
ASPHALT PRODUCTION WITH RAP
ASPHALT PLANT "A" - CLAYTON, NC**

| CONGENER | CONCENTRATION ^a ng/dscm, as measured | EMISSION RATE ^b μg/hr |
|---------------------|--|-------------------------------------|
| | S-M23-I-1 | S-M23-I-1 |
| <u>Dioxins</u> | | |
| 2378 TCDD | {0.0129} | {0.369} |
| Total TCDD | 0.161 | 4.61 |
| 12378 PeCDD | 0.0161 | 0.461 |
| Total PeCDD | 0.226 | 6.46 |
| 123478 HxCDD | 0.0646 | 1.84 |
| 123678 HxCDD | 0.129 | 3.69 |
| 123789 HxCDD | 0.161 | 4.61 |
| Total HxCDD | 1.45 | 41.5 |
| 1234678 HpCDD | 2.32 | 66.4 |
| Total HpCDD | 5.16 | 148 |
| Octa CDD | 144 | 4,105 |
| Total CDD | 151 | 4,305 |
| <u>Furans</u> | | |
| 2378 TCDF | {0.0646} | {1.84} |
| Total TCDF | 0.452 | 12.9 |
| 12378 PeCDF | 0.0258 | 0.738 |
| 23478 PeCDF | 0.0646 | 1.84 |
| Total PeCDF | 0.387 | 11.1 |
| 123478 HxCDF | 0.194 | 5.53 |
| 123678 HxCDF | 0.0646 | 1.84 |
| 234678 HxCDF | {0.0646} | {1.84} |
| 123789 HxCDF | 0.0226 | 0.646 |
| Total HxCDF | 0.613 | 17.5 |
| 1234678 HpCDF | 0.387 | 11.1 |
| 1234789 HpCDF | 0.129 | 3.69 |
| Total HpCDF | 0.968 | 27.7 |
| Octa CDF | 0.516 | 14.8 |
| Total CDF | 2.94 | 83.9 |
| Total PCDDs + PCDFs | 154 | 4,389 |

^a Nanogram per dry standard cubic meter at 20°C and 1 atm.

^b Micrograms per hour.

{ } Estimated Maximum Possible Concentration. EMPC values are counted in totals and averages.

TABLE 2.4

**PCDDs/PCDFs CONCENTRATIONS AND 2378 TOXIC EQUIVALENT
CONCENTRATIONS ADJUSTED TO 7 PERCENT OXYGEN
ROTARY DRUM DRYER - BAGHOUSE INLET
ASPHALT PRODUCTION WITH RAP
ASPHALT PLANT "A" - CLAYTON, NC**

| CONGENER | CONCENTRATION ^a ng/dscm, adjusted to 7% O ₂ | 2378-TCDD ^b Toxic Equivalent Factor | 2378 TOXIC EQUIVALENTS ng/dscm, adjusted to 7% O ₂ |
|---------------------|---|--|--|
| | S-M23-I-1 | | S-M23-I-1 |
| <u>Dioxins</u> | | | |
| 2378 TCDD | {0.0230} | 1.00 | {0.0230} |
| Total TCDD | 0.288 | | |
| 12378 PeCDD | 0.0288 | 0.500 | 0.0144 |
| Total PeCDD | 0.403 | | |
| 123478 HxCDD | 0.115 | 0.100 | 0.0115 |
| 123678 HxCDD | 0.230 | 0.100 | 0.0230 |
| 123789 HxCDD | 0.288 | 0.100 | 0.0288 |
| Total HxCDD | 2.59 | | |
| 1234678 HpCDD | 4.14 | 0.010 | 0.0414 |
| Total HpCDD | 9.20 | | |
| Octa CDD | 256 | 0.001 | 0.256 |
| Total PCDD | 268 | | {0.398} |
| <u>Furans</u> | | | |
| 2378 TCDF | {0.115} | 0.100 | {0.0115} |
| Total TCDF | 0.805 | | |
| 12378 PeCDF | 0.0460 | 0.050 | 0.00230 |
| 23478 PeCDF | 0.115 | 0.500 | 0.0575 |
| Total PeCDF | 0.690 | | |
| 123478 HxCDF | 0.345 | 0.100 | 0.0345 |
| 123678 HxCDF | 0.115 | 0.100 | 0.0115 |
| 234678 HxCDF | {0.115} | 0.100 | {0.0115} |
| 123789 HxCDF | 0.0403 | 0.100 | 0.00403 |
| Total HxCDF | 1.09 | | |
| 1234678 HpCDF | 0.690 | 0.010 | 0.00690 |
| 1234789 HpCDF | 0.230 | 0.010 | 0.00230 |
| Total HpCDF | 1.73 | | |
| Octa CDF | 0.920 | 0.001 | 0.000920 |
| Total CDF | 5.23 | | {0.143} |
| Total PCDDs + PCDFs | 274 | | {0.541} |

^a Nanogram per dry standard cubic meter adjusted to 7% oxygen at 20°C and 1 atm.

^b North Atlantic Treaty Organization, Committee on the Challenges of Modern Society. Pilot study on International Information Exchange on Dioxins and Related Compounds: International Toxicity Equivalency Factor (I-TEF) Methods of Risk Assessment for Complex Mixtures of Dioxins and Related Compounds. Report No. 176, August 1988.

{ } Estimated Maximum Possible Concentration. EMPC values are counted in totals and averages.

O₂ and 2378-TCDD equivalents at the baghouse inlet gas stream was 0.541 ng/dscm. The reader is reminded that assumptions made on the basis of the results of testing at inlet location should be made with care, due to the low sample volume and because only one sampling run was conducted at the inlet location instead of the three normally preferred.

2.2.2 Baghouse Outlet - Asphalt Production with RAP

PES conducted three Method 23 sampling runs at the baghouse outlet during the production of asphalt concrete with RAP. Table 2.5 summarizes the PCDDs/PCDFs sampling and exhaust gas parameters. Each sampling run was 240 minutes in duration, with the exception of the third test run which was 200 minutes. The third test run was stopped early at the direction of the EPA WAM due to storms and lightning in the vicinity of the test location. The (3-run) average sample volume was 153.390 dscf or 4.344 dscm. The (3-run) average stack gas temperature was 206°F and contained 5.3 % CO₂ by volume, 13.1 % O₂ by volume, and 21.6% moisture by volume. The (3-run) average stack gas volumetric flow rate was 36,596 acfm or 22,533 dscfm or 638.1 dscmm.

Table 2.6 presents the PCDDs/PCDFs concentrations and emission rates at the baghouse exhaust. The (3-run) average concentration of total PCDDs was 0.127 ng/dscm, and the (3-run) average concentration of total PCDF in the stack gas was 0.0796 ng/dscm. The (3-run) average concentration of total PCDDs/PCDFs was 0.207 ng/dscm. These values corresponded to average emission rates of 4.69 µg/hr for total PCDDs, 3.04 µg/hr for total PCDFs, and 7.72 µg/hr for total PCDDs/PCDFs compounds.

Table 2.7 presents the PCDDs/PCDFs concentrations adjusted to a reference diluent concentration of 7% O₂. Since the oxygen concentration of the effluent gas was greater than 7% for every sampling run, the adjusted PCDDs/PCDFs values are greater than the actual values. The (3-run) average adjusted concentration of total PCDDs was 0.227 ng/dscm @ 7% O₂, the (3-run) average adjusted concentration of total PCDFs was 0.142 ng/dscm @ 7% O₂, and the (3-run) average adjusted concentration of total PCDDs/PCDFs was 0.369 ng/dscm @ 7% O₂. Also presented in Table 2.7 are the PCDDs and PCDFs concentrations at 7 % O₂, adjusted to a toxicity equivalent to that of 2378 TCDD. The (3-run) average concentration of PCDDs was 0.000240 ng/dscm when presented on a 2378-TCDD toxic equivalent basis, the (3-run) average concentration of PCDFs was 0.00590 ng/dscm when presented on a 2378-TCDD toxic equivalent basis, and the concentration of total PCDDs/PCDFs compounds was 0.00830 ng/dscm, corrected to a 2378-TCDD toxic equivalent basis, at a reference diluent concentration of 7% O₂.

2.2.3 Baghouse Outlet - Asphalt Production without RAP

At the request of EPA, PES conducted one test run at the baghouse outlet during the production of asphalt concrete without the addition of RAP. Table 2.8 summarizes the PCDDs/PCDFs emissions sampling. The total sampling time for the test run was 240 minutes. The sample volume was 165.621 dscf or 4.690 dscm. The stack gas temperature was 180 °F and contained 3.2 % CO₂, 10.8 % O₂, and 18.9 % moisture. The stack gas volumetric flow rate was 37,027 acfm or 24,580 dscfm or 696.0 dscmm.

TABLE 2.5

**PCDDs/PCDFs EMISSIONS SAMPLING AND STACK GAS PARAMETERS
ROTARY DRUM DRYER - BAGHOUSE OUTLET
ASPHALT PRODUCTION WITH RAP
ASPHALT PLANT "A" - CLAYTON, NC**

| Run Number | S-M23-O-1 | S-M23-O-2 | S-M23-O-3 | Average |
|--|------------------|------------------|------------------|----------------|
| Date | 8/19/97 | 8/20/97 | 8/20/97 | |
| Time | 0915-1456 | 0822-1240 | 1405-1730 | |
| Sampling Duration, minutes | 240 | 240 | 200 | 227 |
| Average Sampling Rate, dscfm ^a | 0.524 | 0.774 | 0.743 | 0.680 |
| Sample Volume: | | | | |
| dscf ^b | 125.786 | 185.768 | 148.617 | 153.390 |
| dscm ^c | 3.562 | 5.260 | 4.208 | 4.344 |
| Stack Gas Temperature, °F | 185 | 223 | 209 | 206 |
| O ₂ Concentration, % by volume | 13.1 | 13.1 | 13.1 | 13.1 |
| CO ₂ Concentration, % by volume | 5.3 | 5.5 | 5.1 | 5.3 |
| Moisture, % by volume | 18.4 | 24.1 | 22.4 | 21.6 |
| Stack Gas Volumetric Flow Rate: | | | | |
| acfm ^d | 30,291 | 41,402 | 38,097 | 36,596 |
| dscfm ^a | 20,210 | 24,166 | 23,222 | 22,533 |
| dscmm ^e | 572.3 | 684.3 | 657.6 | 638.1 |
| Isokinetic Sampling Ratio, % | 94.6 | 106.8 | 106.7 | 102.7 |

^a Dry standard cubic feet per minute at 68°F and 1 atm

^b Dry standard cubic feet at 68°F and 1 atm

^c Dry standard cubic meters at 20°C and 1 atm

^d Actual cubic feet per minute at stack conditions

^e Dry standard cubic meters per minute at 20°C and 1 atm

TABLE 2.6

**PCDDs/PCDFs CONCENTRATIONS AND EMISSION RATES
ROTARY DRUM DRYER - BAGHOUSE OUTLET
ASPHALT PRODUCTION WITH RAP
ASPHALT PLANT "A" - CLAYTON, NC**

| CONGENER | CONCENTRATION ^a ng/dscm, as measured | | | | EMISSION RATE ^b µg/hr | | | |
|-------------------|--|-----------|------------|------------|-------------------------------------|-----------|-----------|-----------|
| | S-M23-O-1 | S-M23-O-2 | S-M23-O-3 | Average | S-M23-O-1 | S-M23-O-2 | S-M23-O-3 | Average |
| Dioxins | | | | | | | | |
| 2378 TCDD | ND | ND | {0.000713} | {0.000238} | ND | ND | {0.0281} | {0.00938} |
| Total TCDD | 0.00197 | 0.00380 | 0.00238 | 0.00271 | 0.0675 | 0.156 | 0.0938 | 0.106 |
| 12378 PeCDD | ND | ND | 0.00119 | 0.000396 | ND | ND | 0.0469 | 0.0156 |
| Total PeCDD | {0.0112} | 0.00570 | 0.00713 | {0.00802} | {0.386} | 0.234 | 0.281 | {0.300} |
| 123478 HxCDD | ND | ND | 0.00190 | 0.00634 | ND | ND | 0.0750 | 0.0250 |
| 123678 HxCDD | 0.00281 | {0.00380} | 0.00475 | {0.00379} | 0.0964 | {0.156} | 0.188 | {0.147} |
| 123789 HxCDD | 0.00562 | ND | {0.00238} | {0.00266} | 0.193 | ND | {0.0938} | {0.0955} |
| Total HxCDD | 0.0337 | 0.0152 | 0.0356 | 0.0282 | 1.16 | 0.624 | 1.41 | 1.06 |
| 1234678 HpCDD | 0.0168 | {0.00760} | 0.0143 | {0.0129} | 0.578 | {0.312} | 0.563 | {0.484} |
| Total HpCDD | 0.0281 | 0.00760 | 0.0143 | 0.0166 | 0.964 | 0.312 | 0.563 | 0.613 |
| Octa CDD | 0.149 | 0.0361 | 0.0309 | 0.0719 | 5.11 | 1.48 | 1.22 | 2.60 |
| Total PCDD | {0.224} | 0.0684 | 0.0903 | 0.127 | {7.68} | 2.81 | 3.56 | 4.69 |
| Furans | | | | | | | | |
| 2378 TCDF | {0.00225} | ND | 0.00475 | {0.00233} | {0.0771} | ND | 0.188 | {0.0882} |
| Total TCDF | 0.00842 | 0.00760 | 0.00713 | 0.00772 | 0.289 | 0.312 | 0.281 | 0.294 |
| 12378 PeCDF | {0.00168} | ND | 0.00166 | {0.00112} | {0.0578} | ND | 0.066 | {0.0412} |
| 23478 PeCDF | {0.00281} | ND | 0.00238 | {0.00173} | {0.0964} | ND | 0.0938 | {0.063} |
| Total PeCDF | 0.0140 | ND | 0.0143 | 0.00943 | 0.482 | ND | 0.563 | 0.348 |
| 123478 HxCDF | 0.0112 | 0.00760 | 0.0143 | 0.0110 | 0.386 | 0.312 | 0.563 | 0.420 |
| 123678 HxCDF | 0.00281 | 0.00190 | 0.00475 | 0.00315 | 0.0964 | 0.0781 | 0.188 | 0.121 |
| 234678 HxCDF | 0.00562 | 0.00380 | 0.00475 | 0.00472 | 0.193 | 0.156 | 0.188 | 0.179 |
| 123789 HxCDF | ND | ND | ND | 0.00 | ND | ND | ND | 0.00 |
| Total HxCDF | 0.0337 | 0.0209 | 0.0404 | 0.0317 | 1.16 | 0.859 | 1.59 | 1.20 |
| 1234678 HpCDF | {0.0197} | 0.0133 | 0.0214 | {0.0181} | {0.675} | 0.546 | 0.844 | {0.688} |
| 1234789 HpCDF | 0.0112 | 0.00380 | {0.00713} | {0.00739} | 0.386 | 0.156 | {0.281} | {0.274} |
| Total HpCDF | 0.0112 | 0.0228 | 0.0214 | 0.0185 | 0.386 | 0.937 | 0.844 | 0.722 |
| Octa CDF | 0.0112 | 0.0114 | 0.0143 | 0.0123 | 0.386 | 0.468 | 0.563 | 0.472 |
| Total PCDF | 0.0786 | 0.0627 | 0.0974 | 0.0796 | 2.70 | 2.58 | 3.84 | 3.04 |
| Total PCDD + PCDF | {0.302} | 0.131 | 0.188 | {0.207} | {10.4} | 5.39 | 7.41 | {7.72} |

^a Nanogram per dry standard cubic meter at 20°C and 1 atm.

^b Micrograms per hour.

ND Non Detectable - Results are below target analyte detection limits. ND values are counted as zero in totals and averages.

{ } Estimated Maximum Possible Concentration. EMPC values are counted in totals and averages.

TABLE 2.7

**PCDDs/PCDFs STACK GAS CONCENTRATIONS AND 2378 TOXIC EQUIVALENT STACK
GAS CONCENTRATIONS ADJUSTED TO 7 PERCENT OXYGEN
ROTARY DRUM DRYER BAGHOUSE OUTLET
ASPHALT PRODUCTION WITH RAP
ASPHALT PLANT "A" - CLAYTON, NC**

| CONGENER | CONCENTRATION* ng/dscm, adjusted to 7 percent O ₂ | | | | 2378-TCDD TEF ^b | 2378 TOXIC EQUIVALENTS ng/dscm, adjusted to 7 percent O ₂ | | | |
|-----------------|---|-----------|-----------|------------|----------------------------|---|-------------|------------|------------|
| | S-M23-O-1 | S-M23-O-2 | S-M23-O-3 | Average | | S-M23-O-1 | S-M23-O-2 | S-M23-O-3 | Average |
| <u>Dioxins</u> | | | | | | | | | |
| 2378 TCDD | ND | ND | {0.00127} | {0.000423} | 1.0 | ND | ND | {0.00127} | {0.000423} |
| Total TCDD | 0.00350 | 0.00678 | 0.00423 | 0.00484 | | | | | |
| 12378 PeCDD | ND | ND | 0.00212 | 0.00706 | 0.50 | ND | ND | 0.00106 | 0.000353 |
| Total PeCDD | {0.0200} | 0.0102 | 0.0127 | {0.0143} | | | | | |
| 123478 HxCDD | ND | ND | 0.00339 | 0.00113 | 0.10 | ND | ND | 0.000339 | 0.000113 |
| 123678 HxCDD | 0.00500 | {0.00678} | 0.00847 | 0.00675 | 0.10 | 0.000500 | {0.000678} | 0.000847 | {0.000675} |
| 123789 HxCDD | 0.0100 | ND | {0.00423} | {0.00475} | 0.10 | 0.00100 | ND | {0.000423} | {0.000475} |
| Total HxCDD | 0.0600 | 0.0271 | 0.0635 | 0.0502 | | | | | |
| 1234678 HpCDD | 0.0300 | {0.0136} | 0.0254 | {0.0230} | 0.01 | 0.000300 | {0.000136} | 0.000254 | {0.000230} |
| Total HpCDD | 0.0500 | 0.0136 | 0.0254 | 0.0297 | | | | | |
| Octa CDD | 0.265 | 0.0644 | 0.0550 | 0.128 | 0.001 | 0.000265 | 0.0000644 | 0.0000550 | 0.000128 |
| Total CDD | {0.399} | 0.122 | 0.161 | {0.227} | | 0.00207 | {0.0000877} | {0.00425} | {0.000240} |
| <u>Furans</u> | | | | | | | | | |
| 2378 TCDF | {0.00400} | ND | 0.00847 | {0.00416} | 0.10 | {0.000400} | ND | 0.000847 | {0.000416} |
| Total TCDF | 0.0150 | 0.0136 | 0.0127 | 0.0138 | | | | | |
| 12378 PeCDF | {0.00300} | ND | 0.00296 | {0.00199} | 0.05 | {0.000150} | ND | 0.000148 | 0.0000994 |
| 23478 PeCDF | {0.00500} | ND | 0.00423 | {0.00308} | 0.50 | {0.00250} | ND | 0.00212 | {0.00154} |
| Total PeCDF | 0.0250 | ND | 0.0254 | 0.0168 | | | | | |
| 123478 HxCDF | 0.0200 | 0.0136 | 0.0254 | 0.0197 | 0.10 | 0.00200 | 0.00136 | 0.00254 | 0.00197 |
| 123678 HxCDF | 0.00500 | 0.00339 | 0.00847 | 0.00562 | 0.10 | 0.000500 | 0.000339 | 0.000847 | 0.000562 |
| 234678 HxCDF | 0.0100 | 0.00678 | 0.00847 | 0.00842 | 0.10 | 0.00100 | 0.000678 | 0.000847 | 0.000842 |
| 123789 HxCDF | ND | ND | ND | 0.00 | 0.10 | ND | ND | ND | 0.00 |
| Total HxCDF | 0.0600 | 0.0373 | 0.0720 | 0.0564 | | | | | |
| 1234678 HpCDF | {0.0350} | 0.0237 | 0.0381 | {0.0323} | 0.01 | {0.000350} | 0.000237 | 0.000381 | {0.000323} |
| 1234789 HpCDF | 0.0200 | 0.00678 | {0.0127} | {0.0132} | 0.01 | 0.000200 | 0.0000678 | {0.000127} | {0.000132} |
| Total HpCDF | 0.0200 | 0.0407 | 0.0381 | 0.0329 | | | | | |
| Octa CDF | 0.0200 | 0.0203 | 0.0254 | 0.0219 | 0.001 | 0.0000200 | 0.0000203 | 0.0000254 | 0.0000219 |
| Total CDF | 0.140 | 0.112 | 0.174 | 0.142 | | {0.00712} | 0.00270 | 0.00788 | {0.00590} |
| Total CDD + CDF | {0.539} | 0.234 | 0.335 | {0.369} | | {0.00919} | {0.00357} | {0.0121} | {0.00830} |

* Nanogram per dry standard cubic meter adjusted to 7 percent oxygen at 20°C and 1 atm.

^b North Atlantic Treaty Organization, Committee on the Challenges of Modern Society. Pilot study on International Information Exchange on Dioxins and Related Compounds: International Toxicity Equivalency Factor (I-TEF) Methods of Risk Assessment for Complex Mixtures of Dioxins and Related Compounds. Report No. 176, August 1988.

ND Non Detectable - Results are below target analyte detection limits. ND values are counted as zero in totals and averages

{ } Estimated Maximum Possible Concentration. EMPC values are counted in totals and averages.

TABLE 2.8

**PCDDs/PCDFs EMISSIONS SAMPLING AND STACK GAS PARAMETERS
ROTARY DRUM DRYER - BAGHOUSE OUTLET
ASPHALT PRODUCTION WITHOUT RAP
ASPHALT PLANT "A" - CLAYTON, NC**

| Run Number | S-M23-O-4 |
|--|------------------|
| Date | 8/21/97 |
| Time | 0741-1148 |
| Sampling Duration, minutes | 240 |
| Average Sampling Rate, dscfm ^a | 0.690 |
| Sample Volume: | |
| dscf ^b | 165.621 |
| dscm ^c | 4.690 |
| Stack Gas Temperature, °F | 180 |
| O ₂ Concentration, % by volume | 10.8 |
| CO ₂ Concentration, % by volume | 3.2 |
| Moisture, % by volume | 18.9 |
| Stack Gas Volumetric Flow Rate: | |
| acfm ^d | 37,027 |
| dscfm ^a | 24,580 |
| dscmm ^e | 696.0 |
| Isokinetic Sampling Ratio % | 93.7 |

^a Dry standard cubic feet per minute at 68°F and 1 atm

^b Dry standard cubic feet at 68°F and 1 atm

^c Dry standard cubic meters at 20°C and 1 atm

^d Actual cubic feet per minute at stack conditions

^e Dry standard cubic meters per minute at 20°C and 1 atm

Table 2.9 presents the PCDDs/PCDFs stack gas concentrations and emission rates. The concentration of total PCDDs was 0.0527 ng/dscm, and the concentration of PCDFs was 0.0576 ng/dscm. The concentration of total PCDDs/PCDFs was 0.110 ng/dscm. These values corresponded to emission rates of 2.20 µg/hr for PCDDs, 2.40 µg/hr for PCDFs and a total emission rate of 4.60 µg/hr for all PCDDs/PCDFs. Table 2.10 presents the PCDDs/PCDFs concentrations adjusted to 7% O₂. The measured stack gas O₂ concentration was 10.8 %. Therefore, the adjusted PCDDs/PCDFs concentrations were greater than the actual concentrations. The adjusted concentration of total PCDDs was 0.725 ng/dscm @ 7 % O₂, and 0.0792 ng/dscm @ 7 % O₂ for PCDFs. The adjusted concentration of total PCDDs/PCDFs was 0.152 ng/dscm @ 7 % O₂. Table 2.10 also presents the adjusted concentrations in 2378 toxic equivalents. The TEF concentration for total PCDDs/PCDFs was 0.004 µg/dscm.

2.3 PARTICULATE MATTER AND METALS MEASUREMENTS

2.3.1 Baghouse Inlet - Asphalt Production with RAP

As stated previously, only one sampling test run was attempted at the baghouse inlet. Table 2.11 summarizes the particulate matter/metals emissions sampling and gas parameters at the baghouse inlet. The total sampling time was 20 minutes. The sample volume was 10.491 dscf or 0.297 dscm. The exhaust gas temperature was 230 °F and contained 5.3% CO₂, 13.1% O₂, and 26.1% moisture. The exhaust gas volumetric flow rate was 23,773 acfm or 13,353 dscfm or 378 dscmm. Although the test was not valid due to a low sample volume, the sample was recovered, extracted, and analyzed at the instruction of the EPA WAM to determine particulate matter and metals catch weights.

Table 2.12 summarizes the exhaust gas particulate matter concentrations and emission rates at the baghouse inlet. The concentration was 63.7 grains per dry standard cubic foot (gr/dscf) or 146 grams per dry standard cubic meter (g/dscm). The concentrations are also shown adjusted to 7% O₂. The average mass emission rate was 7,296 pounds per hour (lb/hr) or 3,310 kilograms per hour (kg/hr).

Table 2.13 summarizes the exhaust gas metals concentrations and emission rates. Most of the target metals were found to be present in the sample. Concentrations ranged from 11,944 micrograms per dry standard cubic meter (µg/dscm) for phosphorus to 3.26 µg/dscm for selenium.

TABLE 2.9

**PCDDs/PCDFs CONCENTRATIONS AND EMISSION RATES
ROTARY DRUM DRYER - BAGHOUSE OUTLET
ASPHALT PRODUCTION WITHOUT RAP
ASPHALT PLANT "A" - CLAYTON, NC**

| CONGENER | CONCENTRATION ^a ng/dscm, as measured | EMISSION RATE ^b μg/hr |
|--------------------|--|-------------------------------------|
| | S-M23-O-4 | S-M23-O-4 |
| <u>Dioxins</u> | | |
| 2378 TCDD | ND | ND |
| Total TCDD | {0.00149} | {0.0623} |
| 12378 PeCDD | ND | ND |
| Total PeCDD | 0.00213 | 0.0890 |
| 123478 HxCDD | ND | ND |
| 123678 HxCDD | 0.00213 | 0.0809 |
| 123789 HxCDD | ND | ND |
| Total HxCDD | 0.0149 | 0.623 |
| 1234678 HpCDD | {0.00853} | {0.356} |
| Total HpCDD | {0.0149} | {0.623} |
| Octa CDD | 0.0192 | 0.801 |
| Total PCDD | {0.0527} | {2.20} |
| <u>Furans</u> | | |
| 2378 TCDF | ND | ND |
| Total TCDF | 0.00640 | 0.267 |
| 12378 PeCDF | ND | ND |
| 23478 PeCDF | {0.00213} | {0.0890} |
| Total PeCDF | 0.00213 | 0.0890 |
| 123478 HxCDF | 0.00640 | 0.267 |
| 123678 HxCDF | 0.00213 | 0.0890 |
| 234678 HxCDF | 0.00426 | 0.178 |
| 123789 HxCDF | ND | ND |
| Total HxCDF | 0.0192 | 0.801 |
| 1234678 HpCDF | 0.0107 | 0.445 |
| 1234789 HpCDF | 0.00426 | 0.178 |
| Total HpCDF | 0.0192 | 0.801 |
| Octa CDF | 0.0107 | 0.445 |
| Total PCDF | 0.0576 | 2.40 |
| Total PCDDs+ PCDFs | {0.110} | {4.60} |

^a Nanogram per dry standard cubic meter at 20°C and 1 atm.

^b Micrograms per hour.

ND Non Detectable - Results are below target analyte detection limits. ND values are counted as zero in totals and averages.

{ } Estimated Maximum Possible Concentration. EMPC values are counted in totals and averages.

TABLE 2.10

**PCDDs/PCDFs CONCENTRATIONS AND 2378 TOXIC EQUIVALENT
CONCENTRATIONS ADJUSTED TO 7 PERCENT OXYGEN
ROTARY DRUM DRYER - BAGHOUSE OUTLET
ASPHALT CONCRETE PRODUCTION WITHOUT RAP
ASPHALT PLANT "A" - CLAYTON, NC**

| CONGENER | CONCENTRATION ^a ng/dscm, adjusted to 7 % O ₂ | 2378-TCDD ^b Toxic Equiv. Factor | 2378 TOXIC EQUIVALENTS ng/dscm, adjusted to 7 % O ₂ |
|---------------------|---|--|---|
| | S-M23-O-4 | | S-M23-O-4 |
| <u>Dioxins</u> | | | |
| 2378 TCDD | ND | 1.000 | ND |
| Total TCDD | {0.00205} | | |
| 12378 PeCDD | ND | 0.500 | ND |
| Total PeCDD | 0.00293 | | |
| 123478 HxCDD | ND | 0.100 | ND |
| 123678 HxCDD | 0.00293 | 0.100 | 0.000293 |
| 123789 HxCDD | ND | 0.100 | ND |
| Total HxCDD | 0.0205 | | |
| 1234678 HpCDD | {0.0117} | 0.010 | {0.000117} |
| Total HpCDD | {0.0205} | | |
| Octa CDD | 0.0264 | 0.001 | 0.0000264 |
| Total CDD | {0.725} | | {0.000437} |
| <u>Furans</u> | | | |
| 2378 TCDF | ND | 0.100 | ND |
| Total TCDF | 0.00880 | | |
| 12378 PeCDF | ND | 0.050 | ND |
| 23478 PeCDF | {0.00293} | 0.500 | {0.00147} |
| Total PeCDF | 0.00293 | | |
| 123478 HxCDF | 0.00880 | 0.100 | 0.000880 |
| 123678 HxCDF | 0.00293 | 0.100 | 0.000293 |
| 234678 HxCDF | 0.00587 | 0.100 | 0.000587 |
| 123789 HxCDF | ND | 0.100 | ND |
| Total HxCDF | 0.0264 | | |
| 1234678 HpCDF | 0.0147 | 0.010 | 0.000147 |
| 1234789 HpCDF | 0.00587 | 0.010 | 0.0000587 |
| Total HpCDF | 0.0264 | | |
| Octa CDF | 0.0147 | 0.001 | 0.0000147 |
| Total CDF | 0.0792 | | {0.000345} |
| Total PCDDs + PCDFs | {0.152} | | {0.000389} |

^a Nanogram per dry standard cubic meter adjusted to 7 percent oxygen at 20°C and 1 atm.

^b North Atlantic Treaty Organization, Committee on the Challenges of Modern Society. Pilot study on International Information Exchange on Dioxins and Related Compounds: International Toxicity Equivalency Factor (I-TEF) Methods of Risk Assessment for Complex Mixtures of Dioxins and Related Compounds. Report No. 176, August 1988.

ND Non Detectable - Results are below target analyte detection limits. ND values are counted as zero in totals and averages.

{ } Estimated Maximum Possible Concentration. EMPC values are counted in totals and averages.

TABLE 2.11

**PARTICULATE/METALS EMISSIONS SAMPLING AND
INLET GAS PARAMETERS
ROTARY DRUM DRYER - BAGHOUSE INLET
ASPHALT PRODUCTION WITH RAP
ASPHALT PLANT "A" - CLAYTON, NC**

| Run Number | S-M29-I-1 |
|--|-----------|
| Date | 8/19/97 |
| Time | 0915-1010 |
| Sampling Duration, minutes | 20 |
| Average Sampling Rate, dscfm ^a | 0.525 |
| Sample Volume: | |
| dscf ^b | 10.491 |
| dscm ^c | 0.297 |
| Inlet Gas Temperature, °F | 230 |
| O ₂ Concentration, % by volume | 13.1 |
| CO ₂ Concentration, % by volume | 5.3 |
| Moisture, % by volume | 26.1 |
| Exhaust Gas Volumetric Flow Rate: | |
| acfm ^d | 23,773 |
| dscfm ^a | 13,353 |
| dscmm ^e | 378 |
| Isokinetic Sampling Ratio, % | 93.6 |

^a Dry standard cubic feet per minute at 68°F and 1 atm.

^b Dry standard cubic feet at 68°F and 1 atm.

^c Dry standard cubic meters at 20°C and 1 atm.

^d Actual cubic feet per minute at inlet gas conditions.

^e Dry standard cubic meters per minute at 20°C and 1 atm.

TABLE 2.12.

**PARTICULATE MATTER CONCENTRATIONS AND EMISSION RATES
ROTARY DRUM DRYER - BAGHOUSE INLET
ASPHALT PRODUCTION WITH RAP
ASPHALT PLANT "A" - CLAYTON, NC**

| Run Number | S-M29-I-1 |
|--|-----------|
| Date | 8/19/97 |
| Time | 0915-1010 |
| Particulate Matter Concentration: | |
| gr/dscf ^a | 63.7 |
| gr/dscf @ 7% O ₂ ^b | 114 |
| g/dscm ^c | 146 |
| g/dscm @ 7% O ₂ ^d | 260 |
| Particulate Matter Emission Rate: | |
| lb/hr ^e | 7,296 |
| kg/hr ^f | 3,310 |

^a Grains per dry standard cubic foot at 68°F and 1 atm.

^b Grains per dry standard cubic foot at 68°F and 1 atm adjusted to 7 percent O₂.

^c Grams per dry standard cubic meter at 20°C and 1 atm.

^d Grams per dry standard cubic meter at 20°C and 1 atm adjusted to 7 percent O₂.

^e Pounds per hour.

^f Kilograms per hour.

TABLE 2.13

**METALS CONCENTRATIONS AND EMISSION RATES
ROTARY DRUM DRYER - BAGHOUSE INLET
ASPHALT PRODUCTION WITH RAP
ASPHALT PLANT "A" - CLAYTON, NC**

| Run Number | S-M29-I-1 |
|--------------------------------|-----------|
| Date | 8/19/97 |
| Clock Time, 24-hr Clock | 0915-1010 |
| Antimony (Sb) | |
| $\mu\text{g/dscm}^a$ | ND |
| $\mu\text{g/dscm @ 7\% O}_2^b$ | ND |
| g/hr^c | ND |
| Arsenic (As) | |
| $\mu\text{g/dscm}^a$ | 51.2 |
| $\mu\text{g/dscm @ 7\% O}_2^b$ | 91.2 |
| g/hr^c | 1.16 |
| Barium (Ba) | |
| $\mu\text{g/dscm}^a$ | 2,063 |
| $\mu\text{g/dscm @ 7\% O}_2^b$ | 3,677 |
| g/hr^c | 46.8 |
| Beryllium (Be) | |
| $\mu\text{g/dscm}^a$ | ND |
| $\mu\text{g/dscm @ 7\% O}_2^b$ | ND |
| g/hr^c | ND |
| Cadmium (Cd) | |
| $\mu\text{g/dscm}^a$ | 22.5 |
| $\mu\text{g/dscm @ 7\% O}_2^b$ | 40.1 |
| g/hr^c | 0.511 |
| Chromium (Cr) | |
| $\mu\text{g/dscm}^a$ | 91.7 |
| $\mu\text{g/dscm @ 7\% O}_2^b$ | 163 |
| g/hr^c | 2.08 |
| Cobalt (Co) | |
| $\mu\text{g/dscm}^a$ | 89.2 |
| $\mu\text{g/dscm @ 7\% O}_2^b$ | 159 |
| g/hr^c | 2.02 |
| Copper (Cu) | |
| $\mu\text{g/dscm}^a$ | 417 |
| $\mu\text{g/dscm @ 7\% O}_2^b$ | 743 |
| g/hr^c | 9.46 |

^a Micrograms per dry standard cubic meter @ 20°C and 1 atm.

^b Micrograms per dry standard cubic meter @ 20°C and 1 atm, adjusted to 7% O₂.

^c Grams per hour.

ND - Not detected.

TABLE 2.13 (Concluded)

**METALS CONCENTRATIONS AND EMISSION RATES
ROTARY DRUM DRYER - BAGHOUSE INLET
ASPHALT PRODUCTION WITH RAP
ASPHALT PLANT "A" - CLAYTON, NC**

| Run Number | S-M29-I-1 |
|--|------------------|
| Lead (Pb) | |
| μg/dscm ^a | 170 |
| μg/dscm @ 7% O ₂ ^b | 302 |
| g/hr ^c | 3.85 |
| Manganese (Mn) | |
| μg/dscm ^a | 3,946 |
| μg/dscm @ 7% O ₂ ^b | 7,032 |
| g/hr ^c | 89.5 |
| Mercury (Hg) | |
| μg/dscm ^a | ND |
| μg/dscm @ 7% O ₂ ^b | ND |
| g/hr ^c | ND |
| Nickel (Ni) | |
| μg/dscm ^a | 39.8 |
| μg/dscm @ 7% O ₂ ^b | 70.9 |
| g/hr ^c | 0.903 |
| Phosphorus (P) | |
| μg/dscm ^a | 11,934 |
| μg/dscm @ 7% O ₂ ^b | 21,267 |
| g/hr ^c | 271 |
| Silver (Ag) | |
| μg/dscm ^a | ND |
| μg/dscm @ 7% O ₂ ^b | ND |
| g/hr ^c | ND |
| Selenium (Se) | |
| μg/dscm ^a | 3.26 |
| μg/dscm @ 7% O ₂ ^b | 5.81 |
| g/hr ^c | 0.0740 |
| Thallium (Tl) | |
| μg/dscm ^a | 9.76 |
| μg/dscm @ 7% O ₂ ^b | 17.4 |
| g/hr ^c | 0.221 |
| Zinc (Zn) | |
| μg/dscm ^a | 1,752 |
| μg/dscm @ 7% O ₂ ^b | 3,123 |
| g/hr ^c | 39.8 |

^a Micrograms per dry standard cubic meter @ 20°C and 1 atm.

^b Micrograms per dry standard cubic meter @ 20°C and 1 atm, adjusted to 7% O₂.

^c Grams per hour.

ND - Not detected.

2.3.2 Baghouse Outlet - Asphalt Production with RAP

Table 2.14 summarizes the particulate matter/metals emissions sampling and stack gas parameters. The total sampling time for each test run was 240 minutes, except the third test run which was 200 minutes. The average sample volume was 166.137 dscf or 4.704 dscm. The average stack gas temperature was 203°F and contained 5.3% CO₂, 13.1% O₂, and 20.2% moisture. The average stack gas volumetric flow rate was 37,437 acfm or 23,661 dscfm or 670 dscmm.

Table 2.15 summarizes the stack gas particulate matter concentrations and emission rates. The average concentration was 0.0176 gr/dscf or 0.0402 g/dscm. The concentrations are also shown adjusted to 7% O₂. The average emission rate was 3.43 lb/hr or 1.56 kg/hr.

Table 2.16 summarizes the stack gas metals concentrations and emission rates. Most of the target metals were found to be present in all three samples. Average concentrations ranged from 0.0231 µg/dscm for antimony to 45.5 µg/dscm for phosphorus. Beryllium was not detected during any of the sampling runs, cobalt was only detected during the first run, and silver and thallium were only detected during two of the sampling runs. There were two instances where the target metal was detected, but was present at a concentration less than the concentration detected in the reagent blank samples. In these two cases (antimony during the third run and silver during the second run) a value of 0.00 has been reported.

2.3.3 Baghouse Outlet - Asphalt Production without RAP

PES conducted one test run at the baghouse outlet during asphalt production without RAP. Table 2.17 summarizes the particulate matter/metals emissions sampling and stack gas parameters. The total sampling time for the test run was 240 minutes. The sample volume was 168.390 dscf or 4.768 dscm. The stack gas temperature was 180°F and contained 3.2 % CO₂, 10.8 % O₂, and 18.7 % moisture. The stack gas volumetric flow rate was 36,415 acfm or 24,240 dscfm or 686 dscmm.

Table 2.18 summarizes the stack gas particulate matter concentrations and emission rates. The concentration was 0.00122 gr/dscf or 0.00279 g/dscm. The concentrations are also shown adjusted to 7% O₂. The average PM emission rate was 0.253 lb/hr or 0.115 kg/hr.

Table 2.19 summarizes the stack gas metals concentrations and emission rates. Most of the target metals were present in the sample. Concentrations ranged from 0.0436 µg/dscm for silver to 15.2 µg/dscm for phosphorus. In general, the emissions of metals during production without RAP was less than emissions during production with RAP. In the cases of antimony, silver, and selenium, the quantities detected in the sample were less than the quantities detected in the reagent blanks. For these three targets, values of 0.00 have been reported.

TABLE 2.14

**PARTICULATE/METALS EMISSIONS SAMPLING AND
STACK GAS PARAMETERS
ROTARY DRUM DRYER - BAGHOUSE OUTLET
ASPHALT PRODUCTION WITH RAP
ASPHALT PLANT "A" - CLAYTON, NC**

| Run Number | S-M29-O-1 | S-M29-O-2 | S-M29-O-3 | Average |
|--|-----------|-----------|-----------|---------|
| Date | 8/19/97 | 8/20/97 | 8/20/97 | |
| Time | 0915-1454 | 0822-1240 | 1405-1735 | |
| Sampling Duration, minute | 240 | 240 | 200 | 227 |
| Average Sampling Rate, dscfm ^a | 0.644 | 0.830 | 0.723 | 0.732 |
| Sample Volume: | | | | |
| dscf ^b | 154.579 | 199.270 | 144.561 | 166.137 |
| dscm ^c | 4.377 | 5.643 | 4.094 | 4.704 |
| Stack Gas Temperature, °F | 179 | 222 | 207 | 203 |
| O ₂ Concentration, % by volume | 13.1 | 13.1 | 13.1 | 13.1 |
| CO ₂ Concentration, % by volume | 5.3 | 5.5 | 5.1 | 5.3 |
| Moisture, % by volume | 17.4 | 19.0 | 24.2 | 20.2 |
| Volumetric Flow Rate: | | | | |
| acfm ^d | 32,964 | 42,043 | 37,305 | 37,437 |
| dscfm ^a | 22,478 | 26,229 | 22,276 | 23,661 |
| dscmm ^e | 637 | 743 | 631 | 670 |
| Isokinetic Sampling Ratio, % | 95.6 | 103.9 | 106.5 | 102.0 |
| Stack Gas Opacity: | | | | |
| Average Opacity, % | < 5 | < 5 | < 5 | < 5 |
| Calculated Average, % | 2.15 | 1.21 | 0.702 | 1.35 |
| Max. Single Reading, % | 15 | 20 | 15 | - |
| Max. 6-min. Block Avg., % | 6.25 | 2.62 | 1.67 | - |
| Max. 6-min Rolling Avg., % | 6.46 | 2.75 | 2.17 | - |

^a Dry standard cubic feet per minute at 68°F and 1 atm.

^b Dry standard cubic feet at 68°F and 1 atm.

^c Dry standard cubic meters at 20°C and 1 atm.

^d Actual cubic feet per minute at stack conditions.

^e Dry standard cubic meters per minute at 20°C and 1 atm.

TABLE 2.15

**PARTICULATE MATTER CONCENTRATIONS AND EMISSION RATES
ROTARY DRUM DRYER - BAGHOUSE OUTLET
ASPHALT PRODUCTION WITH RAP
ASPHALT PLANT "A" - CLAYTON, NC**

| Run Number | S-M29-O-1 | S-M29-O-2 | S-M29-O-3 | Average |
|--|-----------|-----------|-----------|---------|
| Date | 8/19/97 | 8/20/97 | 8/20/97 | |
| Time | 0915-1454 | 0822-1240 | 1405-1735 | |
| Particulate Matter Concentration: | | | | |
| gr/dscf ^a | 0.0449 | 0.00482 | 0.00292 | 0.0176 |
| gr/dscf @ 7% O ₂ ^b | 0.0800 | 0.00858 | 0.00521 | 0.0313 |
| g/dscm ^c | 0.103 | 0.0110 | 0.00669 | 0.0402 |
| g/dscm @ 7% O ₂ ^d | 0.183 | 0.0196 | 0.0119 | 0.0716 |
| Particulate Matter Emission Rate: | | | | |
| lb/hr ^e | 8.65 | 1.08 | 0.558 | 3.43 |
| kg/hr ^f | 3.93 | 0.491 | 0.253 | 1.56 |

^a Grains per dry standard cubic foot at 68°F and 1 atm.

^b Grains per dry standard cubic foot at 68°F and 1 atm adjusted to 7 percent O₂.

^c Grams per dry standard cubic meter at 20°C and 1 atm.

^d Grams per dry standard cubic meter at 20°C and 1 atm adjusted to 7 percent O₂.

^e Pounds per hour.

^f Kilograms per hour.

TABLE 2.16

**METALS CONCENTRATIONS AND EMISSION RATES
ROTARY DRUM DRYER - BAGHOUSE OUTLET
ASPHALT PRODUCTION WITH RAP
ASPHALT PLANT "A" - CLAYTON, NC**

| Run Number | S-M29-O-1 | S-M29-O-2 | S-M29-O-3 | Average |
|--------------------------------|-----------|-----------|-----------|----------|
| Date | 8/19/97 | 8/20/97 | 8/20/97 | |
| Time | 0915-1454 | 0822-1240 | 1405-1735 | |
| Antimony (Sb) | | | | |
| $\mu\text{g/dscm}^a$ | 0.0640 | 0.00532 | 0.00 | 0.0231 |
| $\mu\text{g/dscm @ 7\% O}_2^b$ | 0.114 | 0.00947 | 0.00 | 0.0412 |
| g/hr ^c | 0.00244 | 0.000237 | 0.00 | 0.000893 |
| Arsenic (As) | | | | |
| $\mu\text{g/dscm}^a$ | 0.608 | 0.133 | 0.188 | 0.310 |
| $\mu\text{g/dscm @ 7\% O}_2^b$ | 1.08 | 0.238 | 0.334 | 0.552 |
| g/hr ^c | 0.0232 | 0.00594 | 0.00712 | 0.0121 |
| Barium (Ba) | | | | |
| $\mu\text{g/dscm}^a$ | 49.9 | 8.37 | 4.39 | 20.9 |
| $\mu\text{g/dscm @ 7\% O}_2^b$ | 89.0 | 14.9 | 7.82 | 37.2 |
| g/hr ^c | 1.91 | 0.373 | 0.166 | 0.815 |
| Beryllium (Be) | | | | |
| $\mu\text{g/dscm}^a$ | ND | ND | ND | ND |
| $\mu\text{g/dscm @ 7\% O}_2^b$ | ND | ND | ND | ND |
| g/hr ^c | ND | ND | ND | ND |
| Cadmium (Cd) | | | | |
| $\mu\text{g/dscm}^a$ | 0.199 | 0.395 | 0.440 | 0.345 |
| $\mu\text{g/dscm @ 7\% O}_2^b$ | 0.355 | 0.704 | 0.784 | 0.614 |
| g/hr ^c | 0.00759 | 0.0176 | 0.0166 | 0.0139 |
| Chromium (Cr) | | | | |
| $\mu\text{g/dscm}^a$ | 1.47 | 0.161 | 0.125 | 0.584 |
| $\mu\text{g/dscm @ 7\% O}_2^b$ | 2.61 | 0.287 | 0.222 | 1.04 |
| g/hr ^c | 0.0560 | 0.00719 | 0.00472 | 0.0226 |
| Cobalt (Co) | | | | |
| $\mu\text{g/dscm}^a$ | 0.416 | ND | ND | 0.139 |
| $\mu\text{g/dscm @ 7\% O}_2^b$ | 0.741 | ND | ND | 0.247 |
| g/hr ^c | 0.0159 | ND | ND | 0.00529 |
| Copper (Cu) | | | | |
| $\mu\text{g/dscm}^a$ | 4.05 | 0.77 | 1.68 | 2.16 |
| $\mu\text{g/dscm @ 7\% O}_2^b$ | 7.21 | 1.37 | 2.99 | 3.86 |
| g/hr ^c | 0.155 | 0.0342 | 0.0635 | 0.0841 |
| Lead (Pb) | | | | |
| $\mu\text{g/dscm}^a$ | 6.07 | 1.41 | 26.6 | 11.4 |
| $\mu\text{g/dscm @ 7\% O}_2^b$ | 10.8 | 2.51 | 47.4 | 20.2 |
| g/hr ^c | 0.232 | 0.0628 | 1.01 | 0.434 |

^a Micrograms per dry standard cubic meter @ 20° C and 1 atm.

^b Micrograms per dry standard cubic meter @ 20°C and 1 atm, adjusted to 7% O₂.

^c Grams per hour.

ND - Not Detected.

TABLE 2.16 (Concluded)

**METALS CONCENTRATIONS AND EMISSION RATES
ROTARY DRUM DRYER - BAGHOUSE OUTLET
ASPHALT PRODUCTION WITH RAP
ASPHALT PLANT "A" - CLAYTON, NC**

| Run Number | S-M29-O-1 | S-M29-O-2 | S-M29-O-3 | Average |
|--|-----------|-----------|-----------|---------|
| Manganese (Mn) | | | | |
| μg/dscm ^a | 47.1 | 5.88 | 3.46 | 18.8 |
| μg/dscm @ 7% O ₂ ^b | 83.9 | 10.5 | 6.17 | 33.5 |
| g/hr ^c | 1.80 | 0.262 | 0.131 | 0.731 |
| Mercury (Hg) | | | | |
| μg/dscm ^a | 0.500 | 0.431 | 3.78 | 1.57 |
| μg/dscm @ 7% O ₂ ^b | 0.892 | 0.767 | 6.74 | 2.80 |
| g/hr ^c | 0.0191 | 0.0192 | 0.143 | 0.0605 |
| Nickel (Ni) | | | | |
| μg/dscm ^a | 0.868 | 0.298 | 0.784 | 0.650 |
| μg/dscm @ 7% O ₂ ^b | 1.55 | 0.53 | 1.40 | 1.16 |
| g/hr ^c | 0.0332 | 0.0133 | 0.0297 | 0.0254 |
| Phosphorus (P) | | | | |
| μg/dscm ^a | 90.9 | 20.4 | 25.3 | 45.5 |
| μg/dscm @ 7% O ₂ ^b | 162 | 36.3 | 45.1 | 81.2 |
| g/hr ^c | 3.47 | 0.909 | 0.959 | 1.78 |
| Silver (Ag) | | | | |
| μg/dscm ^a | ND | 0.00 | 0.151 | 0.0505 |
| μg/dscm @ 7% O ₂ ^b | ND | 0.00 | 0.270 | 0.0900 |
| g/hr ^c | ND | 0.00 | 0.00573 | 0.00191 |
| Selenium (Se) | | | | |
| μg/dscm ^a | 0.139 | 0.0603 | 2.32 | 0.840 |
| μg/dscm @ 7% O ₂ ^b | 0.248 | 0.107 | 4.13 | 1.50 |
| g/hr ^c | 0.00532 | 0.00269 | 0.0877 | 0.0319 |
| Thallium (Tl) | | | | |
| μg/dscm ^a | ND | 0.0372 | 0.0562 | 0.0311 |
| μg/dscm @ 7% O ₂ ^b | ND | 0.0663 | 0.100 | 0.0555 |
| g/hr ^c | ND | 0.00166 | 0.00213 | 0.00126 |
| Zinc (Zn) | | | | |
| μg/dscm ^a | 32.3 | 10.4 | 9.22 | 17.3 |
| μg/dscm @ 7% O ₂ ^b | 57.5 | 18.6 | 16.4 | 30.8 |
| g/hr ^c | 1.23 | 0.464 | 0.349 | 0.682 |

^a Micrograms per dry standard cubic meter @ 20°C and 1 atm.

^b Micrograms per dry standard cubic meter @ 20°C and 1 atm, adjusted to 7% O₂.

^c Grams per hour.

ND - Not detected

TABLE 2.17

**PARTICULATE/METALS EMISSIONS SAMPLING AND
STACK GAS PARAMETERS
ROTARY DRUM DRYER - BAGHOUSE OUTLET
ASPHALT PRODUCTION WITHOUT RAP
ASPHALT PLANT "A" - CLAYTON, NC**

| Run Number | S-M29-O-4 |
|--|------------------|
| Date | 8/21/97 |
| Time | 0741-1153 |
| Sampling Duration, minutes | 240 |
| Average Sampling Rate, dscfm ^a | 0.702 |
| Sample Volume: | |
| dscf ^b | 168.390 |
| dscm ^c | 4.768 |
| Stack Gas Temperature, °F | 180 |
| O ₂ Concentration, % by volume | 10.8 |
| CO ₂ Concentration, % by volume | 3.2 |
| Moisture, % by volume | 18.7 |
| Stack Gas Volumetric Flow Rate: | |
| acfm ^d | 36,415 |
| dscfm ^a | 24,240 |
| dscmm ^e | 686 |
| Isokinetic Sampling Ratio, % | 95.0 |
| Stack Gas Opacity: | |
| Average Opacity, % | < 5 |
| Calculated Average, % | 0.104 |
| Max. Single Reading, % | 5 |
| Max. 6-min. Block Avg., % | 0.42 |
| Max. 6-min Rolling Avg., % | 0.42 |

^a Dry standard cubic feet per minute at 68°F and 1 atm.

^b Dry standard cubic feet at 68°F and 1 atm.

^c Dry standard cubic meters at 20°C and 1 atm.

^d Actual cubic feet per minute at stack conditions.

^e Dry standard cubic meters per minute at 20°C and 1 atm.

TABLE 2.18

**PARTICULATE MATTER CONCENTRATIONS AND EMISSION RATES
ROTARY DRUM DRYER - BAGHOUSE OUTLET
ASPHALT PRODUCTION WITHOUT RAP
ASPHALT PLANT "A" - CLAYTON, NC**

| Run Number | S-M29-O-4 |
|--|-----------|
| Date | 8/21/97 |
| Time | 0741-1153 |
| Particulate Matter Concentration: | |
| gr/dscf ^a | 0.00122 |
| gr/dscf @ 7% O ₂ ^b | 0.00168 |
| g/dscm ^c | 0.00279 |
| g/dscm @ 7% O ₂ ^d | 0.00384 |
| Particulate Matter Emission Rate: | |
| lb/hr ^e | 0.253 |
| kg/hr ^f | 0.115 |

^a Grains per dry standard cubic foot at 68°F and 1 atm.

^b Grains per dry standard cubic foot at 68°F and 1 atm adjusted to 7 percent O₂.

^c Grams per dry standard cubic meter at 20°C and 1 atm.

^d Grams per dry standard cubic meter at 20°C and 1 atm adjusted to 7 percent O₂.

^e Pounds per hour.

^f Kilograms per hour.

TABLE 2.19

**METALS CONCENTRATIONS AND EMISSION RATES
ROTARY DRUM DRYER BAGHOUSE OUTLET
ASPHALT PRODUCTION WITHOUT RAP
ASPHALT PLANT "A" - CLAYTON, NC**

| Run Number | S-M29-O-4 |
|--------------------------------|-----------|
| Date | 8/21/97 |
| Time | 0741-1153 |
| Antimony (Sb) | |
| $\mu\text{g/dscm}^a$ | 0.00 |
| $\mu\text{g/dscm @ 7\% O}_2^b$ | 0.00 |
| g/hr ^c | 0.00 |
| Arsenic (As) | |
| $\mu\text{g/dscm}^a$ | ND |
| $\mu\text{g/dscm @ 7\% O}_2^b$ | ND |
| g/hr ^c | ND |
| Barium (Ba) | |
| $\mu\text{g/dscm}^a$ | 2.06 |
| $\mu\text{g/dscm @ 7\% O}_2^b$ | 2.84 |
| g/hr ^c | 0.0849 |
| Beryllium (Be) | |
| $\mu\text{g/dscm}^a$ | ND |
| $\mu\text{g/dscm @ 7\% O}_2^b$ | ND |
| g/hr ^c | ND |
| Cadmium (Cd) | |
| $\mu\text{g/dscm}^a$ | ND |
| $\mu\text{g/dscm @ 7\% O}_2^b$ | ND |
| g/hr ^c | ND |
| Chromium (Cr) | |
| $\mu\text{g/dscm}^a$ | 0.00881 |
| $\mu\text{g/dscm @ 7\% O}_2^b$ | 0.0121 |
| g/hr ^c | 0.000363 |
| Cobalt (Co) | |
| $\mu\text{g/dscm}^a$ | ND |
| $\mu\text{g/dscm @ 7\% O}_2^b$ | ND |
| g/hr ^c | ND |
| Copper (Cu) | |
| $\mu\text{g/dscm}^a$ | 0.277 |
| $\mu\text{g/dscm @ 7\% O}_2^b$ | 0.381 |
| g/hr ^c | 0.0114 |
| Lead (Pb) | |
| $\mu\text{g/dscm}^a$ | 0.371 |
| $\mu\text{g/dscm @ 7\% O}_2^b$ | 0.511 |
| g/hr ^c | 0.0153 |

^a Micrograms per dry standard cubic meter @ 20°C and 1 atm.

^b Micrograms per dry standard cubic meter @ 20°C and 1 atm, adjusted to 7% O₂.

^c Grams per hour.

TABLE 2.19 (Concluded)

**METALS CONCENTRATIONS AND EMISSION RATES
ROTARY DRUM DRYER - BAGHOUSE OUTLET
ASPHALT PRODUCTION WITHOUT RAP
ASPHALT PLANT "A" - CLAYTON, NC**

| Run Number | S-M29-O-4 |
|---|------------------|
| Manganese (Mn) | |
| $\mu\text{g/dscm}^{\text{a}}$ | 14.8 |
| $\mu\text{g/dscm @ 7\% O}_2^{\text{b}}$ | 20.4 |
| g/hr^{c} | 0.611 |
| Mercury (Hg) | |
| $\mu\text{g/dscm}^{\text{a}}$ | 0.438 |
| $\mu\text{g/dscm @ 7\% O}_2^{\text{b}}$ | 0.603 |
| g/hr^{c} | 0.0181 |
| Nickel (Ni) | |
| $\mu\text{g/dscm}^{\text{a}}$ | 0.0778 |
| $\mu\text{g/dscm @ 7\% O}_2^{\text{b}}$ | 0.107 |
| g/hr^{c} | 0.00320 |
| Phosphorus (P) | |
| $\mu\text{g/dscm}^{\text{a}}$ | 15.2 |
| $\mu\text{g/dscm @ 7\% O}_2^{\text{b}}$ | 20.9 |
| g/hr^{c} | 0.624 |
| Silver (Ag) | |
| $\mu\text{g/dscm}^{\text{a}}$ | 0.00 |
| $\mu\text{g/dscm @ 7\% O}_2^{\text{b}}$ | 0.00 |
| g/hr^{c} | 0.00 |
| Selenium (Se) | |
| $\mu\text{g/dscm}^{\text{a}}$ | 0.00 |
| $\mu\text{g/dscm @ 7\% O}_2^{\text{b}}$ | 0.00 |
| g/hr^{c} | 0.00 |
| Thallium (Tl) | |
| $\mu\text{g/dscm}^{\text{a}}$ | ND |
| $\mu\text{g/dscm @ 7\% O}_2^{\text{b}}$ | ND |
| g/hr^{c} | ND |
| Zinc (Zn) | |
| $\mu\text{g/dscm}^{\text{a}}$ | 4.80 |
| $\mu\text{g/dscm @ 7\% O}_2^{\text{b}}$ | 6.61 |
| g/hr^{c} | 0.198 |

^a Micrograms per dry standard cubic meter @ 20° C and 1 atm.

^b Micrograms per dry standard cubic meter @ 20°C and 1 atm, adjusted to 7% O₂.

^c Grams per hour.

2.4 DETERMINATION OF VISIBLE EMISSIONS

Visible Emissions Observations (VEOs) of the stack exhaust were made during the testing by a certified observer. Observations were made simultaneously with the testing, except during the first run when VEOs were suspended during the period from 1207 to 1304 when the location of the sun was directly over the observer. The average opacity during asphalt production with RAP is presented along with the outlet stack gas parameters in Table 2.14. For each run the calculated average opacities were 2.15, 1.21, and 0.702%. Since VEO observations are recorded in 5% increments, the average opacity during these runs is more properly reported as less than 5% opacity. Also presented are the maximum single opacity observed, the maximum 6-minute block average, and the maximum 6-minute rolling average during each test run. During the production of asphalt without RAP, the the calculated average opacity of the outlet gas stream was 0.104%; however, this result is more properly reported as an average opacity of < 5 %. The opacity data during production with RAP are presented along with the stack gas parameters in Table 2.17.

3.0 PROCESS DESCRIPTION

The Asphalt Plant "A" concrete production facility in Clayton, North Carolina, has been in operation since 1989. It is a counter flow, continuous drum mix process. The dryer/mixer is an ASTEC double-barrel drum, a variation of the drum mixer, with a rated capacity of 400 tons per hour (tph). The plant has the capability of producing up to 15 asphalt mix types, with or without the use of RAP.

Asphalt concrete, called "hot mix asphalt" (HMA) by the industry, is a mixture of well-graded, high quality aggregate that is heated and mixed with liquid asphalt cement to produce paving material. The characteristics of the asphalt concrete are determined by the relative amounts and types of aggregate (and RAP) used. In the asphalt reclamation process, old asphalt pavement is removed from the road surface, transported to the plant, and crushed and screened to the appropriate size for further processing.

In the counter flow continuous double-barrel drum mix process, virgin aggregate of various sizes is fed to the drum by cold feed controls in proportions dictated by the final mix specifications. Aggregate is delivered by conveyor belt to the inner drum, entering at the opposite end of the burner (hence, the descriptor "counter" flow). The aggregate moves toward the burner within the inner drum and is dried. The hot aggregate falls to the outer drum through holes at the burner end of the inner drum. As the hot aggregate moves along the outer drum, liquid asphalt cement and conditioner are delivered to the drum mixer by a variable flow pump that is electronically linked to the aggregate feed weigh scales. Recycled dust from the control system and RAP (if used) are also added into the outer drum. The resulting asphalt concrete mixture is discharged from the outer drum and conveyed to storage silos for delivery to trucks.

There are five cold storage bins and three hot mix storage silos at Asphalt Plant "A". The hot mix storage silo capacity is 200 tons each, for a total of 600 tons. There are three screens for aggregate sizing and one 52,000 gallon (130 ton) heated asphalt cement storage vessel. The plant uses virgin and recycled No. 2 fuel oil, supplied by Noble Oil Services, Inc., for all its process fuel needs. A fuel assay report is presented in Appendix A. Virgin fuel oil is used during extremely cold weather and/or if there is a fuel-related problem with the burner. Therefore, virgin fuel is usually only used during the winter months (January/February). The amount of energy needed from the fuel for the asphalt production process is 225,600 BTU per ton of asphalt produced. The hot gas contact time with the aggregate is approximately one minute, and the process time from the beginning of the drum to the coater is approximately six minutes.

Asphalt Plant "A" uses an asphalt cement (AC) called AC-20, obtained from Citgo of Wilmington, North Carolina. An anti-strip conditioner, called Perma-Tac (from Arr-Maz), is sometimes used; antistrip is required for all North Carolina Department of Transportation jobs. For PM control, the Asphalt Plant "A" facility uses a fabric filter. The fabric filter is an ASTEC Pulse-Jet, equipped with 1,024 14-ounce Nomex bags and is operated with an air-to-cloth ratio of 5.54:1 feet per minute. The process exits the drum and coater and proceeds into the fabric filter, where it is exhausted through a stack. As mentioned above, the dust collected by the PM control devices is recycled to the process.

Data were taken at 15-minute intervals during the entire "test period" (i.e., the time period when at least one manual and both instrumental tests were running). According to plant personnel, the plant was operating under normal conditions during the tests.

The average asphalt concrete production rates during the four test runs were 171, 276, 240, and 185 tph, respectively, corresponding to total production of 735, 1,187, 840, and 778 tons. During the first three test runs (August 19 and August 20), a surface asphalt coating that included RAP was produced. During the fourth test run (August 21), a surface coating (accounting for 75 % of the total asphalt concrete produced) and a binder coating (accounting for 25 % of total production) were produced, both without RAP. Recycled No. 2 fuel oil was used for fuel in the production process during the tests. Conditioner was used during the four test runs at a rate of 0.25 % of the asphalt cement used, for a total of 186, 302, 220, and 200 pounds, respectively, during the four test runs.

Table 3.1 summarizes the operating conditions observed during the EPA source test periods at Asphalt Plant "A". Tables 3.2 and 3.3 describe the asphalt mixes produced and the fuel used, respectively, during the tests. Table 3.4 describes the specifics of plant operation during the tests. Appendix A shows all the data recorded during the tests, along with the results of statistical analyses.

TABLE 3.1
PLANT OPERATING CONDITIONS
ASPHALT PLANT "A" - CLAYTON, NC

| Process Data | Test Run | | | |
|--|--|--|--|---|
| | S-M23-O-1 S-M29-O-1 8/19/97 0915-1456 | S-M23-O-2 S-M29-O-2 8/20/97 0822-1240 | S-M23-O-3 S-M29-O-3 8/20/97 1405-1735 | S-M23-O-4 S-M29-O-4 8/21/97 0741-1153 |
| Product Type(s)* | surface mix, with RAP (BCSC, Type RDS) | surface mix, with RAP (BCSC, Type RDS) | surface mix, with RAP (BCSC, Type RDS) | surface mix, no RAP (BCSC, Type HDS); and binder (BCBC, Type H) |
| Asphalt Concrete Production Rate, tph Average ^b Range Total Produced, tons | 171 146-254 735 | 276 223-302 1,187 | 240 152-254 840 | 185 150-204 778 |
| Mix Temperature, °F Average ^b Range | 305 295-315 | 312 303-346 | 310 299-322 | 308 271-351 |
| Raw Material (Virgin Aggregate) Use Rate, tph Average ^b Range Total Used, tons | 145 126-213 622 | 236 191-255 1,013 | 205 138-215 718 | 176 142-194 740 |
| RAP Use rate, tph Average ^b Range Total Used, tons | 18 13-27 76 | 28 21-32 119 | 24 17-27 85 | none |
| Asphalt Cement Use rate, tph Average ^b Range Total Used, tons | 8.7 7.5-12.6 37 | 14.0 11.4-15.5 60 | 12.3 7.8-13.0 43 | 9.2 7.8-10.6 39 |
| Conditioner (lb) ^c | 186 | 302 | 216 | 200 |

TABLE 3.1 (Concluded)

**PLANT OPERATING CONDITIONS
ASPHALT PLANT "A" - CLAYTON, NC**

| Process Data | Test Run | | | |
|--|--|--|--|--|
| | S-M23-O-1 S-M29-O-1 8/19/97 0915-1456 | S-M23-O-2 S-M29-O-2 8/20/97 0822-1240 | S-M23-O-3 S-M29-O-3 8/20/97 1405-1735 | S-M23-O-4 S-M29-O-4 8/21/97 0741-1153 |
| Fabric Filter Operation^b | | | | |
| Temperature, °F | | | | |
| Inlet | 193 | 255 | 232 | 201 |
| Outlet | 170 | 214 | 195 | 175 |
| Pressure Drop inches water | | | | |
| Average ^b | 1.8 | 3.3 | 2.5 | 1.9 |
| Range | 1.5-2.9 | 2.1-4.0 | 1.8-2.9 | 1.8-2.0 |
| Fuel | | | | |
| Use Rate, ^d gal/hr | 214 | 410 | 334 | 280 |
| Total Used, gal | 920 | 1,762 | 1,168 | 1,117 |

^a BCSC, Type HDS = bituminous concrete, surface coarse, type high density surface
BCSC, Type RDS = bituminous concrete, surface coarse, type high density surface with RAP
BCBC, Type H = bituminous concrete, binder coarse (type H)
(See Table 3.2 for more detail on product specifications)

^b As a straight average of the 15-minute interval data shown in Appendix A.

^c The amount of conditioner used was calculated as 0.25 percent of the asphalt cement.

^d Fuel use rate was calculated from the total fuel used during the time interval.

TABLE 3.2

**ASPHALT MIX SPECIFICATIONS
ASPHALT PLANT "A" - CLAYTON, NC**

| Product | Material | Amount |
|---|--|--|
| Surface Coating (BCSC, Type HDS) | 78-M screenings sand asphalt cement conditioner | 50% aggregate 30% aggregate 20% aggregate 5.2% mix 0.25% cement |
| Surface Coating, with RAP (BCSC, Type RDS) | 78-M dry screenings natural sand RAP Asphalt cement total additional from RAP conditioner | 43% aggregate 27% aggregate 20% aggregate 10% aggregate 5.1% mix 4.6% mix 0.5% mix 0.25% cement |
| Binder (BCBC, Type H) | 78-M #67 screenings sand asphalt cement conditioner | 16% aggregate 46% aggregate 20% aggregate 18% aggregate 4.5% mix 0.25% cement |

TABLE 3.3

**FUEL SPECIFICATIONS
ASPHALT PLANT "A" - CLAYTON, NC**

| Fuel Type | Characteristics | Descriptor(s) |
|------------------|---|----------------------------|
| OIL | flash point 150°F lead 28 mg/kg sulfur 3590 mg/kg (0.36%) | recycled no. 2 diesel fuel |

TABLE 3.4

**SPECIFICS OF PLANT OPERATION
ASPHALT PLANT "A" - CLAYTON, NC**

| Parameter | Test Run | | | |
|--|---|--|--|--|
| | S-M23-O-1 S-M29-O-1 8/19/97 0915-1456 | S-M23-O-2 S-M29-O-2 8/20/97 0822-1240 | S-M23-O-3 S-M29-O-3 8/20/97 1405-1735 | S-M23-O-4 S-M29-O-4 8/21/97 0741-1153 |
| Plant Shut Downs ^a (with approximate duration) | none | 0930 (14 min) | none | none |
| Plant Production Rate Change(s) | 1115-1145: mix rate slowed from nominally 250 to 200 tph 1200-1500: mix rate slowed from nominally 200 to 150 tph | 0945-1245: mix rate increased from nominally 225 to 300 tpy | 1715-1745: mix rate decreased from nominally 250 to 150 tph | 1030-1200: mix rate increased from nominally 180 to 200 tph |
| Produce Changes | none | none | none | 0730-0815, 0900-0915, 1015-1115: HDS produced (600 tons) 0830-0900, 0915-1000, 1155-1200: binder produced 195 tons) |

^a Shutdown occurred because the RAP feed went down.

4.0 SAMPLING LOCATIONS

Isokinetic sampling runs were attempted at both the baghouse inlet and outlet sampling locations, but sampling was canceled at the baghouse inlet at the direction of the EPA WAM. Detailed descriptions of the sampling locations and traverse point layouts follow.

4.1 BAGHOUSE INLET SAMPLING LOCATION

The baghouse inlet location consisted of a 48-1/2-inch diameter round duct which connected the outlet of the drier to the baghouse. A schematic diagram of the inlet sampling location is presented in Figure 4.1. The duct exited the drier vertically, made a 90° bend for the run over to the baghouse, and made a second 90° bend prior to running down into the baghouse. In order to enable for the extraction of gas samples at the baghouse inlet, plant personnel installed two four-inch sample ports 25 inches upstream of the entrance to the baghouse. The nearest upstream disturbance to the sample port was a downward turning elbow, which was located 28 inches (0.58 diameters) from the sample ports. The nearest disturbance downstream of the sample ports was the entrance into the baghouse, which was located 25 inches (0.52 diameters) from the sample ports. Based upon the criteria outlined in Method 1, this sample location was not suitable for isokinetic source sampling. However, after consultation with EPA EMC and EPA ESD personnel, the location was selected because an alternate location with better stack geometry did not exist.

To conduct isokinetic sampling at this location, PES selected the maximum number of sample points for particulate traverses as specified in Method 1, which was 24. The 24-point sampling matrix (which is presented in Figure 4.2) consisted of two twelve-point sample traverses on diameters offset 90° to each other. Prior to the initiation of isokinetic sampling activities at this location, a cyclonic flow check using a Type-S pitot tube was conducted. The results of the cyclonic flow check indicated an average rotation angle from null (α) of 7.2°. Since this angle was less than 20° as specified in Method 1, the sampling location was considered acceptable for isokinetic sampling without modification to the duct or the sampling method.

4.2 BAGHOUSE OUTLET SAMPLING LOCATION

The baghouse outlet sampling location consisted of a square stack attached to the opposite end of the baghouse from the inlet duct. The stack was 49-3/4 inches deep by 33 inches wide, and the equivalent duct diameter was 39.7 inches. Six sample ports were located in the

49-3/4 inch wall. The nearest downstream disturbance from the sample ports was the stack exit, which was located 24 inches (0.60 equivalent duct diameters) from the sample ports. The nearest upstream disturbance to the sample ports was the baghouse ID fan, which was located 88 inches (2.2 equivalent duct diameters) from the sample ports. For this sample location, the minimum number of sample points specified by Method 1 was 24. Accordingly, PES used a 24-point sampling matrix consisting of six four-point sample traverses. Figure 4.3 presents a schematic diagram of the baghouse outlet sampling location. Figure 4.4 presents the baghouse outlet sample traverse point locations.

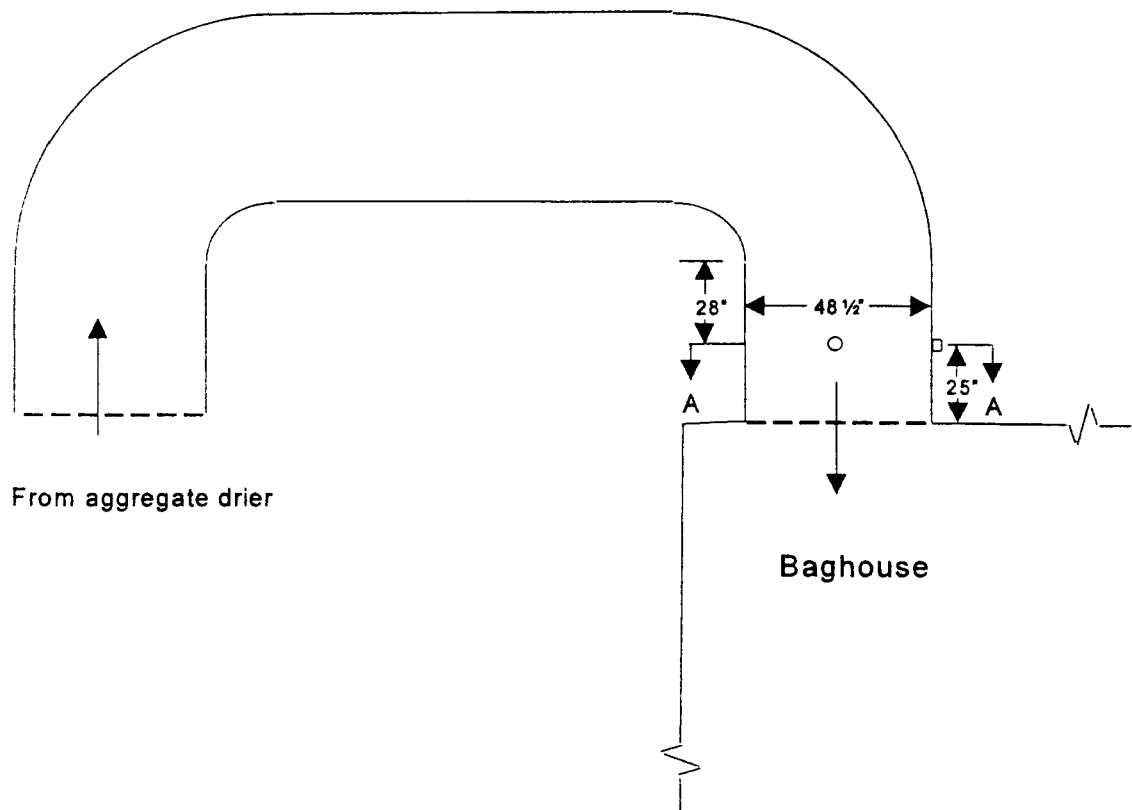
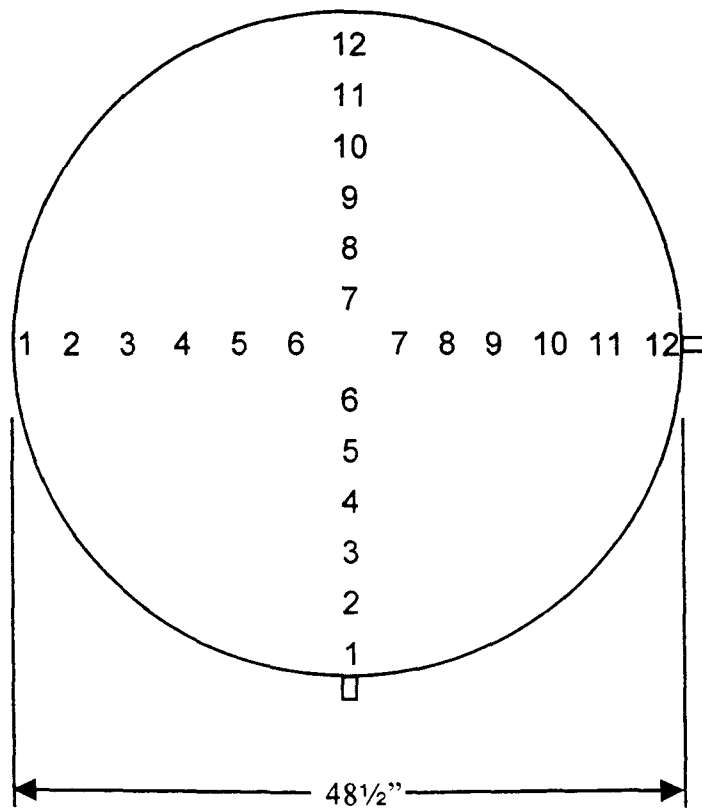


Figure 4.1 Baghouse Inlet Sampling Location - Asphalt Plant "A", Clayton, NC



Section A

| Traverse Point Number | Distance from inside wall inches |
|-----------------------------|--|
| 1 | 1.02 |
| 2 | 3.25 |
| 3 | 5.72 |
| 4 | 8.58 |
| 5 | 12.1 |
| 6 | 17.3 |
| 7 | 31.2 |
| 8 | 36.4 |
| 9 | 39.9 |
| 10 | 42.8 |
| 11 | 45.3 |
| 12 | 47.5 |

Figure 4.2 Baghouse Inlet Point Locations - Asphalt Plant "A", Clayton, NC

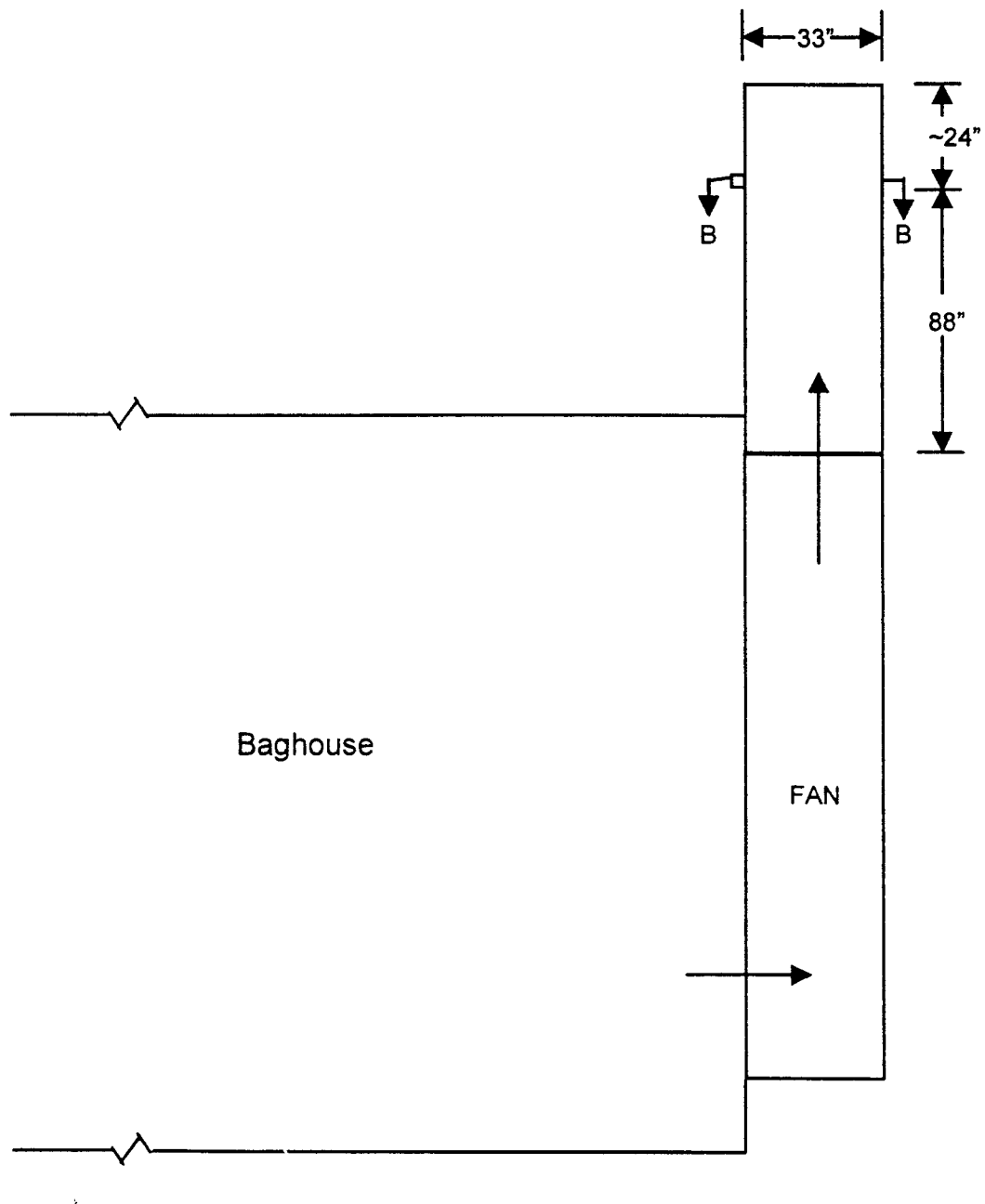
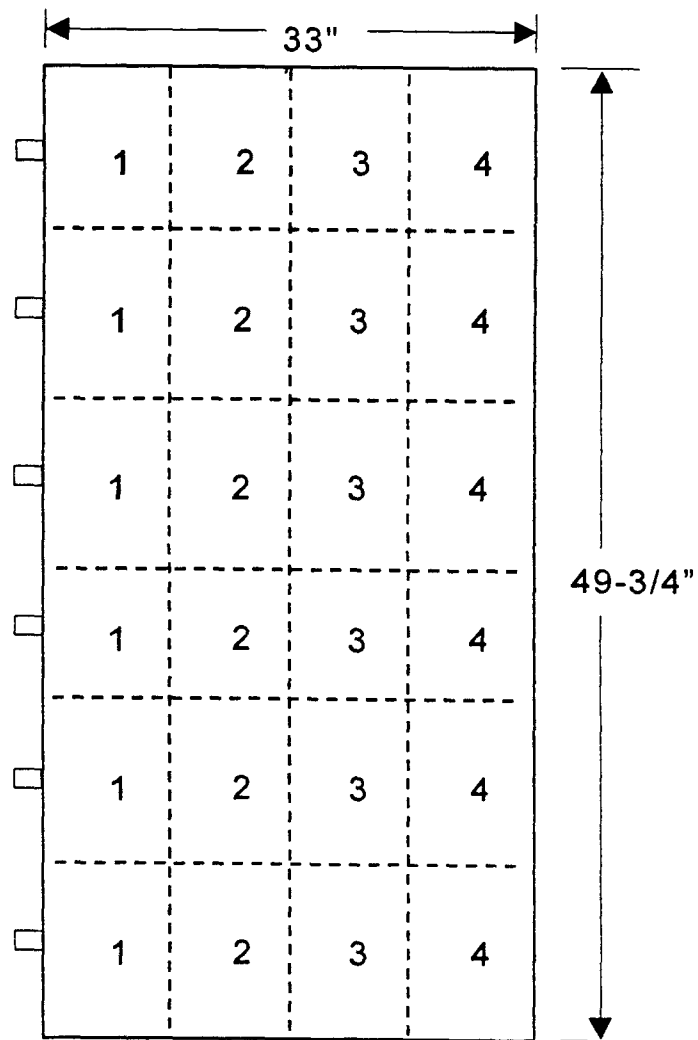


Figure 4.3 Baghouse Outlet Sampling Location - Asphalt Plant "A", Clayton, NC



Section B

| Traverse Point Number | Distance from Inside wall (inches) |
|-----------------------------|--|
| 1 | 4.1 |
| 2 | 12.4 |
| 3 | 20.6 |
| 4 | 28.9 |

Figure 4.4 Baghouse Outlet Point Locations - Asphalt Plant "A", Clayton, NC

5.0 SAMPLING AND ANALYSIS PROCEDURES

Table 5.1 summarizes the sampling locations, test parameters, test methods, number of tests, and net run time of each test event. Brief descriptions of each method follow:

5.1 LOCATION OF MEASUREMENT SITES AND SAMPLE/VELOCITY TRAVERSE POINTS

EPA Method 1, "Sample and Velocity Traverses for Stationary Sources," was used to select the measurement site at the baghouse outlet, and as a guideline for the selection of the measurement site at the baghouse inlet. The cyclonic flow check procedure outlined in Method 1 was used to evaluate the suitability of the inlet location for isokinetic sampling. The sample traverse locations at both the inlet and the outlet sampling locations were determined using Method 1 procedures. The measurement sites are discussed in Section 4.0.

5.2 DETERMINATION OF STACK GAS VOLUMETRIC FLOW RATE

EPA Method 2, "Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube)," was used to determine gas volumetric flow rate at the baghouse inlet and outlet. A Type S pitot tube, constructed according to Method 2 criteria and having an assigned coefficient of 0.84, was connected to an inclined-vertical manometer and used to measure velocity pressure. A Type K thermocouple attached directly to the pitot tube was used to measure gas temperature. For each sampling run, the gas velocity was calculated from the average of the square roots of the velocity pressure readings, the average gas temperature, the molecular weight, and the stack static pressure. The volumetric flow rate was calculated as the product of the average gas velocity and the duct cross-sectional area.

5.3 DETERMINATION OF DRY MOLECULAR WEIGHT AND EMISSION CORRECTION FACTORS

EPA Method 3B, "Gas Analysis for the Determination of Emission Rate Correction Factor or Excess Air," was used to measure CO₂ and O₂ content of the stack gases. Gas samples were extracted from the baghouse outlet using the integrated, single-point bag sampling technique. The bag contents were analyzed onsite within four hours after sample collection using an Orsat® analyzer to determine concentrations of CO₂ and O₂. The Orsat® analyzer used for gas analysis had 0.2 % subdivisions.

TABLE 5.1
SAMPLING LOCATIONS, TEST PARAMETERS, AND
TEST METHODS SUMMARY
ASPHALT PLANT "A" - CLAYTON, NC

| Sampling Location | Parameter | Test Methods | No. of Tests | Net Run Time, Minutes |
|--------------------------|---------------------------------|---------------------|---------------------|------------------------------|
| <u>Baghouse Inlet</u> | Flow Rate | EPA 1 & 2 | 1 | 20 |
| | O ₂ /CO ₂ | EPA 3 | 1 | 20 |
| | Moisture | EPA 4 | 1 | 20 |
| | PCDDs/PCDFs | EPA 23 | 1 | 20 |
| | PM/Metals | EPA 29 | 1 | 20 |
| <u>Baghouse Outlet</u> | Flow Rate | EPA 1 & 2 | 3 | 240 |
| | O ₂ /CO ₂ | EPA 3 | 3 | 240 |
| | Moisture | EPA 4 | 3 | 240 |
| | PCDDs/PCDFs | EPA 23 | 3 | 240 |
| | PM/Metals | EPA 29 | 3 | 240 |

5.4 DETERMINATION OF STACK GAS MOISTURE CONTENT

EPA Method 4, "Determination of Moisture Content in Stack Gases," was used to determine gas moisture content. The quantity of condensate collected during each sampling run was determined gravimetrically as the difference of the pre- and post-test impinger weights. The gas moisture volume was then calculated as the ratio of the moisture volume (assuming a conversion factor of 0.0415 grams per cubic foot) to the sum of the moisture volume and the dry gas volume as indicated by the dry gas meter. The Method 4 procedure was conducted simultaneously with each Method 23 and Method 29 sampling run.

5.5 DETERMINATION OF POLYCHLORINATED DIBENZO-P-DIOXINS AND POLYCHLORINATED DIBENZOFURANS

EPA Method 23, "Determination of Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans From Stationary Sources" was used to determine PCDDs and PCDFs at the baghouse inlet and outlet. A schematic of the Method 23 sampling train is shown in Figure 5.1. Gas samples were extracted from the gas streams isokinetically, and passed through a glass nozzle, heated glass-lined sample probe, a heated glass fiber filter, a coil

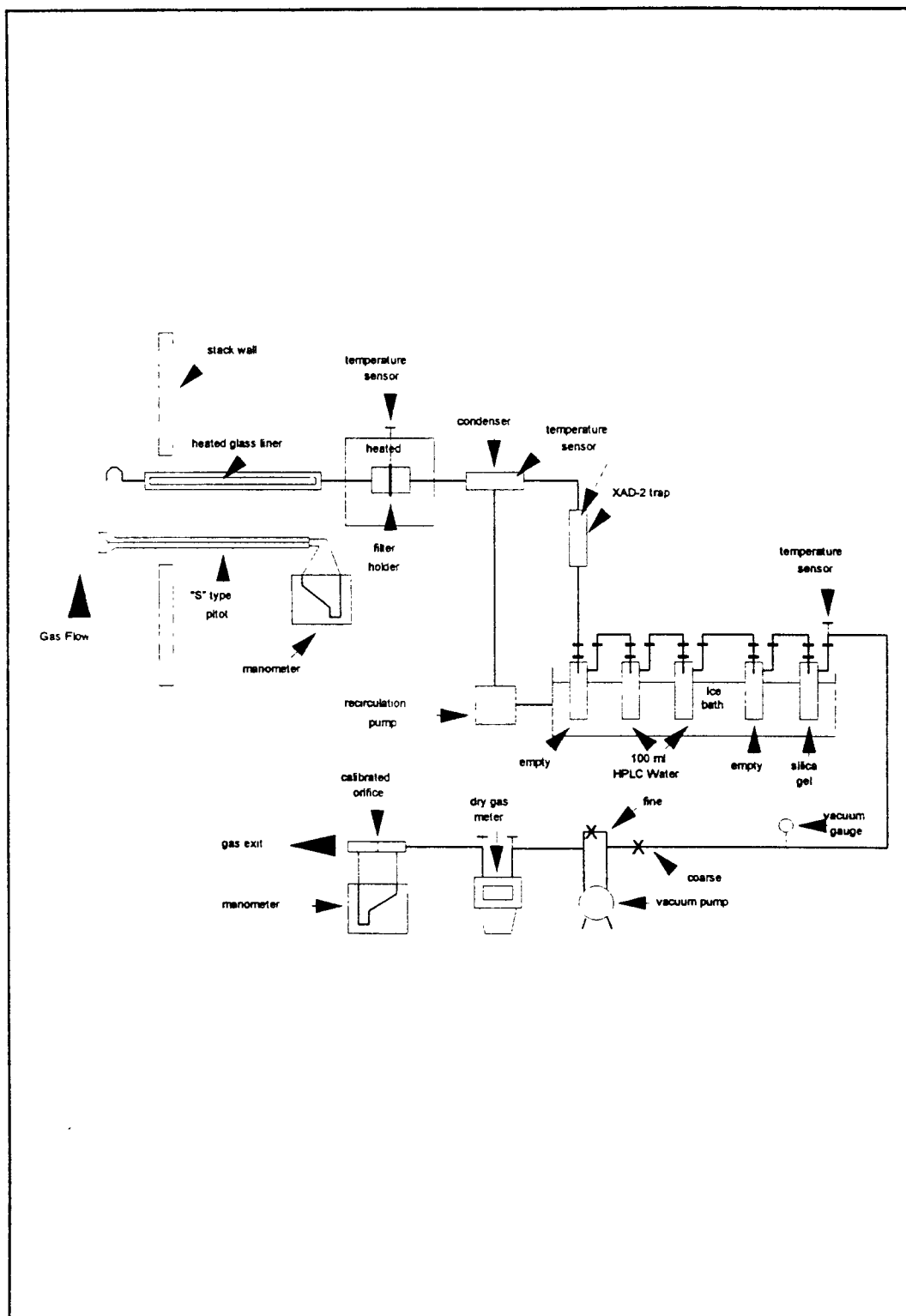


Figure 5.1 Method 23 Sample Train Schematic - Asphalt Plant "A", Clayton NC

condenser, and a sorbent resin trap containing approximately 40 grams of spiked XAD[®]-2 sorbent resin. Ice water from the impinger bath was continuously recirculated through water jackets on the coil condenser and the XAD[®]-2 sorbent resin trap to cool the sample gas and facilitate absorption of PCDDs and PCDFs onto the XAD[®]-2 resin. At the conclusion of each sample run, the sample train components (except the sorbent trap) were rinsed with pesticide-grade acetone, methylene chloride, and toluene.

Upon receipt by the subcontract laboratory, TLI, the samples were concentrated combined, and analyzed using a GC/MS. Sample aliquots were initially separated using a DB-5 capillary column. In cases where the results of the analyses using the DB-5 column indicated the presence of 2378 PCDFs; the sample was re-analyzed using a DB-225 capillary column, and the results of the DB-225 analysis were used for the subsequent calculations of emission rate and toxic equivalency for the 2378 PCDFs congener.

5.6 DETERMINATION OF PARTICULATE MATTER AND METALS

EPA Method 29, "Determination of Metals Emissions From Stationary Sources," was used to determine filterable PM and metals at the baghouse inlet and baghouse outlet locations. The target metals included: Antimony (Sb), Arsenic (As), Barium (Ba), Beryllium (Be), Cadmium (Cd), Chromium (Cr), Cobalt (Co), Copper (Cu), Lead (Pb), Manganese (Mn), Mercury (Hg), Nickel (Ni), Phosphorus (P), Silver (Ag), Selenium (Se), Thallium (Tl), and Zinc (Zn). A Method 29 sampling train schematic is presented in Figure 5.2.

Gas samples were withdrawn from the gas streams isokinetically and through a glass nozzle, heated glass-lined sample probe, a heated quartz fiber filter, and an impinger train containing reagents for the absorption of metals. The first impinger in the train was empty, the second and third impingers each contained 100 milliliters (ml) of a 5 % nitric acid (HNO₃)/10 % hydrogen peroxide (H₂O₂) solution, the fourth impinger was empty, the fifth and sixth impingers each contained 100 ml of a 4 % potassium permanganate (KMnO₄)/10 % sulfuric acid (H₂SO₄) solution, and the last impinger contained a known quantity of silica gel.

The sample recovery scheme for metals is shown in Figures 5.3 and 5.4. At the conclusion of each sampling run, the front half of the sampling train (i.e., in front of the tared quartz fiber filter) was rinsed with acetone followed by a solution of 0.1 N HNO₃. The first three impingers were quantitatively recovered and rinsed with 100 ml of HNO₃ solution; the impinger contents and the rinses were collected in a pre-cleaned glass sample bottle. The contents of the fourth and fifth impingers were recovered and impingers rinsed with 100 ml of fresh acidified potassium permanganate solution, followed by a rinse with 100 ml of deionized water into a pre-cleaned glass sample bottle. The fourth and fifth impingers were then rinsed with 25 ml of 8 N HCL solution, which was collected in pre-cleaned glass sample jar containing 200 ml of deionized water.

Analyses for the determination of PM concentrations and emission rates were conducted at PES' facilities in Research Triangle Park, NC. The acetone and nitric acid probe rinses and the filters were transferred to pre-cleaned, tared beakers, evaporated to dryness, desiccated, and

weighed to constant weight. At the conclusion of the PM analysis, the beakers were sealed with Parafilm™ and transported to the subcontract laboratory, TLI, for determination of the target metals content. Each sample run generated two fractions for the analysis of all target metals except mercury, and five fractions for analysis of mercury. Analysis for the target metals was conducted according to the sample analysis scheme presented in Figures 5.3 and 5.4. Except for mercury, analyses of the target metals were conducted using the analytical method which resulted in the lowest detection for each metal; either graphite furnace atomic absorption spectroscopy (GFAAS), or inductively coupled argon plasma (ICP) emission spectroscopy. Analysis for mercury content was determined using cold vapor atomic absorption spectroscopy (CVAAS).

5.7 DETERMINATION OF PLUME OPACITY

EPA Method 9, "Visual Determination of the Opacity of Emissions from Stationary Sources" was used to quantify visible emissions from the baghouse outlet stack. DEECO, PES' subcontractor, provided a certified VEO. The observer was certified to read plume opacities at a field training session held in Raleigh, North Carolina by Eastern Technical Associates of Raleigh, North Carolina on March 12, 1997 (Certificate No. 257158).

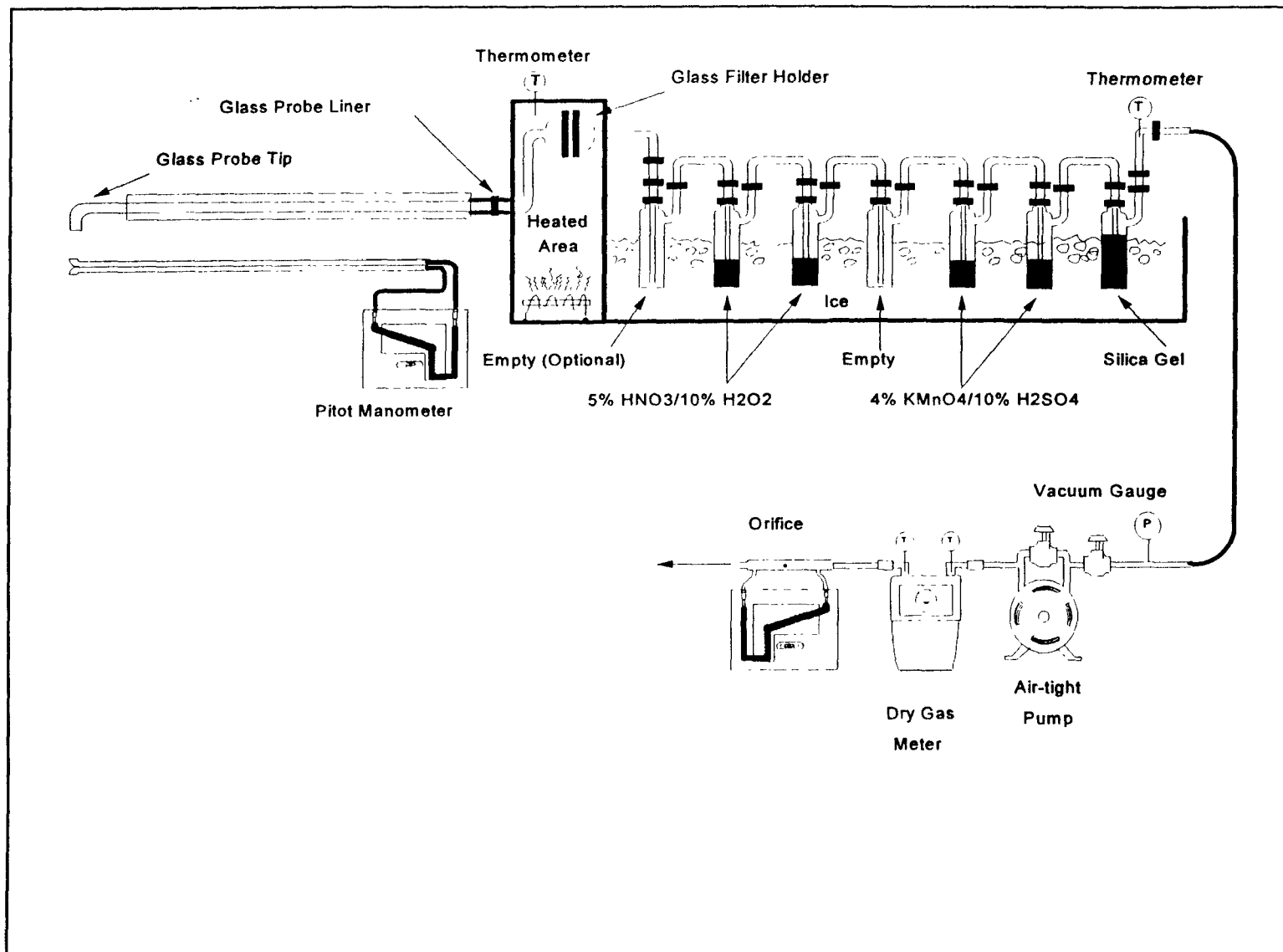


Figure 5.2 Method 29 Sample Train Schematic - Asphalt Plant "A", Clayton NC

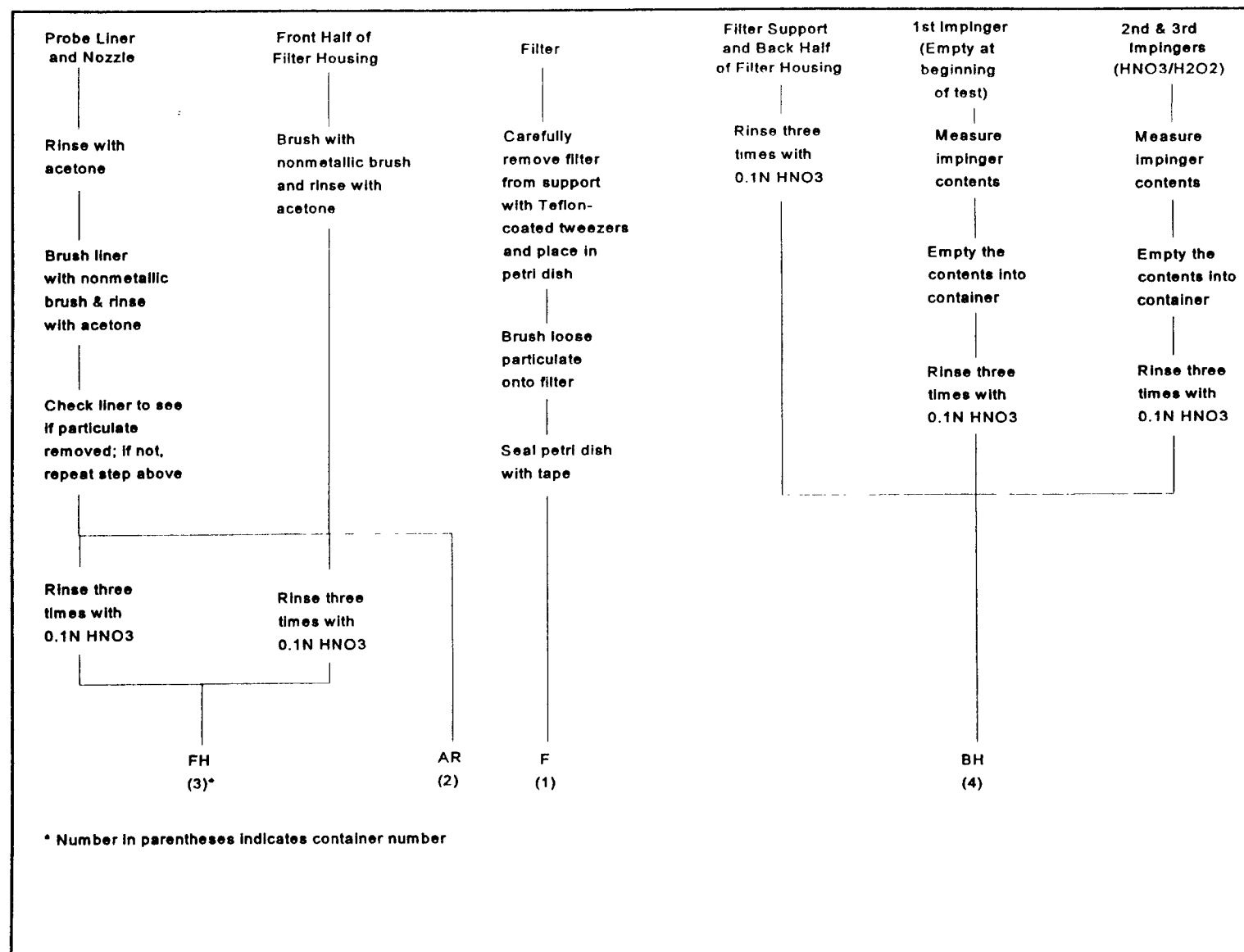
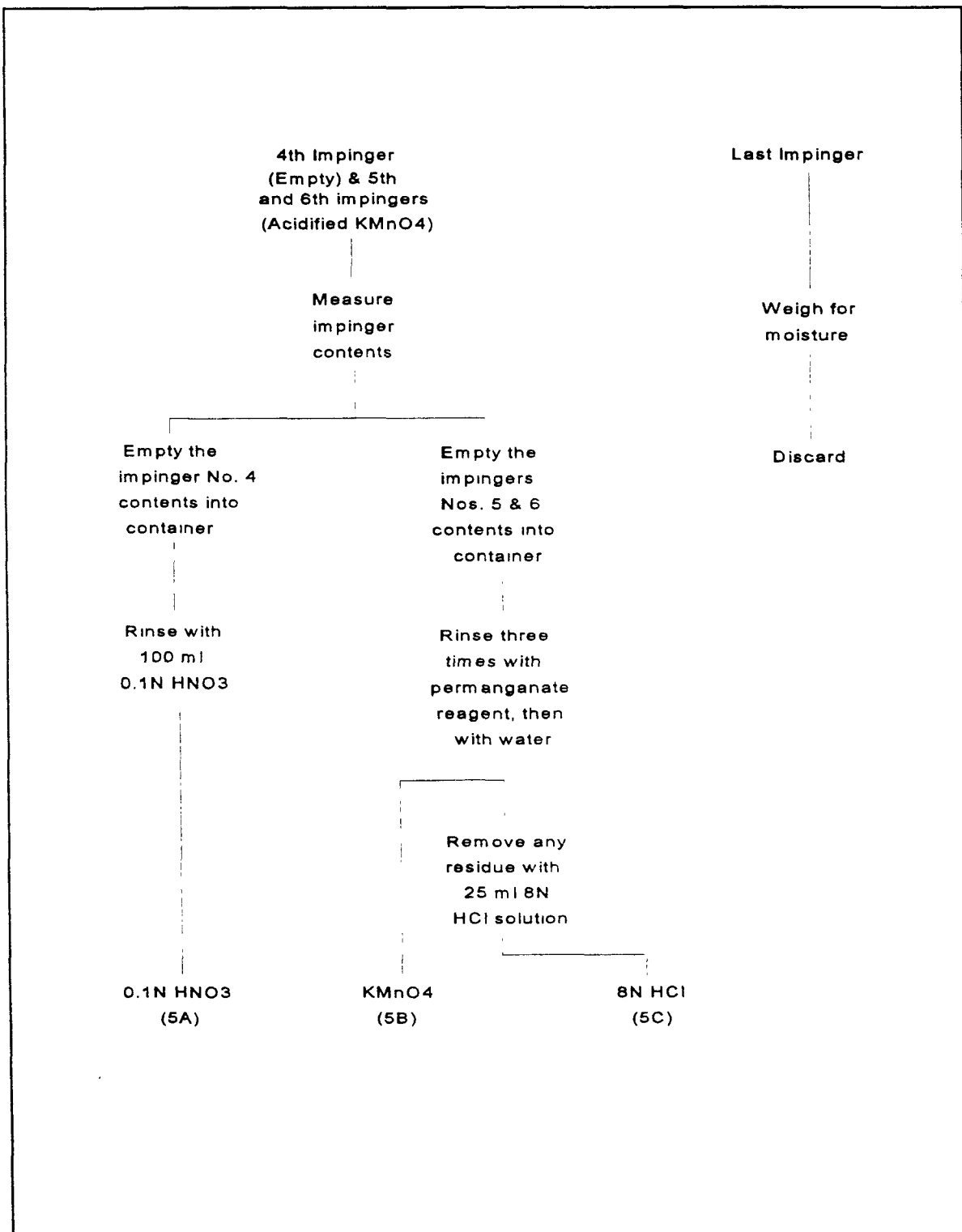


Figure 5.3 Method 29 Sample Recovery Scheme (Sample Fractions 1-4)
Asphalt Plant "A", Clayton NC



**Figure 5.4 Method 29 Sample Recovery Scheme (Sample Fraction 5)
Asphalt Plant "A", Clayton NC**

6.0 QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES AND RESULTS

This section describes the specific QA/QC procedures employed by PES during the performance of this source testing program. PES' quality assurance program was based upon the procedures and guidelines contained in the "Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III, Stationary Source Specific Methods," EPA/600/R-94/038c, as well as in the test methods to ensure the collection, analysis, and reporting of reliable source test data.

6.1 CALIBRATION OF APPARATUS

Since no mechanism exists for an independent measurement of emissions from the source, careful preparation, checkout, and calibration of the source testing sampling and analysis equipment is essential to ensure the collection of data of high quality. PES maintains a comprehensive schedule for preventative maintenance, calibration, and preparation of the source testing equipment.

6.1.1 Barometers

PES used aneroid barometers which were calibrated against a station pressure value reported by a nearby National Weather Service Station, and corrected for elevation.

6.1.2 Temperature Sensors

The responses of the Type K thermocouples used in the field testing program were checked using Calibration Procedure 2e as described in the Quality Assurance Handbook. The response of each temperature sensor was recorded when immersed in an ice water bath, at ambient temperature, and in a boiling water bath; each response was checked against an ASTM 3F reference thermometer. Table 6.1 summarizes the results of the thermocouple checks and the acceptable levels of variance. Digital temperature readouts were checked for calibration using a thermocouple simulator having a range of 0-2400 °F.

6.1.3 Pitot Tubes

For the measurement of velocity pressure in the gas streams, PES used Type S pitot tubes constructed according to EPA Method 2 specifications. Pitot tubes meeting these geometric specifications are assigned a baseline pitot coefficient (C_p) of 0.84 and need not be

TABLE 6.1

**SUMMARY OF TEMPERATURE SENSOR CALIBRATION DATA
ASPHALT PLANT "A" - CLAYTON, NC**

| Temp. Sensor I.D. | Usage | Temperature, °R | | Absolute Difference % | EPA Criteria % |
|-------------------------|------------------|-----------------|--------|-----------------------------|----------------------|
| | | Reference | Sensor | | |
| 5C | Stack Gas | 498 | 498 | 0 | < ±1.5 |
| | | 562 | 561 | 0.17 | < ±1.5 |
| | | 628 | 629 | 0.16 | < ±1.5 |
| 5B | Stack Gas | 496 | 499 | 0.60 | < ±1.5 |
| | | 553 | 559 | 1.0 | < ±1.5 |
| | | 596 | 596 | 0 | < ±1.5 |
| RT3 | Stack Gas | 501 | 501 | 0 | < ±1.5 |
| | | 532 | 532 | 0 | < ±1.5 |
| | | 670 | 672 | 0.30 | < ±1.5 |
| RT20 | Stack Gas | 492 | 493 | 0.20 | < ±1.5 |
| | | 534 | 532 | 0.37 | < ±1.5 |
| | | 672 | 671 | 0.15 | < ±1.5 |
| RT11 | Impinger Exit | 496 | 495 | 0.20 | < ±1.5 |
| | | 532 | 534 | 0.37 | < ±1.5 |
| | | 670 | 670 | 0 | < ±1.5 |
| SH4 | Impinger Exit | 497 | 496 | 0.20 | < ±1.5 |
| | | 532 | 535 | 0.56 | < ±1.5 |
| | | 670 | 669 | 0.15 | < ±1.5 |

subjected to a wind tunnel calibration. PES performs, at a minimum, annual calibration checks of pitots using Calibration Procedure 2 as found in the Quality Assurance Handbook. The results of the dimensional checks for each pitot tube used in this test program are summarized in Table 6.2.

6.1.4 Differential Pressure Gauges

PES uses Dwyer inclined/vertical manometers to measure differential pressures. These include velocity pressure, static pressure, and meter orifice pressure. Manometers are selected with sufficient sensitivity to accurately measure pressures over the entire range of expected values. Manometers are primary standards and require no calibration.

6.1.5 Dry Gas Meter and Orifice

The Method 23 and 29 dry gas meters and orifices were calibrated in accordance with Calibration Procedure 5 in the Quality Assurance Handbook. This procedure involves direct comparison of the dry gas meter to a reference dry test meter. The reference dry test meter is calibrated annually against a wet test meter. Before its initial use in the field, the metering system was calibrated at several flow rates over the normal operating range of the metering system. For the initial calibration to be considered valid, the results of individual meter calibration factors (γ), cannot differ from the average by more than 0.02, and the results of individual meter orifice factors (ΔH_o), cannot differ from the average by more than 0.20. After field use, the metering system calibration was checked at the average flow rate and highest vacuum observed during the test period. The results of the post-test meter correction factor check cannot differ by more than 5% from the average meter correction factor obtained during the initial, or thereafter, the annual calibration. Table 6.3 presents the results of the dry gas meter and orifice calibrations. All dry gas meters and orifices used in this test program met the method calibration requirements.

6.2 ON-SITE MEASUREMENTS

The on-site QA/QC activities include:

6.2.1 Measurement Sites

Prior to sampling, the stack was checked dimensionally to determine the suitability of the measurement site locations with respect to the Method 1 criteria. Distances to upstream and downstream disturbances, test port locations, and inside stack dimensions were checked to evaluate the uniformity of the stack cross sectional area. The inside stack dimensions, stack wall thickness, and sample port lengths were measured to the nearest 0.1 inch.

TABLE 6.2

**SUMMARY OF PITOT TUBE DIMENSIONAL DATA
ASPHALT PLANT "A" - CLAYTON, NC**

| Measure- ment | Criteria | RESULTS | | |
|----------------------|------------------------------------|------------------------------|-----------------------------|-------------------------------|
| | | Pitot Tube Identification | | |
| | | 5C | 5B | RP-20 |
| α_1 | $-10^\circ \leq a_1 \leq 10^\circ$ | 2.5 | 2 | 2 |
| α_2 | $-10^\circ \leq a_1 \leq 10^\circ$ | -2.5 | -1 | 1 |
| β_1 | $-5^\circ \leq a_1 \leq 5^\circ$ | 1 | 2 | 0 |
| β_2 | $-5^\circ \leq a_1 \leq 5^\circ$ | -1 | 0 | 1 |
| γ | - | 2.5 | 1 | 0.5 |
| θ | - | 0 | 0.5 | 0 |
| A | - | 1.013 | 0.990 | 1.0065 |
| $Z = A \tan \gamma$ | ≤ 0.125 in. | 0.044 | 0.017 | 0.009 |
| $W = A \tan \theta$ | ≤ 0.03125 in. | 0 | 0.009 | 0 |
| D_t | $0.1875" \leq D_t \leq 0.375"$ | 0.370 | 0.383 | 0.375 |
| $A/2D_t$ | $1.05 D_t \leq P \leq 1.50 D_t$ | $0.389 \leq 0.55 \leq 0.555$ | $0.402 \leq 0.5 \leq 0.575$ | $0.394 \leq 0.503 \leq 0.563$ |
| Acceptable | | Yes | Yes | Yes |
| Assigned Coefficient | | 0.84 | 0.84 | 0.84 |

6.2.2 Velocity Measurements

All velocity measurement apparatus were assembled, leveled, zeroed, and leak-checked prior to and at the end of each sampling run. The stack static pressure was determined at a single point within the stack corresponding to the average velocity pressure as obtained during the pre-test velocity traverse.

TABLE 6.3

**SUMMARY OF DRY GAS METER AND ORIFICE CALIBRATION DATA
ASPHALT PLANT "A" - CLAYTON, NC**

| Meter Box No. | Dry Gas Meter Correction Factor (γ) | | | | Meter Orifice Coefficient (ΔH_o) | | |
|---------------|--|-----------|---------|--------------|--|---------------|---------------|
| | Pre-test | Post-test | % Diff. | EPA Criteria | Average | Range | EPA Criteria |
| M5-4 | 1.021 | 1.046 | 2.5 | < 5% | 1.818 | 1.740 - 1.869 | 1.618 - 2.018 |
| M5-9 | 1.016 | 1.016 | 0.0 | < 5% | 1.776 | 1.708 - 1.823 | 1.576 - 1.976 |
| MB-11 | 0.987 | 1.008 | 2.1 | < 5% | 1.93 | 1.873 - 1.970 | 1.730 - 2.130 |
| MB-10 | 0.965 | 0.979 | 1.45 | < 5% | 1.747 | 1.683 - 1.820 | 1.547 - 1.947 |

6.2.3 Flue Gas Sampling

Integrated flue gas samples were collected in Tedlar® gas bags from the baghouse exhaust. Prior to their initial use, the bags were leak checked and purged with nitrogen to ensure cleanliness. Prior to and after completion of each sampling run, the stack gas molecular weight sampling system was leak checked. The bag samples were analyzed on-site using an Orsat® analyzer. Prior to use the Orsat® analyzer was assembled and replenished with fresh reagents and leak checked as per the manufacturer's procedures.

6.2.4 Moisture

During sampling, the exit gas temperature of the last impinger in each sampling train was maintained below 68°F to ensure condensation of stack gas water vapor. The moisture gain in the impinger train due to flue gas moisture was determined gravimetrically using a digital top-loading electronic balance with a resolution of 0.1 g. For subsequent calculations of the flue gas moisture volume, the calculated moisture volume due to the impinger weight gain was compared to the stack gas saturation volume at the average stack gas temperature. If the calculated moisture volume due to impinger weight gain exceeds the saturation volume, the assumption is made that moisture droplets entered to sampling system, and the saturation volume is used to

calculate stack gas molecular weight. The lower moisture value obtained using the reference method and saturation method was subsequently used in all Method 23 and Method 29 calculations.

6.2.5 Method 23/Method 29

The QA/QC activities for the for Method 23 and Method 29 sampling trains were similar. Prior to field testing, all glassware used was pre-cleaned according to the guidelines presented in Methods 23 and 29. The Method 23 glassware was cleaned based upon procedures presented in Section 3A of "The Manual of Analytical Methods for the Analysis of Pesticides in Human and Environmental Samples." The Method 29 sampling train glassware was prepared by first rinsing with hot tap and then water and then washed in hot soapy water. Next, all glassware was rinsed three times with tap water, followed by three additional rinses with water. Then all glassware was soaked in a 10 percent (V/V) nitric acid solution for a minimum of 4 hours, rinsed three times with water, then rinsed a final time with acetone, and allowed to air dry. On all of the Method 23 and Method 29 glassware, openings where contamination could occur were covered with Parafilm™ or Teflon® tape until the trains were assembled for sampling.

Table 6.4 summarizes the results of the post-test sample train leak checks for the Method 23 and Method 29 sampling trains, as well as the isokinetic sampling ratios for each of the sampling runs attempted. It should be noted that the Method 23 and Method 29 sampling runs at the baghouse inlet were aborted after approximately 20 minutes of sampling. Although the Method 29 isokinetic sampling ratio was within the required tolerance, the Method 23 ratio was not. This was due to the significant pressure drop across the train from the collected particulate matter and the XAD®-2 sorbent resin trap, which made it impossible to collect a gas at the flow rate required by the isokinetic rate equation. All pre- and post-test sample train leak checks met the acceptance criteria.

In order to evaluate the effectiveness of the on-site cleanup procedures, field blank samples of the Method 23 and Method 29 sample trains were collected during the field test program. The sample trains were assembled in same manner as the trains prepared for actual sampling runs and were transported to the baghouse outlet sampling location. The sample trains were each leak-checked and allowed to heat to the normal operating temperature. They were then leak-checked again and transported to the on-site field laboratory for recovery. The samples generated from the field blank trains were handled and analyzed in the same manner as the other samples generated during actual test runs.

In order to evaluate contamination levels in the sampling reagents, blank samples of all reagents used for both the Method 23 and Method 29 sampling were collected. These sample blanks were submitted for analysis along with the run samples and field blank samples for analysis.

TABLE 6.4

**SUMMARY OF METHOD 23/ METHOD 29 FIELD SAMPLING QA/QC DATA
ASPHALT PLANT "A" - CLAYTON, NC**

| Date | Site | Run No. | Post-Test Leak Rate (cfm) | EPA Criteria | Percent Isokinetic | EPA Criteria |
|-------------|-----------------|----------------|--|-------------------------|-------------------------------|---------------------|
| 8/19/97 | Baghouse Inlet | S-M23-I-1* | 0.003 | <0.02 cfm | 77.0 | 90-110% |
| | | S-M29-I-1* | 0.007 | <0.02 cfm | 93.6 | 90-110% |
| | Baghouse Outlet | S-M23-O-1 | 0.002 | <0.02 cfm | 94.6 | 90-110% |
| | | S-M29-O-1 | 0.004 | <0.02 cfm | 95.6 | 90-110% |
| 8/20/97 | Baghouse Outlet | S-M23-O-2 | 0.002 | <0.02 cfm | 106.8 | 90-110% |
| | | S-M29-O-2 | 0.005 | <0.02 cfm | 103.9 | 90-110% |
| | | S-M23-O-3 | 0.009 | <0.02 cfm | 106.7 | 90-110% |
| | | S-M29-O-3 | 0.009 | <0.02 cfm | 106.5 | 90-110% |
| 8/21/97 | Baghouse Outlet | S-M23-O-4 | 0.001 | <0.02 cfm | 93.7 | 90-110% |
| | | S-M29-O-4 | 0.008 | <0.02 cfm | 95.0 | 90-110% |

* Run aborted due to high grain loading at baghouse inlet location.

6.3 ANALYSES

Table 6.5 presents the results of the recoveries of the internal standards in the PCDDs/PCDFs samples. The recoveries for run S-M23-O-4 are elevated because an insufficient amount of recovery standard was added to the sample. Due to the nature of the error, the measured amounts of PCDDs/PCDFs congeners in the sample are not biased. Analysis of method, field, and reagent blanks showed background levels of the congeners less than the target detection limits for each congener.

The results of QA/QC analyses for Method 29 are presented in Tables 6.6 through 6.13. Table 6.6 presents the results of the TLI Lab Control Spike. All lab control spike recoveries were within 10 percent of the spiked amount. The post digestion matrix spike (Table 6.7) indicated recoveries outside of the QC criteria (75%-125%) for Ag, Be, P, Pb, and Se on the front-half spikes, and As, and Mn, on the back-half spikes. The results of the spikes indicate matrix effects specific to these analytes in the native sample matrix. The results of the duplicate analysis performed are presented in Table 6.8. A duplicate analysis is not reported for Tl since graphite furnace atomic absorption (GFAA) was used after analysis by inductively coupled plasma emission spectroscopy (ICP) indicated high negative values. The GFAA apparatus takes two separate aliquots sample of the and averages the result. The ICP takes a continuous aliquot, performs three analyses, and averages the result. Since the analysis for most of the target metals was less than 10 times the reporting detection limit (RDL), the duplicate analysis should not be considered a valid qualifier for those analytes. These cases are noted as "<RDL". For duplicate analyses which are reported the QC criteria is $\pm 20\%$.

Table 6.9 presents the results of the serial dilution analyses. Serial dilution analyses are not considered valid when the analyte concentration is less than 10 times RDL for ICP analyses, and 5 times RDL for GFAA analyses. The quality control relative percent deviation (RPD) for serial dilutions is $\pm 10\%$. For results that exceed the QA limits matrix interferences are suspected. All analytes in the method blank (MB) shown in Table 6.10 were detected at levels less than or equal to the reporting detection limit (RDL), with the exception of lead (Pb). TLI used RDLs of 1-10 times the instrument detection limit (IDL) for reporting purposes. IDLs for metallic analytes range from 0.2 - 8 ppb. Lead was detected in the method blank at concentrations of 2.82 micrograms per liter ($\mu\text{g/L}$), which is slightly greater than the RDL of 2 $\mu\text{g/L}$ for Pb. Lead results for run S-M29-O-2 are likely due to laboratory contamination. Lead results for runs S-M29-I-1 and S-M29-O-1 should be considered estimated, and Pb results for run S-M29-O-3 should be considered valid. Table 6.11 presents the results of the field blank and reagent blank analysis. Reagent blanks were collected to quantify the presence of contamination in the reagents used for the sampling program. A field blank train was assembled transported to the sampling location, leak checked, returned to the field lab and recovered. The field blank provides a check on the recovery efficiency from the sample trains. The results of the field and reagent blank analyses indicate that bias of the results due to cross contamination between field glassware trains and contamination of the reagents used for sampling is negligible.

Table 6.12 presents results mercury spike analyses. Lab control spikes performed for mercury indicate recoveries within the QC criteria of $\pm 20\%$. Pre-digestion matrix spikes for mercury indicate recoveries in excess of the QC limits, which indicate an interference for

TABLE 6.5

**SUMMARY OF METHOD 23 STANDARDS RECOVERY EFFICIENCIES
ASPHALT PLANT "A" - CLAYTON, NC**

| | Percent Recovery | | | | | | | | |
|------------------------------|------------------|---------------|---------------|---------------|---------------|---------------|----------------|----------------|--------------|
| | TLI Blank | S-M23- I-1 | S-M23- O-1 | S-M23- O-2 | S-M23- O-3 | S-M23- O-4 | S-M23- O-FB | S-M23- O-RB | QC LIMITS |
| FULL SCREEN ANALYSIS | | | | | | | | | |
| <u>Internal Standards</u> | | | | | | | | | |
| 2,3,7,8-TCDF | 92.5 | 98.5 | 69.4 | 62.4 | 184 | 120 | 49.5 | 88.5 | 40-130% |
| 2,3,7,8-TCDD | 80.9 | 89.0 | 63.2 | 55.6 | 163 | 98.7 | 34.3 | 76.4 | 40-130% |
| 1,2,3,7,8-PeCDF | 92.4 | 95.5 | 67.1 | 57.6 | 161 | 107 | 44.9 | 89.1 | 40-130% |
| 1,2,3,7,8-PeCDD | 100 | 103 | 68.2 | 60.5 | 170 | 112 | 54.8 | 99.3 | 40-130% |
| 1,2,3,6,7,8-HxCDF | 92.8 | 102 | 68.8 | 65.7 | 187 | 113 | 34.7 | 74.0 | 40-130% |
| 1,2,3,6,7,8-HxCDD | 83.6 | 93.6 | 65.4 | 58.8 | 173 | 103 | 40.1 | 78.2 | 40-130% |
| 1,2,3,4,6,7,8- HpCDF | 72.2 | 71.1 | 42.3 | 41.3 | 105 | 88.5 | 32.7 | 56.7 | 25-130% |
| 1,2,3,4,6,7,8- HpCDD | 85.0 | 78.3 | 50.4 | 44.9 | 109 | 90.1 | 38.2 | 61.3 | 25-130% |
| OCDD | 67.5 | 60.5 | 36.0 | 27.5 | 65.1 | 68.8 | 36.9 | 60.9 | 25-130% |
| <u>Surrogate Standards</u> | | | | | | | | | |
| 2,3,7,8-TCDD | 105 | 97.6 | 96.1 | 98.8 | 98.4 | 106 | 123 | 107 | 70-140% |
| 2,3,4,7,8-PeCDF | 87.7 | 93.2 | 86.1 | 85.1 | 88.6 | 93.4 | 112 | 102 | 70-140% |
| 1,2,3,4,7,8-HxCDF | 93.9 | 94.6 | 87.3 | 92.1 | 98.2 | 97.6 | 91.1 | 90.2 | 70-140% |
| 1,2,3,4,7,8-HxCDD | 89.6 | 88.0 | 81.0 | 91.9 | 87.9 | 85.9 | 82.4 | 91.6 | 70-140% |
| 1,2,3,4,7,8,9- HpCDF | 107 | 83.6 | 88.7 | 84.9 | 91.3 | 98.7 | 85.4 | 89.0 | 70-140% |
| <u>Alternate Standards</u> | | | | | | | | | |
| 1,2,3,7,8,9-HxCDF | 97.3 | 91.3 | 58.1 | 54.3 | 120 | 117 | 32.2 | 66.8 | 40-130% |
| 2,3,4,6,7,8-HxCDF | 84.8 | 99.0 | 61.4 | 62.0 | 173 | 107 | 34.1 | 76.9 | 40-130% |
| CONFIRMATION ANALYSIS | | | | | | | | | |
| <u>Internal Standards</u> | | | | | | | | | |
| 2,3,7,8-TCDF | 72.7 | 73.7 | 59.8 | 52.4 | 148 | 104 | | 67.7 | 40-130% |

* Confirmation analysis was not necessary on S-M23-0-FB because no TCDF were detected in the full screen analysis.

TABLE 6.6

**SUMMARY OF METHOD 29 ANALYSIS QC DATA
LAB CONTROL SPIKES
ASPHALT PLANT "A" - CLAYTON, NC**

| Analyte | Spike Amount (µg) | Recovered Amount (µg) | Recovery (%) |
|----------------|------------------------------|----------------------------------|---------------------|
| Ag | 50 | 45.11 | 90 |
| As | 50 | 45.25 | 90 |
| Ba | 50 | 49.05 | 98 |
| Be | 50 | 47.58 | 95 |
| Cd | 50 | 48.64 | 97 |
| Co | 50 | 49.24 | 98 |
| Cr | 50 | 48.24 | 96 |
| Cu | 50 | 49.07 | 98 |
| Mn | 50 | 48.63 | 97 |
| Ni | 50 | 47.19 | 94 |
| P | 1000 | 981.55 | 98 |
| Pb | 50 | 46.89 | 94 |
| Sb | 50 | 48.51 | 97 |
| Se | 50 | 47.66 | 95 |
| Tl | 50 | 45.00 | 90 |
| Zn | 200 | 199.45 | 100 |

TABLE 6.7

**SUMMARY OF METHOD 29 ANALYSIS QC DATA
POST DIGESTION MATRIX SPIKES RUN NO. S-M29-O-1
ASPHALT PLANT "A" - CLAYTON, NC**

| Analyte | Front Half | | Back Half | |
|---|-------------------------|--------------|-------------------------|--------------|
| | Recovered Amount (µg/L) | Recovery (%) | Recovered Amount (µg/L) | Recovery (%) |
| Ag | 37.13 | 74 | 41.57 | 83 |
| As | 66.21 | 79 | 36.64 | 73 |
| Ba | 2207.64 | LS | 60.46 | 80 |
| Be | 31.50 | 63 | 45.63 | 91 |
| Cd | 44.31 | 84 | 52.79 | 94 |
| Co | 60.73 | 85 | 46.23 | 92 |
| Cr | 187.14 | 80 | 55.26 | 88 |
| Cu | 216.04 | 86 | 69.47 | 95 |
| Mn | 2026.71 | LS | 68.47 | 47 |
| Ni | 112.31 | 79 | 61.16 | 90 |
| P | 4053.51 | 74 | 1409.02 | 79 |
| Pb | 231.32 | 68 | 108.50 | 89 |
| Sb | 83.39 | 78 | 47.69 | 95 |
| Se | 80.62 | 74 | 46.09 | 82 |
| Tl | N/A | N/A | 20.6 | 82 |
| Zn | 1289.01 | LS | 456.69 | 88 |
| LS - Low spike; % Recovery is not considered valid when spike amount is less than 20% of recovered amount N/A - QC analysis not reported since method of standard additions (MSA) was performed. | | | | |

TABLE 6.8

**METHOD 29 DUPLICATE ANALYSIS QC DATA RUN NO. S-M29-O-2
ASPHALT PLANT "A" - CLAYTON, NC**

| Analyte | Front Half | | | Back Half | | |
|--|-----------------------------|--------------------------------|------------|-----------------------------|--------------------------------|------------|
| | Sample (μg) | Duplicate (μg) | RPD (%) | Sample (μg) | Duplicate (μg) | RPD (%) |
| Ag | 0.173 | 0.188 | <RDL | <0.106 | <0.106 | <RDL |
| As | 0.592 | 0.913 | <RDL | <0.532 | <0.532 | <RDL |
| Ba | 51.1 | 50.8 | 0.589 | 0.914 | 0.915 | <RDL |
| Be | <0.100 | <0.100 | <RDL | <0.106 | <0.106 | <RDL |
| Cd | 2.13 | 2.11 | 0.943 | <0.106 | 0.108 | <RDL |
| Co | <0.100 | <0.100 | <RDL | <0.106 | <0.106 | <RDL |
| Cr | 9.97 | 10.1 | 1.30 | 0.435 | 0.427 | <RDL |
| Cu | 4.43 | 4.37 | 1.36 | 2.03 | 1.94 | <RDL |
| Mn | 33.4 | 33.4 | 0.00 | 1.70 | 1.70 | <RDL |
| Ni | 6.09 | 6.15 | 0.98 | 0.846 | 0.853 | <RDL |
| P | 60.4 | 59.5 | 1.50 | 58.3 | 57.7 | 1.03 |
| Pb | 5.78 | 5.60 | 3.16 | 2.52 | 2.53 | 0.396 |
| Sb | 4.15 | 4.26 | 2.62 | <0.426 | <0.426 | <RDL |
| Se | 3.96 | 4.06 | 2.49 | 0.336 | <0.319 | <RDL |
| Tl | 0.210 | N/A | N/A | <0.213 | N/A | N/A |
| Zn | 46.7 | 46.7 | 0.00 | 15.6 | 15.7 | 0.639 |
| Note: Duplicate analysis not reported for elements analyzed by GFAA. Tl was analyzed by GFAA | | | | | | |

TABLE 6.9

**METHOD 29 SERIAL DILUTION ANALYSIS QC DATA
ASPHALT PLANT "A" - CLAYTON, NC**

| Serial Dilution, Run No. S-M29-O-1 | | | |
|--|--|---|--------------|
| Analyte | Sample μg | Serial Dilution μg | RPD * |
| Ag | <0.100 | <0.500 | <RDL |
| As | 2.66 | <2.50 | <RDL |
| Ba | 221 | 242 | 9.07% |
| Be | <0.100 | <0.500 | <RDL |
| Cd | 0.218 | <0.500 | <RDL |
| Co | 1.82 | 1.95 | <RDL |
| Cr | 14.7 | 18.2 | 21.3% |
| Cu | 17.3 | 18.1 | 4.52% |
| Mn | 203 | 226 | 10.7% |
| Ni | 7.26 | 8.72 | <RDL |
| P | 332 | 385 | 14.8% |
| Pb | 19.7 | 23.0 | 15.5% |
| Sb | 4.46 | 4.91 | <RDL |
| Se | 4.39 | 5.40 | <RDL |
| Tl | <0.200 | N/A | N/A |
| Zn | 114 | 130 | 13.1% |
| * < 10 RDL / 5 RDL - Serial dilution analyte results are not considered valid when the concentration in the analyte is less than 10 times the Reported Detection Limit (RDL) for ICP analysis and 5 times the RDL for GFAA analysis. RPD = Relative percent deviation. | | | |

TABLE 6.10**METHOD 29 METHOD BLANK ANALYSIS QC DATA
ASPHALT PLANT "A" - CLAYTON, NC**

| Analyte | Reporting Detection Limit ($\mu\text{g/L}$) | Recovered Amount ($\mu\text{g/L}$) | Pass or Fail * |
|--|---|--|-----------------------|
| Ag | 1 | 0.13 | Pass |
| As | 5 | 2.09 | Pass |
| Ba | 2 | 0.20 | Pass |
| Be | 1 | 0.01 | Pass |
| Cd | 1 | 0.44 | Pass |
| Co | 1 | 0.19 | Pass |
| Cr | 2 | 1.08 | Pass |
| Cu | 2 | 0.22 | Pass |
| Mn | 2 | 0.19 | Pass |
| Ni | 3 | 1.00 | Pass |
| P | 30 | 0.70 | Pass |
| Pb | 2 | 2.82 | Fail |
| Sb | 4 | 1.10 | Pass |
| Se | 3 | 1.14 | Pass |
| Tl | 2 | 0.10 | Pass |
| Zn | 12 | 7.27 | Pass |
| <p>* Method Blank considered "Pass" when recovered amount is less than the reporting detection limit (RDL).</p> <p>The RDL is used instead of the instrument detection limit (IDL). IDL ranges from 0.2 0-8 ppb for many analytes. TLI used RDL values of 1-10 times IDL for reporting purposes.</p> | | | |

TABLE 6.11

**METHOD 29 FIELD AND REAGENT BLANK ANALYSIS QC DATA
ASPHALT PLANT "A" - CLAYTON, NC**

| Analyte | Field Blank | | Reagent Blank | |
|---------|---------------------------------|--------------------------------|-------------------------------|--------------------------------|
| | Front Half (μg) | Back Half (μg) | (Front Half) μg | Back Half (μg) |
| Ag | 0.107 | <0.100 | 0.270 | <0.100 |
| As | 0.627 | <0.500 | <0.500 | <0.500 |
| Ba | 4.66 | 0.237 | 4.33 | 0.326 |
| Be | <0.100 | <0.100 | <0.100 | <0.100 |
| Cd | <0.100 | 0.130 | <0.100 | <0.100 |
| Co | <0.100 | <0.100 | <0.100 | <0.100 |
| Cr | 9.5 | 0.376 | 9.33 | 0.222 |
| Cu | 1.05 | 0.624 | 1.06 | 1.44 |
| Mn | 1.09 | 7.17 | 0.911 | 34.7 |
| Ni | 4.82 | <0.300 | 4.68 | 0.606 |
| P | <3.00 | 12.1 | <3.00 | 55.3 |
| Pb | <0.200 | 6.59 | <0.200 | 0.265 |
| Sb | 4.91 | <0.400 | 4.18 | <0.400 |
| Se | 4.27 | 0.421 | 4.35 | <0.300 |
| Tl | <0.200 | <0.200 | <0.200 | <0.200 |
| Zn | 3.02 | 2.96 | 2.60 | 2.03 |

TABLE 6.12**METHOD 29 MERCURY SPIKE ANALYSIS QC DATA
ASPHALT PLANT "A" - CLAYTON, NC**

| Sample ID | Spike Amt μg | Recovery | Recovery Limits |
|--------------------------------------|---|-----------------|------------------------|
| Lab Control Spikes | | | |
| LCS 1 | 5 | 106% | 80-120% |
| LCS 1 Dup | 5 | 100% | 80-120% |
| LCS 2 | 5 | 100% | 80-120% |
| LCS 2 Dup | 5 | 95% | 80-120% |
| Matrix Spikes (Pre-Digestion) | | | |
| O-M29-1 | 5 | 170% | 80-120% |
| O-M29-1 Dup | 5 | 170% | 80-120% |
| O-M29-3 | 5 | 168% | 80-120% |
| O-M29-3 Dup | 5 | 160% | 80-120% |
| O-M29-4 | 5 | 155% | 80-120% |
| O-M29-4 Dup | 5 | 152% | 80-120% |
| I-M29-1 | 5 | 88% | 80-120% |
| I-M29-1 Dup | 5 | 103% | 80-120% |

mercury due to a matrix effect present in the native sample. Results for mercury should be considered biased low. Method blanks, field blanks, and reagent blanks for mercury indicated that the sample results for mercury were not biased due to mercury contamination in the reagents, of due to cross contamination in the sampling apparatus. Mercury blank results are presented in Table 6.13.

TABLE 6.13**METHOD 29 MERCURY BLANK ANALYSIS QC DATA
ASPHALT PLANT "A" - CLAYTON, NC**

| Sample ID | Detection Limit $\mu\text{g/L}$ | Recovered Amount $\mu\text{g/L}$ |
|-------------------------------|---|--|
| Method Blank | | |
| MB-1 | 0.02 | 0.008 |
| MB-1 Dup | 0.02 | 0.016 |
| MB-2 | 0.02 | 0.003 |
| MB-2 Dup | 0.02 | 0.003 |
| Field Blank and Reagent Blank | | |
| FH | <0.400 | <0.400 |
| FH - Dup | <0.400 | <0.400 |
| BH | <0.60 | <1.20 |
| BH- Dup | <0.60 | <1.20 |
| HNO3 | <0.224 | <0.400 |
| HNO3 - Dup | <0.224 | <0.400 |
| KMnO4 | <0.62 | <1.16 |
| KMnO4 - Dup | <0.62 | <1.16 |
| HCL | | <0.376 |
| HCL - Dup | | <0.376 |

APPENDIX A
PROCESS DATA

Appendix A: Process Data

ASPHALT PLANT "A"

Test Run 1

Test Date: August 19, 1997

Total Test Time: 4.3 hrs

| Time | Event | Product Type | Asphalt Concrete Production | | Asphalt Temp. (oF) | Aggregate Use | | RAP Use | | Asphalt Cement Use | | Calculated Conditioner Use | |
|---------|-------|--------------|-----------------------------|--------------|--------------------|---------------|--------------|------------|--------------|--------------------|--------------|----------------------------|--------------|
| | | | Rate (TPH) | Total (tons) | | Rate (TPH) | Total (tons) | Rate (TPH) | Total (tons) | Rate (TPH) | Total (tons) | Rate (TPH) | Total (tons) |
| 0915 | * | RDS | 250 | | 315 | 213 | | 26 | | 12.5 | | 0.03 | |
| 1100 | | RDS | 254 | | 304 | 211 | | 27 | | 12.6 | | 0.03 | |
| 1115 | * | RDS | 202 | | 295 | 171 | | 22 | | 10.2 | | 0.03 | |
| 1130 | | RDS | 202 | | 311 | 170 | | 21 | | 10.0 | | 0.03 | |
| 1145 | | RDS | 200 | | 304 | 168 | | 21 | | 10.0 | | 0.03 | |
| 1200 | * | RDS | 150 | | 299 | 127 | | 15 | | 7.8 | | 0.02 | |
| 1215 | | RDS | 152 | | 306 | 126 | | 16 | | 7.5 | | 0.02 | |
| 1230 | | RDS | 149 | | 306 | 127 | | 16 | | 7.7 | | 0.02 | |
| 1245 | | RDS | 150 | | 300 | 127 | | 15 | | 7.7 | | 0.02 | |
| 1300 | | RDS | 152 | | 300 | 128 | | 16 | | 7.6 | | 0.02 | |
| 1315 | | RDS | 150 | | 300 | 127 | | 16 | | 7.8 | | 0.02 | |
| 1330 | | RDS | 150 | | 310 | 128 | | 15 | | 7.6 | | 0.02 | |
| 1345 | | RDS | 149 | | 301 | 127 | | 15 | | 7.7 | | 0.02 | |
| 1415 | | RDS | 147 | | 313 | 127 | | 13 | | 7.6 | | 0.02 | |
| 1430 | | RDS | 146 | | 307 | 127 | | 15 | | 7.5 | | 0.02 | |
| 1445 | | RDS | 150 | | 305 | 128 | | 15 | | 7.7 | | 0.02 | |
| 1456 | | RDS | 151 | | 304 | 129 | | 15 | | 7.7 | | 0.02 | |
| Total** | | | | 735 | | | 622 | | 76 | | 37 | | 0.093 |
| Mean | | | 171 | | 305 | 145 | | 18 | | 8.7 | | 0.02 | |
| St. Dev | | | 35 | | 5 | 29 | | 4 | | 1.7 | | 0.004 | |
| Min | | | 146 | | 295 | 126 | | 13 | | 7.5 | | 0.02 | |
| Max | | | 254 | | 315 | 213 | | 27 | | 12.6 | | 0.03 | |

* See Table 4 for a description of these events.

** Because running total data were not available, the run totals were calculated from the average of the TPH data multiplied by the total run time.

Appendix A: Process Data

ASPHALT PLANT "A"

Test Run 1

Test Date: August 19, 1997

Total Test Time: 4.3 hrs

| Time | Event | Product Type | Fabric Filter | | | Fuel Use | | Visible Emissions |
|---------|-------|--------------|------------------|-------------------|-------------------------|------------|-------------|-------------------|
| | | | Inlet Temp. (oF) | Outlet Temp. (oF) | Pressure Drop (in. H2O) | Rate (GPM) | Total (gal) | |
| 0915 | * | RDS | 245 | 200 | 2.9 | 5 | 80 | none |
| 1100 | | RDS | 240 | 200 | 2.5 | 5 | 1693 | none |
| 1115 | * | RDS | 220 | 195 | 2.5 | 5 | 1817 | none |
| 1130 | | RDS | 205 | 185 | 2.0 | 5 | 1855 | none |
| 1145 | | RDS | 205 | 180 | 2.0 | 3 | 1911 | none |
| 1200 | * | RDS | 180 | 170 | 1.8 | 3 | 1994 | none |
| 1215 | | RDS | 175 | 160 | 1.5 | 3 | 2036 | none |
| 1230 | | RDS | 185 | 160 | 1.5 | 3 | 2092 | none |
| 1245 | | RDS | 180 | 160 | 1.8 | 3 | 2136 | none |
| 1300 | | RDS | 180 | 160 | 1.5 | 3 | 2192 | none |
| 1315 | | RDS | 185 | 160 | 1.5 | 3 | 2234 | none |
| 1330 | | RDS | 185 | 160 | 1.5 | 3 | 2274 | none |
| 1345 | | RDS | 182 | 160 | 1.7 | 3 | 2336 | none |
| 1415 | | RDS | 180 | 160 | 1.5 | 3 | 2388 | none |
| 1430 | | RDS | 180 | 160 | 1.5 | 3 | 2441 | none |
| 1445 | | RDS | 180 | 160 | 1.5 | 3 | 2489 | none |
| 1456 | | RDS | 170 | 160 | 1.5 | 3 | 2533 | none |
| Total** | | | | | | | 920 | |
| Mean | | | 193 | 170 | 1.8 | 3.5 | | |
| St. Dev | | | 22 | 15 | 0.4 | 0.9 | | |
| Min | | | 170 | 160 | 1.5 | 3.0 | | |
| Max | | | 245 | 200 | 2.9 | 5.3 | | |

* See Table 4 for a description of these events.

** Because running total data were not available, the run totals were calculated from the average of the TPH data multiplied by the total run time.

Appendix A: Process Data

ASPHALT PLANT "A"

Test Run 2

Test Date: August 20, 1997 a.m.

Total Test Time: 4.3 hrs

| Time | Event | Product Type | Asphalt Concrete Production | | Asphalt Temp. (oF) | Aggregate Use | | RAP Use | | Asphalt Cement Use | | Calculated Conditioner Use | |
|---------|-------|--------------|-----------------------------|--------------|--------------------|---------------|--------------|------------|--------------|--------------------|--------------|----------------------------|--------------|
| | | | Rate (TPH) | Total (tons) | | Rate (TPH) | Total (tons) | Rate (TPH) | Total (tons) | Rate (TPH) | Total (tons) | Rate (TPH) | Total (tons) |
| 0822 | | RDS | 225 | | 306 | 192 | | 21 | | 11.5 | | 0.03 | |
| 0845 | | RDS | 226 | | 304 | 191 | | 24 | | 11.5 | | 0.03 | |
| 0900 | | RDS | 223 | | 316 | 192 | | 22 | | 11.5 | | 0.03 | |
| 0915 | | RDS | 225 | | 306 | 191 | | 23 | | 11.4 | | 0.03 | |
| 0930 | * | RDS | 223 | | 346 | 214 | | 24 | | 11.5 | | 0.03 | |
| 0945 | * | RDS | 249 | | 308 | 213 | | 25 | | 12.7 | | 0.03 | |
| 0100 | | RDS | 298 | | 312 | 254 | | 30 | | 15.3 | | 0.04 | |
| 1015 | | RDS | 299 | | 314 | 254 | | 30 | | 15.5 | | 0.04 | |
| 1030 | | RDS | 301 | | 308 | 255 | | 30 | | 15.3 | | 0.04 | |
| 1045 | | RDS | 300 | | 314 | 254 | | 31 | | 15.2 | | 0.04 | |
| 1100 | | RDS | 300 | | 303 | 255 | | 26 | | 15 | | 0.04 | |
| 1115 | | RDS | 301 | | 314 | 253 | | 32 | | 15 | | 0.04 | |
| 1130 | | RDS | 302 | | 309 | 255 | | 31 | | 15 | | 0.04 | |
| 1145 | | RDS | 300 | | 311 | 255 | | 31 | | 15.4 | | 0.04 | |
| 1200 | | RDS | 300 | | 317 | 254 | | 30 | | 15.3 | | 0.04 | |
| 1215 | | RDS | 300 | | 307 | 252 | | 31 | | 15 | | 0.04 | |
| 1230 | | RDS | 298 | | 313 | 255 | | 29 | | 15 | | 0.04 | |
| 1240 | | RDS | 299 | | 310 | 253 | | 30 | | 15 | | 0.04 | |
| Total** | | | | 1,187 | | | 1,013 | | 119 | | 60 | | 0.151 |
| Mean | | | 276 | | 312 | 236 | | 28 | | 14.0 | | 0.04 | |
| St. Dev | | | 34 | | 9 | 27 | | 4 | | 1.7 | | 0.00 | |
| Min | | | 223 | | 303 | 191 | | 21 | | 11.4 | | 0.03 | |
| Max | | | 302 | | 346 | 255 | | 32 | | 15.5 | | 0.04 | |

* See Table 4 for a description of these events.

** Because running total data were not available, the run totals were calculated from the average of the TPH data multiplied by the total run time.

Appendix A: Process Data

ASPHALT PLANT "A"

Test Run 2

Test Date: August 20, 1997 a.m.

Total Test Time: 4.3 hrs

| Time | Event | Product Type | Fabric Filter | | | Fuel Use | | Visible Emissions |
|---------|-------|--------------|------------------|-------------------|-------------------------|------------|-------------|-------------------|
| | | | Inlet Temp. (oF) | Outlet Temp. (oF) | Pressure Drop (in. H2O) | Rate (GPM) | Total (gal) | |
| 0822 | | RDS | 230 | 185 | 2.1 | 5 | 324 | none |
| 0845 | | RDS | 230 | 192 | 2.6 | 5 | 427 | none |
| 0900 | | RDS | 230 | 190 | 2.8 | 5 | 512 | none |
| 0915 | | RDS | 235 | 197 | 2.8 | 5 | 592 | none |
| 0930 | * | RDS | 195 | 200 | 2.1 | 3 | 704 | none |
| 0945 | * | RDS | 260 | 205 | 2.8 | 7 | 760 | none |
| 0100 | | RDS | 270 | 215 | 3.2 | 7 | 869 | none |
| 1015 | | RDS | 270 | 225 | 3.1 | 7 | 984 | none |
| 1030 | | RDS | 270 | 230 | 3.8 | 7 | 1118 | none |
| 1045 | | RDS | 271 | 228 | 3.6 | 7 | 1200 | none |
| 1100 | | RDS | 269 | 225 | 3.5 | 7 | 1335 | none |
| 1115 | | RDS | 262 | 220 | 3.8 | 7 | 1440 | none |
| 1130 | | RDS | 270 | 225 | 4.0 | 7 | 1539 | none |
| 1145 | | RDS | 270 | 225 | 3.8 | 8 | 1663 | none |
| 1200 | | RDS | 270 | 230 | 3.5 | 7 | 1757 | none |
| 1215 | | RDS | 265 | 225 | 3.9 | 7 | 1881 | none |
| 1230 | | RDS | 268 | 220 | 3.8 | 7 | 1993 | none |
| 1240 | | RDS | 260 | 220 | 3.8 | 6 | 2086 | none |
| Total** | | | | | | | 1,762 | |
| Mean | | | 255 | 214 | 3.3 | 6.3 | | |
| St. Dev | | | 21 | 15 | 0.6 | 1.2 | | |
| Min | | | 195 | 185 | 2.1 | 3.0 | | |
| Max | | | 271 | 230 | 4.0 | 8.0 | | |

* See Table 4 for a description of these events.

** Because running total data were not available, the run totals were calculated from the average of the TPH data multiplied by the total run time.

Appendix A: Process Data

ASPHALT PLANT "A"

Test Run 3

Test Date: August 20, 1997 p.m.

Total Test Time: 3.5 hrs

| Time | Event | Product Type | Asphalt Concrete Production | | Asphalt Temp. (oF) | Aggregate Use | | RAP Use | | Asphalt Cement Use | | Calculated Conditioner Use | |
|---------|-------|--------------|-----------------------------|--------------|--------------------|---------------|--------------|------------|--------------|--------------------|--------------|----------------------------|--------------|
| | | | Rate (TPH) | Total (tons) | | Rate (TPH) | Total (tons) | Rate (TPH) | Total (tons) | Rate (TPH) | Total (tons) | Rate (TPH) | Total (tons) |
| 1405 | | RDS | 250 | | 309 | 214 | | 25 | | 12.6 | | 0.03 | |
| 1415 | | RDS | 251 | | 303 | 211 | | 27 | | 13.0 | | 0.03 | |
| 1430 | | RDS | 251 | | 312 | 212 | | 27 | | 13.0 | | 0.03 | |
| 1445 | | RDS | 252 | | 311 | 212 | | 26 | | 13.0 | | 0.03 | |
| 1500 | | RDS | 245 | | 305 | 212 | | 25 | | 12.8 | | 0.03 | |
| 1515 | | RDS | 245 | | 320 | 212 | | 22 | | 12.5 | | 0.03 | |
| 1530 | | RDS | 254 | | 310 | 215 | | 26 | | 12.8 | | 0.03 | |
| 1545 | | RDS | 250 | | 307 | 213 | | 25 | | 12.9 | | 0.03 | |
| 1600 | | RDS | 249 | | 307 | 211 | | 24 | | 13.0 | | 0.03 | |
| 1615 | | RDS | 247 | | 322 | 215 | | 23 | | 12.7 | | 0.03 | |
| 1630 | | RDS | 252 | | 312 | 214 | | 25 | | 12.6 | | 0.03 | |
| 1645 | | RDS | 250 | | 316 | 213 | | 24 | | 12.8 | | 0.03 | |
| 1700 | | RDS | 249 | | 315 | 213 | | 25 | | 12.8 | | 0.03 | |
| 1715 | * | RDS | 205 | | 307 | 172 | | 24 | | 10.5 | | 0.03 | |
| 1735 | | RDS | 152 | | 299 | 138 | | 17 | | 7.8 | | 0.02 | |
| Total** | | | | 840 | | | 718 | | 85 | | 43 | | 0.108 |
| Mean | | | 240 | | 310 | 205 | | 24 | | 12.3 | | 0.03 | |
| St. Dev | | | 26 | | 6 | 21 | | 2 | | 1.3 | | 0.003 | |
| Min | | | 152 | | 299 | 138 | | 17 | | 7.8 | | 0.02 | |
| Max | | | 254 | | 322 | 215 | | 27 | | 13.0 | | 0.03 | |

* See Table 4 for a description of these events.

** Because running total data were not available, the run totals were calculated from the average of the TPH data multiplied by the total run time.

Appendix A: Process Data

ASPHALT PLANT "A"

Test Run 3

Test Date: August 20, 1997 p.m.

Total Test Time: 3.5 hrs

| Time | Event | Product Type | Fabric Filter | | | Fuel Use | | Visible Emissions |
|---------|-------|--------------|------------------|-------------------|-------------------------|------------|-------------|-------------------|
| | | | Inlet Temp. (oF) | Outlet Temp. (oF) | Pressure Drop (in. H2O) | Rate (GPM) | Total (gal) | |
| 1405 | | RDS | 240 | 200 | 2.8 | 6 | 2560 | none |
| 1415 | | RDS | 238 | 200 | 2.9 | 5 | 2630 | none |
| 1430 | | RDS | 232 | 200 | 2.5 | 5 | 2731 | none |
| 1445 | | RDS | 235 | 195 | 2.5 | 5 | 2823 | none |
| 1500 | | RDS | 230 | 195 | 2.5 | 5 | 2873 | none |
| 1515 | | RDS | 240 | 195 | 2.8 | 6 | 2992 | none |
| 1530 | | RDS | 235 | 195 | 2.5 | 6 | 3071 | none |
| 1545 | | RDS | 240 | 195 | 2.5 | 5 | 3162 | none |
| 1600 | | RDS | 245 | 200 | 2.5 | 6 | 3248 | none |
| 1615 | | RDS | 235 | 200 | 2.5 | 5 | 3333 | none |
| 1630 | | RDS | 240 | 200 | 2.5 | 6 | 3415 | none |
| 1645 | | RDS | 240 | 200 | 2.5 | 6 | 3488 | none |
| 1700 | | RDS | 240 | 200 | 2.5 | 6 | 3602 | none |
| 1715 | * | RDS | 210 | 190 | 2.0 | 5 | 3656 | none |
| 1735 | | RDS | 180 | 165 | 1.8 | 3 | 3728 | none |
| Total** | | | | | | | 1,168 | |
| Mean | | | 232 | 195 | 2.5 | 5.3 | | |
| St. Dev | | | 16 | 9 | 0.3 | 0.8 | | |
| Min | | | 180 | 165 | 1.8 | 3.0 | | |
| Max | | | 245 | 200 | 2.9 | 6.0 | | |

* See Table 4 for a description of these events.

** Because running total data were not available, the run totals were calculated from the average of the TPH data multiplied by the total run time.

Appendix A: Process Data

ASPHALT PLANT "A"

Test Run 4

Test Date: August 21, 1997

Total Test Time: 4.2 hrs

| Time | Event | Product Type | Asphalt Concrete Production | | Asphalt Temp. (oF) | Aggregate Use | | RAP Use | | Asphalt Cement Use | | Calculated Conditioner Use | |
|---------|-------|--------------|-----------------------------|--------------|--------------------|---------------|--------------|------------|--------------|--------------------|--------------|----------------------------|--------------|
| | | | Rate (TPH) | Total (tons) | | Rate (TPH) | Total (tons) | Rate (TPH) | Total (tons) | Rate (TPH) | Total (tons) | Rate (TPH) | Total (tons) |
| 0741 | | HDS | 150 | | 315 | 142 | | 0 | | 7.8 | | 0.02 | |
| 0745 | | HDS | 179 | | 306 | 169 | | 0 | | 9.2 | | 0.02 | |
| 0800 | | HDS | 177 | | 302 | 169 | | 0 | | 9.2 | | 0.02 | |
| 0815 | | HDS | 177 | | 335 | 168 | | 0 | | 9.3 | | 0.02 | |
| 0830 | | Binder | 178 | | 300 | 171 | | 0 | | 8.1 | | 0.02 | |
| 0845 | | Binder | 179 | | 300 | 171 | | 0 | | 8.2 | | 0.02 | |
| 0900 | | HDS | 184 | | 351 | 174 | | 0 | | 9.0 | | 0.02 | |
| 0915 | | Binder | 179 | | 283 | 167 | | 0 | | 9.1 | | 0.02 | |
| 0930 | | Binder | 181 | | 297 | 172 | | 0 | | 8.5 | | 0.02 | |
| 0945 | | Binder | 178 | | 319 | 172 | | 0 | | 8.0 | | 0.02 | |
| 1000 | | Binder | 177 | | 320 | 171 | | 0 | | 7.8 | | 0.02 | |
| 1015 | | HDS | 176 | | 350 | 167 | | 0 | | 9.3 | | 0.02 | |
| 1030 | * | HDS | 200 | | 271 | 191 | | 0 | | 10.4 | | 0.03 | |
| 1045 | | HDS | 200 | | 303 | 190 | | 0 | | 10.6 | | 0.03 | |
| 1100 | | HDS | 200 | | 282 | 189 | | 0 | | 10.4 | | 0.03 | |
| 1115 | | HDS | 200 | | 310 | 190 | | 0 | | 10.5 | | 0.03 | |
| 1130 | | HDS | 200 | | 289 | 191 | | 0 | | 10.3 | | 0.03 | |
| 1145 | | HDS | 200 | | 318 | 189 | | 0 | | 10.6 | | 0.03 | |
| 1153 | | Binder/ HDS | 204 | | 297 | 194 | | 0 | | 8.9 | | 0.02 | |
| Total** | | | | 778 | | | 740 | | 0 | | 39 | | 0.10 |
| Mean | | | 185 | | 308 | 176 | | 0 | | 9.2 | | 0.02 | |
| St. Dev | | | 13 | | 21 | 13 | | 0 | | 1.0 | | 0.00 | |
| Min | | | 150 | | 271 | 142 | | 0 | | 7.8 | | 0.02 | |
| Max | | | 204 | | 351 | 194 | | 0 | | 10.6 | | 0.03 | |

* See Table 4 for a description of these events.

** Because running total data were not available, the run totals were calculated from the average of the TPH data multiplied by the total run time.

Appendix A: Process Data

ASPHALT PLANT "A"

Test Run 4

Test Date: August 21, 1997

Total Test Time: 4.2 hrs

| Time | Event | Product Type | Fabric Filter | | | Fuel Use | | Visible Emissions |
|---------|-------|--------------|------------------|-------------------|-------------------------|------------|-------------|-------------------|
| | | | Inlet Temp. (oF) | Outlet Temp. (oF) | Pressure Drop (in. H2O) | Rate (GPM) | Total (gal) | |
| 0741 | | HDS | 195 | 168 | 2.0 | 5 | 146 | none |
| 0745 | | HDS | 203 | 178 | 2.0 | 4 | 216 | none |
| 0800 | | HDS | 203 | 177 | 2.0 | 4 | 288 | none |
| 0815 | | HDS | 205 | 178 | 2.0 | 4 | 363 | none |
| 0830 | | Binder | 195 | 170 | 2.0 | 4 | 440 | none |
| 0845 | | Binder | 200 | 170 | 2.0 | 3 | 474 | none |
| 0900 | | HDS | 210 | 180 | 2.0 | 4 | 560 | none |
| 0915 | | Binder | 200 | 180 | 1.8 | 3 | 626 | none |
| 0930 | | Binder | 195 | 170 | 2.0 | 4 | 669 | none |
| 0945 | | Binder | 195 | 175 | 1.9 | 4 | 743 | none |
| 1000 | | Binder | 190 | 168 | 1.9 | 4 | 812 | none |
| 1015 | | HDS | 192 | 170 | 1.8 | 4 | 871 | none |
| 1030 | | HDS | 205 | 170 | 1.9 | 5 | 932 | none |
| 1045 | * | HDS | 210 | 180 | 2.0 | 5 | 1004 | none |
| 1100 | | HDS | 205 | 175 | 1.9 | 5 | 1063 | none |
| 1115 | | HDS | 200 | 180 | 1.8 | 4 | 1133 | none |
| 1130 | | HDS | 205 | 175 | 1.9 | 4 | 1208 | none |
| 1145 | | HDS | 210 | 180 | 2.0 | 5 | 1285 | none |
| 1153 | | Binder/ HDS | 210 | 180 | 1.9 | 4 | 1323 | none |
| Total** | | | | | | | 1,177 | |
| Mean | | | 201 | 175 | 1.9 | 4.2 | | |
| St. Dev | | | 6 | 5 | 0.1 | 0.6 | | |
| Min | | | 190 | 168 | 1.8 | 3.0 | | |
| Max | | | 210 | 180 | 2.0 | 5.0 | | |

* See Table 4 for a description of these events.

** Because running total data were not available, the run totals were calculated from the average of the TPH data multiplied by the total run time.

SPECIALIZED ASSAYS ENVIRONMENTAL
2960 Foster Creighton Drive
Nashville, Tennessee 37204

ANALYTICAL REPORT

•• Original report and a copy of the chain of custody will follow by mail.

NOBLE OIL, CO. 7680
ATTN: LARRY PRICE
5617 CLYDE RHYNE DRIVE
SANFORD, NC 27330

Lab Number: 97-A065425

Sample ID: 861-625 OIL

Date Collected: 7/25/97

Project:

Time Collected:

Project Name:

Date Received: 8/7/97

Sampler:

Time Received: 9:00

State Certification: 387

Sample Type: Oil

| Analyte | Result | Units | Report Limit | Quan Limit | Dil Factor | Date | Time | Analyst | Method | Batch |
|---------------------------------------|-----------------|-------|--------------|------------|------------|---------|-------|-------------|-----------|-------|
| *METALS* | | | | | | | | | | |
| Arsenic | ND | mg/kg | 1.0 | 1.0 | 1 | 8/11/97 | 14:29 | R. Street | 6010A | 2146 |
| Calcium | ND | mg/kg | 1.0 | 1.0 | 1 | 8/11/97 | 14:29 | R. Street | 6010A | 2146 |
| Chromium | ND | mg/kg | 1.0 | 1.0 | 1 | 8/11/97 | 14:29 | R. Street | 6010A | 2146 |
| Lead | 28.0 | mg/kg | 1.0 | 1.0 | 1 | 8/11/97 | 14:29 | R. Street | 6010A | 2146 |
| Nickel | ND | mg/kg | 1.0 | 1.0 | 1 | 8/11/97 | 14:29 | R. Street | 6010A | 2146 |
| *GENERAL CHEMISTRY PARAMETERS* | | | | | | | | | | |
| Chlorine in Oil | 464. | mg/kg | 10.0 | 10.0 | 1 | 8/12/97 | 15:50 | K. Witte | 9376 | 2668 |
| Ash | 0.57 | % | | 0.01 | 1 | 8/9/97 | 14:17 | A. Hardison | D402 | 2433 |
| Flash Point, Closed Cup | FLASHED AT 150F | | | | | 8/14/97 | 9:22 | D. Houser | 1010 | 3455 |
| Sulfur | 3590 | mg/kg | 100. | 5.00 | 20 | 8/14/97 | 12:37 | G. Baun | ASTM D808 | 8920 |

ND = Not detected at the report limit.

Flash point: Ignitability reported to the nearest 10 deg F.

Report Approved By: _____

Report Date: 8/14/97

Theodore J. Duello, Ph.D., Q.A. Officer
Michael M. Dunn, M.S., Technical Director
Danny B. Hale, M.S., Laboratory Director

MATERIAL SAFETY DATA SHEET

Manufacturer
ARR-MAZ PRODUCTS, L.P.
621 Snively Avenue
Winter Haven, FL 33880
Emergency Phone Number
941-293-7884

PRODUCT INFORMATION

Trade Name: AD-here LOF 65-00

Chemical Family: Amines

Composition: Modified Fatty Amidoamine

HMIS RATING:

| | |
|---------------------|------------|
| Health Hazard | 2 Moderate |
| Flammability Hazard | 1 Slight |
| Reactivity Hazard | 0 Minimal |

D.O.T. Shipping Classification: Not regulated

PHYSICAL DATA

Boiling Point (°F): > 500 °F

Solubility in Water: Slight

Vapor Pressure (mmHg at 25°C): < 1

Vapor Density (Air = 1): > 1

Appearance: Dark brown liquid

Odor: Mild

Specific Gravity (at 77°F): 0.96 - 0.98

FIRE EXPLOSION

Flash Point PM Closed Cup °F: >300 °F

Extinguishing Media: CO2, foam, or dry chemical

Special Fire Fighting Procedures: Wear NIOSH/MSHA approved self-contained breathing equipment and protective clothing.

APPENDIX B
RAW FIELD DATA

Appendix B.1

Raw Field Data

Baghouse Inlet



TRAVERSE POINT LOCATION FOR CIRCULAR DUCTS *

Plant: ASPHALT PLANT "A"

Date: 8/18/97

Sampling Location: Baghouse Inlet

Inside of Far Wall to Outside of Nipple: 52

Inside of Near Wall to Outside of Nipple (Nipple Length): 4

Stack I.D.: 48"

Distance Downstream from Flow Disturbance (Distance B):

$$\underline{22} \text{ inches} / \text{Stack I.D.} = \underline{0.458} \text{ dd} *$$

Distance Upstream from Flow Disturbance (Distance A):

$$\underline{33\frac{1}{2}} \text{ inches} / \text{Stack I.D.} = \underline{0.698} \text{ dd}$$

Calculated By: DG AB

Schematic of
Sampling Location

| Traverse Point Number | Fraction of Length | Length (inches) | Product of Columns 2 & 3 (To nearest 1/8") | Nipple Length (inches) | Traverse Point Location (Sum of Col. 4 & 5) |
|-----------------------|--------------------|-----------------|--|------------------------|---|
| 1 | 0.021 | 48 | 1.008 | 4 | 5 |
| 2 | 0.067 | | 3 1/4 | | 7 1/4 |
| 3 | 0.118 | | 5 5/8 | | 9 5/8 |
| 4 | 0.177 | | 8 1/2 | | 12 1/2 |
| 5 | 0.250 | | 12 | | 16 |
| 6 | 0.356 | | 17 1/8 | | 21 1/8 |
| 7 | 0.644 | | 30 3/8 | | 34 7/8 |
| 8 | 0.750 | | 36 | | 40 |
| 9 | 0.823 | | 39 1/2 | | 43 1/2 |
| 10 | 0.882 | | 42 3/8 | | 46 3/8 |
| 11 | 0.933 | | 44 3/4 | | 48 3/4 |
| 12 | 0.979 | ↓ | 47 | ↓ | 51 |

* DOES NOT MEET METHOD 1

GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant: PES/EPA Asphalt Plant # "A" Date: 8/18/97
 Sampling Location: Baghouse Inlet Clock Time: 13:00
 Run #: PRELIMINARY Operators: AB/AD
 Barometric Pressure, in. Hg: 29.90 Static Pressure, in. H₂O: -2.5
 Moisture, %: 25 Molecular wt., Dry: _____ Pitot Tube, Cp: 0.84
 Stack Dimension, in. Diameter or Side 1: 48 Side 2: 48
 Wet Bulb, °F: _____ Dry Bulb, °F: _____

Cyclonic

| | Traverse Point Number | Velocity Head in. H ₂ O | Stack Temp. °F |
|----|-----------------------|------------------------------------|----------------|
| 0 | A 1 | 0.36 | 194 |
| 1 | 2 | 0.25 | 195 |
| 0 | 3 | 0.26 | 193 |
| 4 | 4 | 0.23 | 195 |
| 0 | 5 | 0.26 | 194 |
| 0 | 6 | 0.34 | 193 |
| 11 | 7 | 0.50 | 194 |
| 0 | 8 | 0.39 | 196 |
| 12 | 9 | 0.36 | 194 |
| 4 | 10 | 0.34 | 195 |
| 10 | 11 | 0.22 | 193 |
| 10 | 12 | 0.25 | 195 |
| 15 | B 1 | 0.26 | 194 |
| 0 | 2 | 0.12 | 193 |
| 12 | 3 | 0.10 | 194 |
| 10 | 4 | 0.30 | 196 |
| -8 | 5 | 0.24 | 194 |
| 12 | 6 | 0.30 | 195 |
| 10 | 7 | 0.38 | 193 |
| 5 | 8 | 0.33 | 195 |
| 8 | 9 | 0.30 | 194 |
| 9 | 10 | 0.23 | 193 |
| 18 | 11 | 0.12 | 194 |
| 13 | 12 | 0.09 | 196 |
| | | $\sqrt{\Delta P} = 0.512$ | $T_s = 194.3$ |

$\gamma = 7.2^\circ$

$$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times \%N_2)$$

$$M_d = (0.44 \times \quad) + (0.32 \times \quad) + (0.28 \times \quad)$$

$$M_d =$$

$$M_s = M_d \times (1 - \frac{\%H_2O}{100}) + 18 (\frac{\%H_2O}{100})$$

$$M_s = (\quad) \times (1 - \frac{\quad}{100}) + 18 (\frac{\quad}{100})$$

$$M_s =$$

$$T_s = \quad ^\circ F = \quad ^\circ R (^\circ F + 460)$$

$$P_s = P_b + \frac{S.P.}{13.6} = (\quad) + \frac{\quad}{13.6}$$

$$P_s = \quad \text{in. Hg}$$

$$\sqrt{\Delta P} =$$

$$V_s = 85.49 \times C_p \times \sqrt{\Delta P} \times \sqrt{\frac{T_s (^\circ R)}{P_s \times M_s}}$$

$$V_s = 85.49 \times (\quad) \times (\quad) \times \sqrt{\quad}$$

$$V_s = \quad \text{ft/s}$$

$$A_s = \quad \text{ft}^2$$

$$Q_s = V_s \times A_s \times 60 \text{ s/m}$$

$$Q_s = \quad \times \quad \times 60$$

$$Q_s = \quad \text{acfm}$$

$$Q_{s, \text{std}} = Q_s \times 17.647 \times \frac{P_s}{T_s} \times (1 - \frac{\%H_2O}{100})$$

$$Q_{s, \text{std}} = \quad \times 17.647 \times \quad \times (1 - \frac{\quad}{100})$$

$$Q_{s, \text{std}} = \quad \text{dscfm}$$



FIELD DATA

Condensers _____
 V_L: Silica gel _____
 Total H₂ O _____

used

METHOD 23 CDD/CDF SAMPLE RECOVERY DATA

S-23-I-1

| | | | | | | | |
|---|--------------|-----------------------------|---------------------------|-------------------------|-------------------------------|-----------------------|---|
| Plant: ASPHALT PLANT "A" | | | | | Run No.: # PBR 1 | | |
| Sample Date: 8/19/97 | | Filter No.(s): — | | | Job No.: 5413.003 | | |
| Sample Location: INLET | | | | | | | |
| Recovery Date: 8/19/97 | | XAD-2 Trap No.(s): S-23-I-1 | | | | | |
| Sample Recovery Person: | | | | | | | |
| Moisture Data | | | | | | | |
| Impingers | XAD - 2 Trap | 1 (knockout) | 2 (100 ml H2O) (untipped) | 3 (100 ml H2O) (tipped) | 4 (knockout) (untipped) | Silica gel (untipped) | |
| Final wt. | 433.5 | 474.1 | 699.8 | 703.9 | 594.4 | 888.7 | g |
| Initial wt. | 408.7 | 422.3 | 699.2 | 703.6 | 593.3 | 883.3 | g |
| Net wt. | 24.8 | 51.8 | 0.6 | 0.3 | 1.1 | 5.4 | g |
| Description: | | | | | TOTAL = 78.0 84.0 | | |
| Train System: — | | | | | | | |
| Probe: — | | | | | | | |
| Filter: Color - — | | | | Loading - — | | | |
| Impinger Contents: — | | | | | | | |
| Silica Gel: @Grams Used - — | | | | Color - — | | % Spent - — | |
| Condensate Observed In Front Half: — | | | | | | | |
| Recovered Sample Fractions | | | | | | | |
| Filter Container No. — | | | | | marked/sealed: — | | |
| XAD Module Container No.: — | | | | | marked/sealed: — | | |
| Probe (FH) & Back Half Rinse (Acetone) Container No.: — | | | | | Liquid level marked/sealed: — | | |
| Probe (FH) & Back Half Rinse (Toluene) Container No.: — | | | | | Liquid level marked/sealed: — | | |
| Impinger Contents Container No.: — | | | | | Liquid level marked/sealed: — | | |
| Impinger Rinse (Acetone/MeCl2) Container No.: — | | | | | Liquid level marked/sealed: — | | |

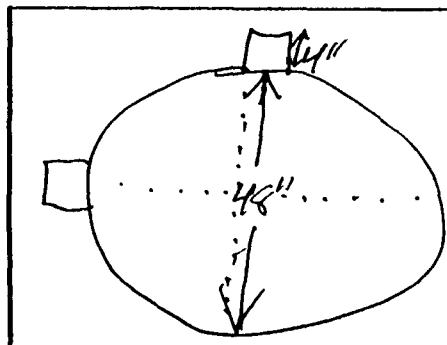
294.1
COND. 292.6



PACIFIC ENVIRONMENTAL SERVICES, INC.

Plant ASPHALT PLANT "A"
Date 8-19-97
Sampling Location Inlet to Baghouse
Sample Type PM- Metals
Run Number S-99-I-1
Operator ATB
Barometric Pressure (B) 29.90
Static Pressure (P) -2.5
Filter Number(s) MC7-001 - (MOM)
Pretest Leak Rate = .005 cfm @ 10" in. Hg
Pretest Pitot Leak Check ✓
Pretest Orsat Leak Check ✓
Read and Record all Data Every 10 Minutes
Page 1 of 1

FIELD DATA



Schematic of
Traverse Point Layout

| | | | |
|-----------------|--|--|--|
| CO ₂ | | | |
| O ₂ | | | |
| CO | | | |
| N ₂ | | | |

| | |
|-----------------------------|--|
| Condensers | |
| V ₁ : Silica gel | |
| Total H ₂ O | |

Probe Length and Type 6' Glass
Pitot Tube I.D. No. 58
Nozzle I.D. 3/16" AB
Assumed Moisture, % 252
Meter Box Number M5 #9
Meter Δ H @ 1.776
Meter Gamma 1.016
Reference p .512
Post Test Leak Rate = .007 cfm @ 10" in. Hg
Post Test Pitot Leak Check ✓
Post Test Orsat Leak Check ✓

Temp. Sensor ID No.

| Traverse Point Number | Sampling Time (min.) | Clock Time (24-hour clock) | Gas Meter Reading (Vol) ft ³ | Velocity Head (ft) | Orifice Pres. Differential (in. H ₂ O) | | Stack Temp. °F (T _s) | Probe Temp. / Filter Temp. °F | Impinger Temp. °F | Dry Gas Meter Temp. | | Pump Vacuum in. Hg |
|-----------------------|----------------------|----------------------------|---|--------------------|---|--------|----------------------------------|-------------------------------|-------------------|-----------------------------|-------------------------------|--------------------|
| | | | | | Desired | Actual | | | | Inlet (T _{in}) °F | Outlet (T _{out}) °F | |
| 12 | 0 | 1:54:41 | 105.740 | .23 | 1.20 | 1.20 | 230 | 233 / 260 | 51 | 91 | 88 | 2 |
| 12 | 5 | 1:59:16 | 105.740 | .23 | 1.09 | 1.10 | 233 | 235 / 265 | 50 | 93 | 88 | 5 |
| 11 | 10 | 2:01:30 | 111.20 | .25 | 1.24 | 1.20 | 228 | 234 / 260 | 49 | 96 | 89 | 23 |
| 10 | 15 | 2:03:05 | 113.35 | .18 | 0.90 | 0.90 | 227 | 232 / 257 | 50 | 97 | 95 | 6 |
| 9 | 20 | 2:05:01 | | | | | | | | | | |
| 8 | 25 | 2:07:01 | | | | | | | | | | |
| 7 | 30 | 2:09:01 | | | | | | | | | | |
| 6 | 35 | 2:11:01 | | | | | | | | | | |
| 5 | 40 | 2:13:01 | | | | | | | | | | |
| 4 | 45 | 2:15:01 | | | | | | | | | | |
| 3 | 50 | 2:17:01 | | | | | | | | | | |
| 2 | 55 | 2:19:01 | | | | | | | | | | |
| 1 | 60 | 2:21:01 | | | | | | | | | | |
| 1 | 65 | 2:23:01 | | | | | | | | | | |
| 1 | 70 | 2:25:01 | | | | | | | | | | |
| 1 | 75 | 2:27:01 | | | | | | | | | | |
| 1 | 80 | 2:29:01 | | | | | | | | | | |
| 1 | 85 | 2:31:01 | | | | | | | | | | |
| 1 | 90 | 2:33:01 | | | | | | | | | | |
| 1 | 95 | 2:35:01 | | | | | | | | | | |
| 1 | 100 | 2:37:01 | | | | | | | | | | |
| 1 | 105 | 2:39:01 | | | | | | | | | | |
| 1 | 110 | 2:41:01 | | | | | | | | | | |

Port 3
Filter Change

MULT

DO
NOT
COPY
↓

SAMPLE RECOVERY DATA

| Plant: ASPHALT PLANT "A" | | Run No.: S 29-I-1 | | | |
|---|---|--------------------|---------------------|-------|--------|
| Date: 8-19-97 | Sample Box No.: — | Job No.: S 413-003 | | | |
| Sample Location: Inlet | | | | | |
| Sample Type: Particulate / Metals | | | | | |
| Sample Recovery Person: Troy Abernathy / Barry Rayfield | | | | | |
| Container | Description | Volume, ml | Sealed/Level Marked | | |
| Front Half | | | | | |
| 1 | Filter No.(s) M97-001 | — | — | | |
| 2 | Acetone Rinse | — | — | | |
| 3 | Nitric Rinse | — | — | | |
| Back Half | | | | | |
| 4 | Nitric Rinse - Imp. 1,2,3, + Back 1/2 Filter | — | — | | |
| 5A | Nitric Rinse - Impinger No. 4 | — | — | | |
| 5B | KMNO ₄ /H ₂ O Rinse - Impingers 5 & 6 | — | — | | |
| 5C | HCl Rinse - Impingers 5 & 6 | — | — | | |
| Moisture Data | | | | | |
| Impinger No. | Contents | Initial Volume, ml | Weight, grams | | |
| | | | Initial | Final | Net |
| 1 | Empty | — | 723.1 | 773.1 | 50.0 |
| 2 | 5% HNO ₃ / 10% H ₂ O ₂ | 100 | 704.7 | 723.1 | 18.4 |
| 3 | 5% HNO ₃ / 10% H ₂ O ₂ | 100 | 730.3 | 734.9 | 4.6 |
| 4 | Empty | — | 636.2 | 636.7 | 0.5 |
| 5 | KMNO ₄ / H ₂ SO ₄ | 100 | 681.0 | 681.5 | 0.5 |
| 6 | KMNO ₄ / H ₂ SO ₄ | 100 | 741.1 | 741.7 | 0.6 |
| 7 | Silica Gel | 200 | 786.8 | 791.0 | 4.2 |
| | | | | | |
| | | | | | |
| | | | | | |
| Total | | | | | 78.8 ✓ |
| Comments: | | | | | |
| | | | | | |
| | | | | | |

Appendix B.2

Raw Field Data

Baghouse Outlet

7-11

COMMENTS:

| <div> <div>RUN</div> <div>GAS</div> </div> | 1 | | 2 | | 3 | | AVERAGE NET VOLUME | MULTIPLIER | MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d |
|--|-------------------|------|-------------------|------|-------------------|-----|--------------------------|------------|---|
| | ACTUAL READING | NET | ACTUAL READING | NET | ACTUAL READING | NET | | | |
| CO ₂ | 5.4 | 5.4 | 5.5 | 5.5 | | | 5.45 | 44/100 | |
| O ₂ (NET IS ACTUAL O ₂ READING MINUS ACTUAL CO ₂ READING) | 18.4 | 13.0 | 18.7 | 13.2 | | | 13.10 | 32/100 | |
| CO(NET IS ACTUAL CO READING MINUS ACTUAL O ₂ READING) | | | | | | | | 28/100 | |
| N ₂ (NET IS 100 MINUS ACTUAL CO READING) | | | | | | | | 28/100 | |
| | | | | | | | | TOTAL | |

11

COMMENTS:

| <div> <div>RUN</div> <div>GAS</div> </div> | 1 | | 2 | | 3 | | AVERAGE NET VOLUME | MULTIPLIER | MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d |
|--|-------------------|------|-------------------|------|-------------------|-----|--------------------------|------------|---|
| | ACTUAL READING | NET | ACTUAL READING | NET | ACTUAL READING | NET | | | |
| CO ₂ | 5.0 | 5.0 | 5.2 | 5.2 | | | 5.1 | 44/100 | |
| O ₂ (NET IS ACTUAL O ₂ READING MINUS ACTUAL CO ₂ READING) | 18.2 | 13.2 | 18.2 | 13.0 | | | 13.1 | 32/100 | |
| CO(NET IS ACTUAL CO READING MINUS ACTUAL O ₂ READING) | | | | | | | | 28/100 | |
| N ₂ (NET IS 100 MINUS ACTUAL CO READING) | | | | | | | | 28/100 | |
| | | | | | | | | TOTAL | |

GAS ANALYSIS DATA FORM



PLANT ASPHALT PLANT "A"
 DATE 8/21/97 TEST NO. #4
 SAMPLING TIME (24-HR CLOCK) _____
 SAMPLING LOCATION OUTLET
 SAMPLE TYPE (BAG INTEGRATED, CONTINUOUS) _____
 ANALYTICAL METHOD _____
 AMBIENT TEMPERATURE _____
 OPERATOR _____

COMMENTS:

| RUN GAS | 1 | | 2 | | 3 | | AVERAGE NET VOLUME | MULTIPLIER | MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d |
|--|--------------------|--------|-------------------|-----|-------------------|-----|--------------------------|------------|---|
| | ACTUAL READING | NET | ACTUAL READING | NET | ACTUAL READING | NET | | | |
| CO ₂ | 3.2 | 3.2 | | | | | | 44/100 | |
| O ₂ (NET IS ACTUAL O ₂ READING MINUS ACTUAL CO ₂ READING) | 14.0 TOTAL 10.8 | 10.8 ✓ | | | | | | 32/100 | |
| CO (NET IS ACTUAL CO READING MINUS ACTUAL O ₂ READING) | | | | | | | | 28/100 | |
| N ₂ (NET IS 100 MINUS ACTUAL CO READING) | | | | | | | | 28/100 | |
| | | | | | | | | TOTAL | |

VISIBLE EMISSIONS RECORD

RUN NO. 1A

| | | | | | | | |
|--|------------------------------|---|---|------------------------|----|------------------------|----|
| SOURCE NAME <u>Baghouse Outlet</u> | | OBSERVATION DATE <u>8-19-97</u> | | START TIME <u>9:18</u> | | STOP TIME <u>11:06</u> | |
| ADDRESS <u>Asphalt Plant "A"</u> | | SEC MIN | | 0 | 15 | 30 | 45 |
| <u>1010 Rd (Cleveland Rd)</u> | | SEC | | 0 | 15 | 30 | 45 |
| CITY | STATE <u>NC</u> | ZIP | | 1 | 5 | 0 | 5 |
| PHONE | SOURCE ID NUMBER | | 2 | 0 | 0 | 0 | 5 |
| PROCESS EQUIPMENT <u>aggregate dryer</u> | OPERATING MODE | | 3 | 0 | 0 | 5 | 5 |
| CONTROL EQUIPMENT <u>baghouse</u> | OPERATING MODE <u>normal</u> | | 4 | 0 | 0 | 0 | 5 |
| DESCRIBE EMISSION POINT <u>rectangular stack</u> | | START <u>same</u> | | 5 | 5 | 0 | 5 |
| HEIGHT ABOVE GROUND LEVEL <u>29 ft</u> | | HEIGHT RELATIVE TO OBSERVER <u>same</u> | | 6 | 0 | 0 | 5 |
| DISTANCE FROM OBSERVER <u>450 ft</u> | | DIRECTION FROM OBSERVER <u>WEST</u> | | 7 | 0 | 5 | 0 |
| DESCRIBE EMISSIONS <u>condensing cone</u> | | START <u>small amount of condensation</u> | | 8 | 5 | 10 | 0 |
| EMISSION COLOR <u>white</u> | | PLUME TYPE <input checked="" type="checkbox"/> CONTINUOUS | | 9 | 0 | 15 | 0 |
| START <u>same</u> | | FUGITIVE <input type="checkbox"/> INTERMITTENT <input type="checkbox"/> | | 10 | 5 | 5 | 5 |
| WATER DROPLETS PRESENT <input checked="" type="checkbox"/> YES | | IF WATER DROPLET PLUME <input checked="" type="checkbox"/> ATTACHED | | 11 | 0 | 0 | 5 |
| POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED <u>1 dia above exit</u> | | STOP <u>same</u> | | 12 | 0 | 0 | 0 |
| DESCRIBE BACKGROUND <u>trees</u> | | STOP <u>same</u> | | 13 | 5 | 0 | 0 |
| BACKGROUND COLOR <u>green</u> | | SKY CONDITIONS <u>scattered</u> | | 14 | 0 | 0 | 0 |
| WIND SPEED <u>2-4 mph</u> | | WIND DIRECTION <u>NW</u> | | 15 | 5 | 5 | 0 |
| AMBIENT TEMP <u>77</u> | | WET BULB TEMP <u>67</u> | | 16 | 0 | 0 | 5 |
| STOP <u>86</u> | | RH. percent <u>59</u> | | 17 | 0 | 0 | 0 |
| STOP <u>42</u> | | STOP <u>same</u> | | 18 | 0 | 5 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 19 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 20 | 0 | 0 | 5 |
| STOP <u>same</u> | | STOP <u>same</u> | | 21 | 5 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 22 | 10 | 5 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 23 | 0 | 0 | 5 |
| STOP <u>same</u> | | STOP <u>same</u> | | 24 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 25 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 26 | 5 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 27 | 1 | 5 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 28 | 1 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 29 | 0 | 5 | 5 |
| STOP <u>same</u> | | STOP <u>same</u> | | 30 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 31 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 32 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 33 | 5 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 34 | 0 | 5 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 35 | 5 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 36 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 37 | 0 | 5 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 38 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 39 | 0 | 5 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 40 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 41 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 42 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 43 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 44 | 5 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 45 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 46 | 5 | 0 | 5 |
| STOP <u>same</u> | | STOP <u>same</u> | | 47 | 0 | 0 | 5 |
| STOP <u>same</u> | | STOP <u>same</u> | | 48 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 49 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 50 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 51 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 52 | 0 | 5 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 53 | 5 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 54 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 55 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 56 | 5 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 57 | 5 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 58 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 59 | 5 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 60 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 61 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 62 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 63 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 64 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 65 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 66 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 67 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 68 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 69 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 70 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 71 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 72 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 73 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 74 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 75 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 76 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 77 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 78 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 79 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 80 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 81 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 82 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 83 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 84 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 85 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 86 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 87 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 88 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 89 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 90 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 91 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 92 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 93 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 94 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 95 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 96 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 97 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 98 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 99 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 100 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 101 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 102 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 103 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 104 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 105 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 106 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 107 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 108 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 109 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 110 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 111 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 112 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 113 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 114 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 115 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 116 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 117 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 118 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 119 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 120 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 121 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 122 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 123 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 124 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 125 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 126 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 127 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 128 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 129 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 130 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 131 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 132 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 133 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 134 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 135 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 136 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 137 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 138 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 139 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 140 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 141 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 142 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 143 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 144 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 145 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 146 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 147 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 148 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 149 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 150 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 151 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 152 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 153 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 154 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 155 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 156 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 157 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 158 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 159 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 160 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 161 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 162 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 163 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 164 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 165 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 166 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 167 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 168 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 169 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 170 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 171 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 172 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 173 | 0 | 0 | 0 |
| STOP <u>same</u> | | STOP <u>same</u> | | 174 | 0 | 0 | 0 |

VISIBLE EMISSIONS RECORD

RUN NO. 18

| | | | | | | | | | | | | | | | | | |
|--|------------------|--|---------------------------------|--------------------------|--|------------|-------------------------|-------------|--|------------|------------------------|--|--|--|--|--|--|
| SOURCE NAME <u>Baghouse Exit</u> | | | OBSERVATION DATE <u>8-19-97</u> | | | | START TIME <u>11:07</u> | | | | STOP TIME <u>12:07</u> | | | | | | |
| ADDRESS <u>Asphalt Plant "A"</u> | | | SEC MIN 0 15 30 45 | | | | SEC MIN 0 15 30 45 | | | | | | | | | | |
| <u>1010 Rd (Cleveland Rd)</u> | | | 1 5 0 0 / | | | | 31 0 0 0 / | | | | | | | | | | |
| CITY | STATE <u>NC</u> | ZIP | 2 / / 0 0 | | | | 32 0 0 5 0 | | | | | | | | | | |
| PHONE | SOURCE ID NUMBER | | 3 0 0 0 0 | | | | 33 0 0 0 / | | | | | | | | | | |
| PROCESS EQUIPMENT <u>aggregate dryer</u> | | OPERATING MODE | | 4 0 5 0 0 | | | | 34 5 0 0 0 | | | | | | | | | |
| CONTROL EQUIPMENT <u>baghouse</u> | | OPERATING MODE <u>normal</u> | | 5 5 5 5 0 | | | | 35 0 0 0 0 | | | | | | | | | |
| DESCRIBE EMISSION POINT START <u>rectangular yellow stack</u> STOP <u>same</u> | | | | 6 0 0 0 / | | | | 36 0 0 0 0 | | | | | | | | | |
| HEIGHT ABOVE GROUND LEVEL START <u>29 ft</u> STOP <u>same</u> | | HEIGHT RELATIVE TO OBSERVER START <u>0</u> STOP <u>same</u> | | 7 5 0 0 0 | | | | 37 0 5 0 0 | | | | | | | | | |
| DISTANCE FROM OBSERVER START <u>450 ft</u> STOP <u>same</u> | | DIRECTION FROM OBSERVER START <u>WEST</u> STOP <u>same</u> | | 8 0 0 0 0 | | | | 38 0 0 0 0 | | | | | | | | | |
| DESCRIBE EMISSIONS START <u>con'g condensing</u> STOP <u>same</u> | | | | 9 0 0 0 0 | | | | 39 0 0 0 0 | | | | | | | | | |
| EMISSION COLOR <u>gray</u> START <u>pink, yellow</u> STOP <u>same</u> | | PLUME TYPE CONTINUOUS <input checked="" type="checkbox"/> FUGITIVE <input type="checkbox"/> INTERMITTENT <input type="checkbox"/> | | 10 0 0 0 0 | | | | 40 0 0 0 0 | | | | | | | | | |
| WATER DROPLETS PRESENT. NO <input type="checkbox"/> YES <input checked="" type="checkbox"/> | | IF WATER DROPLET PLUME: ATTACHED <input type="checkbox"/> DETACHED <input checked="" type="checkbox"/> | | 11 / 0 5 0 | | | | 41 10 0 5 0 | | | | | | | | | |
| POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED START <u>23 ft above exit</u> STOP <u>same</u> | | | | 12 0 0 5 5 | | | | 42 5 0 / / | | | | | | | | | |
| DESCRIBE BACKGROUND START <u>trees</u> STOP <u>same</u> | | | | 13 0 5 0 0 | | | | 43 0 0 0 5 | | | | | | | | | |
| BACKGROUND COLOR <u>green</u> START <u>green</u> STOP <u>same</u> | | SKY CONDITIONS START <u>scattered</u> STOP <u>same</u> | | 14 0 0 5 0 | | | | 44 0 0 0 0 | | | | | | | | | |
| WIND SPEED START <u>2</u> STOP <u>same</u> | | WIND DIRECTION START <u>NW</u> STOP <u>same</u> | | 15 0 / 0 0 | | | | 45 5 5 0 0 | | | | | | | | | |
| AMBIENT TEMP. START <u>86</u> STOP <u>88</u> | | WET BULB TEMP <u>68</u> | | RH, percent <u>38</u> | | 16 0 0 0 0 | | | | 46 0 0 5 0 | | | | | | | |
| <p>Source Layout Sketch</p> <p>Draw North Arrow</p> <p>Observation Point</p> <p>Baghouse Exit</p> <p>Sun</p> <p>Wind</p> <p>Plume and Stack</p> <p>Sun Location Line</p> <p>140°</p> <p>7-40</p> | | 17 0 0 5 0 | | | | 47 0 0 0 0 | | | | | | | | | | | |
| | | 18 0 0 0 0 | | | | 48 0 0 0 0 | | | | | | | | | | | |
| | | 19 5 0 0 / | | | | 49 0 5 0 0 | | | | | | | | | | | |
| | | 20 0 0 0 / | | | | 50 0 0 0 5 | | | | | | | | | | | |
| | | 21 0 0 0 5 | | | | 51 0 5 0 0 | | | | | | | | | | | |
| | | 22 0 0 0 0 | | | | 52 0 0 0 0 | | | | | | | | | | | |
| | | 23 0 0 0 0 | | | | 53 5 0 0 0 | | | | | | | | | | | |
| | | 24 5 0 0 0 | | | | 54 0 5 0 0 | | | | | | | | | | | |
| | | 25 0 0 0 0 | | | | 55 0 0 0 0 | | | | | | | | | | | |
| | | 26 0 0 0 5 | | | | 56 0 5 0 0 | | | | | | | | | | | |
| 27 0 0 / / | | | | 57 0 0 0 0 | | | | | | | | | | | | | |
| 28 0 0 0 0 | | | | 58 0 5 0 5 | | | | | | | | | | | | | |
| 29 0 5 0 0 | | | | 59 0 0 0 5 | | | | | | | | | | | | | |
| 30 0 0 0 0 | | | | 60 0 0 0 0 | | | | | | | | | | | | | |
| AVERAGE OPACITY FOR HIGHEST PERIOD <u>1.67%</u> | | NUMBER OF READINGS ABOVE 5 % WERE <u>1</u> | | | | | | | | | | | | | | | |
| RANGE OF OPACITY READINGS MINIMUM <u>0</u> MAXIMUM <u>10</u> | | | | | | | | | | | | | | | | | |
| OBSERVER'S NAME (PRINT) <u>David Goshaw</u> | | | | | | | | | | | | | | | | | |
| OBSERVER'S SIGNATURE <u>[Signature]</u> | | DATE <u>8-19-97</u> | | | | | | | | | | | | | | | |
| ORGANIZATION <u>DEECO Inc</u> | | | | | | | | | | | | | | | | | |
| I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS SIGNATURE <u>[Signature]</u> | | CERTIFIED BY <u>ETA</u> | | DATE <u>3/97</u> | | | | | | | | | | | | | |
| TITLE | | DATE | | VERIFIED BY | | DATE | | | | | | | | | | | |

VISIBLE EMISSIONS RECORD

RUN NO. 16

| | | | | | | | |
|---|------------------|--|--|---------------------------|--|------------------------|--|
| SOURCE NAME <u>Baghouse Exit</u> | | OBSERVATION DATE <u>8-19-97</u> | | START TIME # <u>13:04</u> | | STOP TIME <u>14:04</u> | |
| ADDRESS <u>Asphalt Plant "A"</u> | | SEC MIN | | SEC MIN | | | |
| <u>101.0 Rd (Cleveland Rd)</u> | | 0 15 30 45 | | 0 15 30 45 | | | |
| CITY | STATE <u>NC</u> | ZIP | | | | | |
| PHONE | SOURCE ID NUMBER | | | | | | |
| PROCESS EQUIPMENT <u>aggregate dryer</u> | | OPERATING MODE | | | | | |
| CONTROL EQUIPMENT <u>BAGHOUSE</u> | | OPERATING MODE <u>NORMAL</u> | | | | | |
| DESCRIBE EMISSION POINT | | | | | | | |
| START <u>rectangular yellow stack</u> STOP <u>same</u> | | | | | | | |
| HEIGHT ABOVE GROUND LEVEL | | HEIGHT RELATIVE TO OBSERVER | | | | | |
| START <u>29 ft</u> STOP <u>same</u> | | START <u>29 ft</u> STOP <u>same</u> | | | | | |
| DISTANCE FROM OBSERVER | | DIRECTION FROM OBSERVER | | | | | |
| START <u>300 ft</u> STOP <u>same</u> | | START <u>NE</u> STOP <u>same</u> | | | | | |
| DESCRIBE EMISSIONS | | | | | | | |
| START <u>coning</u> STOP <u>same</u> | | | | | | | |
| EMISSION COLOR | | PLUME TYPE. CONTINUOUS <input checked="" type="checkbox"/> | | | | | |
| START <u>grey</u> STOP <u>same</u> | | FUGITIVE <input type="checkbox"/> INTERMITTENT <input type="checkbox"/> | | | | | |
| WATER DROPLETS PRESENT | | IF WATER DROPLET PLUME | | | | | |
| NO <input type="checkbox"/> YES <input checked="" type="checkbox"/> | | ATTACHED <input type="checkbox"/> DETACHED <input checked="" type="checkbox"/> | | | | | |
| POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED | | | | | | | |
| START <u>3 ft above exit</u> STOP <u>same</u> | | | | | | | |
| DESCRIBE BACKGROUND | | | | | | | |
| START <u>trees</u> STOP <u>same</u> | | | | | | | |
| BACKGROUND COLOR | | SKY CONDITIONS | | | | | |
| START <u>green</u> STOP <u>same</u> | | START <u>scattered</u> STOP <u>same</u> | | | | | |
| WIND SPEED | | WIND DIRECTION | | | | | |
| START <u>2-3 mph</u> STOP <u>same</u> | | START <u>NW</u> STOP <u>same</u> | | | | | |
| AMBIENT TEMP. | | WET BULB TEMP | | RH, percent | | | |
| START <u>88</u> STOP <u>89</u> | | <u>68</u> | | <u>34</u> | | | |
| <p>Source Layout Sketch</p> | | | | | | | |
| <p>Comments</p> <p><u>1 - interference from fugitive</u></p> <p><u>source</u></p> | | | | | | | |
| I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS | | OBSERVER'S NAME (PRINT) | | OBSERVER'S SIGNATURE | | DATE | |
| SIGNATURE | | David Goshaw | | | | 8-19-97 | |
| TITLE | | ORGANIZATION | | CERTIFIED BY | | DATE | |
| | | DEECO Inc | | ETA | | 3/97 | |
| DATE | | VERIFIED BY | | | | DATE | |
| | | | | | | | |

AVERAGE OPACITY FOR 3.15% HIGHEST PERIOD 3.54% NUMBER OF READINGS ABOVE 5% WERE 7

RANGE OF OPACITY READINGS MINIMUM 0 MAXIMUM 10

OBSERVER'S NAME (PRINT) David Goshaw

OBSERVER'S SIGNATURE DATE 8-19-97

ORGANIZATION DEECO Inc

CERTIFIED BY ETA DATE 3/97

VERIFIED BY DATE

VISIBLE EMISSIONS RECORD

RUN NO. 10

| SOURCE NAME <u>Baghouse Exit</u> | | | | OBSERVATION DATE <u>8-19-97</u> | | | | START TIME <u>14:12</u> | | | | STOP TIME <u>15:12</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|------------------|----|--|-----|---|----|-------------------------|-----|----|----|------------------------|-----|---|----|----|----|-----|--|--|--|--|-----|--|--|--|--|--|--|--|--|-----|---|----|----|----|-----|---|----|----|----|-----|--|--|--|--|-----|--|--|--|--|
| ADDRESS <u>ASPHALT PLANT "A"</u> | | | | <table border="1" style="width: 100%; text-align: center;"> <tr> <th>SEC</th><th>0</th><th>15</th><th>30</th><th>45</th><th>SEC</th><th>0</th><th>15</th><th>30</th><th>45</th></tr> <tr> <td>MIN</td><td></td><td></td><td></td><td></td><td>MIN</td><td></td><td></td><td></td><td></td></tr> </table> | | | | SEC | 0 | 15 | 30 | 45 | SEC | 0 | 15 | 30 | 45 | MIN | | | | | MIN | | | | | <table border="1" style="width: 100%; text-align: center;"> <tr> <th>SEC</th><th>0</th><th>15</th><th>30</th><th>45</th><th>SEC</th><th>0</th><th>15</th><th>30</th><th>45</th></tr> <tr> <td>MIN</td><td></td><td></td><td></td><td></td><td>MIN</td><td></td><td></td><td></td><td></td></tr> </table> | | | | SEC | 0 | 15 | 30 | 45 | SEC | 0 | 15 | 30 | 45 | MIN | | | | | MIN | | | | |
| SEC | 0 | 15 | 30 | | | | | 45 | SEC | 0 | 15 | 30 | 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MIN | | | | | MIN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SEC | 0 | 15 | 30 | 45 | SEC | 0 | 15 | 30 | 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MIN | | | | | MIN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <u>1010 Rd (Cleveland Corp. Rd)</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CITY | | STATE <u>NC</u> | | ZIP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PHONE | | SOURCE ID NUMBER | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PROCESS EQUIPMENT <u>aggregate dryer</u> | | | | OPERATING MODE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CONTROL EQUIPMENT <u>Baghouse</u> | | | | OPERATING MODE <u>Normal</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DESCRIBE EMISSION POINT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| START <u>rectangular yellow stack</u> | | | | STOP <u>same</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HEIGHT ABOVE GROUND LEVEL | | | | HEIGHT RELATIVE TO OBSERVER | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| START <u>29 ft</u> | | | | STOP <u>same</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DISTANCE FROM OBSERVER | | | | DIRECTION FROM OBSERVER | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| START <u>300 ft</u> | | | | STOP <u>same</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DESCRIBE EMISSIONS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| START <u>conting</u> | | | | STOP <u>same</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EMISSION COLOR | | | | PLUME TYPE CONTINUOUS <input checked="" type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| START <u>light grey</u> | | | | STOP <u>same</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FUGITIVE <input type="checkbox"/> INTERMITTENT <input type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| WATER DROPLETS PRESENT: NO <input type="checkbox"/> YES <input checked="" type="checkbox"/> | | | | IF WATER DROPLET PLUME: ATTACHED <input type="checkbox"/> DETACHED <input checked="" type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| START <u>3 ft above exit</u> | | | | STOP <u>same</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DESCRIBE BACKGROUND | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| START <u>Trees</u> | | | | STOP <u>same</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BACKGROUND COLOR | | | | SKY CONDITIONS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| START <u>green</u> | | | | STOP <u>same</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| WIND SPEED | | | | WIND DIRECTION | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| START <u>2-3 mph</u> | | | | STOP <u>same</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| WIND DIRECTION | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| START <u>NW</u> | | | | STOP <u>same</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| AMBIENT TEMP. <u>88</u> | | | | WET BULB TEMP. <u>68</u> | | | | RH. percent <u>34</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| START <u>88</u> | | | | STOP <u>68</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <div style="text-align: center;"> <p>Source Layout Sketch Draw North Arrow</p> </div> | | | | 1 | | | | 5 | | | | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 2 | | | | 5 | | | | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 3 | | | | 0 | | | | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 4 | | | | 0 | | | | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 5 | | | | 5 | | | | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 6 | | | | 0 | | | | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 7 | | | | 1 | | | | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 8 | | | | 1 | | | | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 9 | | | | 1 | | | | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 10 | | | | 5 | | | | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 11 | | | | 0 | | | | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 12 | | | | 5 | | | | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | | | | 5 | | | | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | | | | 5 | | | | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | | | | 5 | | | | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | | | | 1 | | | | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | | | | 5 | | | | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | | | | 10 | | | | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | | | | 1 | | | | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | | | | 5 | | | | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | | | | 5 | | | | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | | | | 5 | | | | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | | | | 1 | | | | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 26 | | | | 0 | | | | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27 | | | | 10 | | | | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 | | | | 5 | | | | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29 | | | | 5 | | | | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 | | | | 5 | | | | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

AVERAGE OPACITY FOR 6.46% NUMBER OF READINGS ABOVE HIGHEST PERIOD 5 % WERE 1

RANGE OF OPACITY READINGS MINIMUM 0 MAXIMUM 10

OBSERVER'S NAME (PRINT) David Goshaw

OBSERVER'S SIGNATURE [Signature] DATE 8-19-97

ORGANIZATION DEECO Inc

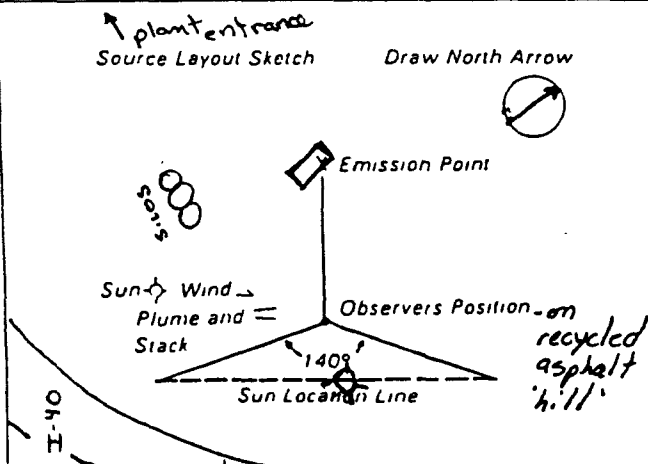
I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS SIGNATURE _____ DATE 3/97

TITLE _____ DATE _____ VERIFIED BY _____ DATE _____

Visible Emission Observation Form

2A

| SOURCE NAME | | | | OBSERVATION DATE | | | | START TIME | | | | STOP TIME | | | |
|--|--|------------------|--|--|--|------------|--|--|--|------------|--|--------------------------------------|--|--|--|
| Baghouse Exit | | | | 8-20-97 | | | | 8:24 | | | | 9:24 | | | |
| ADDRESS | | | | SEC | | | | SEC | | | | SEC | | | |
| ASPHALT PLANT "A" | | | | MIN 0 15 30 45 | | | | MIN 0 15 30 45 | | | | MIN 0 15 30 45 | | | |
| 1010 Rd (Cleveland Rd) | | | | 1 0 0 0 0 | | | | 31 5 0 0 | | | | 2 0 0 0 0 | | | |
| CITY | | STATE NC | | ZIP | | 3 0 0 5 0 | | 32 0 0 5 0 | | 33 0 0 5 0 | | 34 0 0 5 0 | | | |
| PHONE | | SOURCE ID NUMBER | | 4 0 0 0 0 | | 35 5 0 0 0 | | 36 0 0 0 5 | | 37 0 0 5 0 | | 38 5 1 0 5 | | | |
| PROCESS EQUIPMENT | | OPERATING MODE | | 5 5 5 0 0 | | 39 0 1 1 0 | | 40 5 0 0 0 | | 41 0 5 5 0 | | 42 0 0 0 0 | | | |
| aggregate dryer | | normal | | 6 0 0 0 0 | | 43 0 0 0 0 | | 44 5 0 1 0 | | 45 0 0 5 5 | | 46 0 0 0 0 | | | |
| CONTROL EQUIPMENT | | OPERATING MODE | | 7 0 0 0 0 | | 47 0 5 0 0 | | 48 0 1 1 0 | | 49 0 0 0 0 | | 50 0 0 0 0 | | | |
| baghouse | | normal | | 8 0 0 0 0 | | 49 1 1 0 0 | | 50 0 0 0 0 | | 51 5 0 0 0 | | 52 0 0 1 0 | | | |
| DESCRIBE EMISSION POINT | | | | 9 0 0 0 0 | | | | 53 0 0 0 0 | | | | 54 1 1 0 0 | | | |
| START yellow rectangular stack STOP same | | | | 10 5 0 0 0 | | | | 55 0 0 0 0 | | | | 56 5 0 1 0 | | | |
| HEIGHT ABOVE GROUND LEVEL | | | | 11 0 5 0 0 | | | | 57 0 0 0 5 | | | | 58 0 0 5 0 | | | |
| START 29 ft STOP same | | | | 12 0 0 0 0 | | | | 59 0 0 5 0 | | | | 60 1 0 0 0 | | | |
| HEIGHT RELATIVE TO OBSERVER | | | | 13 0 0 5 0 | | | | AVERAGE OPACITY FOR HIGHEST PERIOD 1.46% | | | | NUMBER OF READINGS ABOVE 5 % WERE 1 | | | |
| START 3 ft STOP same | | | | 14 5 0 1 0 | | | | RANGE OF OPACITY READINGS MINIMUM 0 MAXIMUM 10 | | | | OBSERVER'S NAME (PRINT) David Goshaw | | | |
| DISTANCE FROM OBSERVER | | | | 15 1 0 0 0 | | | | OBSERVER'S SIGNATURE | | | | DATE 8-20-97 | | | |
| START 475 ft STOP same | | | | 16 0 0 0 0 | | | | ORGANIZATION DEECO Inc | | | | CERTIFIED BY ETA | | | |
| DIRECTION FROM OBSERVER | | | | 17 0 0 5 0 | | | | I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS SIGNATURE | | | | DATE 3-97 | | | |
| START NW STOP same | | | | 18 0 0 0 0 | | | | TITLE | | | | DATE | | | |
| DESCRIBE EMISSIONS | | | | 19 0 0 0 0 | | | | VERIFIED BY | | | | DATE | | | |
| START coning/condensing STOP same | | | | 20 0 0 0 0 | | | | | | | | | | | |
| EMISSION COLOR | | | | 21 0 0 0 0 | | | | | | | | | | | |
| START light gray STOP same | | | | 22 0 0 0 0 | | | | | | | | | | | |
| PLUME TYPE: CONTINUOUS <input checked="" type="checkbox"/> FUGITIVE <input checked="" type="checkbox"/> INTERMITTENT <input checked="" type="checkbox"/> | | | | 23 5 0 0 0 | | | | | | | | | | | |
| WATER DROPLETS PRESENT. NO <input type="checkbox"/> YES <input checked="" type="checkbox"/> | | | | 24 0 0 0 0 | | | | | | | | | | | |
| IF WATER DROPLET PLUME ATTACHED <input type="checkbox"/> DETACHED <input checked="" type="checkbox"/> | | | | 25 0 0 0 0 | | | | | | | | | | | |
| POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED | | | | 26 0 0 0 0 | | | | | | | | | | | |
| START 3 ft above exit STOP same | | | | 27 0 0 5 0 | | | | | | | | | | | |
| DESCRIBE BACKGROUND | | | | 28 0 0 0 0 | | | | | | | | | | | |
| START trees STOP same | | | | 29 1 0 0 0 | | | | | | | | | | | |
| BACKGROUND COLOR | | | | 30 0 0 0 0 | | | | | | | | | | | |
| START green STOP same | | | | AVERAGE OPACITY FOR HIGHEST PERIOD 1.46% | | | | | | | | | | | |
| SKY CONDITIONS | | | | RANGE OF OPACITY READINGS MINIMUM 0 MAXIMUM 10 | | | | | | | | | | | |
| START broken STOP overcast | | | | OBSERVER'S NAME (PRINT) David Goshaw | | | | | | | | | | | |
| WIND SPEED | | | | OBSERVER'S SIGNATURE | | | | | | | | | | | |
| START 0-1 mph STOP 2-5 mph | | | | ORGANIZATION DEECO Inc | | | | | | | | | | | |
| WIND DIRECTION | | | | I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS SIGNATURE | | | | | | | | | | | |
| START North STOP N | | | | TITLE | | | | | | | | | | | |
| AMBIENT TEMP | | | | DATE | | | | | | | | | | | |
| START 74 STOP 79 | | | | VERIFIED BY | | | | | | | | | | | |
| WET BULB TEMP | | | | | | | | | | | | | | | |
| RH. percent | | | | | | | | | | | | | | | |
| 66 | | | | | | | | | | | | | | | |
| 65 | | | | | | | | | | | | | | | |



COMMENTS
small intermittent opacity "puffs" every few minutes for ~1 second

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS SIGNATURE

TITLE

DATE

OBSERVER'S SIGNATURE

DATE 8-20-97

ORGANIZATION DEECO Inc

CERTIFIED BY ETA

DATE 3-97

VERIFIED BY

DATE

Visible Emission Observation Form

28

| | | | | | | | | | | | | | | | |
|---|--|------------------------------|--|--|--|----------|--|------------------------|--|----------|--|------------------------|--|--|--|
| SOURCE NAME <u>Baghouse Exit</u> | | | | OBSERVATION DATE <u>8-20-97</u> | | | | START TIME <u>9:30</u> | | | | STOP TIME <u>10:30</u> | | | |
| ADDRESS <u>ASPHALT PLANT "A"</u> | | | | SEC MIN | | | | SEC MIN | | | | SEC MIN | | | |
| <u>1010 Rd (Cleveland Rd)</u> | | | | 0 15 30 45 | | | | 0 15 30 45 | | | | 0 15 30 45 | | | |
| CITY | | STATE <u>NC</u> | | ZIP | | 1 0 0 0 | | 31 | | — | | 0 0 10 | | | |
| PHONE | | SOURCE ID NUMBER | | 2 0 0 5 | | 0 | | 32 | | 0 5 0 0 | | 0 | | | |
| PROCESS EQUIPMENT <u>aggregate dryer</u> | | OPERATING MODE | | 3 0 0 0 | | 0 | | 33 | | 0 0 0 0 | | 0 | | | |
| CONTROL EQUIPMENT <u>baghouse</u> | | OPERATING MODE <u>normal</u> | | 4 0 0 0 | | 0 | | 34 | | 0 0 5 0 | | 0 | | | |
| DESCRIBE EMISSION POINT | | | | 5 0 5 0 | | | | 10 | | 35 | | 0 0 0 0 | | | |
| START <u>yellow rectangular stack</u> STOP <u>same</u> | | | | 6 0 0 0 | | | | 5 | | 36 | | 0 0 10 — | | | |
| HEIGHT ABOVE GROUND LEVEL START <u>29 ft</u> STOP <u>same</u> | | | | 7 0 0 0 | | | | 0 | | 37 | | 0 5 0 0 | | | |
| HEIGHT RELATIVE TO OBSERVER START <u>3 ft</u> STOP <u>same</u> | | | | 8 0 0 0 | | | | 0 | | 38 | | 15 0 0 0 | | | |
| DISTANCE FROM OBSERVER START <u>475 ft</u> STOP <u>same</u> | | | | 9 0 0 0 | | | | 0 | | 39 | | 0 0 0 0 | | | |
| DIRECTION FROM OBSERVER START <u>NW</u> STOP <u>same</u> | | | | 10 5 0 0 | | | | 0 | | 40 | | 0 0 0 0 | | | |
| DESCRIBE EMISSIONS | | | | 11 0 — — — | | | | 41 | | 0 0 0 0 | | 0 | | | |
| START <u>coning</u> STOP <u>same</u> | | | | 12 — 0 0 0 | | | | 42 | | 0 0 0 0 | | 0 | | | |
| EMISSION COLOR START <u>light gray</u> STOP | | | | 13 0 0 0 0 | | | | 43 | | 0 10 0 0 | | 0 | | | |
| PLUME TYPE: CONTINUOUS <input checked="" type="checkbox"/> FUGITIVE <input type="checkbox"/> INTERMITTENT <input checked="" type="checkbox"/> | | | | 14 0 0 0 0 | | | | 44 | | 0 10 — 0 | | 0 | | | |
| WATER DROPLETS PRESENT: NO <input type="checkbox"/> YES <input checked="" type="checkbox"/> | | | | 15 — 0 5 0 | | | | 45 | | 5 10 0 5 | | 0 | | | |
| IF WATER DROPLET PLUME ATTACHED <input type="checkbox"/> DETACHED <input checked="" type="checkbox"/> | | | | 16 0 0 0 0 | | | | 46 | | 0 0 0 0 | | 0 | | | |
| POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED | | | | 17 5 — 0 0 | | | | 47 | | 10 0 0 5 | | 0 | | | |
| START <u>2-3 ft above exit</u> STOP <u>same</u> | | | | 18 0 0 0 0 | | | | 48 | | 0 0 0 0 | | 0 | | | |
| DESCRIBE BACKGROUND | | | | 19 0 5 0 0 | | | | 49 | | 0 — 5 10 | | 0 | | | |
| START <u>trees</u> STOP <u>same</u> | | | | 20 0 0 0 0 | | | | 50 | | 0 10 0 5 | | 0 | | | |
| BACKGROUND COLOR START <u>green</u> STOP <u>same</u> | | | | 21 0 10 0 — | | | | 51 | | 0 5 0 0 | | 0 | | | |
| SKY CONDITIONS START <u>overcast</u> STOP <u>same</u> | | | | 22 0 0 0 0 | | | | 52 | | 0 0 5 0 | | 0 | | | |
| WIND SPEED START <u>1-5 mph</u> STOP <u>same</u> | | | | 23 0 0 0 0 | | | | 53 | | 0 0 0 5 | | 0 | | | |
| WIND DIRECTION START <u>North</u> STOP <u>same</u> | | | | 24 0 0 0 5 | | | | 54 | | 5 0 0 0 | | 0 | | | |
| AMBIENT TEMP START <u>79</u> STOP <u>83</u> | | | | 25 — 0 0 0 | | | | 55 | | 0 0 0 0 | | 0 | | | |
| WET BULB TEMP. <u>69</u> | | | | 26 0 0 0 0 | | | | 56 | | 0 0 0 5 | | 0 | | | |
| RH, percent <u>60</u> | | | | 27 0 0 0 0 | | | | 57 | | 0 0 10 0 | | 0 | | | |
| SOURCE LAYOUT SKETCH | | | | 28 0 0 0 0 | | | | 58 | | 15 0 0 0 | | 0 | | | |
| Draw North Arrow | | | | 29 0 0 0 0 | | | | 59 | | 5 — 5 0 | | 0 | | | |
| 30 0 0 0 5 | | | | 60 | | 0 10 0 0 | | | | | | | | | |
| AVERAGE OPACITY FOR HIGHEST PERIOD <u>2.7%</u> | | | | NUMBER OF READINGS ABOVE 5% WERE <u>14</u> | | | | | | | | | | | |
| RANGE OF OPACITY READINGS MINIMUM <u>0</u> MAXIMUM <u>15</u> | | | | | | | | | | | | | | | |
| OBSERVER'S NAME (PRINT) <u>David Goshaw</u> | | | | | | | | | | | | | | | |
| OBSERVER'S SIGNATURE <u>[Signature]</u> | | | | DATE <u>8-20-97</u> | | | | | | | | | | | |
| ORGANIZATION <u>DEECO Inc</u> | | | | | | | | | | | | | | | |
| I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS SIGNATURE | | | | CERTIFIED BY <u>ETA</u> | | | | DATE <u>3-97</u> | | | | | | | |
| TITLE | | | | DATE | | | | VERIFIED BY | | | | DATE | | | |

NOTE: intermittent opacity "puffs" for ~1/second

Visible Emission Observation Form

2c

| | | | | | | | | |
|--|------------------|--|---|-------------------------|---|------------------------|---|--|
| SOURCE NAME <u>Baghouse Exit</u> | | OBSERVATION DATE <u>8-20-97</u> | | START TIME <u>10:35</u> | | STOP TIME <u>11:35</u> | | |
| ADDRESS <u>Asphalt Plant "A"</u> | | SEC MIN | | SEC MIN | | | | |
| 1010 Rd (Cleveland Corp. Rd) | | 0 15 30 45 | | 0 15 30 45 | | | | |
| CITY | STATE <u>NC</u> | ZIP | | 1 | | 2 | | |
| PHONE | SOURCE ID NUMBER | | 3 | | 4 | | 5 | |
| PROCESS EQUIPMENT <u>aggregate dryer</u> | | OPERATING MODE | | 6 | | 7 | | |
| CONTROL EQUIPMENT <u>baghouse</u> | | OPERATING MODE <u>normal</u> | | 8 | | 9 | | |
| DESCRIBE EMISSION POINT <u>rectangular yellow stack</u> | | START <u>same</u> | | 10 | | 11 | | |
| HEIGHT ABOVE GROUND LEVEL <u>29ft</u> | | HEIGHT RELATIVE TO OBSERVER <u>3ft</u> | | 12 | | 13 | | |
| DISTANCE FROM OBSERVER <u>475ft</u> | | DIRECTION FROM OBSERVER <u>NW</u> | | 14 | | 15 | | |
| DESCRIBE EMISSIONS <u>coning</u> | | STOP <u>same</u> | | 16 | | 17 | | |
| EMISSION COLOR <u>light grey</u> | | PLUME TYPE: CONTINUOUS <input checked="" type="checkbox"/> | | 18 | | 19 | | |
| START <u>same</u> | | FUGITIVE <input type="checkbox"/> INTERMITTENT <input checked="" type="checkbox"/> | | 20 | | 21 | | |
| WATER DROPLETS PRESENT: <u>NO</u> | | IF WATER DROPLET PLUME: <u>ATTACHED</u> | | 22 | | 23 | | |
| POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED <u>4ft above exit</u> | | STOP <u>same</u> | | 24 | | 25 | | |
| DESCRIBE BACKGROUND <u>trees</u> | | STOP <u>same</u> | | 26 | | 27 | | |
| BACKGROUND COLOR <u>green</u> | | SKY CONDITIONS <u>overcast</u> | | 28 | | 29 | | |
| WIND SPEED <u>2-6 mph</u> | | WIND DIRECTION <u>North</u> | | 30 | | 31 | | |
| AMBIENT TEMP <u>83</u> | | WET BULB TEMP. <u>70</u> | | 32 | | 33 | | |
| | | RH, percent <u>52</u> | | 34 | | 35 | | |
| Source Layout Sketch | | Draw North Arrow | | 36 | | 37 | | |
| | | | | 38 | | 39 | | |
| AVERAGE OPACITY FOR HIGHEST PERIOD <u>3.75%</u> | | NUMBER OF READINGS ABOVE % WERE | | 40 | | 41 | | |
| RANGE OF OPACITY READINGS MINIMUM <u>0</u> | | MAXIMUM <u>20</u> | | 42 | | 43 | | |
| OBSERVER'S NAME (PRINT) <u>David Goshaw</u> | | OBSERVER'S SIGNATURE <u>David Goshaw</u> | | 44 | | 45 | | |
| COMMENTS <u>intermittent opacity "puffs" for ~1 second</u> | | DATE <u>8-20-97</u> | | 46 | | 47 | | |
| <u>account for 5-15% opacity readings</u> | | ORGANIZATION <u>DEECO Inc</u> | | 48 | | 49 | | |
| I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS SIGNATURE | | CERTIFIED BY <u>ETA</u> | | 50 | | 51 | | |
| TITLE | | DATE | | 52 | | 53 | | |
| | | VERIFIED BY | | 54 | | 55 | | |
| | | DATE | | 56 | | 57 | | |

Visible Emission Observation Form

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| | | | | | | | | | | | | |
|---|---|--------------------------|---|----|----|----|-------------------------|-------------------------|------------------------|----|----|----|
| SOURCE NAME <u>Baghouse Exit</u> | | | OBSERVATION DATE <u>8-20-97</u> | | | | START TIME <u>11:40</u> | | STOP TIME <u>12:40</u> | | | |
| ADDRESS <u>ASPHALT PLANT "A"</u> | | | SEC MIN | 0 | 15 | 30 | 45 | SEC MIN | 0 | 15 | 30 | 45 |
| <u>1010 Rd (Cleveland Rd)</u> | | | 1 | 0 | 0 | — | 0 | 31 | 0 | 0 | 0 | 0 |
| CITY | STATE <u>NC</u> | ZIP | 2 | 0 | — | — | 0 | 32 | — | 0 | 15 | 5 |
| PHONE | SOURCE ID NUMBER | | 3 | 0 | 0 | 0 | — | 33 | 0 | 0 | 0 | 0 |
| PROCESS EQUIPMENT <u>aggregate dryer</u> | OPERATING MODE | | 4 | 0 | — | 0 | — | 34 | 0 | 0 | 0 | 0 |
| CONTROL EQUIPMENT <u>baghouse</u> | OPERATING MODE <u>Normal</u> | | 5 | 0 | 0 | 0 | 0 | 35 | 0 | 0 | 5 | 0 |
| DESCRIBE EMISSION POINT START <u>yellow rectangular stack</u> STOP <u>same</u> | | | 6 | 10 | 0 | 0 | 0 | 36 | 0 | — | 0 | 15 |
| HEIGHT ABOVE GROUND LEVEL START <u>29 ft</u> STOP <u>same</u> | HEIGHT RELATIVE TO OBSERVER START <u>— 3 ft</u> STOP <u>same</u> | | 7 | 5 | 0 | 0 | 0 | 37 | 0 | 0 | 0 | 0 |
| DISTANCE FROM OBSERVER START <u>475 ft</u> STOP <u>same</u> | DIRECTION FROM OBSERVER START <u>NW</u> STOP <u>same</u> | | 8 | 0 | 0 | 0 | 0 | 38 | 0 | 0 | 0 | 0 |
| DESCRIBE EMISSIONS START <u>coning</u> STOP <u>same</u> | | | 9 | 0 | 0 | 10 | — | 39 | 15 | 0 | 15 | — |
| EMISSION COLOR START <u>light grey</u> STOP | PLUME TYPE: CONTINUOUS <input type="checkbox"/> FUGITIVE <input type="checkbox"/> INTERMITTENT <input checked="" type="checkbox"/> | | 10 | 0 | — | 0 | — | 40 | 0 | 0 | 0 | 0 |
| WATER DROPLETS PRESENT: NO <input checked="" type="checkbox"/> YES <input type="checkbox"/> | IF WATER DROPLET PLUME: ATTACHED <input type="checkbox"/> DETACHED <input type="checkbox"/> | | 11 | 0 | 0 | 0 | — | 41 | 0 | 0 | 0 | 0 |
| POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED START <u>4 ft above exit</u> STOP <u>same</u> | | | 12 | 0 | 0 | 0 | 0 | 42 | 5 | — | 0 | 0 |
| DESCRIBE BACKGROUND START <u>trees</u> STOP <u>same</u> | | | 13 | 0 | 0 | 0 | 0 | 43 | 0 | 0 | 5 | 0 |
| BACKGROUND COLOR START <u>green</u> STOP <u>same</u> | SKY CONDITIONS START <u>overcast</u> STOP <u>broken</u> | | 14 | 5 | 0 | 0 | 0 | 44 | 0 | 0 | 0 | 10 |
| WIND SPEED START <u>5-10 mph</u> STOP <u>5-10</u> | WIND DIRECTION START <u>NW</u> STOP <u>NW</u> | | 15 | 0 | 15 | 10 | 0 | 45 | 10 | 0 | 0 | 0 |
| AMBIENT TEMP START <u>83</u> STOP <u>84</u> | WET BULB TEMP. <u>71</u> | RH. percent <u>55</u> | 16 | — | 0 | 0 | — | 46 | 0 | 0 | 0 | 0 |
| <p>Source Layout Sketch</p> <p>↑ plant entrance Sun → Wind → Plume and Stack Observers Position = on road Sun Location Line 140° T-40</p> | | | 17 | — | 5 | 5 | 0 | 47 | 5 | — | 0 | 0 |
| | | | 18 | 0 | 10 | 0 | 0 | 48 | — | 0 | 0 | 0 |
| | | | 19 | 0 | 0 | 0 | 0 | 49 | 0 | — | 0 | 0 |
| | | | 20 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | — | 0 |
| | | | 21 | — | — | 5 | 0 | 51 | 0 | 0 | 0 | 0 |
| | | | 22 | 0 | 0 | 0 | — | 52 | 0 | 0 | 0 | 0 |
| | | | 23 | 0 | 0 | 0 | 15 | 53 | 0 | 0 | 0 | 0 |
| | | | 24 | 0 | 10 | 10 | 15 | 54 | 5 | 0 | 10 | 0 |
| | | | 25 | 0 | 0 | 0 | 0 | 55 | 0 | 0 | 0 | 0 |
| | | | 26 | 0 | 0 | 0 | — | 56 | 0 | 0 | 0 | 0 |
| 27 | 0 | 5 | 0 | 0 | 57 | 0 | 0 | 0 | 0 | | | |
| 28 | 0 | 0 | — | 0 | 58 | 0 | 0 | 0 | 0 | | | |
| 29 | 0 | 0 | 0 | 0 | 59 | 0 | 0 | 0 | 0 | | | |
| 30 | — | 15 | 0 | — | 60 | 0 | — | — | 0 | | | |
| AVERAGE OPACITY FOR HIGHEST PERIOD <u>2.92%</u> | | | NUMBER OF READINGS ABOVE % WERE | | | | | | | | | |
| RANGE OF OPACITY READINGS MINIMUM <u>0</u> MAXIMUM <u>15</u> | | | OBSERVER'S NAME (PRINT) <u>David Goshaw</u> | | | | | | | | | |
| COMMENTS <u>intermittent opacity cycles of 4-30 sec for ~ 1 second</u> | | | OBSERVER'S SIGNATURE <u>[Signature]</u> | | | | | DATE <u>8-20-97</u> | | | | |
| I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS SIGNATURE | | | ORGANIZATION <u>DEFCO Inc</u> | | | | | CERTIFIED BY <u>ETA</u> | | | | |
| TITLE | | | DATE | | | | | DATE <u>3-16-97</u> | | | | |
| VERIFIED BY | | | DATE | | | | | DATE | | | | |

Visible Emission Observation Form

3A

| | | | | | | | | | | | | | | |
|---|--|---|---------------------------------|-------------|-----------|--------------|-------------------------|--|--|--|------------------------|--|--|--|
| SOURCE NAME <u>Baghouse Exit</u> | | | OBSERVATION DATE <u>8-20-97</u> | | | | START TIME <u>14:05</u> | | | | STOP TIME <u>15:05</u> | | | |
| ADDRESS <u>Asphalt Plant "A"</u> | | | SEC MIN 0 15 30 45 | | | | SEC MIN 0 15 30 45 | | | | | | | |
| <u>1010 Rd (Cleveland Rd)</u> | | | 1 0 0 0 0 | | | | 31 0 0 0 0 | | | | | | | |
| CITY | | STATE <u>NC</u> | ZIP | | 2 0 0 - 5 | | 32 0 0 0 0 | | | | | | | |
| PHONE | | SOURCE ID NUMBER | | 3 0 0 0 0 | | 33 0 0 0 0 | | | | | | | | |
| PROCESS EQUIPMENT <u>aggregate dryer</u> | | OPERATING MODE | | 4 5 0 0 0 | | 34 0 5 0 0 | | | | | | | | |
| CONTROL EQUIPMENT <u>baghouse</u> | | OPERATING MODE <u>Normal</u> | | 5 0 0 0 0 | | 35 10 0 0 0 | | | | | | | | |
| DESCRIBE EMISSION POINT | | | 6 0 5 0 0 | | | | 36 0 0 0 0 | | | | | | | |
| START <u>rectangular yellow stack</u> STOP <u>same</u> | | | 7 - 0 0 0 | | | | 37 - 0 0 - | | | | | | | |
| HEIGHT ABOVE GROUND LEVEL | | HEIGHT RELATIVE TO OBSERVER | | 8 0 0 5 0 | | 38 15 0 10 0 | | | | | | | | |
| START <u>29ft</u> STOP <u>same</u> | | START <u>29ft</u> STOP <u>same</u> | | 9 0 0 5 - | | 39 0 0 0 0 | | | | | | | | |
| DISTANCE FROM OBSERVER | | DIRECTION FROM OBSERVER | | 10 0 5 0 0 | | 40 0 0 0 0 | | | | | | | | |
| START <u>300ft</u> STOP <u>same</u> | | START <u>NE</u> STOP <u>same</u> | | 11 0 10 - 0 | | 41 0 0 - 0 | | | | | | | | |
| DESCRIBE EMISSIONS | | | 12 0 0 0 10 | | | | 42 0 0 0 0 | | | | | | | |
| START <u>coming</u> STOP <u>same</u> | | | 13 0 0 0 0 | | | | 43 0 0 5 - | | | | | | | |
| EMISSION COLOR | | PLUME TYPE. CONTINUOUS <input type="checkbox"/> | | 14 0 0 15 0 | | 44 0 0 10 0 | | | | | | | | |
| START <u>light grey</u> STOP | | FUGITIVE <input type="checkbox"/> INTERMITTENT <input checked="" type="checkbox"/> | | 15 0 0 0 10 | | 45 0 5 0 0 | | | | | | | | |
| WATER DROPLETS PRESENT: NO <input checked="" type="checkbox"/> YES <input type="checkbox"/> | | IF WATER DROPLET PLUME: ATTACHED <input type="checkbox"/> DETACHED <input type="checkbox"/> | | 16 0 0 0 - | | 46 0 0 0 0 | | | | | | | | |
| POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED | | | 17 0 - 0 0 | | | | 47 0 0 0 0 | | | | | | | |
| START <u>3ft above exit</u> STOP <u>same</u> | | | 18 - 10 0 0 | | | | 48 0 0 0 0 | | | | | | | |
| DESCRIBE BACKGROUND | | | 19 0 0 0 0 | | | | 49 5 0 0 0 | | | | | | | |
| START <u>trees</u> STOP <u>same</u> | | | 20 5 0 0 0 | | | | 50 - 0 0 0 | | | | | | | |
| BACKGROUND COLOR | | SKY CONDITIONS | | 21 0 - 0 10 | | 51 0 0 0 - | | | | | | | | |
| START <u>green</u> STOP <u>same</u> | | START <u>overcast</u> STOP <u>same</u> | | 22 0 0 5 0 | | 52 0 0 0 0 | | | | | | | | |
| WIND SPEED | | WIND DIRECTION | | 23 0 0 0 0 | | 53 5 0 0 0 | | | | | | | | |
| START <u>2-7 mph</u> STOP | | START <u>NW</u> STOP <u>same</u> | | 24 0 0 0 5 | | 54 0 5 0 5 | | | | | | | | |
| AMBIENT TEMP | | WET BULB TEMP. | | 25 0 5 0 0 | | 55 0 0 10 0 | | | | | | | | |
| START <u>93</u> STOP <u>93</u> | | 74 | | 26 0 0 0 0 | | 56 - 0 0 0 | | | | | | | | |
| | | RH. percent | | 27 0 0 5 0 | | 57 0 0 0 0 | | | | | | | | |
| | | 42 | | 28 0 0 0 0 | | 58 5 0 0 0 | | | | | | | | |
| Source Layout Sketch | | | 29 0 10 0 0 | | | | 59 0 0 0 0 | | | | | | | |
| | | | 30 0 0 0 0 | | | | 60 0 5 0 0 | | | | | | | |
| <p>AVERAGE OPACITY FOR HIGHEST PERIOD <u>2.29%</u></p> <p>RANGE OF OPACITY READINGS MINIMUM <u>0</u> MAXIMUM <u>15</u></p> <p>OBSERVER'S NAME (PRINT) <u>David Goshaw</u></p> <p>OBSERVER'S SIGNATURE <u>[Signature]</u> DATE <u>8-20-97</u></p> <p>ORGANIZATION <u>DEECO Inc</u></p> <p>CERTIFIED BY <u>ETA</u> DATE <u>8/97</u></p> <p>VERIFIED BY DATE</p> | | | | | | | | | | | | | | |
| COMMENTS | | | | | | | | | | | | | | |
| I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS SIGNATURE | | | | | | | | | | | | | | |
| TITLE | | | DATE | | | | | | | | | | | |

Visible Emission Observation Form

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| | | | | | | | | | | | | | | | | | |
|---|--------------------|--|--|--------------------------|--|---|----------------------------|------------|--|------------|---------------------------|---|--|--|------------------------|--|--|
| SOURCE NAME BAGHOUSE EXIT | | | OBSERVATION DATE 8-20-97 | | | | START TIME 15:10 | | | | STOP TIME 16:10 | | | | | | |
| ADDRESS ASPHALT PLANT "A" | | | SEC MIN 0 15 30 45 | | | | SEC MIN 0 15 30 45 | | | | | | | | | | |
| 1010 Rd (Cleveland Rd) | | | 1 0 5 0 0 | | | | 31 0 0 0 0 | | | | | | | | | | |
| CITY | STATE NC | ZIP | 2 10 - 0 5 | | | | 32 0 0 0 0 | | | | | | | | | | |
| PHONE | SOURCE ID NUMBER | | 3 0 0 0 10 | | | | 33 0 - 0 0 | | | | | | | | | | |
| PROCESS EQUIPMENT aggregate dryer | | OPERATING MODE | | 4 0 0 0 - | | | | 34 - 0 5 0 | | | | | | | | | |
| CONTROL EQUIPMENT big house | | OPERATING MODE normal | | 5 0 0 5 0 | | | | 35 0 0 5 0 | | | | | | | | | |
| DESCRIBE EMISSION POINT START yellow rectangular stack STOP same | | | 6 0 0 0 0 | | | | 36 - 5 5 0 | | | | | | | | | | |
| HEIGHT ABOVE GROUND LEVEL START 29' STOP same | | HEIGHT RELATIVE TO OBSERVER START 29' STOP same | | 7 0 0 - 0 | | | | 37 0 0 0 0 | | | | | | | | | |
| DISTANCE FROM OBSERVER START 300' STOP same | | DIRECTION FROM OBSERVER START NE STOP same | | 8 0 5 0 - | | | | 38 0 0 0 0 | | | | | | | | | |
| DESCRIBE EMISSIONS START coning STOP same | | | 9 0 0 0 - | | | | 39 0 0 0 0 | | | | | | | | | | |
| EMISSION COLOR START grey STOP same | | PLUME TYPE: CONTINUOUS <input type="checkbox"/> FUGITIVE <input type="checkbox"/> INTERMITTENT <input checked="" type="checkbox"/> | | 10 - 0 0 0 | | | | 40 5 0 0 0 | | | | | | | | | |
| WATER DROPLETS PRESENT: NO <input checked="" type="checkbox"/> YES <input type="checkbox"/> | | IF WATER DROPLET PLUME: ATTACHED <input type="checkbox"/> DETACHED <input type="checkbox"/> | | 11 0 0 10 0 | | | | 41 0 0 0 0 | | | | | | | | | |
| POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED START 3' above exit STOP same | | | 12 5 0 0 0 | | | | 42 0 0 0 10 | | | | | | | | | | |
| DESCRIBE BACKGROUND START trees STOP same | | | 13 - - - 5 | | | | 43 0 0 0 0 | | | | | | | | | | |
| BACKGROUND COLOR START green STOP same | | SKY CONDITIONS START overcast STOP broken | | 14 0 0 0 - | | | | 44 - - - - | | | | | | | | | |
| WIND SPEED START 2-8 mph STOP 3 mph | | WIND DIRECTION START NNE STOP same | | 15 5 0 0 - | | | | 45 - - 0 0 | | | | | | | | | |
| AMBIENT TEMP START 73 STOP 84 | | WET BULB TEMP. 74 | | RH, percent 42 | | 16 0 0 0 0 | | | | 46 0 0 0 5 | | | | | | | |
| <p>Source Layout Sketch</p> <p>Draw North Arrow</p> <p>1</p> <p>Sun -> Wind -> Plume and Stack</p> <p>100°</p> <p>Sun Location Line</p> <p>Silos</p> <p>petroleum tanks</p> <p>Observers Position</p> | | | 17 0 0 0 0 | | | | 47 0 0 - 0 | | | | | | | | | | |
| | | | 18 5 - - 0 | | | | 48 - - 0 10 | | | | | | | | | | |
| | | | 19 0 - 15 0 | | | | 49 0 0 0 0 | | | | | | | | | | |
| | | | 20 0 0 0 0 | | | | 50 0 10 0 0 | | | | | | | | | | |
| | | | 21 0 0 0 0 | | | | 51 0 - 0 0 | | | | | | | | | | |
| | | | 22 5 10 0 0 | | | | 52 0 0 0 0 | | | | | | | | | | |
| | | | 23 0 0 0 0 | | | | 53 0 0 0 0 | | | | | | | | | | |
| | | | 24 0 0 0 0 | | | | 54 5 0 0 - | | | | | | | | | | |
| | | | 25 0 0 0 0 | | | | 55 - 0 0 5 | | | | | | | | | | |
| | | | 26 0 10 - - | | | | 56 - 0 0 0 | | | | | | | | | | |
| 27 - - - - | | | | 57 0 0 0 0 | | | | | | | | | | | | | |
| 28 0 5 0 0 | | | | 58 5 0 0 0 | | | | | | | | | | | | | |
| 29 0 0 0 - | | | | 59 0 10 0 0 | | | | | | | | | | | | | |
| 30 0 - 0 0 | | | | 60 0 0 - 5 | | | | | | | | | | | | | |
| AVERAGE OPACITY FOR HIGHEST PERIOD 1.46% | | | NUMBER OF READINGS ABOVE 5 % WERE 10 | | | RANGE OF OPACITY READINGS MINIMUM 0 MAXIMUM 15 | | | OBSERVER'S NAME (PRINT) David Goshaw | | | OBSERVER'S SIGNATURE <i>David Goshaw</i> | | | DATE 8-20-97 | | |
| COMMENTS | | | I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS SIGNATURE | | | CERTIFIED BY ETA | | | DATE 3/97 | | | VERIFIED BY | | | DATE | | |

Visible Emission Observation Form

3c

| SOURCE NAME | | OBSERVATION DATE | | START TIME | | STOP TIME | | | | | |
|---|---|--|---|------------------------------------|----|-----------|-----|----|----|----|----|
| Barhouse Exit | | 8-20-97 | | 16:15 | | 17:20 | | | | | |
| ADDRESS | | SEC | 0 | 15 | 30 | 45 | SEC | 0 | 15 | 30 | 45 |
| ASPHALT PLANT "A" | | MIN | | | | | MIN | | | | |
| 1010 Rd (Cleveland Rd) | | 1 | 0 | 0 | 0 | — | 31 | 0 | 0 | 0 | 0 |
| CITY | STATE NC ZIP | 2 | 0 | — | 0 | 0 | 32 | 0 | 0 | 0 | 0 |
| PHONE | SOURCE ID NUMBER | 3 | 0 | 5 | 0 | 0 | 33 | 0 | 0 | 0 | 0 |
| PROCESS EQUIPMENT aggregate dryer | | 4 | 0 | 0 | — | — | 34 | 0 | 0 | 0 | 0 |
| OPERATING MODE | | 5 | 0 | 0 | — | 0 | 35 | 0 | 0 | 0 | — |
| CONTROL EQUIPMENT baghouse | | 6 | 0 | — | 5 | 0 | 36 | 5 | 0 | 0 | 0 |
| OPERATING MODE normal | | 7 | 0 | 0 | 0 | 0 | 37 | 0 | 0 | — | — |
| DESCRIBE EMISSION POINT yellow START rectangular stack STOP same | | 8 | 5 | 0 | 0 | — | 38 | — | 0 | 0 | 0 |
| HEIGHT ABOVE GROUND LEVEL | HEIGHT RELATIVE TO OBSERVER | 9 | 0 | — | 0 | 0 | 39 | 10 | 0 | 0 | 10 |
| START 29 ft STOP same | START 29 ft STOP same | 10 | 0 | 0 | 0 | 0 | 40 | 0 | 0 | 0 | 0 |
| DISTANCE FROM OBSERVER | DIRECTION FROM OBSERVER | 11 | 0 | 0 | 0 | 0 | 41 | 10 | — | — | 0 |
| START 300 ft STOP same | START NE STOP same | 12 | 5 | 0 | 0 | 5 | 42 | — | 0 | 0 | 0 |
| DESCRIBE EMISSIONS START coning STOP same | | 13 | 0 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 |
| EMISSION COLOR START light grey STOP | PLUME TYPE: CONTINUOUS <input checked="" type="checkbox"/> FUGITIVE <input type="checkbox"/> INTERMITTENT <input checked="" type="checkbox"/> | 14 | 0 | — | — | — | 44 | 0 | — | — | 0 |
| WATER DROPLETS PRESENT: NO <input checked="" type="checkbox"/> YES <input type="checkbox"/> | IF WATER DROPLET PLUME: ATTACHED <input type="checkbox"/> DETACHED <input type="checkbox"/> | 15 | 0 | 0 | — | 10 | 45 | 0 | 0 | 0 | 0 |
| POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED START 3.5 ft above exit STOP same | | 16 | 0 | 0 | 0 | 0 | 46 | 0 | 0 | 0 | 0 |
| DESCRIBE BACKGROUND START trees STOP same | | 17 | 0 | 0 | 0 | — | 47 | 0 | 0 | — | 10 |
| BACKGROUND COLOR START green STOP same | | 18 | 0 | 0 | — | — | 48 | 5 | — | 0 | 0 |
| SKY CONDITIONS START broken STOP same | | 19 | — | 5 | 0 | 0 | 49 | 0 | 0 | 0 | — |
| WIND SPEED START 3-5 mph STOP 1-3 mph | WIND DIRECTION START E STOP same | 20 | 0 | 0 | 0 | 0 | 50 | 0 | — | — | 0 |
| WET BULB TEMP. 73 | RH. percent 42 | 21 | 0 | 0 | 0 | 0 | 51 | 0 | 0 | 50 | 0 |
| AMBIENT TEMP START 91 STOP 84 | | 22 | 0 | 0 | 0 | 10 | 52 | 0 | 0 | 5 | 0 |
| Sun location line | | 23 | 0 | 0 | 0 | 0 | 53 | 0 | 0 | 0 | 0 |
| Source Layout Sketch | | 24 | 0 | 0 | 0 | 0 | 54 | 0 | 0 | 0 | 0 |
| Draw North Arrow | | 25 | 0 | 5 | 5 | 0 | 55 | 0 | 0 | 0 | 0 |
| Emission Point | | 26 | 0 | 0 | 0 | 0 | 56 | 0 | 5 | 0 | 0 |
| 85 lbs | | 27 | — | 0 | 5 | 0 | 57 | 0 | 0 | 0 | 0 |
| Observers Position | | 28 | 0 | 0 | 0 | 0 | 58 | 0 | — | 0 | 0 |
| petroleum tanks | | 29 | 0 | 0 | 0 | 5 | 59 | — | 0 | 0 | 0 |
| 140° | | 30 | 0 | 0 | 0 | — | 60 | 0 | 5 | 0 | 0 |
| Sun location line | | AVERAGE OPACITY FOR HIGHEST PERIOD 1.46% | | NUMBER OF READINGS ABOVE 5% WERE 6 | | | | | | | |
| plant entrance | | RANGE OF OPACITY READINGS MINIMUM 0 | | MAXIMUM 10 | | | | | | | |
| COMMENTS | | OBSERVER'S NAME (PRINT) David Goshaw | | OBSERVER'S SIGNATURE | | | | | | | |
| | | DATE 8-20-97 | | ORGANIZATION DEECO Inc | | | | | | | |
| I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS SIGNATURE | | CERTIFIED BY ETA | | DATE 3/97 | | | | | | | |
| TITLE | | DATE | | VERIFIED BY | | | | | | | |
| | | | | DATE | | | | | | | |

Visible Emission Observation Form

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| | | | | | | | | | | | | | | | | | |
|--|--|--|------------------------------------|--------------------------|--|---------------------------------|----------------------------|----|------|----|---------------------------|--|--|--|--|--|--|
| SOURCE NAME Baghouse Exit | | | OBSERVATION DATE 8-20-97 | | | | START TIME 17:22 | | | | STOP TIME 17:42 | | | | | | |
| ADDRESS ASPHALT PLANT "A" | | | SEC MIN | | | | SEC MIN | | | | SEC MIN | | | | | | |
| | | | 0 15 30 45 | | | | 0 15 30 45 | | | | 0 15 30 45 | | | | | | |
| 1010 Rd Cleveland Rd | | | 1 0 0 0 0 | | | | 31 | | | | | | | | | | |
| CITY | | STATE | ZIP | 2 0 - 5 0 | | | | 32 | | | | | | | | | |
| | | NC | | 3 0 0 0 0 | | | | 33 | | | | | | | | | |
| PHONE | | SOURCE ID NUMBER | | 4 0 0 0 0 | | | | 34 | | | | | | | | | |
| PROCESS EQUIPMENT aggregate dryer | | OPERATING MODE | | 5 0 0 0 0 | | | | 35 | | | | | | | | | |
| CONTROL EQUIPMENT baghouse | | OPERATING MODE normal | | 6 0 0 0 5 | | | | 36 | | | | | | | | | |
| DESCRIBE EMISSION POINT START yellow rectangular stack STOP same | | | 7 0 0 0 0 | | | | 37 | | | | | | | | | | |
| HEIGHT ABOVE GROUND LEVEL START 29 ft STOP same | | HEIGHT RELATIVE TO OBSERVER START 29 ft STOP same | | 8 0 0 0 0 | | | | 38 | | | | | | | | | |
| DISTANCE FROM OBSERVER START 300 ft STOP same | | DIRECTION FROM OBSERVER START NE STOP same | | 9 0 0 0 0 | | | | 39 | | | | | | | | | |
| DESCRIBE EMISSIONS START coming STOP same | | | 10 0 5 0 0 | | | | 40 | | | | | | | | | | |
| EMISSION COLOR START grey STOP | | PLUME TYPE: CONTINUOUS <input type="checkbox"/> FUGITIVE <input type="checkbox"/> INTERMITTENT <input checked="" type="checkbox"/> | | 11 0 0 0 0 | | | | 41 | | | | | | | | | |
| WATER DROPLETS PRESENT: NO <input checked="" type="checkbox"/> YES <input type="checkbox"/> | | IF WATER DROPLET PLUME: ATTACHED <input type="checkbox"/> DETACHED <input type="checkbox"/> | | 12 0 0 0 0 | | | | 42 | | | | | | | | | |
| POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED START 3-5 ft above exit STOP same | | | 13 0 0 0 0 | | | | 43 | | | | | | | | | | |
| DESCRIBE BACKGROUND START trees STOP same | | | 14 5 0 0 0 | | | | 44 | | | | | | | | | | |
| BACKGROUND COLOR START green STOP same | | SKY CONDITIONS START overcast STOP same | | 15 0 0 0 0 | | | | 45 | | | | | | | | | |
| WIND SPEED START 1-3 mph STOP 5-12 mph | | WIND DIRECTION START East STOP swirling | | 16 0 0 0 0 | | | | 46 | | | | | | | | | |
| AMBIENT TEMP START 84 STOP 84 | | WET BULB TEMP. 71 | | RH. percent 52 | | 17 0 0 0 - | | | | 47 | | | | | | | |
| <p>Source Layout Sketch Draw North Arrow</p> | | | 18 0 0 0 0 | | | | 48 | | | | | | | | | | |
| | | | 19 0 0 0 0 | | | | 49 | | | | | | | | | | |
| | | | 20 - - * | | | | 50 | | | | | | | | | | |
| | | | 21 | | | | 51 | | | | | | | | | | |
| | | | 22 | | | | 52 | | | | | | | | | | |
| | | | 23 | | | | 53 | | | | | | | | | | |
| | | | 24 | | | | 54 | | | | | | | | | | |
| | | | 25 | | | | 55 | | | | | | | | | | |
| | | | 26 | | | | 56 | | | | | | | | | | |
| | | | 27 | | | | 57 | | | | | | | | | | |
| 28 | | | | 58 | | | | | | | | | | | | | |
| 29 | | | | 59 | | | | | | | | | | | | | |
| 30 | | | | 60 | | | | | | | | | | | | | |
| AVERAGE OPACITY FOR HIGHEST PERIOD | | | | | | NUMBER OF READINGS ABOVE % WERE | | | | | | | | | | | |
| RANGE OF OPACITY READINGS MINIMUM MAXIMUM | | | | | | | | | | | | | | | | | |
| OBSERVER'S NAME (PRINT) David Goshaw | | | | | | | | | | | | | | | | | |
| OBSERVER'S SIGNATURE <i>[Signature]</i> | | | | | | DATE 8-20-97 | | | | | | | | | | | |
| ORGANIZATION DEECO Inc | | | | | | | | | | | | | | | | | |
| CERTIFIED BY ETA | | | | | | DATE 3/97 | | | | | | | | | | | |
| VERIFIED BY | | | | | | DATE | | | | | | | | | | | |
| COMMENTS thundercast skies created reduction in light; | | | | | | | | | | | | | | | | | |
| I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS | | | | | | | | | | | | | | | | | |
| SIGNATURE | | | | | | | | | | | | | | | | | |
| TITLE | | | DATE | | | DATE | | | DATE | | | | | | | | |

Visible Emission Observation Form

9 4A

| SOURCE NAME | | OBSERVATION DATE | | START TIME | | STOP TIME | | | | | |
|---|--|---|---|------------|----|-----------|-----|---|----|----|----|
| Baghouse Exit | | 8-21-97 | | 7:41 | | 8:41 | | | | | |
| ADDRESS | | SEC | 0 | 15 | 30 | 45 | SEC | 0 | 15 | 30 | 45 |
| ASPHALT PLANT "A" | | MIN | | | | | MIN | | | | |
| 1010 Rd (Cokerend Rd) | | 1 | 0 | 0 | 0 | 0 | 31 | 0 | 0 | 0 | 0 |
| CITY | STATE NC ZIP | 2 | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 0 |
| PHONE | SOURCE ID NUMBER | 3 | 0 | 0 | 0 | 0 | 33 | 0 | 0 | 0 | 0 |
| PROCESS EQUIPMENT | OPERATING MODE | 4 | 0 | 0 | 0 | 0 | 34 | 0 | 0 | 0 | 0 |
| aggregate dryer | | 5 | 0 | 0 | 5 | 0 | 35 | 0 | 0 | 0 | 0 |
| CONTROL EQUIPMENT | OPERATING MODE | 6 | 0 | 0 | 0 | 0 | 36 | 0 | 0 | 5 | 0 |
| baghouse | | 7 | 0 | 0 | 0 | 0 | 37 | 0 | 0 | 0 | 0 |
| DESCRIBE EMISSION POINT | | 8 | 0 | 0 | 0 | 0 | 38 | 0 | 0 | 0 | 5 |
| START yellow rectangular stack STOP same | | 9 | 0 | 0 | 0 | 0 | 39 | 0 | 0 | 0 | 0 |
| HEIGHT ABOVE GROUND LEVEL | HEIGHT RELATIVE TO OBSERVER | 10 | 0 | 0 | 0 | 0 | 40 | 0 | 0 | 0 | 0 |
| START 29ft STOP same | START - 3ft STOP same | 11 | 0 | 0 | 0 | 0 | 41 | 0 | 0 | 0 | 0 |
| DISTANCE FROM OBSERVER | DIRECTION FROM OBSERVER | 12 | 0 | 0 | 0 | 0 | 42 | 0 | 0 | 0 | 0 |
| START 475ft STOP same | START NW STOP same | 13 | 0 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 |
| DESCRIBE EMISSIONS | | 14 | 0 | 0 | 0 | 0 | 44 | 0 | 0 | 0 | 0 |
| START coning, condensing STOP same coning | | 15 | 0 | 0 | 0 | 0 | 45 | 0 | 0 | 0 | 0 |
| EMISSION COLOR | PLUME TYPE: CONTINUOUS <input checked="" type="checkbox"/> | 16 | 0 | 0 | 0 | 0 | 46 | 0 | 5 | 0 | 0 |
| START light grey STOP same | FUGITIVE <input type="checkbox"/> INTERMITTENT <input type="checkbox"/> | 17 | 0 | 0 | 0 | 0 | 47 | 0 | 0 | 0 | 0 |
| WATER DROPLETS PRESENT | IF WATER DROPLET PLUME | 18 | 0 | 0 | 0 | 0 | 48 | 0 | 5 | 0 | 0 |
| NO <input type="checkbox"/> YES <input checked="" type="checkbox"/> | ATTACHED <input type="checkbox"/> DETACHED <input checked="" type="checkbox"/> | 19 | 0 | 0 | 0 | 5 | 49 | 0 | 0 | 0 | 0 |
| POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED | | 20 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 |
| START 2-3ft above exit STOP 3-5ft above exit | | 21 | 0 | 0 | 0 | 0 | 51 | 0 | 0 | 0 | 0 |
| DESCRIBE BACKGROUND | | 22 | 0 | 0 | 0 | 0 | 52 | 0 | 0 | 0 | 0 |
| START trees STOP same | | 23 | 0 | 0 | 0 | 0 | 53 | 0 | 0 | 0 | 0 |
| BACKGROUND COLOR | SKY CONDITIONS | 24 | 0 | 0 | 0 | 0 | 54 | 0 | 0 | 0 | 0 |
| START green STOP same | START scattered STOP clear | 25 | 0 | 0 | 0 | 0 | 55 | 0 | 0 | 0 | 0 |
| WIND SPEED | WIND DIRECTION | 26 | 0 | 0 | 0 | 0 | 56 | 0 | 0 | 0 | 0 |
| START 0-2mph STOP 0-2mph | START NE STOP same | 27 | 0 | 0 | 0 | 0 | 57 | 0 | 0 | 0 | 0 |
| AMBIENT TEMP | WET BULB TEMP. | 28 | 0 | 0 | 0 | 0 | 58 | 5 | 0 | 0 | 0 |
| START 71 STOP 75 | RH. percent | 29 | 0 | 0 | 0 | 0 | 59 | 0 | 0 | 0 | 0 |
| | | 30 | 0 | 0 | 0 | 0 | 60 | 0 | 0 | 0 | 0 |
| Source Layout Sketch | | AVERAGE OPACITY FOR HIGHEST PERIOD 0.42% | | | | | | | | | |
| Draw North Arrow | | NUMBER OF READINGS ABOVE 5% WERE 5 | | | | | | | | | |
| | | RANGE OF OPACITY READINGS MINIMUM 0 MAXIMUM 5 | | | | | | | | | |
| COMMENTS | | OBSERVER'S NAME (PRINT) David Goshaw | | | | | | | | | |
| | | OBSERVER'S SIGNATURE [Signature] DATE 8-21-97 | | | | | | | | | |
| | | ORGANIZATION DEECO Inc | | | | | | | | | |
| I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS SIGNATURE | | CERTIFIED BY ETA DATE 8/97 | | | | | | | | | |
| TITLE | | VERIFIED BY | | | | | | | | | |
| DATE | | DATE | | | | | | | | | |

Visible Emission Observation Form

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| | | | | | | | |
|---|------------------|--|---|---------------------------|----|--------------------------|----|
| SOURCE NAME Baghouse Exit | | OBSERVATION DATE 8-21-97 | | START TIME 8:48 | | STOP TIME 9:48 | |
| ADDRESS ASPHALT PLANT "A" | | SEC MIN | | 0 | 15 | 30 | 45 |
| 1010 Rd (Cleveland Rd) | | SEC | | 0 | 15 | 30 | 45 |
| CITY | STATE NC | ZIP | | 1 | 0 | 0 | 0 |
| PHONE | SOURCE ID NUMBER | | 2 | 0 | 0 | 5 | 0 |
| PROCESS EQUIPMENT aggregate dryer | | OPERATING MODE | | 3 | 0 | 0 | 0 |
| CONTROL EQUIPMENT baghouse | | OPERATING MODE | | 4 | 0 | 0 | 0 |
| DESCRIBE EMISSION POINT START yellow rectangular stack STOP same | | SEC | | 5 | 0 | 0 | 0 |
| HEIGHT ABOVE GROUND LEVEL START 29 ft STOP same | | HEIGHT RELATIVE TO OBSERVER START - 3 ft STOP same | | 6 | 0 | 5 | 0 |
| DISTANCE FROM OBSERVER START 475 ft STOP same | | DIRECTION FROM OBSERVER START NW STOP same | | 7 | 0 | 0 | 0 |
| DESCRIBE EMISSIONS START coming STOP same | | SEC | | 8 | 0 | 0 | 0 |
| EMISSION COLOR START grey STOP same | | PLUME TYPE. CONTINUOUS <input checked="" type="checkbox"/> FUGITIVE <input type="checkbox"/> INTERMITTENT <input type="checkbox"/> | | 9 | 0 | 0 | 0 |
| WATER DROPLETS PRESENT: NO <input checked="" type="checkbox"/> YES <input type="checkbox"/> | | IF WATER DROPLET PLUME: ATTACHED <input type="checkbox"/> DETACHED <input type="checkbox"/> | | 10 | 0 | 0 | 0 |
| POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED START 2-5 ft above exit STOP same | | SEC | | 11 | 0 | 0 | 0 |
| DESCRIBE BACKGROUND START trees/blue sky STOP same | | SEC | | 12 | 0 | 0 | 0 |
| BACKGROUND COLOR START green/blue STOP same | | SKY CONDITIONS START clear STOP same | | 13 | 0 | 0 | 0 |
| WIND SPEED START 0-2 mph STOP 0-3 mph | | WIND DIRECTION START East STOP South | | 14 | 0 | 0 | 0 |
| AMBIENT TEMP START 75 STOP 78 | | WET BULB TEMP 66 | | 15 | 0 | 0 | 0 |
| | | RH. percent 62 | | 16 | 0 | 0 | 0 |
| <p>Source Layout Sketch</p> <p>Draw North Arrow</p> <p>Sun -> Wind -> Plume and Stack</p> <p>Observers Position - on recycled asphalt hill</p> <p>Sun Location Line</p> <p>140°</p> <p>0-10</p> | | SEC | | 17 | 0 | 0 | 0 |
| | | SEC | | 18 | 0 | 0 | 0 |
| | | SEC | | 19 | 0 | 0 | 0 |
| | | SEC | | 20 | 0 | 0 | 0 |
| | | SEC | | 21 | 0 | 0 | 0 |
| | | SEC | | 22 | 0 | 0 | 0 |
| | | SEC | | 23 | 0 | 5 | 0 |
| | | SEC | | 24 | 0 | 0 | 0 |
| | | SEC | | 25 | 0 | 0 | 0 |
| | | SEC | | 26 | 0 | 0 | 0 |
| | | SEC | | 27 | 0 | 0 | 0 |
| | | SEC | | 28 | 0 | 0 | 0 |
| | | SEC | | 29 | 0 | 0 | 0 |
| | | SEC | | 30 | 0 | 0 | 0 |
| AVERAGE OPACITY FOR HIGHEST PERIOD 0.42% | | NUMBER OF READINGS ABOVE 0 % WERE 8 | | | | | |
| RANGE OF OPACITY READINGS MINIMUM 0 MAXIMUM 5 | | | | | | | |
| OBSERVER'S NAME (PRINT) David Goshaw | | | | | | | |
| OBSERVER'S SIGNATURE <i>David Goshaw</i> | | DATE 8-21-97 | | | | | |
| ORGANIZATION DEECO Inc | | | | | | | |
| I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS SIGNATURE | | CERTIFIED BY ETA | | DATE 3/97 | | | |
| TITLE | | DATE | | VERIFIED BY | | DATE | |

Visible Emission Observation Form

4c

| SOURCE NAME | | | | OBSERVATION DATE | | | | START TIME | | | | STOP TIME | | | | | | | |
|--|--|---|--|---|--|------------------------|--|--------------------------------------|--|------------------|--|-----------|--|-----------|--|----|--|----|--|
| Baghouse Exit | | | | 8-21-97 | | | | 9:53 | | | | 10:53 | | | | | | | |
| ADDRESS | | | | SEC | | MIN | | SEC | | MIN | | SEC | | MIN | | | | | |
| ASPHALT PLANT "A" | | | | 0 | | 15 | | 30 | | 45 | | 0 | | 15 | | 30 | | 45 | |
| 1010 Rd (Cleveland Rd) | | | | 1 | | 0 | | 0 | | 0 | | 31 | | 0 | | 0 | | 0 | |
| CITY | | STATE | | ZIP | | 2 | | 0 | | 0 | | 5 | | 32 | | 0 | | 0 | |
| PHONE | | SOURCE ID NUMBER | | NC | | 3 | | 0 | | 0 | | 0 | | 33 | | 0 | | 0 | |
| PROCESS EQUIPMENT | | OPERATING MODE | | 4 | | 0 | | 0 | | 0 | | 0 | | 34 | | 0 | | 0 | |
| aggregate dryer | | | | 5 | | 0 | | 0 | | 0 | | 0 | | 35 | | 0 | | 0 | |
| CONTROL EQUIPMENT | | OPERATING MODE | | 6 | | 0 | | 0 | | 0 | | 0 | | 36 | | 0 | | 0 | |
| bag house | | | | 7 | | 0 | | 0 | | 0 | | 0 | | 37 | | 0 | | 0 | |
| DESCRIBE EMISSION POINT | | | | 8 | | 0 | | 0 | | 0 | | 0 | | 38 | | 0 | | 0 | |
| START yellow rectangle stack STOP SAME | | | | 9 | | 0 | | 0 | | 0 | | 0 | | 39 | | 0 | | 0 | |
| HEIGHT ABOVE GROUND LEVEL | | | | 10 | | 0 | | 0 | | 0 | | 0 | | 40 | | 0 | | 0 | |
| START 29 ft STOP same | | | | 11 | | 0 | | 0 | | 5 | | 0 | | 41 | | 0 | | 5 | |
| HEIGHT RELATIVE TO OBSERVER | | | | 12 | | 0 | | 0 | | 0 | | 0 | | 42 | | 0 | | 0 | |
| START -3 ft STOP same | | | | 13 | | 0 | | 0 | | 0 | | 0 | | 43 | | 0 | | 0 | |
| DISTANCE FROM OBSERVER | | | | 14 | | 0 | | 0 | | 0 | | 0 | | 44 | | 0 | | 0 | |
| START 475 ft STOP same | | | | 15 | | 0 | | 0 | | 0 | | 0 | | 45 | | 0 | | 0 | |
| DIRECTION FROM OBSERVER | | | | 16 | | 0 | | 0 | | 0 | | 0 | | 46 | | 0 | | 0 | |
| START NW STOP same | | | | 17 | | 0 | | 0 | | 0 | | 0 | | 47 | | 0 | | 0 | |
| DESCRIBE EMISSIONS | | | | 18 | | 0 | | 0 | | 0 | | 0 | | 48 | | 0 | | 5 | |
| START coming STOP same | | | | 19 | | 0 | | 0 | | 0 | | 0 | | 49 | | 0 | | 0 | |
| EMISSION COLOR | | PLUME TYPE | | 20 | | 0 | | 0 | | 0 | | 0 | | 50 | | 0 | | 6 | |
| START grey STOP same | | CONTINUOUS <input checked="" type="checkbox"/> | | 21 | | 0 | | 0 | | 0 | | 0 | | 51 | | 0 | | 0 | |
| FUGITIVE <input type="checkbox"/> | | INTERMITTENT <input type="checkbox"/> | | 22 | | 0 | | 0 | | 0 | | 0 | | 52 | | 0 | | 0 | |
| WATER DROPLETS PRESENT. | | IF WATER DROPLET PLUME: | | 23 | | 0 | | 0 | | 0 | | 0 | | 53 | | 0 | | 0 | |
| NO <input checked="" type="checkbox"/> YES <input type="checkbox"/> | | ATTACHED <input type="checkbox"/> DETACHED <input type="checkbox"/> | | 24 | | 0 | | 0 | | 0 | | 0 | | 54 | | 0 | | 5 | |
| POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED | | | | 25 | | 0 | | 0 | | 0 | | 0 | | 55 | | 0 | | 0 | |
| START 2.5 ft above exit STOP SAME | | | | 26 | | 0 | | 0 | | 0 | | 0 | | 56 | | 0 | | 0 | |
| DESCRIBE BACKGROUND | | | | 27 | | 0 | | 0 | | 0 | | 0 | | 57 | | 0 | | 0 | |
| START trees/sky STOP SAME | | | | 28 | | 0 | | 0 | | 0 | | 0 | | 58 | | 0 | | 0 | |
| BACKGROUND COLOR | | SKY CONDITIONS | | 29 | | 0 | | 0 | | 0 | | 0 | | 59 | | 0 | | 0 | |
| START grey STOP SAME | | START clear STOP SAME | | 30 | | 0 | | 0 | | 0 | | 0 | | 60 | | 0 | | 0 | |
| WIND SPEED | | WIND DIRECTION | | AVERAGE OPACITY FOR HIGHEST PERIOD 0.42% | | | | NUMBER OF READINGS ABOVE 0% WERE 6 | | | | | | | | | | | |
| START 1-3 mph STOP same | | START South STOP South | | RANGE OF OPACITY READINGS MINIMUM 0 MAXIMUM 5 | | | | OBSERVER'S NAME (PRINT) David Goshaw | | | | | | | | | | | |
| AMBIENT TEMP | | WET BULB TEMP. | | RH. percent | | OBSERVER'S SIGNATURE | | | | DATE 8-21-97 | | | | | | | | | |
| START 78 STOP 82 | | 67 | | 56 | | ORGANIZATION DEECO Inc | | | | CERTIFIED BY ETA | | | | DATE 3/97 | | | | | |
| SOURCE LAYOUT SKETCH | | | | VERIFIED BY | | | | DATE | | | | | | | | | | | |
| <p>Source Layout Sketch</p> <p>Draw North Arrow</p> <p>Silos</p> <p>Emission Point</p> <p>Observers Position - on recycled asphalt pile</p> <p>Sun Location Line</p> <p>140 ft</p> <p>Sun - Wind - Plume and Stack</p> <p>I-40</p> | | | | | | | | | | | | | | | | | | | |
| COMMENTS | | | | | | | | | | | | | | | | | | | |
| I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS | | | | | | | | | | | | | | | | | | | |
| SIGNATURE | | | | | | | | | | | | | | | | | | | |
| TITLE | | | | | | | | | | | | | | | | | | | |
| DATE | | | | | | | | | | | | | | | | | | | |

Visible Emission Observation Form

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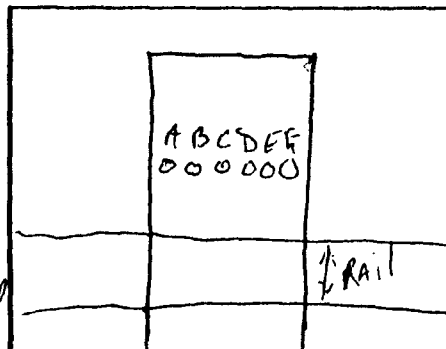
| | | | | | | | | | | | | | | |
|---|--|--------------------------|---|---|----|----|-------------------------|------------|---|----|------------------------|----|--|--|
| SOURCE NAME Baghouse Exit | | | OBSERVATION DATE 8-21-97 | | | | START TIME 10:58 | | | | STOP TIME 11:58 | | | |
| ADDRESS ASPHALT PLANT "A" | | | SEC MIN | 0 | 15 | 30 | 45 | SEC MIN | 0 | 15 | 30 | 45 | | |
| 1010 Rd (Cleveland Rd) | | | 1 | 0 | 0 | 0 | 0 | 31 | 0 | 0 | 0 | 0 | | |
| CITY | STATE NC | ZIP | 2 | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 0 | | |
| PHONE | SOURCE ID NUMBER | | 3 | 0 | 0 | 0 | 0 | 33 | 0 | 0 | 0 | 0 | | |
| PROCESS EQUIPMENT aggregate dryer | OPERATING MODE | | 4 | 0 | 0 | 5 | 0 | 34 | 0 | 0 | 0 | 0 | | |
| CONTROL EQUIPMENT baghouse | OPERATING MODE | | 5 | 0 | 0 | 0 | 0 | 35 | 0 | 0 | 0 | 0 | | |
| DESCRIBE EMISSION POINT START yellow rectangular stack STOP SAME | | | 6 | 0 | 0 | 0 | 0 | 36 | 0 | 0 | 0 | 0 | | |
| HEIGHT ABOVE GROUND LEVEL START 29 ft STOP same | HEIGHT RELATIVE TO OBSERVER START 3 ft STOP SAME | | 7 | 0 | 0 | 0 | 0 | 37 | 0 | 0 | 0 | 0 | | |
| DISTANCE FROM OBSERVER START 475 ft STOP SAME | DIRECTION FROM OBSERVER START NW STOP SAME | | 8 | 0 | 0 | 0 | 0 | 38 | 0 | 0 | 0 | 0 | | |
| DESCRIBE EMISSIONS START coning STOP SAME | | | 9 | 0 | 0 | 0 | 0 | 39 | 0 | 0 | 0 | 0 | | |
| EMISSION COLOR START grey STOP same | PLUME TYPE: CONTINUOUS <input checked="" type="checkbox"/> FUGITIVE <input type="checkbox"/> INTERMITTENT <input type="checkbox"/> | | 10 | 0 | 0 | 0 | 0 | 40 | 0 | 0 | 0 | 0 | | |
| WATER DROPLETS PRESENT: NO <input checked="" type="checkbox"/> YES <input type="checkbox"/> | IF WATER DROPLET PLUME: ATTACHED <input type="checkbox"/> DETACHED <input type="checkbox"/> | | 11 | 0 | 0 | 0 | 0 | 41 | 0 | 0 | 0 | 0 | | |
| POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED START 2-5 ft above exit STOP same | | | 12 | 0 | 0 | 0 | 0 | 42 | 0 | 5 | 0 | 0 | | |
| DESCRIBE BACKGROUND START trees/sky STOP SAME | | | 13 | 0 | 0 | 0 | 5 | 43 | 0 | 5 | 0 | 0 | | |
| BACKGROUND COLOR START grey/blue STOP same | SKY CONDITIONS START clear STOP SAME | | 14 | 0 | 0 | 0 | 0 | 44 | 0 | 0 | 0 | 0 | | |
| WIND SPEED START 2-4 mph STOP SAME | WIND DIRECTION START South STOP SAME | | 15 | 0 | 0 | 0 | 0 | 45 | — | 0 | 0 | 0 | | |
| AMBIENT TEMP START 82 STOP 85 | WET BULB TEMP. 68 | RH, percent 48 | 16 | 0 | 0 | 0 | 0 | 46 | 0 | 0 | 0 | 0 | | |
| <p>↑ plant entrance</p> <p>Source Layout Sketch Draw North Arrow</p> | | | 17 | 0 | 0 | 0 | 0 | 47 | 0 | 0 | 0 | 0 | | |
| | | | 18 | 0 | 0 | 0 | 0 | 48 | 0 | 0 | 0 | 0 | | |
| | | | 19 | 0 | 0 | 0 | 0 | 49 | 0 | 0 | 0 | 0 | | |
| | | | 20 | 0 | 0 | 5 | 0 | 50 | 0 | 0 | 0 | 0 | | |
| | | | 21 | 0 | 0 | 0 | 0 | 51 | 0 | 0 | 0 | 0 | | |
| | | | 22 | 0 | 0 | 0 | 0 | 52 | 0 | 0 | 0 | 0 | | |
| | | | 23 | 0 | 0 | 0 | 0 | 53 | 0 | 0 | 0 | 0 | | |
| | | | 24 | 0 | 0 | 0 | 0 | 54 | 5 | 0 | 0 | 0 | | |
| | | | 25 | 0 | 0 | 0 | 0 | 55 | 0 | 0 | 0 | 0 | | |
| | | | 26 | 0 | 0 | 0 | 0 | 56 | 0 | 0 | 0 | 0 | | |
| AVERAGE OPACITY FOR HIGHEST PERIOD 0.21% | | | NUMBER OF READINGS ABOVE 0% WERE 5 | | | | | | | | | | | |
| RANGE OF OPACITY READINGS MINIMUM 0 MAXIMUM 5 | | | | | | | | | | | | | | |
| OBSERVER'S NAME (PRINT) David Goshaw | | | | | | | | | | | | | | |
| OBSERVER'S SIGNATURE | | | DATE 8-21-97 | | | | | | | | | | | |
| ORGANIZATION DEECO Inc | | | | | | | | | | | | | | |
| I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS SIGNATURE | | | CERTIFIED BY ETA | | | | | | | | | | | |
| TITLE | | | DATE 9/97 | | | | | | | | | | | |
| DATE | | | VERIFIED BY | | | | | | | | | | | |
| | | | DATE | | | | | | | | | | | |



PACIFIC ENVIRONMENTAL SERVICES, INC.

FIELD DATA

Plant ASPHALT PLANT "A"
 Date 8-19-97
 Sampling Location stack
 Sample Type M-23
 Run Number 1 9123-0-1
 Operator DMC
 Barometric Pressure (B) 29.9
 Static Pressure (R) -0.22
 Filter Number(s) Outlet #1 *unfired*
 Pretest Leak Rate = 0.004 cfm @ 17 in. Hg
 Pretest Pitot Leak Check ✓
 Pretest Orsat Leak Check ✓
 Read and Record all Data Every 5 Minutes
 Page 1 of



| | | | |
|-------------------|--|--|--|
| (CO) ₂ | | | |
| O ₂ | | | |
| CO | | | |
| N ₂ | | | |

| | |
|-----------------------------|--|
| Condensers | |
| V ₁ : Silica gel | |
| Total H ₂ O | |

Probe Length and Type 4' glass
 Pitot Tube I.D. No.
 Nozzle I.D. 0.240
 Assumed Moisture, %
 Meter Box Number MB11
 Meter Δ H₂O 1.95
 Meter Gamma 0.987
 Reference p N/A
 Post Test Leak Rate = 0.002 cfm @ 5 in. Hg
 Post Test Pitot Leak Check ✓
 Post Test Orsat Leak Check ✓

Schematic of Traverse Point Layout

Temp. Sensor ID No.

| Traverse Point Number | Sampling Time (min.) | Clock Time (24-hour clock) | Gas Meter Reading (Vol) ft ³ | Velocity (ft/sec) in. H ₂ O | Orifice Pica. Differential (dH) in. H ₂ O | | Stack Temp. °F (T ₁) | Probe Temp. / Filter Temp. °F | Impinger Temp. °F | Dry Gas Meter Temp. | | Pump Vacuum in. Hg | XAD |
|-----------------------|----------------------|----------------------------|---|--|--|--------|----------------------------------|-------------------------------|-------------------|-----------------------------|-------------------------------|--------------------|-----|
| | | | | | Desired | Actual | | | | Inlet (T _{in}) °F | Outlet (T _{out}) °F | | |
| A 1 | 0/0 | 10915 | 281.500 | | | | | | | | | | |
| | 5 | 10920 | 288.09 | 3.5 | 7.0 | 7.0 | 208 | 248.1259 | 59 | 88 | 88 | 10 | 65 |
| | 10 | 10925 | 294.27 | 2.8 | 5.6 | 5.6 | 209 | 230.1259 | 54 | 92 | 89 | 10 | 63 |
| | 15 | 10930 | 299.70 | 2.1 | 4.2 | 4.2 | 209 | 230.1258 | 55 | 97 | 91 | 8 | 62 |
| | 20 | 11010 | 305.08 | 2.2 | 4.4 | 4.4 | 208 | 240.1259 | 65 | 97 | 95 | 8 | 63 |
| 3 | 25 | 11104 | 308.40 | 0.72 | 1.44 | 1.44 | 207 | 243.1258 | 65 | 100 | 100 | 3 | 65 |
| | 30 | 11109 | 311.66 | 0.65 | 1.30 | 1.30 | 206 | 245.1259 | 64 | 101 | 101 | 3 | 64 |
| | 35 | 11114 | 314.36 | 0.46 | 0.92 | 0.92 | 208 | 244.1256 | 65 | 103 | 101 | 2 | 64 |
| | 40/0 | 11119 | 316.754 | 0.40 | 0.80 | 0.80 | 210 | 236.1257 | 66 | 108 | 103 | 2 | 64 |
| | 40/0 | 11122 | 321.95 | 1.7 | 3.8 | 3.80 | 206 | 242.1257 | 64 | 107 | 104 | 7 | 66 |
| 2 | 10 | 11127 | 327.09 | 1.9 | 3.8 | 3.8 | 201 | 248.1256 | 67 | 112 | 105 | 7 | 58 |
| | 15 | 11132 | 331.54 | 1.3 | 2.6 | 2.6 | 193 | 238.1255 | 64 | 116 | 107 | 5 | 61 |
| | 20 | 11137 | 335.59 | 1.3 | 2.6 | 2.6 | 191 | 238.1256 | 65 | 118 | 108 | 5 | 63 |
| | 25 | 11142 | 338.60 | 0.57 | 1.14 | 1.14 | 191 | 242.1257 | 65 | 118 | 110 | 3 | 63 |
| | 30 | 11147 | 341.17 | 0.42 | 0.84 | 0.84 | 192 | 238.1257 | 68 | 119 | 111 | 3 | 64 |
| 4 | 35 | 11152 | 343.95 | 0.45 | 0.90 | 0.90 | 190 | 242.1258 | 67 | 119 | 112 | 3 | 65 |
| | 40/0 | 11157/120 | 346.468 | 0.40 | 0.80 | 0.80 | 184 | 243.1256 | 66 | 120 | 114 | 3 | 65 |
| | 5 | 11211 | 350.55 | 1.0 | 2.20 | 2.20 | 175 | 249.1255 | 65 | 117 | 115 | 4 | 65 |
| | 10 | 11216 | 354.68 | 1.2 | 2.40 | 2.40 | 173 | 242.1256 | 66 | 120 | 115 | 4 | 65 |
| | 15 | 11221 | 357.52 | 0.85 | 0.90 | 0.90 | 172 | 243.1255 | 65 | 122 | 116 | 3 | 66 |
| C 1 | 20 | 11226 | 360.28 | 0.45 | 0.90 | 0.90 | 169 | 246.1254 | 66 | 121 | 116 | 3 | 65 |
| | 25 | 11231 | 362.05 | 0.15 | 0.30 | 0.30 | 169 | 248.1256 | 67 | 121 | 117 | 3 | 66 |
| | 30 | 11236 | 363.60 | 0.12 | 0.24 | 0.24 | 169 | 245.1255 | 67 | 121 | 118 | 3 | 65 |
| | 1 | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

cos x
1059

... .. inlet filter near base (1059)

Plant Name: ASPHALT PLANT "A"Test Date: 8-19-97Run Number: 0-1 S-M3-C-1Operator: (VMS)

| Traverse Point Number | Sampling Time, (min.) | Clock Time (24-hour clock) | Gas Meter Reading (V ₆) ft ³ | Velocity (Lead & P ₁) in. H ₂ O | Orifice Pres. Differential (ΔP) in. H ₂ O | | Stack Temp. °F (T) | Probe Temp. / Filter Temp. °F | Impinger Temp. °F | Dry Gas Meter Temp. | | Pump Vacuum In. Hg | YAD |
|-----------------------|-----------------------|----------------------------|---|--|--|--------|--------------------|-------------------------------|-------------------|-----------------------------|-------------------------------|--------------------|-----|
| | | | | | Desired | Actual | | | | Inlet (T _{in}) °F | Outlet (T _{out}) °F | | |
| C-4 | 35 | 1 1241 | 365.21 | 0.09 | 0.18 | 0.18 | 170 | 249 / 255 | 65 | 121 | 118 | 2 | 65 |
| | 40/0 | 1 1246/1246 | 366.500 | 0.09 | 0.18 | 0.18 | 169 | 250 / 255 | 65 | 121 | 118 | 2 | 65 |
| D 1 | 5 | 1 1258 | — | 1.00 | 2.00 | 2.00 | 169 | 246 / 256 | 66 | 121 | 118 | 5 | 65 |
| | 10 | 1 1302 | 374.323 | 1.00 | 2.00 | 2.00 | 165 | 247 / 254 | 66 | 121 | 119 | 5 | 65 |
| 2 | 15 | 1 1308 | 377.110 | 1.20 | .4 | .4 | 167 | 243 / 255 | 66 | 121 | 118 | 5 | 65 |
| | 20 | 1 1313 | 379.114 | .2 | .4 | .4 | 169 | 242 / 254 | 66 | 122 | 119 | 5 | 65 |
| 3 | 25 | 1 1318 | 380.324 | 10.50 | .1 | .1 | 169 | 243 / 252 | 66 | 123 | 119 | 5 | 66 |
| | 30 | 1 1323 | 381.427 | .05 | .1 | .1 | 171 | 240 / 253 | 66 | 121 | 119 | 5 | 67 |
| 4 | 35 | 1 1328 | 382.720 | .08 | .16 | .16 | 172 | 242 / 252 | 67 | 121 | 117 | 2 | 67 |
| | 40/0 | 1 1333 | 384.072 | .08 | .16 | .16 | 174 | 241 / 252 | 67 | 121 | 119 | 2 | 67 |
| E 1 | 5 | 1 1340 | 387.512 | .08 | .16 | .16 | 181 | 242 / 252 | 67 | 122 | 119 | 3 | 67 |
| | 10 | 1 1345 | 390.444 | .08 | .1 | .1 | 169 | 245 / 251 | 65 | 122 | 119 | 3 | 66 |
| 2 | 15 | 1 1350 | 392.395 | .08 | .1 | .1 | 180 | 247 / 253 | 66 | 122 | 119 | 3 | 66 |
| | 20 | 1 1355 | 393.972 | .08 | .16 | .16 | 180 | 247 / 253 | 66 | 122 | 119 | 3 | 66 |
| 3 | 25 | 1 1400 | 395.301 | .15 | .3 | .3 | 182 | 245 / 252 | 68 | 123 | 119 | 2 | 67 |
| | 30 | 1 1405 | 396.992 | .15 | .3 | .3 | 182 | 244 / 252 | 64 | 123 | 119 | 2 | 68 |
| 4 | 35 | 1 1410 | 398.420 | .10 | .2 | .2 | 182 | 247 / 255 | 67 | 122 | 119 | 2 | 67 |
| | 40/0 | 1 1415/1416 | 400.190 | .15 | .3 | .3 | 182 | 244 / 252 | 68 | 120 | 119 | 2 | 67 |
| F 1 | 5 | 1 1421 | 402.584 | .35 | .7 | .7 | 188 | 242 / 253 | 68 | 120 | 119 | 2 | 67 |
| | 10 | 1 1426 | 405.092 | .35 | .7 | .7 | 188 | 243 / 255 | 68 | 122 | 120 | 2 | 68 |
| 2 | 15 | 1 1431 | 407.025 | .21 | .42 | .42 | 187 | 244 / 256 | 68 | 122 | 120 | 2 | 68 |
| | 20 | 1 1436 | 409.030 | .21 | .42 | .42 | 187 | 245 / 253 | 68 | 122 | 120 | 2 | 68 |
| 3 | 25 | 1 1441 | 411.112 | .41 | .82 | .82 | 187 | 242 / 257 | 64 | 121 | 120 | 3 | 67 |
| | 30 | 1 1446 | 414.514 | .41 | .82 | .82 | 197 | 242 / 253 | 68 | 121 | 120 | 3 | 67 |

Plant Name: W01 ASPHALT PLANT "A"

Test Date: 8-19-97

Run Number: 0-1 S-M23-0-1

Operator: CG

[illegible]

METHOD 23 CDD/CDF SAMPLE RECOVERY DATA

5023-0-1

| | | | |
|---|--------------------------------|-------------------------|---------------------------|
| Plant: ASPHALT PLANT "A" | | Run No.: #1 | |
| Sample Date: 8/19/97 | Filter No.(s): _____ | Job No.: 5413-008 | |
| Sample Location: OUTLET RVN1 | | | |
| Recovery Date: 8/19/97 | XAD-2 Trap No.(s): 0-M23-1-XAD | | |
| Sample Recovery Person: BHR | | | |
| Moisture Data | | | |
| Impingers | XAD - 2 Trap | 1 (knockout) | 2 (100 ml H2O) (untipped) |
| | | 3 (100 ml H2O) (tipped) | 4 (knockout) (untipped) |
| Final wt. | 533.1 | 1029.0 | 696.5 |
| Initial wt. | 491.6 | 506.0 | 696.4 |
| Net wt. | 41.5 | 573.0 | 6.1 |
| | | | 0.2 |
| | | | 3.9 |
| | | | 32.9 |
| | | | g |
| | | | g |
| | | | g |
| Description: TOTAL = 601.6 ✓ | | | |
| Train System: _____ | | | |
| Probe: _____ | | | |
| Filter: Color - _____ Loading - _____ | | | |
| Impinger Contents: _____ | | | |
| Silica Gel: @Grams Used - _____ Color - _____ % Spent - _____ | | | |
| Condensate Observed In Front Half: _____ | | | |
| Recovered Sample Fractions | | | |
| Filter Container No. _____ | marked/sealed: | | |
| XAD Module Container No.: _____ | marked/sealed: | | |
| Probe (FH) & Back Half Rinse (Acetone) Container No.: _____ | Liquid level marked/sealed: | | |
| Probe (FH) & Back Half Rinse (Toluene) Container No.: _____ | Liquid level marked/sealed: | | |
| Impinger Contents Container No.: _____ | Liquid level marked/sealed: | | |
| Impinger Rinse (Acetone/MeCl2) Container No.: _____ | Liquid level marked/sealed: | | |

264.1
COND. 263.4



| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 | 101 | 102 | 103 | 104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | 123 | 124 | 125 | 126 | 127 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | 136 | 137 | 138 | 139 | 140 | 141 | 142 | 143 | 144 | 145 | 146 | 147 | 148 | 149 | 150 | 151 | 152 | 153 | 154 | 155 | 156 | 157 | 158 | 159 | 160 | 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 | 169 | 170 | 171 | 172 | 173 | 174 | 175 | 176 | 177 | 178 | 179 | 180 | 181 | 182 | 183 | 184 | 185 | 186 | 187 | 188 | 189 | 190 | 191 | 192 | 193 | 194 | 195 | 196 | 197 | 198 | 199 | 200 | 201 | 202 | 203 | 204 | 205 | 206 | 207 | 208 | 209 | 210 | 211 | 212 | 213 | 214 | 215 | 216 | 217 | 218 | 219 | 220 | 221 | 222 | 223 | 224 | 225 | 226 | 227 | 228 | 229 | 230 | 231 | 232 | 233 | 234 | 235 | 236 | 237 | 238 | 239 | 240 | 241 | 242 | 243 | 244 | 245 | 246 | 247 | 248 | 249 | 250 | 251 | 252 | 253 | 254 | 255 | 256 | 257 | 258 | 259 | 260 | 261 | 262 | 263 | 264 | 265 | 266 | 267 | 268 | 269 | 270 | 271 | 272 | 273 | 274 | 275 | 276 | 277 | 278 | 279 | 280 | 281 | 282 | 283 | 284 | 285 | 286 | 287 | 288 | 289 | 290 | 291 | 292 | 293 | 294 | 295 | 296 | 297 | 298 | 299 | 300 | 301 | 302 | 303 | 304 | 305 | 306 | 307 | 308 | 309 | 310 | 311 | 312 | 313 | 314 | 315 | 316 | 317 | 318 | 319 | 320 | 321 | 322 | 323 | 324 | 325 | 326 | 327 | 328 | 329 | 330 | 331 | 332 | 333 | 334 | 335 | 336 | 337 | 338 | 339 | 340 | 341 | 342 | 343 | 344 | 345 | 346 | 347 | 348 | 349 | 350 | 351 | 352 | 353 | 354 | 355 | 356 | 357 | 358 | 359 | 360 | 361 | 362 | 363 | 364 | 365 | 366 | 367 | 368 | 369 | 370 | 371 | 372 | 373 | 374 | 375 | 376 | 377 | 378 | 379 | 380 | 381 | 382 | 383 | 384 | 385 | 386 | 387 | 388 | 389 | 390 | 391 | 392 | 393 | 394 | 395 | 396 | 397 | 398 | 399 | 400 | 401 | 402 | 403 | 404 | 405 | 406 | 407 | 408 | 409 | 410 | 411 | 412 | 413 | 414 | 415 | 416 | 417 | 418 | 419 | 420 | 421 | 422 | 423 | 424 | 425 | 426 | 427 | 428 | 429 | 430 | 431 | 432 | 433 | 434 | 435 | 436 | 437 | 438 | 439 | 440 | 441 | 442 | 443 | 444 | 445 | 446 | 447 | 448 | 449 | 450 | 451 | 452 | 453 | 454 | 455 | 456 | 457 | 458 | 459 | 460 | 461 | 462 | 463 | 464 | 465 | 466 | 467 | 468 | 469 | 470 | 471 | 472 | 473 | 474 | 475 | 476 | 477 | 478 | 479 | 480 | 481 | 482 | 483 | 484 | 485 | 486 | 487 | 488 | 489 | 490 | 491 | 492 | 493 | 494 | 495 | 496 | 497 | 498 | 499 | 500 | 501 | 502 | 503 | 504 | 505 | 506 | 507 | 508 | 509 | 510 | 511 | 512 | 513 | 514 | 515 | 516 | 517 | 518 | 519 | 520 | 521 | 5 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|

Plant ASPHALT PLANT "A"
 Date 8-20-97
 Sampling Location Batchhouse stack outlet
 Sample Type M-23
 Run Number ~~M-23-2~~ S-M23-O-2
 Operator Tom Donald / G. G. G.
 Barometric Pressure (B) 29.90
 Static Pressure (P_s) - .25
 Filter Number(s) _____
 Pretest Leak Rate = 0.003 cfm @ 18 in. Hg
 Pretest Pilot Leak Check ✓
 Pretest Orsat Leak Check ✓
 Read and Record all Data Every 5 Minutes
 Page 1 of 3

| | |
|-----------------------------|-------|
| Condensers | _____ |
| V _L : Silica gel | _____ |
| Total H ₂ O | _____ |

Probe Length and Type 4' g155
Pilot Tube I.D. No. _____
Nozzle I.D. 0.192 0.251 (in)
Assumed Moisture, % 17
Meter Box Number MB 11
Meter Δ H@ 1.95
Meter Gamma 0.987
Reference p N/A
Post Test Leak Rate = 1.002 cfm @ 10 in. Hg
Post Test Pilot Leak Check ✓
Post Test Orsat Leak Check ✓

Schematic of Traverse Point Layout

Temp. Sensor ID No.

[illegible]

57
57
56
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58
58

Plant Name: ASPHALT PLANT "A"

Test Date: 8-20-97

Run Number: ~~M 23~~ 2 S-M23-O-2

Operator: Imcd / Gmg

| Traverse Point Number | Sampling Time, (min.) | Clock Time (24-hour clock) | Gas Meter Reading (V) ft ³ | Velocity Head (F _P) in. H ₂ O | Orifice Pres. Differential (ΔH) in. H ₂ O | | Stack Temp. °F (T) | Probe Temp. / Filter Temp. °F | Impinger Temp. °F | Dry Gas Meter Temp. | | Pump Vacuum In. Hg |
|-----------------------|-----------------------|----------------------------|---------------------------------------|--|--|--------|--------------------|-------------------------------|-------------------|-----------------------------|-------------------------------|--------------------|
| | | | | | Desired | Actual | | | | Inlet (T _{in}) °F | Outlet (T _{out}) °F | |
| P 4 | 80 | 0196 | 172.591 | .40 | 1.2 | 1.2 | 211 | 255 / 261 | 63 | 104 | 99 | 2 |
| F 1 | 5 | 1952 | 476002 | .40 | 1.2 | 1.2 | 212 | 253 / 261 | 63 | 104 | 99 | 2 |
| 2 | 10 | 1957 | 479012 | .30 | .90 | .90 | 217 | 258 / 258 | 62 | 105 | 100 | 2 |
| 2 | 15 | 11002 | 481.670 | .30 | .90 | .90 | 220 | 248 / 260 | 62 | 107 | 101 | 2 |
| 3 | 20 | 11007 | 484.691 | .76 | 2.2 | 2.2 | 229 | 244 / 261 | 62 | 107 | 101 | 2 |
| 3 | 25 | 11012 | 488.622 | .76 | 2.2 | 2.2 | 233 | 244 / 261 | 62 | 110 | 103 | 5 |
| 4 | 30 | 11017 | 492.987 | .78 | 2.3 | 2.3 | 236 | 247 / 263 | 62 | 111 | 104 | 6 |
| 4 | 35 | 11022 | 497.126 | .77 | 2.3 | 2.3 | 236 | 248 / 262 | 62 | 113 | 105 | 6 |
| | 120 | 11027 | 501.197 | .78 | 2.3 | 2.3 | 236 | 240 / 261 | 62 | 114 | 107 | 6 |
| | 1 | | | | | | | 1 | | | | |
| | 120 | 011031 | 506.382 | 2.19 | 8.4 | 8.4 | 235 | 244 / 260 | 64 | 111 | 106 | 10 |
| A 1 | 5 | 11042 | 515710 | 2.8 | 8.4 | 8.4 | 236 | 248 / 262 | 64 | 113 | 107 | 10 |
| | 10 | 11047 | 520561 | 2.5 | 7.5 | 7.5 | 237 | 249 / 262 | 64 | 113 | 107 | 10 |
| 2 | 15 | 11054 | 526.512 | 2.5 | 7.5 | 7.5 | 238 | 250 / 263 | 64 | 109 | 107 | 10 |
| | 20 | 11059 | 532.220 | 2.0 | 6.0 | 6.0 | 237 | 248 / 265 | 64 | 109 | 106 | 10 |
| 3 | 25 | 11104 | 538.899 | 2.0 | 6.0 | 6.0 | 231 | 244 / 267 | 65 | 109 | 106 | 10 |
| | 30 | 11109 | 542.251 | .28 | .84 | .84 | 220 | 250 / 265 | 65 | 109 | 106 | 5 |
| 4 | 35 | 11114 | 545.082 | .29 | .84 | .84 | 229 | 250 / | 65 | 109 | 100 | 5 |
| | 1100 | 1 | | | | | | 1 | | | | |
| | 1 | | | 1.009 | | 3.507 | 219.6 | 1 | | 109-3 | 103.6 | |
| | 1 | | | | | | | 1 | | | | |
| | 1 | | | | | | | 1 | | | | |
| | 1 | | | | | | | 1 | | | | |
| | 1 | | | | | | | 1 | | | | |

Plant Name: ASPHALT PLANT "A"Test Date: 8-20-97Run Number: M23-2 S-M23-0-2Operator: TMW

| Traverse Point Number | Sampling Time, (min.) | Clock Time (24-hour clock) | Gas Meter Reading (V) ft ³ | Velocity Head (P _v) in. H ₂ O | Orifice Pres. Differential (ΔH) in. H ₂ O | | Stack Temp. °F (T) | Probe Temp. / Filter Temp. °F | Impinger Temp. °F | Dry Gas Meter Temp. | | Pump Vacuum In. Hg |
|-----------------------|-----------------------|----------------------------|---------------------------------------|--|--|---------|--------------------|-------------------------------|-------------------|-----------------------------|-------------------------------|--------------------|
| | | | | | Desired | Actual | | | | Inlet (T _{in}) °F | Outlet (T _{out}) °F | |
| B1 | 160/01 | 1114 | 545.032 | | | | | 1 | | | | |
| B1 | 5 | 1119 | 551.623 | 2.8 | 2.4 | 2.4 | 233 | 251 / 263 | 65 | 109 | 103 | 10 61 |
| 2 | 10 | 1124 | 557.420 | 2.8 | 2.4 | 2.4 | 234 | 252 / 264 | 66 | 111 | 105 | 10 61 |
| 2 | 15 | 1129 | 563.523 | 1.5 | 4.5 | 4.5 | 239 | 255 / 260 | 66 | 110 | 104 | 10 61 |
| 3 | 20 | 1134 | 569.001 | 1.5 | 4.5 | 4.5 | 236 | 260 / 261 | 66 | 109 | 103 | 10 61 |
| 3 | 25 | 1139 | 574.220 | 1.1 | 3.3 | 3.3 | 237 | 254 / 262 | 65 | 111 | 104 | 10 61 |
| 4 | 30 | 1144 | 579.910 | 1.1 | 3.3 | 3.3 | 237 | 254 / 262 | 65 | 110 | 104 | 10 61 |
| 4 | 35 | 1149 | 583.710 | 1.65 | 1.9 | 1.9 | 237 | 255 / 260 | 66 | 110 | 105 | 10 61 |
| | 200/0 | 1154 | 587.701 | 1.65 | 1.9 | 1.9 | 239 | 257 / 262 | 66 | 111 | 106 | 6 61 |
| | 1 | | | LEAK CH | 0.05 @ | 13.4 ft | | 1 CHGED FIRST imp. | | | | |
| | 1 | | | LEAK CH | 0.07 @ | 14.4 ft | | 1 | | | | |
| | 200/0 | 12:00 | 587.834 | 1.48 | 2.7 | 2.9 | 240 | 267 / 262 | 66 | 107 | 104 | 7 61 |
| B1 | 5 | 1206 | 592.571 | 1.89 | 2.6 | 2.6 | 237 | 260 / 254 | 66 | 111 | 109 | 7 61 |
| | 10 | 1210 | 596.942 | 1.70 | 2.1 | 2.1 | 238 | 260 / 257 | 67 | 112 | 108 | 7 62 |
| 2 | 15 | 1215 | 601.220 | 1.70 | 2.1 | 2.1 | 237 | 252 / 259 | 65 | 112 | 105 | 7 61 |
| | 20 | 1220 | 605.438 | 1.80 | 1.8 | 1.8 | 239 | 255 / 260 | 65 | 113 | 105 | 7 61 |
| 3 | 25 | 1225 | 609.342 | 1.55 | 1.6 | 1.6 | 237 | 250 / 261 | 65 | 113 | 105 | 5 61 |
| | 30 | 1230 | 613.110 | 1.51 | 1.5 | 1.5 | 234 | 247 / 260 | 65 | 113 | 106 | 5 61 |
| 4 | 35 | 1235 | 616.710 | 1.51 | 1.5 | 1.5 | 232 | 244 / 258 | 65 | 112 | 106 | 5 61 |
| | 240/0 | 1240 | 620.321 | | | | | 1 | | | | |
| | 1 | | | | | | | 1 | | | | |
| | 1 | | | 1.109 | | 3.35 | 236.4 | 1 | | 110.8 | 105.1 | |
| | 1 | | | | | | | 1 | | | | |
| | 1 | | | | | | | 1 | | | | |

200.006 0.931

2.715 222.7

105 98.9

METHOD 23 CDD/CDF SAMPLE RECOVERY DATA

S-m23-0-2

| | | | |
|---|--------------|-----------------------------|---------------------------|
| Plant: ASPHALT PLANT "A" | | Run No.: #2 | |
| Sample Date: 8/20/97 | | Filter No.(s): | |
| Sample Location: OUTLET | | Job No.: | |
| Recovery Date: | | XAD-2 Trap No.(s): | |
| Sample Recovery Person: | | | |
| Moisture Data | | | |
| Impingers | XAD - 2 Trap | 1 (knockout) | 2 (100 ml H2O) (untipped) |
| | | 3 (100 ml H2O) (tipped) | 4 (knockout) (untipped) |
| Final wt. | 484.9 | SEE BELOW | 907.3 |
| Initial wt. | 453.3 | 488.6 | 691.6 |
| Net wt. | 31.6 | 938.2 | 215.7 |
| | | | -2.1 |
| | | | 6.9 |
| | | | 62.8 |
| Description 1253.1 ✓ | | | |
| Train System: | | | |
| Probe: | | | |
| Filter: Color - | | Loading - | |
| Impinger Contents: | | | |
| Silica Gel: @Grams Used - | | Color - % Spent - | |
| Condensate Observed In Front Half: | | | |
| Recovered Sample Fractions | | | |
| Filter Container No. | | marked/sealed: | |
| XAD Module Container No.: | | marked/sealed: | |
| Probe (FH) & Back Half Rinse (Acetone) Container No.: | | Liquid level marked/sealed: | |
| Probe (FH) & Back Half Rinse (Toluene) Container No.: | | Liquid level marked/sealed: | |
| Impinger Contents Container No.: | | Liquid level marked/sealed: | |
| Impinger Rinse (Acetone/MeCl2) Container No.: | | Liquid level marked/sealed: | |

COND 4
513.8
197.6

H2O
740.6

FIELD DATA SHEET

Plant: ASPHALT PLANT "A"

Sample Type: m 26³ Operator: 6644

Nozzle ID: 251 Thermocouple #: _____

Sampling Location: BAK House 02161

Pbar: 29.8 Ps: -0.25

Assumed Bws: 17 Filter #: _____

Run Number: 0-7 Date: 8-20-97

CO2: _____ O2: _____

Meter Box #: 11 Y: 987 ΔH@: 1.950

Pretest Leak Rate: 0.03 cfm @ 15 in. Hg.

Probe Length/Type: 2' GLASS Pitot #: _____

Post-Test Leak Rate: _____ cfm @ _____ in. Hg.

Pretest Leak Check: Pitot: ✓ Orsat: ✓

Stack Diameter: _____ As: _____

Post-Test Leak Check: Pitot: _____ Orsat: _____

| Traverse Point Number | Sampling Time (min) | Clock Time (24-hour clock) | Gas Meter Reading (Vm) ft ³ | Velocity Head (Δp) in H ₂ O | Orifice Pressure Differential (ΔH) in H ₂ O | | Stack Temp. (Ts) | Temperature °F | | Impinger Temp. °F | Dry Gas Meter Temp. | | Pump Vacuum (in. Hg) |
|-----------------------|---------------------|----------------------------|--|--|--|--------|------------------|----------------|--------|-------------------|---------------------|--------------------|----------------------|
| | | | | | Desired | Actual | | Probe | Filter | | Inlet (Tm in °F) | Outlet (Tm out °F) | |
| | 0 | 1405 | 620.573 | | | | | | | | | | |
| A 1 | 5 | 1416 | 626.819 | 3.7 | 9.3 | 9.3 | 209 | 248 | 260 | 69 | 106 | 103 | 60 |
| | 10 | 1415 | 633.480 | 3.1 | 9.3 | 9.3 | 247 | 261 | 260 | 69 | 105 | 104 | 10 |
| 2 | 15 | 1420 | 639.992 | 2.1 | 6.3 | 6.3 | 208 | 249 | 261 | 69 | 108 | 104 | 10 |
| | 20 | 1425 | 646.627 | 2.1 | 6.3 | 6.3 | 216 | 247 | 253 | 69 | 110 | 106 | 10 |
| 3 | 25 | 1430 | 651.752 | 1.94 | 2.8 | 2.8 | 205 | 241 | 255 | 69 | 112 | 106 | 10 |
| | 30 | 1435 | 658.672 | 1.92 | 2.8 | 2.8 | 203 | 243 | 255 | 69 | 114 | 107 | 10 |
| 4 | 35 | 1440 | 660.342 | 1.40 | 1.2 | 1.2 | 204 | 249 | 255 | 69 | 114 | 107 | 10 |
| | 40 | 1445 | 663.889 | 1.40 | 1.2 | 1.2 | 203 | 251 | 256 | 69 | 115 | 108 | 10 |
| B 1 | 45 | 1447 | 670.019 | 2.1 | 6.3 | 6.3 | 208 | 255 | 257 | 69 | 113 | 107 | 11 |
| | 50 | 1457 | 676.720 | 2.1 | 6.3 | 6.3 | 209 | 252 | 257 | 69 | 114 | 108 | 11 |
| 2 | 55 | 1502 | 682.999 | 1.4 | 4.2 | 4.2 | 209 | 247 | 255 | 68 | 115 | 108 | 10 |
| | 60 | 1507 | 688.210 | 1.4 | 4.2 | 4.2 | 206 | 250 | 252 | 68 | 115 | 108 | 10 |
| 3 | 65 | 1512 | 692.199 | 1.75 | 2.3 | 2.3 | 207 | 247 | 251 | 68 | 116 | 108 | 5 |
| | 70 | 1517 | 697.538 | 1.75 | 2.3 | 2.3 | 208 | 249 | 252 | 68 | 117 | 108 | 5 |
| 4 | 75 | 1522 | 701.502 | 1.61 | 1.8 | 1.8 | 207 | 246 | 250 | 68 | 114 | 108 | 5 |
| | 80 | 1527 | 705.317 | 1.61 | 1.8 | 1.8 | 208 | 247 | 253 | 68 | 115 | 108 | 5 |
| C 1 | 85 | 1529 | 710.501 | 1.1 | 3.3 | 3.3 | 211 | 246 | 253 | 68 | 110 | 108 | 6 |
| | 90 | 1534 | 715.520 | 1.1 | 3.3 | 3.3 | 210 | 256 | 249 | 69 | 117 | 108 | 6 |
| 2 | 95 | 1529 | 719.410 | 1.56 | 1.6 | 1.6 | 209 | 244 | 250 | 68 | 112 | 107 | 5 |
| | 100 | 1544 | 723.192 | 1.56 | 1.6 | 1.6 | 210 | 251 | 251 | 68 | 110 | 106 | 5 |
| 3 | 105 | 1549 | 726.187 | 1.32 | 1.6 | 1.6 | 213 | 255 | 259 | 68 | 111 | 109 | 3 |
| | 110 | 1554 | 729.058 | 1.32 | 1.6 | 1.6 | 215 | 252 | 249 | 68 | 110 | 106 | 3 |
| 4 | 115 | 1559 | 732.311 | 1.46 | 1.3 | 1.3 | 214 | 249 | 250 | 68 | 111 | 106 | 3 |
| | 120 | 1604 | 735.550 | 1.46 | 1.3 | 1.3 | 216 | 250 | 255 | 68 | 112 | 107 | 3 |

ΔVm=

√Δp=

ΔH=

Ts=

Tm=

Plant Name: ASPHALT PLANT "A"Test Date: 8-20-97Run Number: ~~0-2~~ S-M23-0-3Operator: G. Gay

| Traverse Point Number | Sampling Time, (min.) | Clock Time (24-hour clock) | Gas Meter Reading (V) ft ³ | Velocity Head (P ₁) in. H ₂ O | Orifice Pres. Differential (ΔH) in. H ₂ O | | Stack Temp. °F (T) | Probe Temp. / Filter Temp. °F | Impinger Temp. °F | Dry Gas Meter Temp. | | Pump Vacuum In. Hg |
|-----------------------|-----------------------|----------------------------|---------------------------------------|--|--|--------|--------------------|-------------------------------|-------------------|-----------------------------|-------------------------------|--------------------|
| | | | | | Desired | Actual | | | | Inlet (T _{in}) °F | Outlet (T _{out}) °F | |
| D1 | 125 | 1613 | 739.430 | .68 | 2.0 | 2.0 | 215 | 247 / 252 | 68 | 110 | 109 | 4 |
| | 130 | 1618 | 743.267 | .65 | 1.9 | 1.9 | 213 | 248 / 250 | 67 | 111 | 107 | 4 |
| 2 | 135 | 1622 | 745.872 | .22 | .66 | .66 | 213 | 252 / 251 | 67 | 111 | 106 | 2 |
| | 140 | 1628 | 748.213 | .21 | .66 | .66 | 213 | 255 / 252 | 67 | 111 | 109 | 2 |
| 3 | 145 | 1633 | 751.482 | .45 | 1.3 | 1.3 | 216 | 248 / 253 | 67 | 110 | 108 | 2 |
| | 150 | 1637 | 754.772 | .45 | 1.3 | 1.3 | 214 | 252 / 250 | 68 | 111 | 107 | 2 |
| 4 | 155 | 1643 | 758.642 | .52 | 1.5 | 1.5 | 211 | 253 / 252 | 68 | 110 | 107 | 2 |
| | 160 | 1648 | 761.711 | .52 | 1.5 | 1.5 | 214 | 252 / 255 | 69 | 111 | 108 | 2 |
| E 1 | 165 | 1655 | 764.512 | .30 | .90 | .90 | 211 | 251 / 253 | 68 | 111 | 108 | 2 |
| | 170 | 1660 | 767.215 | .30 | .90 | .90 | 212 | 250 / 251 | 68 | 112 | 109 | 2 |
| 2 | 175 | 1705 | 769.742 | .25 | .75 | .75 | 213 | 251 / 252 | 68 | 112 | 109 | 2 |
| | 180 | 1716 | 772.299 | .23 | .69 | .69 | 205 | 252 / 250 | 68 | 112 | 109 | 2 |
| 3 | 185 | 1715 | 779.999 | .25 | 1.0 | 1.0 | 197 | 258 / 256 | 68 | 112 | 109 | 2 |
| | 190 | 1720 | 777.982 | .25 | 1.0 | 1.0 | 193 | 252 / 256 | 67 | 110 | 108 | 2 |
| 4 | 195 | 1725 | 780.262 | .20 | .60 | .60 | 183 | 250 / 253 | 67 | 109 | 105 | 2 |
| | 200 | 1730 | 782.690 | .20 | .60 | .60 | 178 | 251 / 255 | 67 | 108 | 107 | 2 |
| F 1 | 205 | | | | | | | 250 / 240 | 67 | 110 | 108 | 2 |
| | 210 | | | | | | | | | | | |
| 2 | 215 | | | | | | | | | | | |
| | 220 | | | | | | | | | | | |
| 3 | 225 | | | | | | | | | | | |
| | 230 | | | | | | | | | | | |
| 4 | 235 | | | | | | | | | | | |
| | 240 | | | | | | | | | | | |

CH 1st Imp. LCMC.009 @ 7:11

METHOD 23 CDD/CDF SAMPLE RECOVERY DATA

5-m23-0-3

| | | | | | | | |
|---|-----------------|-----------------|---------------------------------|-------------------------------|-------------------------------|--------------------------------|---|
| Plant: <u>ASPHALT PLANT "A"</u> | | | | | | Run No.: <u>#3</u> | |
| Sample Date: <u>8/20/97</u> | | | Filter No.(s): | | | Job No.: | |
| Sample Location: <u>OUTLET</u> | | | | | | | |
| Recovery Date: <u>8/20/97</u> | | | XAD-2 Trap No.(s): | | | | |
| Sample Recovery Person: <u>BHR</u> | | | | | | | |
| Moisture Data | | | | | | | |
| Impingers | XAD - 2 Trap | 1 (knockout) | 2 (100 ml H2O) (untipped) | 3 (100 ml H2O) (tipped) | 4 (knockout) (untipped) | Silica gel (untipped) | |
| Final wt. | <u>502.1</u> | <u>1145.9</u> | <u>799.8</u> | <u>684.4</u> | <u>619.9</u> | <u>932.4</u> | g |
| Initial wt. | <u>466.2</u> | <u>422.6</u> | <u>694.4</u> | <u>687.5</u> | <u>612.0</u> | <u>889.4</u> | g |
| Net wt. | <u>35.9</u> | <u>723.3</u> | <u>105.4</u> | <u>(2.1)</u> | <u>7.9</u> | <u>43.0</u> | g |
| Description | | | | | | <u>total = 912.4g</u> | |
| Train System: | | | | | | | |
| Probe: | | | | | | | |
| Filter: Color - | | | | Loading - | | | |
| Impinger Contents: | | | | | | | |
| Silica Gel: @Grams Used - | | | | Color - | | % Spent - | |
| Condensate Observed In Front Half: | | | | | | | |
| Recovered Sample Fractions | | | | | | | |
| Filter Container No. | | | | | | marked/sealed: | |
| XAD Module Container No.: | | | | | | marked/sealed: | |
| Probe (FH) & Back Half Rinse (Acetone) Container No.: | | | | | | Liquid level marked/sealed: | |
| Probe (FH) & Back Half Rinse (Toluene) Container No.: | | | | | | Liquid level marked/sealed: | |
| Impinger Contents Container No.: | | | | | | Liquid level marked/sealed: | |
| Impinger Rinse (Acetone/MeCl2) Container No.: | | | | | | Liquid level marked/sealed: | |

COND-2

514.4

METHOD 5 TESTING FIELD DATA SHEET

PAGE 1 of 3

| PLANT AND CITY | DATE | SAMPLING LOCATION | SAMPLE TYPE | HUN NUMBER |
|-------------------|---------|-------------------|-------------|------------|
| ASPHALT PLANT "A" | 8-21-97 | BK House OUTLET | m 263 | S-M23-0-4 |

| OPERATOR | AMBIENT PRESS (in Hg) | STATIC PRESS (in Hg) | AMBIENT TEMP (deg F) | FILTER NUMBERS | STACK ID (in) | PROT CO | PROBE LENGTH AND LINER TYPE | NOZZLE NUMBER | NOZZLE DIAMETER |
|----------|-----------------------|----------------------|----------------------|----------------|---------------|---------|-----------------------------|---------------|-----------------|
| Gary | 29.7 | -1.25 | 72 | | | .84 | 3' Gurs | 1251 | .251 |

| ASSUMED MOISTURE (%) | DCM BOX NO | DCM Hg | DCM OIL FACTOR (%) | STACK HEEM NO | STACK PROT NO | OIL NO | LEAK CHECK (INITIAL) | LEAK CHECK (FINAL) | TOP FORTEN % | GOL CONTENT % | REMARKS |
|----------------------|------------|--------|--------------------|---------------|---------------|--------|----------------------|--------------------|--------------|---------------|---------|
| 17% | MO 11 | 1.950 | .987 | | | | ✓ | | | | 3.4 |

| TRAV. POINT NO | ELAPSED TEST TIME (MIN) | CLOCK TIME (24HR) | DCM HEADLINE VOL (in) | PUMP VERGOLY HEAD (in Hg) | DAINER OFFICE (in Hg) | STACK HEEM (deg F) | PROBE TEMP (deg F) | PUMP OVER TEMP (deg F) | OIL GEL MEINER TEMP (deg F) | DCM INJOUR TEMP (deg F) | SAMPLE HEAM VAC (in Hg) |
|----------------|-------------------------|-------------------|-----------------------|---------------------------|-----------------------|--------------------|--------------------|------------------------|-----------------------------|-------------------------|-------------------------|
| | 0 | 741 | 782.720 | 3.1 | 8.9 | 182 | 256 | 255 | 64 | 77 77 | 10 |
| A 1 | 5 | 746 | 789.24 | 3.1 | 8.5 | 184 | 254 | 256 | 64 | 85 79 | 10 |
| | 10 | 751 | 795.330 | 2.5 | 7.2 | 183 | 255 | 257 | 65 | 86 79 | 10 |
| 2 | 15 | 756 | 801.992 | 2.2 | 6.4 | 182 | 256 | 259 | 64 | 91 88 | 10 |
| | 20 | 801 | 809.245 | 1.1 | 3.2 | 182 | 257 | 258 | 64 | 93 85 | 6 |
| 3 | 25 | 806 | 813.2 | 1.1 | 3.2 | 184 | 257 | 256 | 64 | 95 85 | 6 |
| | 30 | 811 | 816.04 | .49 | 1.5 | 181 | 258 | 251 | 64 | 98 87 | 3 |
| 4 | 35 | 816 | 821.542 | .46 | 1.3 | 181 | 253 | 253 | 65 | 101 90 | 3 |
| | 40 | 821 | 824.755 | - | - | - | 253 | 251 | 65 | 101 90 | 3 |
| B 1 | 45 | 827 | 827.272 | 2.5 | 7.4 | 181 | 260 | 255 | 62 | 103 92 | 11 |
| | 50 | 828 | 837.615 | 2.5 | 7.4 | 182 | 255 | 255 | 62 | 104 92 | 11 |
| 2 | 55 | 833 | 843.510 | 1.6 | 4.4 | 176 | 254 | 255 | 62 | 105 92 | 9 |
| | 60 | 838 | 849.67 | 1.6 | 4.4 | 174 | 254 | 255 | 62 | 107 90 | 9 |
| | TOTAL TIME | | DCM VOLUME | AVE GOLF HEAD | AVE DRAIN | AVE TEMP | | | | AVE TEMP | |

63
64
64
64
63
64
64
64
64
64
64
64
63
63

| PLANT AND CITY | | | | DATE | SAMPLING LOCATION | | | SAMPLE TYPE | | RUN NUMBER | | | |
|----------------------|----------------------------------|--------------------------|--|---|--|-----------------------|-----------------------|--------------------------------|-------------------------------------|-------------------------------|----------------------|---|----------|
| ASPHALT PLANT "A" | | | | 8-21-97 | BAGHOUSE OUTLET 0-4 | | | m. 25 | | 0-4 | | | |
| TRAV POINT NO. | ELAPSED TEST TIME (min) | CLOCK TIME (24 hr) | GAS METER READING V _m (lit) | W VELOCITY HEAD (lit H ₂ O) | H ORIFICE (lit H ₂ O) | STACK TEMP (°F) | PHONE TEMP (°F) | FILTER OVEN TEMP (°F) | SIL GEL IMPINGEN TEMP (°F) | DGM IN/OUT TEMP (°F) | AUX. TEMP (°F) | SAMPLE TRAIN ACCU (lit H ₂ O) | |
| 3 | 65 | 843 | 853.678 | .66 | 1.9 | 176 | 252 | 255 | 63 | 109 98 | | 9 | 63 |
| | 70 | 849 | 857.580 | .66 | 1.9 | 175 | 254 | 252 | 63 | 109 99 | | 8 | 63 |
| 4 | 75 | 853 | 861.110 | .56 | 1.6 | 176 | 255 | 253 | 64 | 110 101 | | 3 | 64 K=2.9 |
| | 80 | 858 | 864.675 | .56 | 1.6 | 176 | 247 | 252 | 65 | 110 102 | | 3 | 64 * 2.9 |
| 1 | 85 | 905 | 869.999 | .5 | 4.38 | 183 | 252 | 253 | 62 | 112 101 | | 7 | 64 |
| | 90 | 910 | 875.232 | .5 | 3.8 | 179 | 253 | 254 | 65 | 113 103 | | 7 | 64 |
| 2 | 95 | 915 | 879.22 | .78 | 2.0 | 177 | 247 | 251 | 65 | 115 106 | | 4 | 64 |
| | 100 | 920 | 883.20 | .78 | 2.0 | 174 | 250 | 251 | 65 | 115 104 | | 4 | 65 |
| 3 | 105 | 925 | 885.352 | .20 | .5 | 176 | 252 | 253 | 64 | 116 110 | | 2 | 65 |
| | 110 | 930 | 887.498 | .26 | .5 | 176 | 253 | 255 | 64 | 115 111 | | 2 | 65 |
| 4 | 115 | 935 | 890.442 | .42 | 1.1 | 179 | 250 | 254 | 63 | 115 111 | | 2 | 64 |
| | 120 | 940 | 893.571 | .42 | 1.1 | 181 | 251 | 255 | 64 | 115 112 | | 2 | 64 |
| 1 | 125 | 948 | 897.842 | .83 | 2.1 | 178 | 252 | 256 | 65 | 116 112 | | 4 | 65 |
| | 130 | 953 | 901.720 | .83 | 2.1 | 176 | 252 | 253 | 65 | 116 113 | | 4 | 65 |
| 2 | 135 | 958 | 905.078 | .50 | 1.3 | 174 | 255 | 256 | 65 | 116 113 | | 3 | 65 |
| | 140 | 1003 | 908.101 | .50 | 1.3 | 173 | 256 | 255 | 64 | 117 113 | | 3 | 65 |
| 3 | 145 | 1008 | 910.001 | .18 | .4 | 172 | 255 | 252 | 64 | 115 111 | | 2 | 64 |
| | 150 | 1013 | 912.010 | .18 | .4 | 177 | 255 | 255 | 64 | 119 112 | | 2 | 64 |
| 4 | 155 | 1018 | 915.831 | .11 | 1.29 | 177 | 256 | 254 | 64 | 113 110 | | 2 | 64 |
| | 160 | 1023 | 915.460 | .11 | 1.29 | 176 | 252 | 252 | 63 | 111 109 | | 2 | 64 |
| TOTAL TIME | | | DGM VOLUME | AVG. SCHED. W | AVG. H | AVG. STACK T | | | | AVG DGM T | | | |

Sheet Checked By: _____

Date _____

METHOD 23 CDD/CDF SAMPLE RECOVERY DATA

0-M23-4

| | | | | | | | |
|---|--------------|--------------|---------------------------|-------------------------|-------------------------|-----------------------------|---|
| Plant: ASPHALT PLANT "A" | | | | | Run No.: #4 | | |
| Sample Date: 8/20/97 | | | Filter No.(s): | | Job No.: | | |
| Sample Location: OUTLET | | | | | | | |
| Recovery Date: 8/21/97 | | | XAD-2 Trap No.(s): | | | | |
| Sample Recovery Person: BHR | | | | | | | |
| Moisture Data | | | | | | | |
| Impingers | XAD - 2 Trap | 1 (knockout) | 2 (100 ml H2O) (untipped) | 3 (100 ml H2O) (tipped) | 4 (knockout) (untipped) | Silica gel (untipped) | |
| Final wt. | 496.3 | 1249.1 | 697.6 | 686.1 | 610.6 | 949.2 | g |
| Initial wt. | 465.0 | 506.7 | 700.0 | 689.5 | 603.5 | 900.1 | g |
| Net wt. | 31.3 | 742.4 | (2.4) | (3.4) | 7.1 | 44.1 | g |
| Description: Total 819.1 ✓ | | | | | | | |
| Train System: | | | | | | | |
| Probe: | | | | | | | |
| Filter: Color - | | | | Loading - | | | |
| Impinger Contents: | | | | | | | |
| Silica Gel: @Grams Used - | | | | Color - | | % Spent - | |
| Condensate Observed In Front Half: | | | | | | | |
| Recovered Sample Fractions | | | | | | | |
| Filter Container No. | | | | | | marked/sealed: | |
| XAD Module Container No.: | | | | | | marked/sealed: | |
| Probe (FH) & Back Half Rinse (Acetone) Container No.: | | | | | | Liquid level marked/sealed: | |
| Probe (FH) & Back Half Rinse (Toluene) Container No.: | | | | | | Liquid level marked/sealed: | |
| Impinger Contents Container No.: | | | | | | Liquid level marked/sealed: | |
| Impinger Rinse (Acetone/MeCl2) Container No.: | | | | | | Liquid level marked/sealed: | |

CAND 2

513.5 503.9
400.6



Free
Blank.

Plant ASPHALT PLANT "A"
Date 8-19-97
Sampling Location STACK
Sample Type M23
Run Number F10
Operator AMJ
Barometric Pressure (B) 29.14
Static Pressure (P_s) NA
Filter Number(s) _____
Pretest Leak Rate = .010 cfm @ 9 in. Hg
Pretest Pitot Leak Check NA
Pretest Orsat Leak Check NA
Read and Record all Data Every NA Minutes
Page 1 of 1

**Schematic of
Traverse Point Layout**

Temp. Sensor ID No.

| | | | |
|-----------------|--|--|--|
| CO ₂ | | | |
| O ₂ | | | |
| CO | | | |
| N ₂ | | | |

Condensers _____
 V₁: Silica gel _____
 Total H₂O _____

Probe Length and Type 4' Glass
Pitot Tube I.D. No. NA
Nozzle I.D. 0.60
Assumed Moisture, % ND
Meter Box Number M010
Meter ΔH @ 1.74
Meter Gamma 0.65
Reference Δp _____
Post Test Leak Rate = 0.10 cfm @ 9 in. Hg
Post Test Pitot Leak Check _____
Post Test Orsat Leak Check _____

[illegible]

METHOD 23 CDD/CDF SAMPLE RECOVERY DATA

| | | | | | | | |
|---|--------------|--------------|---------------------------------|-------------------------|-------------------------|-----------------------------|---|
| Plant: ASPHALT PLANT "A" | | | | | | Run No.: FB | |
| Sample Date: 8/29/97 | | | Filter No.(s): | | | Job No.: | |
| Sample Location: FIELD BLANK | | | | | | | |
| Recovery Date: | | | XAD-2 Trap No.(s): O-M23-FB-XAD | | | | |
| Sample Recovery Person: | | | | | | | |
| Moisture Data | | | | | | | |
| Impingers | XAD - 2 Trap | 1 (knockout) | 2 (100 ml H2O) (untipped) | 3 (100 ml H2O) (tipped) | 4 (knockout) (untipped) | Silica gel (untipped) | |
| Final wt. | 316.0 | 480.5 | 698.4 | 708.1 | 594.3 | 868.9 | g |
| Initial wt. | 316.5 | 480.6 | 696.2 | 708.1 | 594.0 | 868.9 | g |
| Net wt. | | | | | | | g |
| Description | | | | | | | |
| Train System: | | | | | | | |
| Probe: | | | | | | | |
| Filter: Color - | | | | Loading - | | | |
| Impinger Contents: | | | | | | | |
| Silica Gel: @Grams Used - | | | | Color - | | % Spent - | |
| Condensate Observed In Front Half: | | | | | | | |
| Recovered Sample Fractions | | | | | | | |
| Filter Container No. | | | | | | marked/sealed: | |
| XAD Module Container No.: | | | | | | marked/sealed: | |
| Probe (FH) & Back Half Rinse (Acetone) Container No.: | | | | | | Liquid level marked/sealed: | |
| Probe (FH) & Back Half Rinse (Toluene) Container No.: | | | | | | Liquid level marked/sealed: | |
| Impinger Contents Container No.: | | | | | | Liquid level marked/sealed: | |
| Impinger Rinse (Acetone/MeCl2) Container No.: | | | | | | Liquid level marked/sealed: | |



PACIFIC ENVIRONMENTAL SERVICES, INC.

Plant ASPHALT PLANT "A"

Date 8-19-95

Sampling Location STACK

Sample Type M-29

Run Number 01

Operator MAD

Barometric Pressure (B) 29.9

Static Pressure (R) -.25

Filter Number(s)

Pretest Leak Rate = 0.06 cfm @ 15 in. Hg

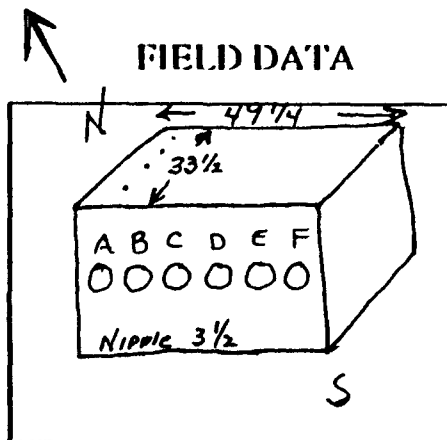
Pretest Pitot Leak Check LEAK CL. GROUND

Pretest Orsat Leak Check

Read and Record all Data Every 5 Minutes

Page 1 of 2

FIELD DATA



| | | | |
|-------------------|--|--|--|
| (CO) ₂ | | | |
| O ₂ | | | |
| (CO) | | | |
| N ₂ | | | |

| | |
|-----------------------------|--|
| Condensers | |
| V ₁ : Silica gel | |
| Total H ₂ O | |

Probe Length and Type 4' Glass

Pitot Tube I.D. No.

Nozzle I.D. 0.251

Assumed Moisture, % 25

Meter Box Number M310

Meter Δ H₂O 1.74

Meter Gamma .965

Reference p

Post Test Leak Rate = 0.04 cfm @ 7 in. Hg

Post Test Pitot Leak Check ✓

Post Test Orsat Leak Check ✓

Schematic of Traverse Point Layout

Temp. Sensor ID No.

| Traverse Point Number | Sampling Time (min.) | Clock Time (24-hour clock) | Gas Meter Reading (Vol) ft ³ | Velocity Head (ft) in. H ₂ O | Orifice Pres. Differential (ΔP) in. H ₂ O | | Stack Temp. °F (T _s) | Probe Temp. / Filter Temp. °F | Impinger Temp. °F | Dry Gas Meter Temp. | | Pump Vacuum in. Hg |
|-----------------------|----------------------|----------------------------|---|---|--|--------|----------------------------------|-------------------------------|-------------------|-----------------------------|-------------------------------|--------------------|
| | | | | | Desired | Actual | | | | Inlet (T _{in}) °F | Outlet (T _{out}) °F | |
| | 0 | 1 0915 | 76.4 | | | | | | | | | |
| C 1 | 5 | 1 0920 | 22.44 | 2.14 | N/A | 4.4 | 209 | 225 / 240 | 45 | 92 | 89 | 3 |
| | 10 | 1 0925 | 88.1 | 1.3 | | 4.1 | 208 | 235 / 235 | 44 | 92 | 89 | 3 |
| 2 | 15 | 1 0930 | 92.97 | .90 | | 2.8 | 210 | 235 / 236 | 46 | 97 | 91 | 3 |
| | 20 | 1 1000 | 97.271 | .91 | | 2.2 | 210 | 242 / 232 | 46 | 99 | 91 | 2 |
| 3 | 25 | 1 1104 | 100.42 | .40 | | 1.19 | 212 | 233 / 234 | 62 | 103 | 103 | 2 |
| | 30 | 1 1109 | 103.51 | .45 | | 1.12 | 212 | 234 / 235 | 60 | 104 | 103 | 2 |
| 4 | 35 | 1 1114 | 106.97 | .54 | | 1.3 | 213 | 232 / 250 | 58 | 107 | 104 | 2 |
| | 40 | 1 1119 | 110.042 | .65 | | 1.6 | 216 | 236 / 253 | 52 | 110 | 109 | 2 |
| D 1 | 45 | 1 1124 | 116.07 | 1.6 | | 3.7 | 204 | 244 / 254 | 57 | 110 | 106 | 2 |
| | 50 | 1 1132 | 121.74 | 1.6 | | 3.9 | 205 | 243 / 251 | 56 | 113 | 106 | 3 |
| 2 | 55 | 1 1137 | 126.3 | 1.3 | | 3.2 | 187 | 244 / 255 | 57 | 104 | 107 | 3 |
| | 60 | 1 1142 | 128.8 | .3 | | .74 | 180 | 241 / 254 | 57 | 104 | 102 | 2 |
| 3 | 65 | 1 1147 | 130.95 | .2 | | .44 | 189 | 240 / 256 | 58 | 103 | 102 | 2 |
| | 70 | 1 1152 | 137.15 | .22 | | .54 | 191 | 241 / 252 | 59 | 104 | 104 | 2 |
| 4 | 75 | 1 1157 | 136.15 | .39 | | .97 | 191 | 246 / 254 | 40 | 102 | 100 | 3 |
| | 80 | 1 1202 | 138.706 | .35 | | .87 | 192 | 245 / 256 | 60 | 102 | 101 | 3 |
| E 1 | 85 | 1 1207 | 141.5 | .3 | | .75 | 172 | 246 / 254 | 61 | 100 | 98 | 2 |
| | 90 | 1 1216 | 144.38 | .34 | | .85 | 173 | 241 / 255 | 61 | 103 | 100 | 2 |
| 2 | 95 | 1 1221 | 146.75 | .1 | | .25 | 170 | 246 / 259 | 57 | 105 | 103 | 2 |
| | 100 | 1 1226 | 148.13 | .14 | | .35 | 171 | 246 / 257 | 56 | 106 | 107 | 1 |
| 3 | 105 | 1 1231 | 149.57 | .15 | | .37 | 167 | 244 / 259 | 57 | 103 | 102 | 1 |
| | 110 | 1 1236 | 152.14 | .2 | | .5 | 168 | 247 / 261 | 60 | 103 | 102 | 1 |
| 4 | 115 | 1 1241 | 154.3 | .10 | | .45 | 162 | 249 / 260 | 60 | 100 | 97 | 1 |

STOP @ 0930 1102 11059
STOP @ 1112 11059

Plant Name: ASPHALT PLANT "A"Test Date: 8-19-97Run Number: 01Operator: MAAD

| Traverse Point Number | Sampling Time, (min.) | Clock Time (24-hour clock) | Gas Meter Reading (V) ft ³ | Velocity Head (P _v) in. H ₂ O | Orifice Pres. Differential (ΔH) in. H ₂ O | | Stack Temp. °F (T) | Probe Temp. / Filter Temp. °F | Impinger Temp. °F | Dry Gas Meter Temp. | | Pump Vacuum In. Hg |
|-----------------------|-----------------------|----------------------------|---------------------------------------|--|--|--------|--------------------|-------------------------------|-------------------|-----------------------------|-------------------------------|--------------------|
| | | | | | Desired | Actual | | | | Inlet (T _{in}) °F | Outlet (T _{out}) °F | |
| E 4 | 120 | 1 1246 | 156.085 | .12 | ND | .3 | 170 | 256 / 257 | 62 | 102 | 102 | 2 |
| F 1 | 125 | 1 1248 / 1253 | 159.4 | .55 | | 1.3 | 166 | 251 / 248 | 64 | 98 | 98 | 2 |
| | 130 | 1 1258 | 162.92 | .53 | | 1.3 | 167 | 256 / 246 | 69 | 102 | 101 | 2 |
| 2 | 135 | 1 1303 | 164.97 | .19 | | .47 | 167 | 253 / 248 | 65 | 104 | 100 | 2 |
| | 140 | 1 1308 | 166.96 | .16 | | .4 | 166 | 250 / 249 | 61 | 104 | 101 | 2 |
| 3 | 145 | 1 1313 | 169.35 | .25 | | .62 | 166 | 248 / 248 | 62 | 103 | 103 | 2 |
| | 150 | 1 1318 | 171.81 | .27 | | .67 | 167 | 249 / 249 | 63 | 104 | 103 | 2 |
| 4 | 155 | 1 1323 | 175.04 | .42 | | 1.05 | 167 | 247 / 241 | 64 | 105 | 103 | 2 |
| | 160 | 1 1328 | 178.27 | .45 | | 1.12 | 167 | 248 / 244 | 64 | 107 | 104 | 2 |
| A 1 | 165 | 1 1334 / 1336 | 185.94 | .30 | | 7.5 | 167 | 247 / 245 | 58 | 113 | 105 | 4 |
| | 170 | 1 1341 | 193.22 | .24 | | 6.0 | 168 | 246 / 247 | 57 | 113 | 107 | 4 |
| 2 | 175 | 1 1346 | 197.55 | .85 | | 2.1 | 167 | 247 / 249 | 58 | 115 | 106 | 4 |
| | 180 | 1 1351 | 201.82 | .86 | | 2.2 | 167 | 248 / 254 | 59 | 116 | 105 | 4 |
| 3 | 185 | 1 1356 | 204.57 | .76 | | .65 | 166 | 249 / 253 | 58 | 114 | 107 | 3 |
| | 190 | 1 1401 | 207.07 | .23 | | .57 | 165 | 253 / 251 | 57 | 112 | 109 | 3 |
| 4 | 195 | 1 1406 | 209.37 | .23 | | .57 | 165 | 254 / 254 | 58 | 96 | 99 | 3 |
| | 200 | 1 1411 | 211.697 | .23 | | .57 | 155 | 257 / 252 | 59 | 99 | 98 | 3 |
| B 1 | 205 | 1 1414 / 1419 | 218.2 | .21 | | 5.2 | 164 | 252 / 256 | 61 | 107 | 107 | 3 |
| | 210 | 1 1424 | 224.57 | 1.9 | | 4.7 | 168 | 254 / 258 | 63 | 110 | 108 | 3 |
| 2 | 215 | 1 1429 | 229.56 | 1.2 | | 3.0 | 167 | 255 / 256 | 62 | 115 | 109 | 3 |
| | 220 | 1 1434 | 234.22 | 1.0 | | 2.5 | 166 | 254 / 258 | 62 | 114 | 109 | 3 |
| 3 | 225 | 1 1439 | 237.27 | .42 | | 1.05 | 167 | 248 / 259 | 64 | 115 | 110 | 3 |
| | 230 | 1 1444 | 240.82 | .46 | | 1.15 | 168 | 247 / 259 | 65 | 113 | 110 | 3 |
| 4 | 235 | 1 1449 | 243.63 | .49 | ✓ | 1.22 | 166 | 249 / 254 | 65 | 110 | 109 | 3 |
| | 240 | 1 1454 | 246.974 | .49 | | 1.22 | 166 | 248 / 246 | 65 | 108 | 106 | 3 |

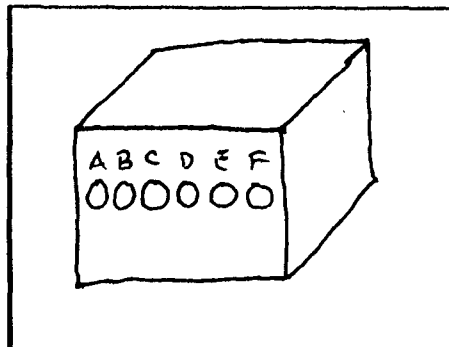
Leak @ .004 @ 774

MULTI-METALS SAMPLE RECOVERY DATA

| Plant: ASPHALT PLANT "A" | | Run No.: S29-0-1 | | | |
|---|--|--------------------|---------------------|--------|------------------------|
| Date: 8-19-97 | Sample Box No.: — | Job No.: S413.003 | | | |
| Sample Location: Outlet | | | | | |
| Sample Type: Particulate / Metals | | | | | |
| Sample Recovery Person: Troy Abernathy / Barry Rayfield | | | | | |
| Container | Description | Volume, ml | Sealed/Level Marked | | |
| Front Half | | | | | |
| 1 | Filter No.(s) M97-003 | — | — | | |
| 2 | Acetone Rinse | — | — | | |
| 3 | Nitric Rinse | — | — | | |
| Back Half | | | | | |
| 4 | Nitric Rinse - Imp. 1,2,3, + Back 1/2 Filter | — | — | | |
| 5A | Nitric Rinse - Impinger No. 4 | — | — | | |
| 5B | KMNO4/H2O Rinse - Impingers 5 & 6 | — | — | | |
| 5C | HCl Rinse - Impingers 5 & 6 | — | — | | |
| Moisture Data | | | | | |
| Impinger No. | Contents | Initial Volume, ml | Weight, grams | | |
| | | | Initial | Final | Net |
| 1 | Empty | — | 722.6 | 1259.7 | 537.1 |
| 2 | 5% HNO3 / 10% H2O2 | 100 | 697.4 | 802.6 | 105.2 |
| 3 | 5% HNO3 / 10% H2O2 | 100 | 732.1 | 752.7 | 20.6 |
| 4 | Empty | — | 524.1 | 528.2 | 4.1 |
| 5 | KMNO4 / H2SO4 | 100 | 684.3 | 685.3 | 1.0 |
| 6 | KMNO4 / H2SO4 | 100 | 708.7 | 709.2 | 0.5 |
| 7 | Silica Gel | 200 | 874.9 | 897.4 | 22.5 |
| | | | | | |
| | | | | | |
| | | | | | |
| Total | | | | | 685.6 691.0 |
| Comments: | | | | | |
| | | | | | |
| | | | | | |



FIELD DATA



| | | | |
|---------------|--|--|--|
| CO_2 | | | |
| O_2 | | | |
| CO | | | |
| N_2 | | | |

Condensers _____
 V_L: Silica gel _____
 Total H₂O _____

Probe Length and Type 4' Glass
Pitot Tube I.D. No. _____
Nozzle I.D. .253
Assumed Moisture, % .17
Meter Box Number MB 10
Meter ΔH @ 1.74
Meter Gamma .945
Reference ρ 636
Post Test Leak Rate = .009 cfm @ 11 in. H₂O
Post Test Pitot Leak Check OK Good
Post Test Orsat Leak Check _____

Schematic of Traverse Point Layout

Temp. Sensor ID No.

| Traverse Point Number | Sampling Time, (min.) | Clock Time (24-hour clock) | Gas Meter Reading (ft^3) @ 3 | Velocity Head (4 ft) in. H_2O | Orifice Pres. Differential (ΔP) in. H_2O | | Stack Temp. $^{\circ}\text{F}$ (T_s) | Probe Temp. / Filter Temp. $^{\circ}\text{F}$ | Impinger Temp. $^{\circ}\text{F}$ | Dry Gas Meter Temp. | | Pump Vacuum in. Hg |
|-----------------------------|-----------------------------|----------------------------------|---|---|---|--------|--|---|---|--|--|-----------------------------------|
| | | | | | Desired | Actual | | | | Inlet (T_{in}) $^{\circ}\text{F}$ | Outlet (T_{out}) $^{\circ}\text{F}$ | |
| | 0 | 10022 | 49.199 | | | | | | | | | |
| A 1 | 5 | 10827 | 67.9. | 3.2 | NA | 8.8 | 190 | 238 / 247 | 42 | 80 | 78 | 4 |
| | 10 | 10832 | 66.95 | 3.3 | | 9.1 | 190 | 237 / 246 | 43 | 81 | 78 | 4 |
| 2 | 15 | 10837 | 73.15 | 2.4 | | 6.6 | 194 | 240 / 247 | 48 | 86 | 79 | 4 |
| | 20 | 10842 | 80.2 | 2.3 | | 6.3 | 193 | 241 / 248 | 48 | 87 | 79 | 4 |
| 3 | 25 | 10847 | 84.88 | 1.0 | | 2.7 | 199 | 241 / 248 | 49 | 90 | 81 | 2 |
| | 30 | 10852 | 89.72 | .96 | | 2.6 | 198 | 244 / 248 | 51 | 92 | 83 | 2 |
| 4 | 35 | 10857 | 93.25 | .4 | | 1.15 | 191 | 243 / 248 | 54 | 93 | 84 | 2 |
| | 40 | 10902 | 96.791 | .35 | | 1.01 | 189 | 242 / 249 | 56 | 94 | 86 | 2 |
| B 1 | 45 | 10904/0909 | 104.15 | 2.3 | | 6.37 | 200 | 244 / 244 | 57 | 93 | 87 | 3 |
| | 50 | 10914 | 111.46 | 2.3 | | 6.37 | 200 | 246 / 244 | 52 | 93 | 87 | 3 |
| 2 | 55 | 10919 | 118.78 | 2.0 | | 5.49 | 210 | 247 / 241 | 53 | 93 | 87 | 3 |
| | 60 | 10924 | 125.3 | 1.5 | | 4.11 | 210 | 247 / 240 | 53 | 92 | 87 | 3 |
| 3 | 65 | 10929 | 130.83 | 1.2 | | 3.14 | 215 | 246 / 242 | 53 | 95 | 90 | 3 |
| | 70 | 10934 | 136.1 | 1.2 | | 3.14 | 214 | 246 / 243 | 53 | 101 | 93 | 3 |
| 4 | 75 | 10939 | 140.41 | .75 | | 1.96 | 213 | 245 / 244 | 52 | 102 | 94 | 3 |
| | 80 | 10944 | 144.631 | .77 | | 2.0 | 214 | 246 / 243 | 51 | 102 | 94 | 3 |
| C 1 | 85 | 10946/0951 | 149.55 | 1.0 | | 2.61 | 213 | 244 / 246 | 51 | 100 | 94 | 3 |
| | 90 | 10956 | 151.48 | 1.1 | | 2.8 | 211 | 241 / 246 | 51 | 108 | 95 | 3 |
| 2 | 95 | 11001 | 157.47 | .35 | | .31 | 219 | 243 / 244 | 51 | 101 | 95 | 3 |
| | 100 | 11006 | 160.47 | .37 | | .96 | 227 | 244 / 246 | 51 | 101 | 96 | 3 |
| 3 | 105 | 11011 | 164.85 | .74 | | 1.93 | 229 | 244 / 246 | 52 | 100 | 96 | 3 |
| | 110 | 11016 | 169.34 | .74 | | 2.06 | 231 | 239 / 243 | 51 | 103 | 97 | 3 |
| 4 | 115 | 11021 | 173.58 | .69 | | 1.8 | 235 | 244 / 247 | 51 | 103 | 97 | 3 |

Plant Name:

ASPHALT PLANT "A"

Test Date:

8-20-97

Run Number:

02

Operator:

MAD

| Traverse Point Number | Sampling Time, (min.) | Clock Time (24-hour clock) | Gas Meter Reading (V _g) ft ³ | Velocity (lead & P ₁) in. H ₂ O | Orifice Pres. Differential (ΔP) in. H ₂ O | | Stack Temp. °F (T) | Probe Temp. / Filter Temp. °F | Impinger Temp. °F | Dry Gas Meter Temp. | | Pump Vacuum In. Hg |
|-----------------------|-----------------------|----------------------------|---|--|--|--------|--------------------|-------------------------------|-------------------|-----------------------------|-------------------------------|--------------------|
| | | | | | Desired | Actual | | | | Inlet (E _{in}) °F | Outlet (E _{out}) °F | |
| D 1 | 125 | 1103/1036 | 182.47 | 1.0 | NA | 2.6 | 233 | 241 / 246 | 58 | 98 | 98 | 3 |
| | 130 | 1 1041 | 187.41 | 1.1 | | 2.8 | 233 | 241 / 246 | 59 | 100 | 99 | 3 |
| | 135 | 1 1046 | 191.4 | .55 | | 1.4 | 235 | 243 / 244 | 55 | 105 | 99 | 3 |
| | 140 | 1 1051 | 194.76 | .55 | | 1.4 | 235 | 241 / 244 | 56 | 105 | 99 | 3 |
| 3 | 145 | 1 1056 | 198.18 | .53 | | 1.38 | 236 | 242 / 246 | 57 | 102 | 97 | 3 |
| | 150 | 1 1101 | 201.55 | .47 | | 1.23 | 238 | 241 / 246 | 56 | 101 | 93 | 3 |
| | 155 | 1 1106 | 205.6 | .69 | | 1.8 | 236 | 240 / 246 | 57 | 100 | 97 | 3 |
| | 160 | 1 1111 | 209.657 | .7 | | 1.8 | 233 | 239 / 245 | 57 | 100 | 96 | 3 |
| E 1 | 165 | 1111/1119 | 214.45 | 1.0 | | 2.6 | 232 | 240 / 246 | 56 | 99 | 96 | 3 |
| | 170 | 1 1124 | 219.39 | 1.1 | | 2.6 | 232 | 240 / 246 | 55 | 100 | 96 | 3 |
| | 175 | 1 1129 | 223.26 | .55 | | 1.4 | 237 | 241 / 247 | 57 | 101 | 97 | 3 |
| | 180 | 1 1134 | 226.67 | .55 | | 1.4 | 236 | 242 / 247 | 58 | 103 | 98 | 3 |
| 3 | 185 | 1 1139 | 229.96 | .42 | | 1.1 | 236 | 241 / 246 | 59 | 102 | 98 | 3 |
| | 190 | 1 1144 | 232.96 | .38 | | 1.0 | 236 | 241 / 246 | 60 | 102 | 97 | 3 |
| | 195 | 1 1149 | 235.9 | .34 | | .89 | 236 | 241 / 246 | 60 | 100 | 96 | 3 |
| | 200 | 1 1154 | 239.289 | .59 | | 1.54 | 236 | 239 / 247 | 58 | 99 | 96 | 3 |
| P 1 | 205 | 1200/1205 | 242.46 | .38 | | 1.0 | 236 | 242 / 247 | 60 | 97 | 97 | 3 |
| | 210 | 1 1210 | 245.16 | .34 | | .89 | 236 | 243 / 246 | 60 | 98 | 97 | 3 |
| | 215 | 1 1215 | 248.03 | .32 | | .84 | 236 | 244 / 246 | 60 | 99 | 97 | 2 |
| | 220 | 1 1220 | 250.87 | .34 | | .89 | 236 | 244 / 246 | 59 | 101 | 98 | 2 |
| 3 | 225 | 1 1225 | 254.64 | .66 | | 1.74 | 236 | 242 / 247 | 58 | 103 | 98 | 2 |
| | 230 | 1 1230 | 258.64 | .69 | | 1.82 | 235 | 241 / 246 | 58 | 103 | 99 | 2 |
| | 235 | 1 1235 | 262.4 | .66 | | 1.74 | 232 | 242 / | 60 | 103 | 99 | 2 |
| | 240 | 1 1240 | 266.098 | .65 | | 1.71 | 233 | 243 / | 61 | 105 | 99 | 2 |

214.899 0.887

2.574 222

.682

%T = 108.4

98.265 93.2

535.7

MULTI-METALS SAMPLE RECOVERY DATA

| Plant: <u>ASPHALT PLANT "A"</u> | | Run No.: <u>S29-0-2</u> | | | |
|--|---|--------------------------|---------------------|--------|-------------|
| Date: <u>8-20-97</u> | Sample Box No.: <u>—</u> | Job No.: <u>S413.003</u> | | | |
| Sample Location: <u>Outlet</u> | | | | | |
| Sample Type: <u>Particulate / Metals</u> | | | | | |
| Sample Recovery Person: <u>Troy Abernathy / Barry Rayfield</u> | | | | | |
| Container | Description | Volume, ml | Sealed/Level Marked | | |
| Front Half | | | | | |
| 1 | Filter No.(s) <u>m97-002</u> | — | — | | |
| 2 | Acetone Rinse | — | — | | |
| 3 | Nitric Rinse | — | — | | |
| Back Half | | | | | |
| 4 | Nitric Rinse - Imp. 1,2,3, + Back 1/2 Filter | — | — | | |
| 5A | Nitric Rinse - Impinger No. 4 | — | — | | |
| 5B | KMNO ₄ /H ₂ O Rinse - Impingers 5 & 6 | — | — | | |
| 5C | HCl Rinse - Impingers 5 & 6 | — | — | | |
| Moisture Data | | | | | |
| Impinger No. | Contents | Initial Volume, ml | Weight, grams | | |
| | | | Initial | Final | Net |
| 1 | <u>Empty</u> | — | 723.6 | 1408.5 | 684.9 |
| 2 | <u>HNO₃ / H₂O₂</u> | 100 | 698.4 | 874.6 | 176.2 |
| 3 | <u>HNO₃ / H₂O₂</u> | 100 | 732.0 | 808.1 | 76.1 |
| 4 | <u>Empty</u> | — | 525.5 | 533.7 | 8.2 |
| 5 | <u>KMNO₄ / H₂SO₄</u> | 100 | 686.4 | 690.8 | 4.4 |
| 6 | <u>KMNO₄ / H₂SO₄</u> | 100 | 709.1 | 711.7 | 2.6 |
| 7 | <u>Silica Gel</u> | 200 | 838.7 | 879.4 | 40.7 |
| | | | | | |
| | | | | | |
| | | | | | |
| Total | | | | | 993.1 ✓ 46. |
| Comments: | | | | | |
| | | | | | |
| | | | | | |

FIELD DATA SHEET

Plant: ASPHALT PLANT "A"
 Sampling Location: STACK
 Run Number: 03 Date: 8-20-97
 Pretest Leak Rate: 0.11 cfm @ 11 in. Hg.
 Pretest Leak Check: Pitot: CL Orsat: _____

Sample Type: M29 Operator: MAJ
 Pbar: 29.8 Ps: -.25
 CO2: _____ O2: _____
 Probe Length/Type: 4' Glass Pitot #: _____
 Stack Diameter: 33 1/2" x 44" As: _____

Nozzle ID: 253 Thermocouple #: _____
 Assumed Bws: .18 Filter #: _____
 Meter Box #: M010 Y: 965 ΔH@: 1.74
 Post-Test Leak Rate: 0.05 cfm @ 9 in. Hg.
 Post-Test Leak Check: Pitot: _____ Orsat: _____

| Traverse Point Number | Sampling Time (min) | Clock Time (24-hour clock) | Gas Meter Reading (Vm) ft ³ | Velocity Head (Δp) in H2O | Orifice Pressure Differential (ΔH) in H2O | | Stack Temp. (Ts) | Temperature °F | | Impinger Temp. °F | Dry Gas Meter Temp. | | Pump Vacuum (in. Hg) |
|-----------------------|---------------------|----------------------------|--|---------------------------|---|--------|------------------|----------------|--------|-------------------|---------------------|--------------------|----------------------|
| | | | | | Desired | Actual | | Probe | Filter | | Inlet (Tm in °F) | Outlet (Tm out °F) | |
| | 0 | 1405 | 73.784 | | | | | | | | | | |
| D 1 | 5 | 1410 | 78.54 | 1.0 | NA | 2.6 | 210 | 235 | 245 | 64 | 102 | 101 | 2 |
| | 10 | 1415 | 83.61 | 1.1 | | 2.9 | 209 | 237 | 246 | 63 | 103 | 102 | 2 |
| 2 | 15 | 1420 | 86.97 | 4 | | 1.0 | 208 | 256 | 246 | 45 | 106 | 102 | 2 |
| | 20 | 1425 | 89.95 | .37 | | .97 | 212 | 250 | 244 | 47 | 106 | 103 | 2 |
| 3 | 25 | 1430 | 92.75 | .21 | | .76 | 208 | 252 | 240 | 47 | 106 | 103 | 2 |
| | 30 | 1435 | 95.43 | .3 | | .79 | 209 | 253 | 242 | 48 | 106 | 103 | 2 |
| 4 | 35 | 1440 | 98.97 | .5 | | 1.32 | 208 | 254 | 241 | 49 | 105 | 102 | 2 |
| | 40 | 1445 | 102.185 | .47 | | 1.24 | 207 | 255 | 240 | 52 | 104 | 102 | 2 |
| E 1 | 45 | 1445 1452 | 106.97 | 1.1 | | 2.9 | 207 | 254 | 251 | 54 | 104 | 103 | 2 |
| | 50 | 1457 | 112.14 | 1.1 | | 2.9 | 207 | 253 | 250 | 55 | 104 | 103 | 2 |
| 2 | 55 | 1502 | 114.55 | .2 | | .52 | 208 | 254 | 251 | 56 | 106 | 103 | 2 |
| | 60 | 1507 | 116.71 | .19 | | .5 | 208 | 253 | 252 | 56 | 108 | 103 | 2 |
| 3 | 65 | 1512 | 119.05 | .22 | | .58 | 206 | 253 | 250 | 58 | 105 | 103 | 2 |
| | 70 | 1517 | 121.37 | .22 | | .58 | 205 | 253 | 249 | 58 | 104 | 102 | 2 |
| 4 | 75 | 1522 | 124.65 | .45 | | 1.18 | 205 | 254 | 247 | 59 | 104 | 102 | 2 |
| | 80 | 1527 | 127.923 | .49 | | 1.29 | 206 | 253 | 247 | 59 | 104 | 102 | 2 |
| F 1 | 85 | 1529/1534 | 132.61 | 1.0 | | 2.6 | 207 | 252 | 249 | 57 | 103 | 102 | 2 |
| | 90 | 1539 | 137.65 | 1.1 | | 2.9 | 209 | 251 | 249 | 56 | 103 | 101 | 2 |
| 2 | 95 | 1544 | 141.31 | .52 | | 1.37 | 208 | 250 | 249 | 57 | 105 | 101 | 2 |
| | 100 | 1549 | 144.61 | .5 | | 1.32 | 206 | 250 | 249 | 57 | 107 | 101 | 2 |
| 3 | 105 | 1554 | 147.75 | .45 | | 1.18 | 208 | 250 | 248 | 56 | 106 | 101 | 2 |
| | 110 | 1559 | 151.08 | .46 | | 1.21 | 210 | 250 | 248 | 56 | 106 | 101 | 2 |
| 4 | 115 | 1604 | 155.15 | .71 | | 1.87 | 211 | 250 | 248 | 57 | 106 | 101 | 2 |
| | 120 | 1609 | 159.188 | .74 | | 1.9 | 212 | 248 | 247 | 58 | 106 | 101 | 2 |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

ΔVm= _____ √Δp= _____ ΔH= _____ Ts= _____ Tm= _____

Plant Name: ASPHALT PLANT "A"

Test Date: 8-20-97

Run Number: 03.

Operator: HEAD

| Traverse Point Number | Sampling Time, (min.) | Clock Time (24-hour clock) | Gas Meter Reading (V) ft ³ | Velocity (Lead & P ₂) in. H ₂ O | Orifice Pres. Differential (ΔP) in. H ₂ O | | Stack Temp. °F (T) | Probe Temp. / Filter Temp. °F | Impinger Temp. °F | Dry Gas Meter Temp. | | Pump Vacuum In. Hg |
|-----------------------|-----------------------|----------------------------|---------------------------------------|--|--|--------|--------------------|-------------------------------|-------------------|-----------------------------|-------------------------------|--------------------|
| | | | | | Desired | Actual | | | | Inlet (T _{in}) °F | Outlet (T _{out}) °F | |
| A | 125 | 11613/1618 | 167.69 | 3.2 | NA | 8.4 | 212 | 246 / 248 | 58 | 106 | 102 | 5 |
| | 130 | 1 1623 | 176.16 | 3.2 | | 8.4 | 212 | 247 / 248 | 58 | 106 | 102 | 5 |
| 2 | 135 | 1 1628 | 181.08 | 1.0 | | 2.64 | 211 | 247 / 249 | 59 | 111 | 102 | 3 |
| | 140 | 1 1633 | 186.07 | 1.1 | | 2.9 | 210 | 247 / 250 | 60 | 108 | 103 | 3 |
| 3 | 145 | 1 1638 | 189.17 | 3.1 | | 1.03 | 212 | 245 / 251 | 61 | 108 | 102 | 3 |
| | 150 | 1 1643 | 192.28 | 3.8 | | 1.8 | 212 | 245 / 251 | 61 | 108 | 102 | 3 |
| 4 | 155 | 1 1648 | 196.9 | 2.9 | | 7.6 | 211 | 243 / 250 | 62 | 107 | 101 | 3 |
| | 160 | 1 1653 | 197.627 | 2.9 | | 7.6 | 208 | 244 / 249 | 61 | 105 | 101 | 3 |
| B | 1 | 1655 / 1700 | 204.39 | 2.0 | | 5.2 | 209 | 246 / 247 | 63 | 106 | 99 | 3 |
| | 170 | 1 1705 | 211.17 | 2.1 | | 5.5 | 210 | 245 / 248 | 64 | 101 | 98 | 3 |
| 2 | 175 | 1 1710 | 215.67 | 7.8 | | 2.06 | 211 | 246 / 249 | 65 | 106 | 99 | 3 |
| | 180 | 1 1715 | 220.11 | 7.7 | | 2.03 | 211 | 242 / 252 | 62 | 107 | 99 | 3 |
| 3 | 185 | 1 1720 | 223.42 | 5.6 | | 1.47 | 240 | 249 / 251 | 60 | 109 | 101 | 3 |
| | 190 | 1 1725 | 227.08 | 5.8 | | 1.53 | 199 | 242 / 252 | 58 | 109 | 101 | 3 |
| 4 | 195 | 1 1730 | 230.4 | 4 | | 1.65 | 182 | 246 / 251 | 54 | 109 | 102 | 3 |
| | 200 | 1 1735 | 233.615 | 4 | | 1.05 | 182 | 245 / 252 | 54 | 109 | 102 | 3 |
| C | 1 | 205 | | | | | | 1 | | | | |
| | 210 | 1 | | | | | | 1 | | | | |
| 2 | 215 | 1 | | | | | | 1 | | | | |
| | 220 | 1 | | | | | | 1 | | | | |
| 3 | 225 | 1 | | | | | | 1 | | | | |
| | 230 | 1 | 159.831 | 0.823 | | 2.054 | 207.15 | 1 | | 105.75 | 101.78 | |
| 4 | 235 | 1 | | | | | | 1 | | | | |
| | 240 | 1 | | | | | | 1 | | | | |
| | | | | | | | | | | 503.7 | | |

$\% \text{H}_2\text{O}$
34.6

7) 1115

MULTI-METALS SAMPLE RECOVERY DATA

| Plant: <u>ASPHALT PLANT "A"</u> | | | Run No.: <u>S29-0-3</u> | | |
|--|--|--------------------------|-------------------------|--------------------------|----------------|
| Date: <u>8-20-97</u> | | Sample Box No.: <u>—</u> | | Job No.: <u>S413.003</u> | |
| Sample Location: <u>Outlet</u> | | | | | |
| Sample Type: <u>Particulate / Metals</u> | | | | | |
| Sample Recovery Person: <u>Troy Abernathy / Barry Rayfield</u> | | | | | |
| Container | Description | Volume, ml | Sealed/Level Marked | | |
| Front Half | | | | | |
| 1 | Filter No.(s) <u>m97-004</u> | <u>—</u> | <u>—</u> | | |
| 2 | Acetone Rinse | <u>—</u> | <u>—</u> | | |
| 3 | Nitric Rinse | <u>—</u> | <u>—</u> | | |
| Back Half | | | | | |
| 4 | Nitric Rinse - Imp. 1,2,3, + Back 1/2 Filter | <u>—</u> | <u>—</u> | | |
| 5A | Nitric Rinse - Impinger No. 4 | <u>—</u> | <u>—</u> | | |
| 5B | KMNO4/H2O Rinse - Impingers 5 & 6 | <u>—</u> | <u>—</u> | | |
| 5C | HCl Rinse - Impingers 5 & 6 | <u>—</u> | <u>—</u> | | |
| Moisture Data | | | | | |
| Impinger No. | Contents | Initial Volume, ml | Weight, grams | | |
| | | | Initial | Final | Net |
| 1 | <u>Empty</u> | <u>703.7A</u> | <u>724.7</u> | <u>1492.2</u> | <u>757.5</u> |
| 2 | <u>HNO3 / H2O2</u> | <u>100</u> | <u>724.9</u> | <u>876.5</u> | <u>151.6</u> |
| 3 | <u>HNO3 / H2O2</u> | <u>100</u> | <u>680.3</u> | <u>710.2</u> | <u>29.9</u> |
| 4 | <u>Empty</u> | <u>—</u> | <u>603.7</u> | <u>607.3</u> | <u>3.6</u> |
| 5 | <u>KMNO4 / H2SO4</u> | <u>100</u> | <u>749.2</u> | <u>750.1</u> | <u>0.9</u> |
| 6 | <u>KMNO4 / H2SO4</u> | <u>100</u> | <u>641.3</u> | <u>642.2</u> | <u>0.9</u> |
| 7 | <u>Silica Gel</u> | <u>200</u> | <u>790.7</u> | <u>825.1</u> | <u>34A</u> |
| | | | | | |
| | | | | | |
| | | | | | |
| Total | | | | | <u>978.8</u> ✓ |
| Comments: | | | | | |
| | | | | | |
| | | | | | |

METHOD 5 TESTING FIELD DATA SHEET

PAGE 1 of 3

| PLANT AND CITY | DATE | SAMPLING LOCATION | SAMPLE TYPE | BUN NUMBER |
|-------------------|---------|-------------------|-------------|------------|
| ASPHALT PLANT "A" | 8-21-97 | STACK | M-29 | 04 |

| DEFINITION | AMBIENT PRESS (in. Hg) | STATIC PRESS (in. Hg) | AMBIENT TEMP (deg. F) | FILTER NUMBER | STACK ID (in.) | PISTON CB | PROBE LENGTH AND LINE TYPE | NOZZLE NUMBER | DIAMETER |
|------------|------------------------|-----------------------|-----------------------|---------------|-----------------|-----------|----------------------------|---------------|----------|
| MAD | 29.7 | -.25 | 72° | | 33.5 X 49.75 | .84 | 4' Glass | | .253 |

| BUMED DISTURE (%) | DCM BOX NO | DCM Hg | DCM OIL FACTOR (%) | STACK REEM NO. | STACK PROX NO. | ORCA NO. | REAR CHECK (INITIAL) | REAR CHECK (FINAL) | O2 MONITOR % | CO2 MONITOR % | REMARKS |
|-------------------|------------|--------|--------------------|----------------|----------------|----------|----------------------|--------------------|--------------|---------------|---------|
| 17 | MB 10 | 1.74 | .965 | | | | 0100 117 X | 0100 80 | | | 10" |

| RAW DATA NO. | ELAPSED TEST TIME (MIN) | CLOCK TIME (24HR) | DCM HEADLINE VOLUME (in. Hg) | TEMP VOLUME HEAD (in. Hg) | TEMP DELTA (in. Hg) | STACK TEMP (deg. F) | PROBE TEMP (deg. F) | PISTON TEMP (deg. F) | ORCA TEMP (deg. F) | DCM TEMP (deg. F) | SAMPLE TEMP (deg. F) |
|--------------|-------------------------|-------------------|------------------------------|---------------------------|---------------------|---------------------|---------------------|----------------------|--------------------|-------------------|----------------------|
| | 0 | 0741 | 34.320 | 1.0 | 2.5 | 185 | 247 | 249 | 65 | 79/77 | 1.5 |
| 1 | 5 | 0746 | 38.94 | .96 | 2.4 | 186 | 250 | 248 | 65 | 82/79 | 2 |
| | 10 | 0751 | 43.52 | .44 | 1.16 | 183 | 252 | 249 | 55 | 91/80 | 2 |
| 2 | 15 | 0756 | 47.16 | .39 | 1.02 | 183 | 251 | 250 | 53 | 93/80 | 2 |
| | 20 | 0801 | 50.38 | .29 | .76 | 180 | 249 | 251 | 53 | 93/82 | 2 |
| 3 | 25 | 0806 | 53.08 | .25 | .66 | 180 | 248 | 252 | 53 | 94/84 | 2 |
| | 30 | 0811 | 56.53 | .44 | 1.16 | 186 | 249 | 250 | 54 | 94/86 | 2 |
| 4 | 35 | 0816 | 58.82 | .44 | 1.16 | 186 | 248 | 250 | 57 | 95/87 | 2 |
| | 40 | 0821 | 62.12 | 1.2 | 3.16 | 180 | 249 | 251 | 59 | 97/96 | 2 |
| 1 | 45 | 0823/0828 | 67.3 | 1.3 | 3.4 | 180 | 247 | 252 | 61 | 98/91 | 2 |
| | 50 | 0833 | 72.85 | .44 | 1.16 | 176 | 249 | 253 | 61 | 99/97 | 2 |
| 2 | 55 | 0838 | 75.98 | .39 | 1.02 | 175 | 251 | 252 | 58 | 102/93 | 2 |
| | 60 | 0843 | 79.17 | | | | | | | | |
| | TOTAL TIME | | DCM VOLUME | AVE. SOR DELTA | AVE. DELTA | AVE. TEMP | | | | AVE. TEMP | |

| PLANT AND CITY | DATE | SAMPLING LOCATION | SAMPLE TIME | RUN NUMBER |
|-------------------|---------|-------------------|-------------|------------|
| ASPHALT PLANT "A" | 8-21-97 | STACK | M29 | 04 |

[illegible]

| PLANT AND CITY | DATE | SAMPLING LOCATION | SAMPLE TYPE | RUN NUMBER |
|---------------------|---------|-------------------|-------------|------------|
| RED PHAIT PLANT "A" | 8-21-97 | STACK | M-29 | 04 |

[illegible]

MULTI-METALS SAMPLE RECOVERY DATA

| Plant: | | ASPHALT PLANT "A" | | Run No.: 529-04 | |
|---|---|--------------------|---------------------|-------------------|-------|
| Date: | | Sample Box No.: — | | Job No.: 5413.003 | |
| Sample Location: Outlet | | | | | |
| Sample Type: Particulate / Metals | | | | | |
| Sample Recovery Person: Troy Abernathy / Barry Rayfield | | | | | |
| Container | Description | Volume, ml | Sealed/Level Marked | | |
| Front Half | | | | | |
| 1 | Filter No.(s) M97-005 | — | — | | |
| 2 | Acetone Rinse | — | — | | |
| 3 | Nitric Rinse | — | — | | |
| Back Half | | | | | |
| 4 | Nitric Rinse - Imp. 1,2,3, + Back 1/2 Filter | — | — | | |
| 5A | Nitric Rinse - Impinger No. 4 | — | — | | |
| 5B | KMNO ₄ /H ₂ O Rinse - Impingers 5 & 6 | — | — | | |
| 5C | HCl Rinse - Impingers 5 & 6 | — | — | | |
| Moisture Data | | | | | |
| Impinger No. | Contents | Initial Volume, ml | Weight, grams | | |
| | | | Initial | Final | Net |
| 1 | Empty | — | 722.5 | 1399.5 | 677.0 |
| 2 | 5% HNO ₃ / H ₂ O ₂ | 100 | 697.0 | 790.6 | 93.6 |
| 3 | HNO ₃ / H ₂ O ₂ | 100 | 730.8 | 745.8 | 15.0 |
| 4 | Empty | — | 523.0 | 524.7 | 1.7 |
| 5 | KMnO ₄ / H ₂ SO ₄ | 100 | 683.6 | 685.1 | 1.5 |
| 6 | KMnO ₄ / H ₂ SO ₄ | 100 | 707.8 | 710.3 | 2.5 |
| 7 | Silica Gel | 200 | 897.4 | 927.5 | 30.1 |
| | | | | | |
| | | | | TOTAL = | 821.4 |
| | | | | | |
| Total | | | | | |
| Comments: | | | | | |

METHOD 5 TESTING FIELD DATA SHEET

PAGE 1 of 1

| PLANT AND CITY | DATE | SAMPLING LOCATION | SAMPLE TYPE | RUN NUMBER |
|-------------------|---------|-------------------|-------------|-------------|
| ASPHALT PLANT "A" | 8-21-97 | STACH | M-29 | Field blank |

| OPERATOR | AMBIENT PRESS (In. Hg) | STATIC PRESS (In. Hg) | AMBIENT TEMP (deg. F) | FILTER NUMBERS | STACK ID (In.) | PITOT Co | PROBE LENGTH AND LINER TYPE | NOZZLE NUMBER | NOZZLE DIAMETER |
|----------|------------------------|-----------------------|-----------------------|----------------|----------------|----------|-----------------------------|---------------|-----------------|
| MD | ND | NA | NA | NA | NA | NA | 4' Glass | NA | .253 |

| ASSUMED MOISTURE (%) | DCM BOX NO. | DCM Hg | DCM OAL FACTOR (N) | STACK THERM NO. | STACK PITOT NO. | ORSAT NO. | LEAK CHECK (INITIAL) | LEAK CHECK (FINAL) | O2 CONTENT % | CO2 CONTENT % | REACTION |
|----------------------|-------------|--------|--------------------|-----------------|-----------------|-----------|----------------------|--------------------|--------------|---------------|----------|
| NA | NA | 1.74 | .965 | NA | NA | ND | .0090 | 10" Hg | | | |

| TRAV POINT NO. | ELAPSED TEST TIME (MIN) | CLOCK TIME (24-HR) | DCM HEADING Vm (GL/G) | JUMP VELOCITY HEAD (In. H2O) | JUMP ORIFICE (In. H2O) | STACK TEMP (deg. F) | PROBE TEMP (deg. F) | FILTER OVEN TEMP (deg. F) | SIL GEL (FINGER) TEMP (deg. F) | DCM IN/OUT TEMP (deg. F) | SAMPLE THERM VAO (In. Hg) |
|----------------|-------------------------|--------------------|-----------------------|------------------------------|------------------------|---------------------|---------------------|---------------------------|--------------------------------|--------------------------|---------------------------|
| | | | 33.944 | | | | | | | | |
| | | | 34.141 | .009 | 8" Hg | | | | | | |
| | | | 34.221 | .012 | 10" Hg | | | | | | |
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| | | | | | | | | | | | |
| | TOTAL TIME | | DCM VOLUME | AVE SCHED | AVE ORIFICE | AVE TEMP | | | | AVE TEMP | |

MULTI-METALS SAMPLE RECOVERY DATA

| Plant: <u>ASPHALT PLANT "A"</u> | | | Run No.: <u>Field Blank</u> | | |
|--|---|--------------------------|-----------------------------|--------------------------|-----|
| Date: <u>8-21-97</u> | | Sample Box No.: <u>—</u> | | Job No.: <u>5413.003</u> | |
| Sample Location: <u>—</u> | | | | | |
| Sample Type: <u>Particulate / Metals</u> | | | | | |
| Sample Recovery Person: <u>Troy Abarnathy / Barry Rayfield</u> | | | | | |
| Container | Description | Volume, ml | Sealed/Level Marked | | |
| Front Half | | | | | |
| 1 | Filter No.(s) <u>M97-006</u> | <u>—</u> | <u>—</u> | | |
| 2 | Acetone Rinse | <u>—</u> | <u>—</u> | | |
| 3 | Nitric Rinse | <u>—</u> | <u>—</u> | | |
| Back Half | | | | | |
| 4 | Nitric Rinse - Imp. 1,2,3, + Back 1/2 Filter | <u>—</u> | <u>—</u> | | |
| 5A | Nitric Rinse - Impinger No. 4 | <u>—</u> | <u>—</u> | | |
| 5B | KMNO ₄ /H ₂ O Rinse - Impingers 5 & 6 | <u>—</u> | <u>—</u> | | |
| 5C | HCl Rinse - Impingers 5 & 6 | <u>—</u> | <u>—</u> | | |
| Moisture Data | | | | | |
| Impinger No. | Contents | Initial Volume, ml | Weight, grams | | |
| | | | Initial | Final | Net |
| 1 | <u>Empty</u> | <u>—</u> | <u>720.5</u> | <u>720.5</u> | |
| 2 | <u>HNO₃ / H₂O₂</u> | <u>100</u> | <u>704.3</u> | <u>704.3</u> | |
| 3 | <u>HNO₃ / H₂O₂</u> | <u>100</u> | <u>728.9</u> | <u>728.8</u> | |
| 4 | <u>Empty</u> | <u>—</u> | <u>635.5</u> | <u>635.6</u> | |
| 5 | <u>KMnO₄ / H₂SO₄</u> | <u>100</u> | <u>735.4</u> | <u>735.4</u> | |
| 6 | <u>KMnO₄ / H₂SO₄</u> | <u>100</u> | <u>652.1</u> | <u>652.1</u> | |
| 7 | <u>Silica Gel</u> | <u>200</u> | <u>790.4</u> | <u>790.6</u> | |
| | | | | | |
| | | | | | |
| | | | | | |
| Total | | | | | |
| Comments: | | | | | |
| | | | | | |
| | | | | | |

TECHNICAL REPORT DATA

Please read instructions on the reverse before completing

| | | |
|--|---|--------------------------------|
| 1 REPORT NO EPA-454/R-020-021A | 2 | 3 RECIPIENT'S ACCESSION NO |
| 4 TITLE AND SUBTITLE Final Report - Volume I of II, Emissions Test at an Asphalt Concrete Production Plant Asphalt Plant "A" - Clayton, North Carolina | 5 REPORT DATE April 2000 | 6 PERFORMING ORGANIZATION CODE |
| | 8 PERFORMING ORGANIZATION REPORT NO | |
| 7 AUTHOR(S) Michael D. Maret Franklin Meadows | 10 PROGRAM ELEMENT NO | |
| 9 PERFORMING ORGANIZATION NAME AND ADDRESS Pacific Environmental Services, Inc Post Office Box 12077 Research Triangle Park, North Carolina 27709-2077 | 11 CONTRACT/GRANT NO. 68-D-70069 | |
| | 13 TYPE OF REPORT AND PERIOD COVERED Final | |
| 12 SPONSORING AGENCY NAME AND ADDRESS U S Environmental Protection Agency Office of Air Quality Planning and Standards Emissions, Monitoring and Analysis Division Research Triangle Park, North Carolina 27711 | 14 SPONSORING AGENCY CODE EPA/200/04 | |
| | 15 SUPPLEMENTARY NOTES | |
| 16 ABSTRACT The United States Environmental Protection Agency (EPA) is investigating the asphalt concrete production source category to identify and quantify emissions of hazardous air pollutants (HAPs) from rotary aggregate dryers. There are two types of rotary drum dryers in use at asphalt concrete production plants, parallel flow, wherein the direction of travel of the drying aggregate is in the same direction of travel of the burner exhaust gases, and counter flow, wherein the aggregate and exhaust gas flows are opposite to each other. Plant "A", Clayton, North Carolina was identified and selected by EPA as the host facility at which to obtain data on air emissions from a counter flow continuous drum mix process that utilized a baghouse for control of air emissions. The primary objective of the testing program was to obtain data on controlled and uncontrolled emissions of polychlorinated dibenzo- <i>p</i> -dioxins (PCDDs or "dioxins") and polychlorinated dibenzofurans (PCDFs or "furans"), particulate matter (PM) and metallic HAP and non-HAP compounds. Testing of uncontrolled emissions was deleted from the scope of work because the high particulate grain loading at the inlet to the baghouse exceeded the sampling capacity of the Method 23 and Method 29 sampling trains. A secondary objective was to observe and record plume opacity from the baghouse. The data will be used by the EPA's Emission Standards Division to determine whether HAPs are emitted at levels that would justify regulation under the Maximum Achievable Control Technology (MACT) program. During the testing program another EPA contractor monitored and recorded process and emission control system operating parameters, and prepared Section 3.0, Process Description, of this report. This volume (Volume I) is comprised of 166 pages and consists of the report text and Appendices A (Process Data) and B (Raw Field Data). | | |
| 17 KEY WORDS AND DOCUMENT ANALYSIS | | |
| a DESCRIPTIONS Baghouse Dioxins/Furans Emission Measurements Hazardous Air Pollutants Metals Particulate Matter Volatile Organic Hazardous Air Pollutants | b IDENTIFIERS/OPEN ENDED TERMS | c COASTI Field/Group |
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