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EMISSIONS OF METALS, CHROMIUM AND NICKEL SPECIES, AND ORGANICS FROM MUNICIPAL WASTEWATER SLUDGE INCINERATORS

VOLUME IX: SITE 9 EMISSION TEST REPORT - APPENDICES

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DISCLAIMER

This material has been funded wholly or in part by the United States Environmental Protection Agency's Risk Reduction Engineering Laboratory and Office of Water under Contract No. 68-02-4442, Work Assignment No. 81; Contract No. 68-02-4462, Work Assignment No. 90-108; and Contract No. 68-C0-0027, Work Assignment No. 0-5. It has been subject to the Agency's review and it has been approved for publication as an EPA document. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

FOREWORD

Today's rapidly developing and changing technologies and industrial products and practices frequently carry with them the increased generation of materials that, if improperly dealt with, can threaten both public health and the environment. The U.S. Environmental Protection Agency is charged by Congress with protecting the Nation's land, air, and water resources. Under a mandate of national environmental laws, the agency strives to formulate and implement actions leading to a compatible balance between human activities and the ability of natural systems to support and nurture life. These laws direct the EPA to perform research to define our environmental problems, measure the impacts, and search for solutions.

The Risk Reduction Engineering Laboratory is responsible for planning, implementing, and managing research, development, and demonstration programs to provide an authoritative, defensible engineering basis in support of the policies, programs, and regulations of the EPA with respect to drinking water, wastewater, pesticides, toxic substances, solid and hazardous wastes, and Superfund-related activities. This publication is one of the products of that research and provides a vital communication link between the research and the user community.

The problem of disposing of primary and secondary sludge generated at municipal wastewater treatment facilities is one of growing concern. Sludge of this type may contain toxics such as heavy metals and various organic species. Viable sludge disposal options include methods of land disposal or incineration. In determining the environmental hazards associated with incineration, the Risk Reduction Engineering Laboratory and the Office of Water have sponsored a program to monitor the emissions of metals and organics from a series of municipal wastewater sludge incinerators. The following document presents the final results from the Site 9 emissions test program.

E. Timothy Oppelt, Director
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ABSTRACT

The U.S. Environmental Protection Agency (EPA) Office of Water (OW) has drafted risk-based sludge regulations under Section 405d of the Clean Water Act and EPA's Risk Reduction Engineering Laboratory (RREL) has been assisting OW in the collection of supporting data for the proposed regulations. Proposed regulations and a solicitation for public comment were published in the Federal Register on February 6, 1989. Final regulations are scheduled for publication in the Federal Register in January 1992. Because of the associated cancer risk, there is particular concern regarding chromium and nickel species in the emissions from sludge incineration.

An RREL/OWRS research program was implemented to determine the ratios of hexavalent to total chromium and nickel subsulfide to total nickel in sewage sludge incinerator emissions under varied incinerator operating conditions. Site 9, a multiple hearth incinerator, was tested under normal combustion conditions and improved combustion conditions. This report presents the test results from the fifth of five incinerator test sites. Four incinerators tested under a previous project conducted by Radian Corporation are included in the Site numbering convention used.

Secondary objectives of the Site 9 test program included comparing the results for chromium and nickel subspecies determined by different analytical procedures, gathering data on other metals and inorganic/organic gases in the incinerator emissions, and assessing pollutant removal efficiencies by measuring emissions at both the inlet and outlet to the venturi/impingement tray scrubber control system, and at the outlet of a full scale wet electrostatic precipitator installed just prior to the test program.

Site 9, a dewatering and incineration facility located in a municipal wastewater treatment plant, is operated and managed by a private firm. The hydraulic portion of the plant is owned and operated by the city in which it is located. The facility is a secondary plant designed for a 15 million gallon per day (MGD) wastewater flow. The privatized solids handling portion of the facility is a regional site that also handles both primary and secondary thickened sludges brought in from surrounding communities.

Site 9 includes a seven (7) hearth, multiple hearth furnace (MHF) built by Nichols Engineering in 1974. The furnace flue gas leaves the furnace through a horizontal breaching and then goes down into an adjustable throat venturi scrubber with a nominal pressure drop of 20 in water column (w.c.). After leaving the venturi, the gases pass upward through a three (3) plate tray scrubber with a Chevron mist eliminator. A 10 ft x 10 ft, upflow, wet electrostatic precipitator, manufactured by Beltran Associates, Inc., was installed during the first week of testing.

It was anticipated that the nickel subsulfide emissions from a multiple hearth incinerator not using lime for conditioning would constitute less than 1% of the total nickel emissions. A wet chemical analysis indicated that within the analytical detection limit ($<$ 10% of the total nickel), no nickel subsulfide was present in the samples.

It was anticipated that the hexavalent chromium emissions from a multiple hearth incinerator not using lime for sludge conditioning would constitute less than 1% of the total chromium emissions. A wet chemical analysis indicated that about 10% of the total chromium emissions exiting the venturi/impingement tray scrubber during both normal and improved combustion conditions was hexavalent chromium.

Polychlorinated dibenzodioxins and furans (PCDDs/PCDFs) and semivolatile and volatile organic compounds were also measured. The total PCDD's and total PCDF's, respectively, were 20.2 and 81.9 ng/dscm at the outlet of venturi/impingement tray scrubber (midpoint sampling location) and 3.2 and 12.4 ng/dscm at the outlet of the wet ESP during normal incinerator operation. During improved incinerator operation, the total PCDD's and total PCDF's, respectively, were 1.6 and 7.1 ng/dscm at the midpoint and 0.65 and 2.1 ng/dscm at the outlet. Several semivolatile organic compounds were detected at the midpoint and outlet locations during runs at both normal and improved incinerator operation. The concentrations and number of semivolatile compounds measured were typically less under improved incinerator operating conditions.

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Appendix A

Incinerator and Scrubber Operating Data

Appendix B

Sampling and Analytical Methods

METHODOLOGY FOR THE DETERMINATION OF METALS EMISSIONS IN EXHAUST GASES FROM HAZARDOUS WASTE INCINERATION AND SIMILAR COMBUSTION PROCESSES

1. Applicability and Principle

1.1 Applicability. This method is applicable for the determination of total chromium (Cr), cadmium (Cd), arsenic (As), nickel (Ni), manganese (Mn), beryllium (Be), copper (Cu), zinc (Zn), lead (Pb), selenium (Se), phosphorus (P), thallium (Tl), silver (Ag), antimony (Sb), barium (Ba), and mercury (Hg) emissions from hazardous waste incinerators and similar combustion processes. This method may also be used for the determination of particulate emissions following the additional procedures described. Modifications to the sample recovery and analysis procedures described in this protocol for the purpose of determining particulate emissions may potentially impact the front half mercury determination.*

1.2 Principle. The stack sample is withdrawn isokinetically from the source, with particulate emissions collected in the probe and on a heated filter and gaseous emissions collected in a series of chilled impingers containing a solution of dilute nitric acid in hydrogen peroxide in two impingers, and acidic potassium permanganate solution in two (or one) impingers. Sampling train components are recovered and digested in separate front and back half fractions. Materials collected in the sampling train are digested with acid solutions to dissolve inorganics and to remove organic constituents that may create analytical interferences. Acid digestion is performed using conventional Parr® Bomb or microwave digestion techniques. The nitric acid and hydrogen peroxide impinger solution, the acidic potassium permanganate impinger solution, and the probe rinse and digested filter solutions are analyzed for mercury by cold vapor atomic absorption spectroscopy (CVAAS). Except for the permanganate solution, the remainder of the sampling

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*Field tests to date have shown that of the total amount of mercury measured by the method, only 0 to <2% was measured in the front half. Therefore, it is tentatively concluded, based on the above data, that particulate emissions may be measured by this train, without significantly altering the mercury results.

train catches are analyzed for Cr, Cd, Ni, Mn, Be, Cu, Zn, Pb, Se, P, Tl, Ag, Sb, Ba, and As by inductively coupled argon plasma emission spectroscopy (ICAP) or atomic absorption spectroscopy (AAS). Graphite furnace atomic absorption spectroscopy (GFAAS) is used for analysis of antimony, arsenic, cadmium, lead, selenium, and thallium, if these elements require greater analytical sensitivity than can be obtained by ICAP. Additionally, if desired, the tester may use AAS for analyses of all metals if the resulting in-stack method detection limits meet the goal of the testing program. For convenience, aliquots of each digested sample fraction can be combined proportionally for a single analytical determination. The efficiency of the analytical procedure is quantified by the analysis of spiked quality control samples containing each of the target metals including actual sample matrix effects checks.

2. Range, Sensitivity, Precision, and Interferences

2.1 Range. For the analyses described in this methodology and for similar analyses, the ICAP response is linear over several orders of magnitude. Samples containing metal concentrations in the nanograms per milliliter (ng/ml) to micrograms per milliliter (ug/ml) range in the analytical finish solution can be analyzed using this technique. Samples containing greater than approximately 50 ug/ml of chromium, lead, or arsenic should be diluted to that level or lower for final analysis. Samples containing greater than approximately 20 ug/ml of cadmium should be diluted to that level before analysis.

2.2 Analytical Sensitivity. ICAP analytical detection limits for the sample solutions (based on SW-846, Method 6010) are approximately as follows: Sb (32 ng/ml), As (53 ng/ml), Ba (2 ng/ml), Be (0.3 ng/ml), Cd (4 ng/ml), Cr (7 ng/ml), Cu (6 ng/ml), Pb (42 ng/ml), Mn (2 ng/ml), Ni (15 ng/ml), P (75 ng/ml), Se (75 ng/ml), Ag (7 ng/ml), Ti (40 ng/ml), and Zn (2 ng/ml). The actual method detection limits are sample dependent and may vary as the sample matrix may affect the limits. The analytical detection limits for analysis by direct aspiration AAS (based on SW-846, Method 7000) are approximately as follows: Sb (200 ng/ml), As (2 ng/ml), Ba (100 ng/ml), Be (5 ng/ml), Cd (5 ng/ml), Cr (50 ng/ml), Cu (20 ng/ml), Pb (100 ng/ml), Mn (10 ng/ml), Ni (40 ng/ml), Se (2 ng/ml), Ag (10 ng/ml), Tl (100 ng/ml), and Zn (5 ng/ml). The detection limit for mercury by CVAAS is approximately 0.2 ng/ml. The use of GFAAS can give added sensitivity compared to the use of direct aspiration AAS for the

following metals: Sb (3 ng/ml), As (1 ng/ml), Be (0.2 ng/ml), Cd (0.1 ng/ml), Cr (1 ng/ml), Pb (1 ng/ml), Se (2 ng/ml), and Tl (1 ng/ml).

Using (1) the procedures described in this method, (2) the analytical detection limits described in the previous paragraph, (3) a volume of 300 ml for the front half and 150 ml for the back half samples, and (4) a stack gas sample volume of 1.25 m^3, the corresponding in-stack method detection limits are presented in Table A-1 and calculated as shown:

$$\frac{A \times B}{C} = D$$

where: A = analytical detection limit, ug/ml.
B = volume of sample prior to aliquot for analysis, ml.
C = stack sample volume, dscm (dsm^3).
D = in-stack detection limit, ug/m^3.

Values in Table A-1 are calculated for the front and back half and/or the total train.

To ensure optimum sensitivity in obtaining the measurements, the concentrations of target metals in the solutions are suggested to be at least ten times the analytical detection limits. Under certain conditions, and with greater care in the analytical procedure, this concentration can be as low as approximately three times the analytical detection limit. In all cases, repetitive analyses, method of standard additions (MSA), serial dilution, or matrix spike addition should be used to establish the quality of the data.

Actual in-stack method detection limits will be determined based on actual source sampling parameters and analytical results as described above. If required, the method in-stack detection limits can be made more sensitive than those shown in Table A-1 for a specific test by using one or more of the following options:

- o A normal 1-hour sampling run collects a stack gas sampling volume of about 1.25 m^3. If the sampling time is increased and 5 m^3 are collected, the in-stack method detection limits would be one fourth of the values shown in Table A-1 (this means that with this change, the method is four times more sensitive than normal).
- o The in-stack detection limits assume that all of the sample is digested (with exception of the aliquot for mercury) and the final liquid volumes for analysis are 300 ml for the front half and 150 ml for the

TABLE A-1. IN-STACK METHOD DETECTION LIMITS (ug/m^3)
FOR TRAIN FRACTIONS USING ICAP AND AAS

Metal	Front Half Fraction 1 Probe and Filter	Back Half$_1$ Fraction 2 Impingers 1-3	Back Half$_2$ Fraction 3 Impingers 4-5	Total Train
Antimony	7.7 (0.7)*	3.8 (0.4)*		11.5 (1.1)*
Arsenic	12.7 (0.3)*	6.4 (0.1)*		19.1 (0.4)*
Barium	0.5	0.3		0.8
Beryllium	0.07 (0.05)*	0.04 (0.03)*		0.11 (0.08)*
Cadmium	1.0 (0.02)*	0.5 (0.01)*		1.5 (0.03)*
Chromium	1.7 (0.2)*	0.8 (0.1)*		2.5 (0.3)*
Copper	1.4	0.7		2.1
Lead	10.1 (0.2)*	5.0 (0.1)*		15.1 (0.3)*
Manganese	0.5 (0.2)*	0.2 (0.1)*		0.7 (0.3)*
Mercury	0.05**	0.03**	0.03**	0.11**
Nickel	3.6	1.8		5.4
Phosphorus	18	9		27
Selenium	18 (0.5)*	9 (0.3)*		27 (0.8)*
Silver	1.7	0.9		2.6
Thallium	9.6 (0.2)*	4.8 (0.1)*		14.4 (0.3)*
Zinc	0.5	0.3		0.8

( )* Detection limit when analyzed by GFAAS.
** Detection limit when analyzed by CVAAS.
Actual method in-stack detection limits will be determined based on actual source sampling parameters and analytical results as described earlier in this section.

back half sample. If the front half volume is reduced from 300 ml to 30 ml, the front half in-stack detection limits would be one tenth of the values shown above (ten times more sensitive). If the back half volume is reduced from 150 ml to 25 ml, the in-stack detection limits would be one sixth of the above values. Matrix effects checks are necessary on analyses of samples and typically are of greater significance for samples that have been concentrated to less than the normal sample volume. A volume less than 25 ml may not allow resolubilization of the residue and may increase interference by other compounds.

- When both of the above two improvements are used on one sample at the same time, the resultant improvements are multiplicative. For example, where stack gas volume is increased by a factor of five and the total liquid sample digested volume of both the front and back halves is reduced by factor of six, the in-stack method detection limit is reduced by a factor of thirty (the method is thirty times more sensitive).

- o Conversely, reducing stack gas sample volume and increasing sample liquid volume will increase limits. The front half and back half$_1$ samples (Fractions 1 and 2) can be combined prior to analysis. The resultant liquid volume (excluding Fraction 3, which must be analyzed separately) is recorded. Combining the sample as described does not allow determination (whether front or back half) of where in the train the sample was captured. The in-stack method detection limit then becomes a single value for all metals except mercury, for which the contribution of Fraction 3 must be considered.
- o The above discussion assumes no blank correction. Blank corrections are discussed later in this method.

2.3 Precision. The precisions (relative standard deviation) for each metal detected in a method development test at a sewage sludge incinerator, are as follows: Sb (12.7%), As (13.5%), Ba (20.6%), Cd (11.5%), Cr (11.2%), Cu (11.5%), Pb (11.6%), P (14.6%), Se (15.3%), Tl (12.3%), and Zn (11.8%). The precision for nickel was 7.7% for another test conducted at a source simulator. Beryllium, manganese and silver were not detected in the tests; however, based on the analytical sensitivity of the ICAP for these metals, it is assumed that their precisions should be similar to those for the other metals, when detected at similar levels.

2.4 Interferences. Iron can be a spectral interference during the analysis of arsenic, chromium, and cadmium by ICAP. Aluminum can be a spectral interference during the analysis of arsenic and lead by ICAP. Generally, these interferences can be reduced by diluting the sample, but this increases the method detection limit. Refer to EPA Method 6010 (SW-846) for details on potential interferences for this method. For all GFAAS analyses, matrix modifiers should be used to limit interferences, and standards should be matrix matched.

3. Apparatus

3.1 Sampling Train. A schematic of the sampling train is shown in Figure A-1. It is similar to the Method 5 train. The sampling train consists of the following components.

3.1.1 Probe Nozzle (Probe Tip) and Borosilicate or Quartz Glass Probe Liner. Same as Method 5, Sections 2.1.1 and 2.1.2. Glass nozzles are required unless an alternate probe tip prevents the possibility of contamination or

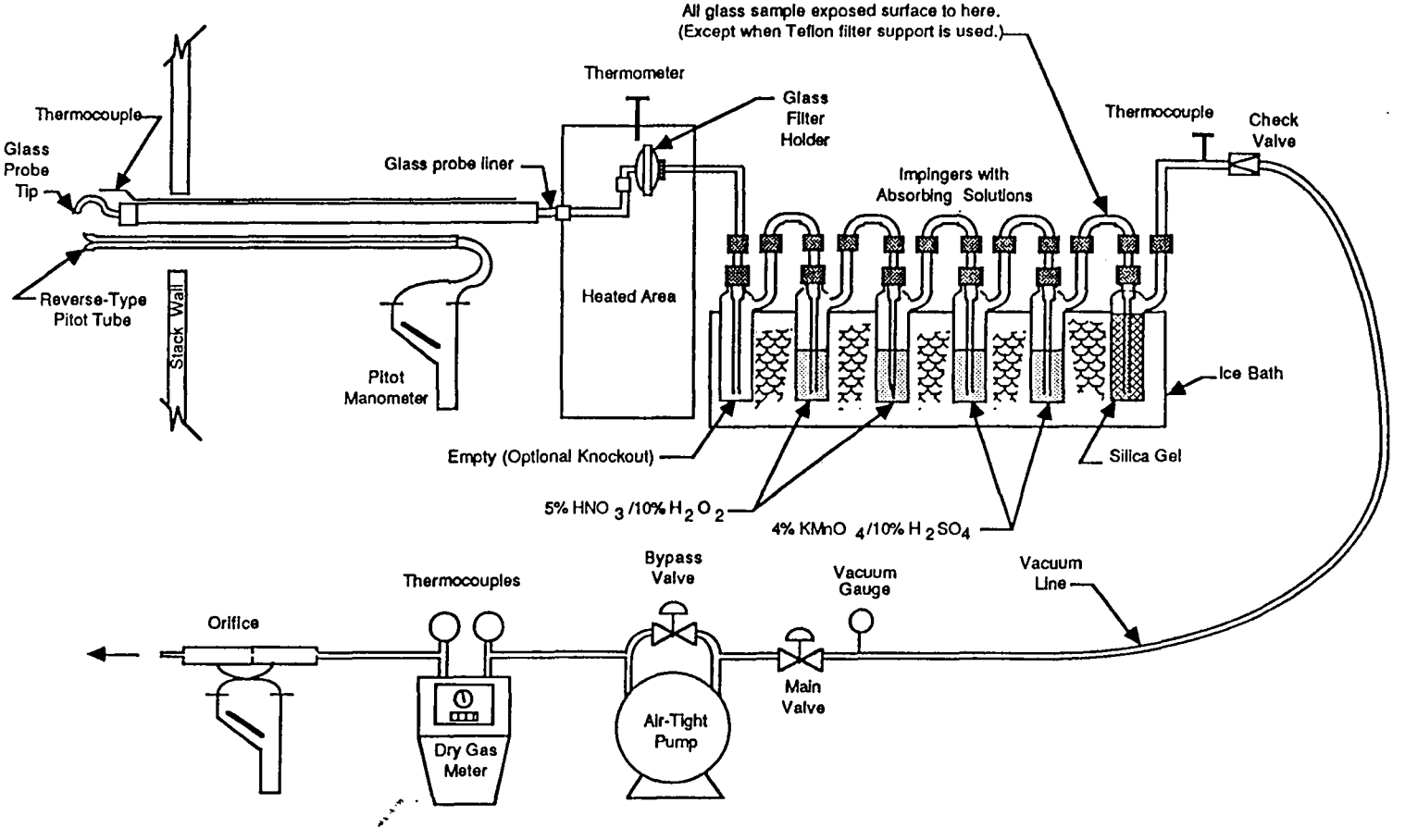


Figure A-1. Schematic of multiple metals sampling train.

interference of the sample with its materials of construction. If a probe tip other than glass is used, no correction of the stack sample test results can be made because of the effect on the results by the probe tip.

3.1.2 Pitot Tube and Differential Pressure Gauge. Same as Method 2, Sections 2.1 and 2.2, respectively.

3.1.3 Filter Holder. Glass, same as Method 5, Section 2.1.5, except that a Teflon filter support must be used to replace the glass frit.

3.1.4 Filter Heating System. Same as Method 5, Section 2.1.6.

3.1.5 Condenser. The following system shall be used for the condensation and collection of gaseous metals and for determining the moisture content of the stack gas. The condensing system should consist of four to six impingers connected in series with leak-free ground glass fittings or other leak-free, non-contaminating fittings. The first impinger is optional and is recommended as a water knockout trap for use during test conditions which require such a trap. The impingers to be used in the metals train are now described. When the first impinger is used as a water knockout, it shall be appropriately-sized for an expected large moisture catch and constructed generally as described for the first impinger in Method 5, Paragraph 2.1.7. The second impinger (or the first HNO_3/H_2O_2 impinger) shall also be as described for the first impinger in Method 5. The third impinger (or the impinger used as the second HNO_3/H_2O_2 impinger) shall be the same as the Greenburg Smith impinger with the standard tip described as the second impinger in Method 5, Paragraph 2.1.7. All other impingers used in the metals train are the same as the second impinger (the first HNO_3/H_2O_2 impinger) previously described in this paragraph. In summary, the first impinger should be empty, the second and third shall contain known quantities of a nitric acid/hydrogen peroxide solution (Section 4.2.1), the fourth (and fifth, if required) shall contain a known quantity of acidic potassium permanganate solution (Section 4.2.2), and the last impinger shall contain a known quantity of silica gel or equivalent desiccant. A thermometer capable of measuring to within 1°C (2°F) shall be placed at the outlet of the last impinger. When the water knockout impinger is not needed, it is removed from the train and the other impingers remain the same. If mercury analysis is not needed, the potassium permanganate impingers are removed.

3.1.6 Metering System, Barometer, and Gas Density Determination Equipment. Same as Method 5, Sections 2.1.8 through 2.1.10, respectively.

3.1.7 Teflon Tape. For capping openings and sealing connections on the sampling train.

3.2 Sample Recovery. Same as Method 5, Sections 2.2.1 through 2.2.8 (Nonmetallic Probe-Liner and Probe-Nozzle Brushes, Wash Bottles, Sample Storage Containers, Petri Dishes, Glass Graduated Cylinder, Plastic Storage Containers, Funnel and Rubber Policeman, and Glass Funnel), respectively, with the following exceptions and additions:

3.2.1 Nonmetallic Probe-Liner and Probe-Nozzle Brushes. For quantitative recovery of materials collected in the front half of the sampling train. Description of acceptable all-Teflon component brushes to be included in EPA's Emission Measurement Technical Information Center (EMTIC) files.

3.2.2 Sample Storage Containers. Glass bottles with Teflon-lined caps, 1000- and 500-ml, shall be used for $KMnO_4$-containing samples and blanks. Polyethylene bottles may be used for other sample types.

3.2.3 Graduated Cylinder. Glass or equivalent.

3.2.4 Funnel. Glass or equivalent.

3.2.5 Labels. For identification of samples.

3.2.6 Polypropylene Tweezers and/or Plastic Gloves. For recovery of the filter from the sampling train filter holder.

3.3 Sample Preparation and Analysis. For the analysis, the following equipment is needed:

3.3.1 Volumetric Flasks, 100 ml, 250 ml, and 1000 ml. For preparation of standards and sample dilution.

3.3.2 Graduated Cylinders. For preparation of reagents.

3.3.3 Parr® Bombs or Microwave Pressure Relief Vessels with Capping Station (CEM Corporation model or equivalent).

3.3.4 Beakers and Watchglasses. 250 ml beakers for sample digestion with watchglasses to cover the tops.

3.3.5 Ring Stands and Clamps. For securing equipment such as filtration apparatus.

3.3.6 Filter Funnels. For holding filter paper.

3.3.7 Whatman 541 Filter Paper (or equivalent). For filtration of digested samples.

3.3.8 Disposable Pasteur Pipets and Bulbs.

3.3.9 Volumetric Pipets.

3.3.10 Analytical Balance. Accurate to within 0.1 mg.

3.3.11 Microwave or Conventional Oven. For heating samples at fixed power levels or temperatures.

3.3.12 Hot Plates.

3.3.13 Atomic Absorption Spectrometer (AAS). Equipped with a background corrector.

3.3.13.1 Graphite Furnace Attachment. With antimony, arsenic, cadmium, lead, selenium, thallium, and hollow cathode lamps (HCLs) or electrodeless discharge lamps (EDLs). Same as EPA Methods 7041 (antimony), 7060 (arsenic), 7131 (cadmium), 7421 (lead), 7740 (selenium), and 7841 (thallium).

3.3.13.2 Cold Vapor Mercury Attachment. With a mercury HCL or EDL. The equipment needed for the cold vapor mercury attachment includes an air recirculation pump, a quartz cell, an aerator apparatus, and a heat lamp or desiccator tube. The heat lamp should be capable of raising the ambient temperature at the quartz cell by 10°C such that no condensation forms on the wall of the quartz cell. Same as EPA Method 7470.

3.3.14 Inductively Coupled Argon Plasma Spectrometer. With either a direct or sequential reader and an alumina torch. Same as EPA Method 6010.

4. Reagents

Unless otherwise indicated, it is intended that all reagents conform to the specifications established by the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available; otherwise, use the best available grade.

4.1 Sampling. The reagents used in sampling are as follows:

4.1.1 Filters. The filters shall contain less than 1.3 ug/in.^{2} of each of the metals to be measured. Analytical results provided by filter manufacturers are acceptable. However, if no such results are available, filter blanks must be analyzed for each target metal prior to emission testing. Quartz fiber or glass fiber filters without organic binders shall be used. The filters should exhibit at least 99.95 percent efficiency (<0.05 percent penetration) on 0.3 micron dioctyl phthalate smoke particles. The filter efficiency test shall be conducted in accordance with ASTM Standard Method D2986-71 (incorporated by reference). For particulate determination in sources containing SO_2 or SO_3, the filter material must be of a type that is unreactive to SO_2 or SO_3, as described in EPA Method 5. Quartz fiber filters meeting these requirements are recommended.

4.1.2 Water. To conform to ASTM Specification D1193.77, Type II (incorporated by reference). Analyze the water for all target metals prior to field use. All target metals should be less than 1 ng/ml.

4.1.3 Nitric Acid. Concentrated. Baker Instra-analyzed or equivalent.

4.1.4 Hydrochloric Acid. Concentrated. Baker Instra-analyzed or equivalent.

4.1.5 Hydrogen Peroxide, 30 Percent (V/V).

4.1.6 Potassium Permanganate.

4.1.7 Sulfuric Acid. Concentrated.

4.1.8 Silica Gel and Crushed Ice. Same as Method 5, Sections 3.1.2 and 3.1.4, respectively.

4.2 Pretest Preparation for Sampling Reagents.

4.2.1 Nitric Acid (HNO_3)/Hydrogen Peroxide (H_2O_2) Absorbing Solution, 5 Percent HNO_3/10 Percent H_2O_2. Add 50 ml of concentrated HNO_3 and 333 ml of 30 percent H_2O_2 to a 1000-ml volumetric flask or graduated cylinder containing approximately 500 ml of water. Dilute to volume with water. The reagent shall contain less than 2 ng/ml of each target metal.

4.2.2 Acidic Potassium Permanganate ($KMnO_4$) Absorbing Solution, 4 Percent $KMnO_4$ (W/V). Prepare fresh daily. Dissolve 40 g of $KMnO_4$ in sufficient 10 percent H_2SO_4 to make 1 liter. Prepare and store in glass bottles to prevent degradation. The reagent shall contain less than 2 ng/ml of Hg.

Precaution: To prevent autocatalytic decomposition of the permanganate solution, filter the solution through Whatman 541 filter paper. Also, due to reaction of the potassium permanganate with the acid, there may be pressure buildup in the sample storage bottle; these bottles should not be fully filled and should be vented both to relieve excess pressure and prevent explosion due to pressure buildup. Venting is highly recommended, but should not allow contamination of the sample; a No. 70-72 hole drilled in the container cap and Teflon liner has been used.

4.2.3 Nitric Acid, 0.1 N. Add 6.3 ml of concentrated HNO_3 (70 percent) to a graduated cylinder containing approximately 900 ml of water. Dilute to 1000 ml with water. Mix well. The reagent shall contain less than 2 ng/ml of each target metal.

4.2.4 Hydrochloric Acid (HCl), 8 N. Add 690 ml of concentrated HCl to a graduated cylinder containing 250 ml of water. Dilute to 1000 ml with water. Mix well. The reagent shall contain less than 2 ng/ml of Hg.

4.3 Glassware Cleaning Reagents.

4.3.1 Nitric Acid, Concentrated. Fisher ACS grade or equivalent.

4.3.2 Water. To conform to ASTM Specifications D1193-77, Type II.

4.3.3 Nitric Acid, 10 Percent (V/V). Add 500 ml of concentrated HNO_3 to a graduated cylinder containing approximately 4000 ml of water. Dilute to 5000 ml with water.

4.4 Sample Digestion and Analysis Reagents.

4.4.1 Hydrochloric Acid, Concentrated.

4.4.2 Hydrofluoric Acid, Concentrated.

4.4.3 Nitric Acid, Concentrated. Baker Instra-analyzed or equivalent.

4.4.4 Nitric Acid, 10 Percent (V/V). Add 100 ml of concentrated HNO_3 to 800 ml of water. Dilute to 1000 ml with water. Mix well. Reagent shall contain less than 2 ng/ml of each target metal.

4.4.5 Nitric Acid, 5 Percent (V/V). Add 50 ml of concentrated HNO_3 to 800 ml of water. Dilute to 1000 ml with water. Reagent shall contain less than 2 ng/ml of each target metal.

4.4.6 Water. To conform to ASTM Specifications D1193-77, Type II.

4.4.7 Hydroxylamine Hydrochloride and Sodium Chloride Solution. See EPA Method 7470 for preparation.

4.4.8 Stannous Chloride.

4.4.9 Potassium Permanganate, 5 Percent (W/V).

4.4.10 Sulfuric Acid, Concentrated.

4.4.11 Nitric Acid, 50 Percent (V/V).

4.4.12 Potassium Persulfate, 5 Percent (W/V).

4.4.13 Nickel Nitrate, $Ni(NO_3)_2 \cdot 6H_2O$.

4.4.14 Lanthanum Oxide, La_2O_3.

4.4.15 AAS Grade Hg Standard, 1000 ug/ml.

4.4.16 AAS Grade Pb Standard, 1000 ug/ml.

4.4.17 AAS Grade As Standard, 1000 ug/ml.

4.4.18 AAS Grade Cd Standard, 1000 ug/ml.

4.4.19 AAS Grade Cr Standard, 1000 ug/ml.

4.4.20 AAS Grade Sb Standard, 1000 ug/ml.

4.4.21 AAS Grade Ba Standard, 1000 ug/ml.

4.4.22 AAS Grade Be Standard, 1000 ug/ml.

4.4.23 AAS Grade Cu Standard, 1000 ug/ml.

4.4.24 AAS Grade Mn Standard, 1000 ug/ml.

4.4.25 AAS Grade Ni Standard, 1000 ug/ml.

4.4.26 AAS Grade P Standard, 1000 ug/ml.

4.4.27 AAS Grade Se Standard, 1000 ug/ml.

4.4.28 AAS Grade Ag Standard, 1000 ug/ml.

4.4.29 AAS Grade Tl Standard, 1000 ug/ml.

4.4.30 AAS Grade Zn Standard, 1000 ug/ml.

4.4.31 AAS Grade Al Standard, 1000 ug/ml.

4.4.32 AAS Grade Fe Standard, 1000 ug/ml.

4.4.33 The metals standards may also be made from solid chemicals as described in EPA Method 200.7. EPA Method 7470 or Standard Methods for the Analysis of Water and Wastewater. 15th Edition, Method 303F should be referred to for additional information on mercury standards.

4.4.34 Mercury Standards and Quality Control Samples. Prepare fresh weekly a 10 ug/ml intermediate mercury standard by adding 5 ml of 1000 ug/ml mercury stock solution to a 500 ml volumetric flask; dilute to 500 ml by first adding 20 ml of 15 percent HNO_3 and then adding water. Prepare a working mercury standard solution fresh daily: add 5 ml of the 10 ug/ml intermediate standard to a 250 ml volumetric flask and dilute to 250 ml with 5 ml of 4 percent $KMnO_4$, 5 ml of 15 percent HNO_3, and then water. At least six separate aliquots of the working mercury standard solution should be used to prepare the standard curve. These aliquots should contain 0.0, 1.0, 2.0, 3.0, 4.0, and 5.0 ml of the working standard solution. Quality control samples should be prepared by making a separate 10 ug/ml standard and diluting until in the range of the calibration.

4.4.35 ICAP Standards and Quality Control Samples. Calibration standards for ICAP analysis can be combined into four different mixed standard solutions as shown below.

MIXED STANDARD SOLUTIONS FOR ICAP ANALYSIS

Solution	Elements
I	As, Be, Cd, Mn, Pb, Se, Zn
II	Ba, Cu, Fe
III	Al, Cr, Ni
IV	Ag, P, Sb, Tl

Prepare these standards by combining and diluting the appropriate volumes of the 1000 ug/ml solutions with 5 percent nitric acid. A minimum of one standard and a blank can be used to form each calibration curve. However, a

separate quality control sample spiked with known amounts of the target metals in quantities in the midrange of the calibration curve should be prepared. Suggested standard levels are 50 ug/ml for Al, 25 ug/ml for Cr and Pb, 15 ug/ml for Fe, and 10 ug/ml for the remaining elements. Standards containing less than 1 ug/ml of metal should be prepared daily. Standards containing greater than 1 ug/ml of metal should be stable for a minimum of 1 to 2 weeks.

4.4.36 Graphite Furnace AAS Standards for Antimony, Arsenic, Cadmium, Lead, Selenium, and Thallium. Prepare a 10 ug/ml standard by adding 1 ml of 1000 ug/ml standard to a 100 ml volumetric flask. Dilute to 100 ml with 10 percent nitric acid. For graphite furnace AAS, the standards must be matrix matched; e.g., if the samples contain 6 percent nitric acid and 4 percent hydrofluoric acid, the standards should also be made up with 6 percent nitric acid and 4 percent hydrofluoric acid. Prepare a 100 ng/ml standard by adding 1 ml of the 10 ug/ml standard to a 100 ml volumetric flask and dilute to 100 ml with the appropriate matrix solution. Other standards should be prepared by dilution of the 100 ng/ml standards. At least five standards should be used to make up the standard curve. Suggested levels are 0, 10, 50, 75, and 100 ng/ml. Quality control samples should be prepared by making a separate 10 ug/ml standard and diluting until it is in the range of the samples. Standards containing less than 1 ug/ml of metal should be prepared daily. Standards containing greater than 1 ug/ml of metal should be stable for a minimum of 1 to 2 weeks.

4.4.37 Matrix Modifiers.

4.4.37.1 Nickel Nitrate, 1 Percent (V/V). Dissolve 4.956 g of $Ni(NO_3)_2 \cdot 6H_2O$ in approximately 50 ml of water in a 100 ml volumetric flask. Dilute to 100 ml with water.

4.4.37.2 Nickel Nitrate, One-tenth Percent (V/V). Dilute 10 ml of 1 percent nickel nitrate solution to 100 ml with water. Inject an equal amount of sample and this modifier into the graphite furnace during AAS analysis for As.

4.4.37.3 Lanthanum. Dissolve 0.5864 g of La_2O_3 in 10 ml of concentrated HNO_3 and dilute to 100 ml with water. Inject an equal amount of sample and this modifier into the graphite furnace during AAS analysis for Pb.

5. Procedure

5.1 Sampling. The complexity of this method is such that, to obtain reliable results, testers should be trained and experienced with the test procedures.

5.1.1 Pretest Preparation. Follow the same general procedure given in Method 5, Section 4.1.1, except that, unless particulate emissions are to be determined, the filter need not be desiccated or weighed. All sampling train glassware should first be rinsed with hot tap water and then washed in hot soapy water. Next, glassware should be rinsed three times with tap water, followed by three additional rinses with water. All glassware should then be soaked in a 10 percent (V/V) nitric acid solution for a minimum of 4 hours, rinsed three times with water, rinsed a final time with acetone, and allowed to air dry. All glassware openings where contamination can occur should be covered until the sampling train is assembled, prior to sampling.

5.1.2 Preliminary Determinations. Same as Method 5, Section 4.1.2.

5.1.3 Preparation of Sampling Train. Follow the same general procedures given in Method 5, Section 4.1.3, except place 100 ml of the nitric acid/hydrogen peroxide solution (Section 4.2.1) in the two HNO_3/H_2O_2 impingers (normally the second and third impingers), place 100 ml of the acidic potassium permanganate solution (Section 4.2.2) in the fourth and fifth impinger, and transfer approximately 200 to 300 g of preweighed silica gel from its container to the last impinger. Alternatively, the silica gel may be weighed directly in the impinger just prior to train assembly.

Several options are available to the tester based on the sampling conditions. The use of an empty first impinger can be eliminated if the moisture to be collected in the impingers is calculated or determined to be less than 150 ml. The tester shall include two impingers containing the acidic potassium permanganate solution for the first test run, unless past testing experience at the same or similar sources has shown that only one is necessary. The last permanganate impinger may be discarded if both permanganate impingers have retained their original deep purple permanganate color. A maximum of 200 ml in each permanganate impinger (and a maximum of three permanganate impingers) may be used, if necessary, to maintain the desired color in the last permanganate impinger.

Retain for reagent blanks, 100 ml of the nitric acid/hydrogen peroxide solution and 100 ml of the acidic potassium permanganate solution. These solutions should be labeled and treated as described in Section 7. Set up the sampling train as shown in Figure A-1. If necessary to ensure leak-free sampling train connections, Teflon tape should be used instead of silicone grease to prevent contamination.

Precaution: Extreme care should be taken to prevent contamination within the train. Prevent the mercury collection reagent (acidic potassium permanganate) from contacting any glassware of the train which is washed and analyzed for Mn. Prevent hydrogen peroxide from mixing with the acidic potassium permanganate.

5.1.4 Leak-Check Procedures. Follow the leak-check procedures given in Method 5, Section 4.1.4.1 (Pretest Leak-Check), Section 4.1.4.2 (Leak-Checks During the Sample Run), and Section 4.1.4.3 (Post-Test Leak-Checks).

5.1.5 Sampling Train Operation. Follow the procedures given in Method 5, Section 4.1.5. For each run, record the data required on a data sheet such as the one shown in Figure 5-2 of Method 5.

5.1.6 Calculation of Percent Isokinetic. Same as Method 5, Section 4.1.6.

5.2 Sample Recovery. Begin cleanup procedures as soon as the probe is removed from the stack at the end of a sampling period.

The probe should be allowed to cool prior to sample recovery. When it can be safely handled, wipe off all external particulate matter near the tip of the probe nozzle and place a rinsed, non-contaminating cap over the probe nozzle to prevent losing or gaining particulate matter. Do not cap the probe tip tightly while the sampling train is cooling. This normally causes a vacuum to form in the filter holder, thus causing the undesired result of drawing liquid from the impingers into the filter.

Before moving the sampling train to the cleanup site, remove the probe from the sampling train and cap the open outlet. Be careful not to lose any condensate that might be present. Cap the filter inlet where the probe was fastened. Remove the umbilical cord from the last impinger and cap the impinger. Cap off the filter holder outlet and impinger inlet. Use non-contaminating caps, whether ground-glass stoppers, plastic caps, serum caps, or Teflon tape to close these openings.

Alternatively, the train can be disassembled before the probe and filter holder/oven are completely cooled, if this procedure is followed: Initially disconnect the filter holder outlet/impinger inlet and loosely cap the open ends. Then disconnect the probe from the filter holder or cyclone inlet and loosely cap the open ends. Cap the probe tip and remove the umbilical cord as previously described.

Transfer the probe and filter-impinger assembly to a cleanup area that is clean and protected from the wind and other potential causes of contamination

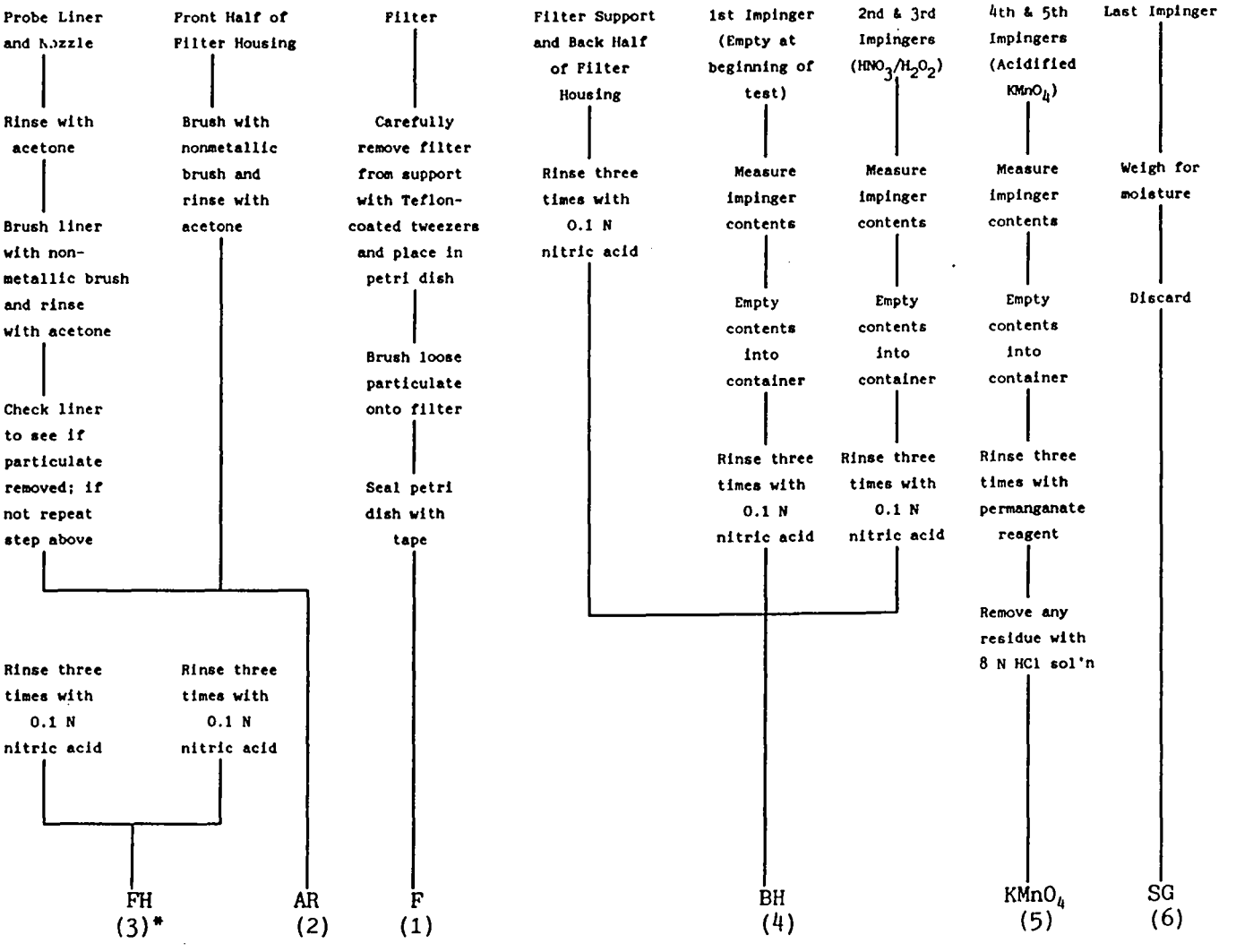
or loss of sample. Inspect the train before and during disassembly and note any abnormal conditions. The sample is recovered and treated as follows (see schematic in Figure A-2). Assure that all items necessary for recovery of the sample do not contaminate it.

5.2.1 Container No. 1 (Filter). Carefully remove the filter from the filter holder and place it in its identified petri dish container. Acid-washed polypropylene or Teflon coated tweezers or clean, disposable surgical gloves rinsed with water should be used to handle the filters. If it is necessary to fold the filter, make certain the particulate cake is inside the fold. Carefully transfer the filter and any particulate matter or filter fibers that adhere to the filter holder gasket to the petri dish by using a dry (acid-cleaned) nylon bristle brush. Do not use any metal-containing materials when recovering this train. Seal the labeled petri dish.

5.2.2 Container No. 2 (Acetone Rinse). Taking care to see that dust on the outside of the probe or other exterior surfaces does not get into the sample, quantitatively recover particulate matter and any condensate from the probe nozzle, probe fitting, probe liner, and front half of the filter holder by washing these components with 100 ml of acetone and placing the wash in a glass container. Note: The use of exactly 100 ml is necessary for the subsequent blank correction procedures. Distilled water may be used instead of acetone when approved by the Administrator and shall be used when specified by the Administrator; in these cases, save a water blank and follow the Administrator's directions on analysis. Perform the acetone rinses as follows: Carefully remove the probe nozzle and clean the inside surface by rinsing with acetone from a wash bottle and brushing with a nonmetallic brush. Brush until the acetone rinse shows no visible particles, after which make a final rinse of the inside surface with acetone.

Brush and rinse the inside parts of the Swagelok fitting with acetone in a similar way until no visible particles remain.

Rinse the probe liner with acetone by tilting and rotating the probe while squirting acetone into its upper end so that all inside surfaces will be wetted with acetone. Allow the acetone to drain from the lower end into the sample container. A funnel may be used to aid in transferring liquid washings to the container. Follow the acetone rinse with a nonmetallic probe brush. Hold the probe in an inclined position, squirt acetone into the upper end as the probe brush is being pushed with a twisting action through the probe; hold a sample



* Number in parantheses indicates container number.

Figure A-2. Sample recovery scheme.

container underneath the lower end of the probe, and catch any acetone and particulate matter which is brushed through the probe three times or more until no visible particulate matter is carried out with the acetone or until none remains in the probe liner on visual inspection. Rinse the brush with acetone, and quantitatively collect these washings in the sample container. After the brushing, make a final acetone rinse of the probe as described above.

It is recommended that two people clean the probe to minimize sample losses. Between sampling runs, keep brushes clean and protected from contamination.

Clean the inside of the front half of the filter holder by rubbing the surfaces with a nonmetallic nylon bristle brush and rinsing with acetone. Rinse each surface three times or more if needed to remove visible particulate. Make a final rinse of the brush and filter holder. After all acetone washings and particulate matter have been collected in the sample container, tighten the lid on the sample container so that acetone will not leak out when it is shipped to the laboratory. Mark the height of the fluid level to determine whether or not leakage occurred during transport. Label the container clearly to identify its contents.

5.2.3 Container No. 3 (Probe Rinse). Rinse the probe liner, probe nozzle, and front half of the filter holder thoroughly with 100 ml of 0.1 N nitric acid and place the wash into a sample storage container. Note: The use of exactly 100 ml is necessary for the subsequent blank correction procedures. Perform the rinses as described in Method 12, Section 5.2.2. Record the volume of the combined rinse. Mark the height of the fluid level on the outside of the storage container and use this mark to determine if leakage occurs during transport. Seal the container and clearly label the contents. Finally, rinse the nozzle, probe liner, and front half of the filter holder with water followed by acetone and discard these rinses.

5.2.4 Container No. 4 (Impingers 1 through 3, Contents and Rinses). Due to the large quantity of liquid involved, the tester may place the impinger solutions in more than one container. Measure the liquid in the first three impingers volumetrically to within 0.5 ml using a graduated cylinder. Record the volume of liquid present. This information is required to calculate the moisture content of the sampled flue gas. Clean each of the first three impingers, the filter support, the back half of the filter housing, and connecting glassware by thoroughly rinsing with 100 ml of 0.1 N nitric acid as

described in Method 12, Section 5.2.4. Note: The use of exactly 100 ml of 0.1 N nitric acid rinse is necessary for the subsequent blank correction procedures. Combine the rinses and impinger solutions, measure and record the volume. Calculate the 0.1 N nitric acid rinse volume by difference. Mark the height of the fluid level on the outside of the container to determine if leakage occurs during transport. Seal the container and clearly label the contents.

5.2.5 Container No. 5 (Acidified Potassium Permanganate Solution and Rinses, Impingers No. 4 & 5). Pour all the liquid from the permanganate impingers (fourth and fifth, if two permanganate impingers are used) into a graduated cylinder and measure the volume to within 0.5 ml. This information is required to calculate the moisture content of the sampled flue gas. Using 100 ml total of the acidified potassium permanganate solution, rinse the permanganate impinger(s) and connecting glass pieces a minimum of three times. Combine the rinses with the permanganate impinger solution. Finally, rinse the permanganate impinger(s) and connecting glassware with 50 ml of 8 N HCl to remove any residue. Note: The use of exactly 100 ml and 50 ml for the two rinses is necessary for the subsequent blank correction procedures. Place the combined rinses and impinger contents in a labeled glass storage bottle. Mark the height of the fluid level on the outside of the bottle to determine if leakage occurs during transport. See the following note and the Precaution in Paragraph 4.2.2 and properly seal the bottle and clearly label the contents.

Note: Due to the potential reaction of the potassium permanganate with the acid, there may be pressure buildup in the sample storage bottles. These bottles should not be filled full and should be vented to relieve excess pressure. Venting is highly recommended. A No. 70-72 hole drilled in the container cap and Teflon liner has been found to allow adequate venting without loss of sample.

5.2.6 Container No. 6 (Silica Gel). Note the color of the indicating silica gel to determine whether it has been completely spent and make a notation of its condition. Transfer the silica gel from its impinger to its original container and seal. The tester may use a funnel to pour the silica gel and a rubber policeman to remove the silica gel from the impinger. The small amount of particles that may adhere to the impinger wall need not be removed. Do not use water or other liquids to transfer the silica gel since weight gained in the silica gel impinger is used for moisture calculations.

Alternatively, if a balance is available in the field, record the weight of the spent silica gel (or silica gel plus impinger) to the nearest 0.5 g.

5.2.7 Container No. 7 (Acetone Blank). Once during each field test, place 100 ml of the acetone used in the sample recovery process into a labeled container for use in the front half field reagent blank. Seal the container.

5.2.8 Container No. 8 (0.1 N Nitric Acid Blank). Once during each field test, place 200 ml of the 0.1 N nitric acid solution used in the sample recovery process into a labeled container for use in the front half and back half field reagent blanks. Seal the container.

5.2.9 Container No. 9 (5% Nitric Acid/10% Hydrogen Peroxide Blank). Once during each field test, place 200 ml of the 5% nitric acid/10% hydrogen peroxide solution used as the nitric acid impinger reagent into a labeled container for use in the back half field reagent blank. Seal the container.

5.2.10 Container No. 10 (Acidified Potassium Permanganate Blank). Once during each field test, place 300 ml of the acidified potassium permanganate solution used as the impinger solution and in the sample recovery process into a labeled container for use in the back half field reagent blank for mercury analysis. Seal the container.

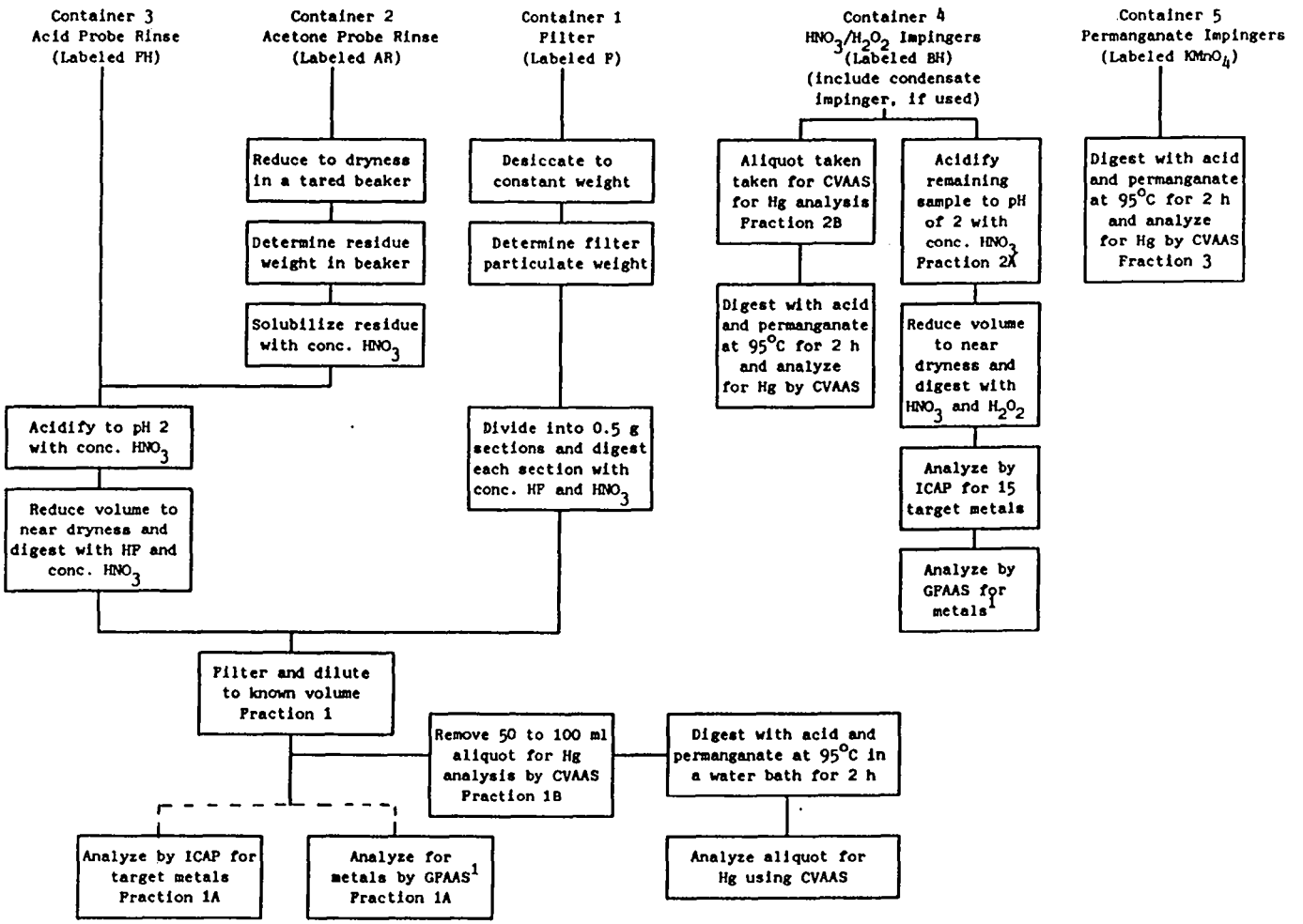
Note: This container should be vented, as described in Section 5.2.4, to relieve excess pressure.

5.2.11 Container No. 11 (8 N HCl Blank). Once during each field test, place 50 ml of the 8 N hydrochloric acid used to rinse the acidified potassium permanganate impingers into a labeled container for use in the back half reagent blank for mercury.

5.2.12 Container No. 12 (Filter Blank). Once during each field test, place an unused filter from the same lot as the sampling filters in a labeled petri dish. Seal the petri dish. This will be used in the front half field reagent blank.

5.3 Sample Preparation. Note the level of the liquid in each of the containers and determine if any sample was lost during shipment. If a noticeable amount of leakage has occurred, either void the sample or use methods, subject to the approval of the Administrator, to correct the final results. A diagram illustrating sample preparation and analysis procedures for each of the sample train components is shown in Figure A-3.

5.3.1 Container No. 1 (Filter). If particulatre emissions are being determined, then desiccate the filter and filter catch without heat and weigh to



[1]Analysis by AAS for metals found at less than 2 ug/ml in digestate solution, if desired. Or analyze for each metal by AAS, if desired.

Figure A-3. Sample preparation and analysis scheme.

a constant weight as described in Section 4.3 of Method 5. For analysis of metals, divide the filter with its filter catch into portions containing approximately 0.5 g each and place into the analyst's choice of either individual microwave pressure relief vessels or Parr[R] Bombs. Add 6 ml of concentrated nitric acid and 4 ml of concentrated hydrofluoric acid to each vessel. For microwave heating, microwave the sample vessels for approximately 12-15 minutes in intervals of 1 to 2 minutes at 600 Watts. For conventional heating, heat the Parr Bombs at 140°C (285°F) for 6 hours. Then cool the samples to room temperature and combine with the acid digested probe rinse as required in Section 5.3.3, below.

Notes: 1. Suggested microwave heating times are approximate and are dependent upon the number of samples being digested. Twelve to 15 minute heating times have been found to be acceptable for simultaneous digestion of up to 12 individual samples. Sufficient heating is evidenced by sorbent reflux within the vessel.

2. If the sampling train uses an optional cyclone, the cyclone catch should be prepared and digested using the same procedures described for the filters and combined with the digested filter samples.

5.3.2 Container No. 2 (Acetone Rinse). Note the level of liquid in the container and confirm on the analysis sheet whether or not leakage occurred during transport. If a noticeable amount of leakage has occurred, either void the sample or use methods, subject to the approval of the Administrator, to correct the final results. Measure the liquid in this container either volumetrically to ±1 ml or gravimetrically to ±0.5 g. Transfer the contents to an acid-cleaned tared 250-ml beaker and evaporate to dryness at ambient temperature and pressure. If particulate emissions are being determined, desiccate for 24 hours without heat, weigh to a constant weight according to the procedures described in Section 4.3 of Method 5, and report the results to the nearest 0.1 mg. Resolubilize the residue with concentrated nitric acid and combine the resultant sample including all liquid and any particulate matter with Container No. 3 prior to beginning the following Section 5.3.3.

5.3.3 Container No. 3 (Probe Rinse). The pH of this sample shall be 2 or lower. If the pH is higher, the sample should be acidified with concentrated nitric acid to pH 2. The sample should be rinsed into a beaker with water and the beaker should be covered with a ribbed watchglass. The sample volume should be reduced to approximately 50 ml by heating on a hot plate at a temperature

just below boiling. Inspect the sample for visible particulate matter, and depending on the results of the inspection, perform one of the following. If no particulate matter is observed, combine the sample directly with the acid digested portions of the filter prepared previously in Section 5.3.1. If particulate matter is observed, digest the sample in microwave vessels or Parr[R] Bombs following the procedures described in Section 5.3.1; then combine the resultant sample directly with the acid digested portions of the filter prepared previously in Section 5.3.1. The resultant combined sample is referred to as Fraction 1. Filter the combined solution of the acid digested filter and probe rinse samples using Whatman 541 filter paper. Dilute to 300 ml (or the appropriate volume for the expected metals concentration) with water. Measure and record the combined volume of the Fraction 1 solution to within 0.1 ml. Quantitatively remove a 50 ml aliquot and label as Fraction 1B. Label the remaining 250 ml portion as Fraction 1A. Fraction 1A is used for ICAP or AAS analysis. Fraction 1B is used for the determination of front half mercury.

5.3.4 Container No. 4 (Impingers 1-3). Measure and record the total volume of this sample (Fraction 2) to within 0.5 ml. Remove a 50 ml aliquot for mercury analysis and label as Fraction 2B. Label the remaining portion of Container No. 4 as Fraction 2A. The Fraction 2B aliquot should be prepared and analyzed as described in Section 5.4.3. Fraction 2A shall be pH 2 or lower. If necessary, use concentrated nitric acid to lower Fraction 2A to pH 2. The sample should be rinsed into a beaker with water and the beaker should be covered with a ribbed watchglass. The sample volume should be reduced to approximately 20 ml by heating on a hot plate at a temperature just below boiling. Then follow either of the digestion procedures described in Sections 5.3.4.1 and 5.3.4.2, below.

5.3.4.1 Conventional Digestion Procedure. Add 30 ml of 50 percent nitric acid and heat for 30 minutes on a hot plate to just below boiling. Add 10 ml of 3 percent hydrogen peroxide and heat for 10 more minutes. Add 50 ml of hot water and heat the sample for an additional 20 minutes. Cool, filter the sample, and dilute to 150 ml (or the appropriate volume for the expected metals concentrations) with water.

5.3.4.2 Microwave Digestion Procedure. Add 10 ml of 50 percent nitric acid and heat for 6 minutes in intervals of 1 to 2 minutes at 600 Watts. Allow the sample to cool. Add 10 ml of 3 percent hydrogen peroxide and heat for 2 more minutes. Add 50 ml of hot water and heat for an additional 5 minutes.

Cool, filter the sample, and dilute to 150 ml (or the appropriate volume for the expected metals concentrations) with water.

Note: All microwave heating times given are approximate and are dependent upon the number of samples being digested at a time. Heating times as given above have been found acceptable for simultaneous digestion of up to 12 individual samples. Sufficient heating is evidenced by solvent reflux within the vessel.

5.3.5 Container No. 5 (Impingers 4 & 5). Measure and record the total volume of this sample to within 0.5 ml. This sample is referred to as Fraction 3. Follow the analysis procedures described in Section 5.4.3.

5.3.6 Container No. 6 (Silica Gel). Weigh the spent silica gel (or silica gel plus impinger) to the nearest 0.5 g using a balance. (This step may be conducted in the field.)

5.4 Sample Analysis. For each sampling train, five individual samples are generated for analysis. A schematic identifying each sample and the prescribed sample preparation and analysis scheme is shown in Figure A-3. The first two samples, labeled Fractions 1A and 1B, consist of the digested samples from the front half of the train. Fraction 1A is for ICAP or AAS analysis as described in Sections 5.4.1 and/or 5.4.2. Fraction 1B is for determination of front half mercury as described in Section 5.4.3.

The back half of the train was used to prepare the third through fifth samples. The third and fourth samples, labeled Fractions 2A and 2B, contain the digested samples from the H_2O and HNO_3/H_2O_2 Impingers 1 through 3. Fraction 2A is for ICAP or AAS analysis. Fraction 2B will be analyzed for mercury.

The fifth sample, labeled Fraction 3, consists of the impinger contents and rinses from the permanganate Impingers 4 and 5. This sample is analyzed for mercury as described in Section 5.4.3. The total back half mercury catch is determined from the sum of Fraction 2B and Fraction 3.

5.4.1 ICAP Analysis. Fraction 1A and Fraction 2A are analyzed by ICAP using EPA Method 200.7 (40 CFR 136, Appendix C). Calibrate the ICAP, and set up an analysis program as described in Method 200.7. The quality control procedures described in Section 7.3.1 of this method shall be followed. Recommended wavelengths for use in the analysis are listed below.

Element	Wavelength (nm)
Aluminum	308.215
Antimony	206.833
Arsenic	193.696
Barium	455.403
Beryllium	313.042
Cadmium	226.502
Chromium	267.716
Copper	324.754
Iron	259.940
Lead	220.353
Manganese	257.610
Nickel	231.604
Selenium	196.026
Silver	328.068
Thallium	190.864
Zinc	213.856

The wavelengths listed are recommended because of their sensitivity and overall acceptance. Other wavelengths may be substituted if they can provide the needed sensitivity and are treated with the same corrective techniques for spectral interference.

Initially, analyze all samples for the target metals plus iron and aluminum. If iron and aluminum are present in the sample, the sample may have to be diluted so that each of these elements is at a concentration of less than 50 ppm to reduce their spectral interferences on arsenic and lead.

Note: When analyzing samples in a hydrofluoric acid matrix, an alumina torch should be used; since all front half samples will contain hydrofluoric acid, use an alumina torch.

5.4.2 AAS by Direct Aspiration and/or Graphite Furnace. If analysis of metals in Fraction 1A and Fraction 2A using graphite furnace or direct aspiration AAS is desired, Table A-2 should be used to determine which techniques and methods should be applied for each target metal. Table A-2 should also be consulted to determine possible interferences and techniques to be followed for their minimization. Calibrate the instrument according to Section 6.3 and follow the quality control procedures specified in Section 7.3.2.

5.4.3 Cold Vapor AAS Mercury Analysis. Fraction 1B, Fraction 2B, and Fraction 3 should be analyzed for mercury using cold vapor atomic absorption spectroscopy following the method outlined in EPA Method 7470 or in Standard Methods for Water and Wastewater Analysis, 15th Edition, Method 303F. Set up

TABLE A-2. APPLICABLE TECHNIQUES, METHODS, AND MINIMIZATION OF INTEFERENCE FOR AAS ANALYSIS

Metal	Technique	Method No.	Wavelength (nm)	Interference	
				Cause	Minimization
Sb	Aspiration	7040	217.6	1000 mg/ml Pb Ni, Cu, or acid	Use secondary wavelenght of 231.1 nm. Match sample & standards acid concentration or use nitrous oxide/acetylene flame
Sb	Furnace	7041	217.6	High Pb	Secondary wavelength or Zeeman correction
As	Furnace	7060	193.7	Arsenic volati - zation Aluminium	Spiked samples & add nickel nitrate solution to digestates prior to analyses Use Zeeman background correction
Ba	Aspiration	7080	553.6	Calcium Barium ionization	High hollow cathode current & narrow band set 2 mL of KCl per 100 mL of sample
Be	Aspiration	7090	234.9	500 ppm Al High Mg & Si	Add 0.1% fluoride Use method of standard additions
Be	Furnace	7091	234.9	Be in optical path	Optimize parameters to miminize effects
Cd	Aspiration	7130	228.8	Absorption & light scattering	Background correction is required
Cd	Furnace	7131	228.8	As above Excess chloride Pipet tips	As above Ammonium phosphate used as a matrix modifier Use cadmium-free tips
Cr	Aspiration	7190	357.9	Alkali metal Absorption & scatt	KCl ionization suppressant in sample & stand Consult manufacturer's literature
Cr	Furnace	7191	357.9	200 mg/L calcium & phosphate	All calcium nitrate for a know constant effect and to eliminate effect of phosphate

(continued)

TABLE A-2 (CONTINUED)

Metal	Technique	Method No.	Wavelength (nm)	Interference	
				Cause	Minimization
Cu	Aspiration	7210	324.7	Absorpt & scatter	Consult manufacturer's manual
Fe	Aspiration	7380	248.3	Contamination	Great care taken to aviod contamination
Pb	Aspiration	7420	283.3	217.0 nm alternat	Background correction required
Pb	Furnace	7421	283.3	Poor recoveries	Matrix modifier, add 10 uL of phosphorus acid to 1-mL of prepared sample in sampler cup
Mn	Aspiration	7460	279.5	403.1 nm alternat	Background correction required
Ni	Aspiration	7520	232.0	352.4 nm alternat Fe, Co, & Cr Nonlinear respons	Background correction required Matrix matching or a nitrous-oxide/acety flame Sample dilution or use 352.4 nm line
Se	Furnace	7740	196.0	Volitality Adsorpt & scatter	Spike samples & reference materials & add nickel nitrate to minimize volatilization Background correction is required & Zeeman background correction can be useful
Ag	Aspiration	7760	328.1	Absorpt & scatter AgCl insoluble Viscosity	Background correction is required Avoid hydrochloric acid unless silver is in solution as a chloride complex Sample & standards monitored for apiration rate
Tl	Aspiration	7840	276.8		Background correction is required Hydrochloric acid should not be used
Tl	Furnace	7841	276.8	Hydrochloric acid or chloride	Background correction is required Verify that losses are not occuring for volitization by spiked samples or standad addt Palladium is a suitable matrix modifier
Zn	Aspiration	7950	213.9	High Si, Cu & P Contamination	Strontium removes Cu and phosphate Care should be taken to avid contamination

the calibration curve as described in Section 7.3 of Method 303F. Add approximately 5 ml of each sample to BOD bottles. Record the amount of sample added. The amount used is dependent upon the expected levels of mercury. Dilute to approximately 120 ml with mercury-free water. Add approximately 15 ml of 5 percent potassium permanganate solution to the Fraction 2B and Fraction 3 samples. Add 5 percent potassium permanganate solution to the Fraction 1B sample as needed to produce a purple solution lasting at least 15 minutes. A minimum of 25 ml is suggested. Add 5 ml of 50 percent nitric acid, 5 ml of concentrated sulfuric acid, and 9 ml of 5 percent potassium persulfate to each sample and each standard. Digest the solution in the capped BOD bottle at 95°C (205°F) in a convection oven or water bath for 2 hours. Cool. Add 5 ml of hydroxylamine hydrochloride solution and mix the sample. Then add 7 ml of stannous chloride to each sample and analyze immediately.

6. Calibration

Maintain a laboratory log of all calibrations.

6.1 Sampling Train Calibration. Calibrate the sampling train components according to the indicated sections of Method 5: Probe Nozzle (Section 5.1); Pitot Tube (Section 5.2); Metering System (Section 5.3); Probe Heater (Section 5.4); Temperature Gauges (Section 5.5); Leak-Check of the Metering System (Section 5.6); and Barometer (Section 5.7).

6.2 Inductively Coupled Argon Plasma Spectrometer Calibration. Prepare standards as outlined in Section 4.4. Profile and calibrate the instrument according to the instrument manufacturer's recommended procedures using the above standards. The instrument calibration should be checked once per hour. If the instrument does not reproduce the concentrations of the standard within 10 percent, the complete calibration procedures should be performed.

6.3 Atomic Absorption Spectrometer - Direct Aspiration, Graphite Furnace and Cold Vapor Mercury Analyses. Prepare the standards as outlined in Section 4.4. Calibrate the spectrometer using these prepared standards. Calibration procedures are also outlined in the EPA methods referred to in Table A-2 and in Standard Methods for Water and Wastewater, 15th Edition, Method 303F (for mercury). Each standard curve should be run in duplicate and the mean values used to calculate the calibration line. The instrument should be recalibrated approximately once every 10 to 12 samples.

7. Quality Control

7.1 Sampling. Field Reagent Blanks. The blank samples in Container Numbers 7 through 12 produced previously in Sections 5.2.7 through 5.2.11, respectively, shall be processed, digested, and analyzed as follows. Digest and process Container No. 12 contents per Section 5.3.1, Container No. 7 per Section 5.3.2, and half of Container No. 8 per Section 5.3.3. This produces Fraction Blank 1A and Fraction Blank 1B from Fraction Blank 1. Combine the remaining half of Container No. 8 with the contents of Container No. 9 and digest and process the resultant volume per Section 5.3.4. This produces Fraction Blank 2A and Fraction Blank 2B from Fraction Blank 2. Container No. 10 and Container No. 11 contents are Fraction Blank 3. Analyze Fraction Blank 1A and Fraction Blank 2A per Section 5.4.1 and/or 5.4.2. Analyze Fraction Blank 1B, Fraction Blank 2B, and Fraction Blank 3 per Section 5.4.3. The analysis of Fraction Blank 1A produces the front half reagent blank correction values for the metals except mercury; the analysis of Fraction Blank 1B produces the front half reagent blank correct value for mercury. The analysis of Fraction Blank 2A produces the back half reagent blank correction values for the metals except mercury, while separate analysis of Fraction Blanks 2B and 3 produce the back half reagent blank correction value for mercury.

7.2 An attempt may be made to determine if the laboratory reagents used in Section 5.3 caused contamination. They should be analyzed by the procedures in Section 5.4. The Administrator will determine whether or not the laboratory blank reagent values can be used in the calculation of the stationary source test results.

7.3 Quality Control Samples. The following quality control samples should be analyzed.

7.3.1 ICAP Analysis. Follow the quality control shown in Section 8 of Method 6010. For the purposes of a three run test series, these requirements have been modified to include the following: two instrument check standard runs, two calibration blank runs, one interference check sample at the beginning of the analysis (must be within 25% or analyze by standard addition), one quality control sample to check the accuracy of the calibration standards (must be within 25% of calibration), and one duplicate analysis (must be within 5% of average or repeat all analysis).

7.3.2 Direct Aspiration and/or Graphite Furnace AAS Analysis for Antimony, Arsenic, Barium, Beryllium, Cadmium, Copper, Chromium, Lead, Nickel, Manganese,

Mercury, Phosphorus, Selenium, Silver, Thallium, and Zinc. All samples should be analyzed in duplicate. Perform a matrix spike on one front half sample and one back half sample or one combined sample. If recoveries of less than 75 percent or greater than 125 percent are obtained for the matrix spike, analyze each sample by the method of additions. A quality control sample should be analyzed to check the accuracy of the calibration standards. The results must be within 10% or the calibration repeated.

7.3.3 Cold Vapor AAS Analysis for Mercury. All samples should be analyzed in duplicate. A quality control sample should be analyzed to check the accuracy of the calibration standards (within 10% or repeat calibration). Perform a matrix spike on one sample from the nitric impinger portion (must be within 25% or samples must be analyzed by the method of standard additions). Additional information on quality control can be obtained from EPA Method 7470 or in Standard Methods for Water and Wastewater, 15th Edition, Method 303F.

8. Calculations

8.1 Dry Gas Volume. Using the data from this test, calculate $V_{m(std)}$, the dry gas sample volume at standard conditions as outlined in Section 6.3 of Method 5.

8.2 Volume of Water Vapor and Moisture Content. Using the data obtained from this test, calculate the volume of water vapor $V_{w(std)}$ and the moisture content B_{ws} of the stack gas. Use Equations 5-2 and 5-3 of Method 5.

8.3 Stack Gas Velocity. Using the data from this test and Equation 2-9 of Method 2, calculate the average stack gas velocity.

8.4 Metals (Except Mercury) in Source Sample.

8.4.1 Fraction 1A, Front Half, Metals (except Hg). Calculate the amount of each metal collected in Fraction 1 of the sampling train using the following equation:

$$M_{fh} = C_a F_d V_{soln,1} \qquad \text{Eq. 1*}$$

*If Fractions 1A and 2A are combined, proportional aliquots must be used. Appropriate changes must be made in Equations 1-3 to reflect this approach.

where:

M_{fh} = total mass of each metal (except Hg) collected in the front half of the sampling train (Fraction 1), ug.
C_a = concentration of metal in sample Fraction 1A as read from the standard curve (ug/ml).
F_d = dilution factor (F_d = the inverse of the fractional portion of the concentrated sample in the solution actually used in the instrument to produce the reading C_a. For example, when the dilution of Fraction 1A is from 2 to 10 ml, F_d = 5).
$V_{soln,1}$ = total volume of digested sample solution (Fraction 1), ml.

8.4.2 Fraction 2A, Back Half, Metals (except Hg). Calculate the amount of each metal collected in Fraction 2 of the sampling train using the following equation.

$$M_{bh} = C_a F_a V_a \qquad \text{Eq. 2*}$$

where:

M_{bh} = total mass of each metal (except Hg) collected in the back half of the sampling train (Fraction 2), ug.
C_a = concentration of metal in sample Fraction 2A, as read from the standard curve (ug/ml).
F_a = aliquot factor, volume of Fraction 2 divided by volume of aliquot Fraction 2A.
V_a = volume of digested sample analyzed (concentrated Fraction 2A), ml.

8.4.3 Total Train, Metals (except Hg). Calculate the total amount of each of the quantified metals collected in the sampling train as follows:

$$M_t = (M_{fh} - M_{fhb}) + (M_{bh} - M_{bhb}) \qquad \text{Eq. 3*}$$

where:

M_t = total mass of each metal (separately stated for each metal) collected in the sampling train, ug.
M_{fhb} = blank correction value for mass of metal detected in front half field reagent blank, ug.
M_{bhb} = blank correction value for mass of metal detected in back half field reagent blank, ug.

*If Fractions 1A and 2A are combined, proportional aliquots must be used. Appropriate changes must be made in Equations 1-3 to reflect this approach.

Note: If the measured blank value for the front half (m_{fhb}) is in the range 0.0 to A ug [where A ug equals the value determined by multiplying 1.4 ug per square inch (1.4 ug/in.^{2}) times the actual area in square inches (in.^{2}) of the filter used in the emission sample], m_{fhb} may be used to correct the emission sample value (m_{fh}); if m_{fhb} exceeds A ug, the greater of the two following values (either I. or II.) may be used:

I. A ug, or

II. the lesser of (a) m_{fhb}, or (b) 5 percent of m_{fh}.

If the measured blank value for the back half (m_{bhb}) is in the range 0.0 to 1 ug, m_{bhb} may be used to correct the emission sample value (m_{bh}); if m_{bhb} exceeds 1 ug, the greater of the two following values may be used: 1 ug or 5 percent of m_{bh}.

8.5 Mercury in Source Sample.

8.5.1 Fraction 1B, Front Half, Hg. Calculate the amount of mercury collected in the front half, Fraction 1, of the sampling train using the following equation:

$$Hg_{fh} = \frac{Q_{fh}}{V_{f1B}} \times V_{soln,1} \qquad \text{Eq. 4}$$

where:

Hg_{fh} = total mass of mercury collected in the front half of the sampling train (Fraction 1), ug.
Q_{fh} = quantity of mercury in analyzed sample, ug.
$V_{soln,1}$ = total volume of digested sample solution (Fraction 1), ml.
V_{f1B} = volume of Fraction 1B analyzed, ml. See the following Note.

Note: V_{F1B} is the actual amount of Fraction 1B analyzed. For example, if 1 ml of Fraction 1B were diluted to 100 ml to bring it into the proper analytical range, and 1 ml of the 100 ml dilution was analyzed, V_{f1B} would be 0.01.

8.5.2 Fraction 2B and Fraction 3, Back Half, Hg. Calculate the amount of mercury collected in Fractions 2 and 3 using Equations 5 and 6, respectively. Calculate the total amount of mercury collected in the back half of the sampling train using Equation 7.

$$Hg_{bh2} = \frac{Q_{bh2}}{V_{f1B}} \times V_{soln,2} \qquad \text{Eq. 5}$$

where:

Hg_{bh2} = total mass of mercury collected in Fraction 2, ug.
Q_{bh2} = quantity of mercury in analyzed sample, ug.
V_{f2B} = volume of Fraction 2B analyzed, ml (see Note in Section 8.5.1).
$V_{soln,2}$ = total volume of Fraction 2, ml.

$$Hg_{bh3} = \frac{Q_{bh3}}{V_{f2B}} \times V_{soln,3} \qquad \text{Eq. 6}$$

where:

Hg_{bh3} = total mass of mercury collected in Fraction 3, ug.
Q_{bh3} = quantity of mercury in analyzed sample, ug.
V_{f3} = volume of Fraction 3 analyzed, ml (see Note in Section 8.5.1).
$V_{soln,3}$ = total volume of Fraction 3, ml.

$$Hg_{bh} = Hg_{bh2} + Hg_{bh3} \qquad \text{Eq. 7}$$

where:

Hg_{bh} = total mass of mercury collected in the back half of the sampling train, ug.

8.5.3 Total Train Mercury Catch. Calculate the total amount of mercury collected in the sampling train using Equation 8.

$$M_t = (Hg_{fh} - Hg_{fhb}) + (Hg_{bh} - Hg_{bhb}) \qquad \text{Eq. 8}$$

where:

M_t = total mass of mercury collected in the sampling train, ug.
Hg_{fhb} = blank correction value for mass of mercury detected in front half field reagent blank, ug.
Hg_{bhb} = blank correction value for mass of mercury detected in back half field reagent blank, ug.

Note: If the total of the measured blank values ($Hg_{fhb} + Hg_{bhb}$) is in the range of 0 to 3 ug, then the total may be used to correct the emission sample value ($Hg_{fh} + Hg_{bh}$); if it exceeds 3 ug, the greater of the following two values may be used: 3 ug or 5 percent of the emission sample value ($Hg_{fh} + Hg_{bh}$).

8.6 Metal Concentration of Stack Gas. Calculate the cadmium, total chromium, arsenic, nickel, manganese, beryllium, copper, lead, phosphorus, thallium, silver, barium, zinc, selenium, antimony, and mercury concentrations in the stack gas (dry basis, adjusted to standard conditions) as follows:

$$C_s = K_4 \ (M_t / V_{m(std)}) \qquad \text{Eq.9}$$

where:

C_s = concentration of each metal in the stack gas, mg/dscm.
K_4 = 10^{-3} mg/ug.
M_t = total mass of each metal collected in the sampling train, ug.
$V_{m(std)}$ = volume of gas sample as measured by the dry gas meter, corrected to dry standard conditions, dscm.

8.7 Isokinetic Variation and Acceptable Results. Same as Method 5, Sections 6.11 and 6.12, respectively.

9. Bibliography

9.1 Method 303F in Standard Methods for the Examination of Water Wastewater, 15th Edition, 1980. Available from the American Public Health Association, 1015 18th Street N.W., Washington, D.C. 20036.

9.2 EPA Methods 6010, 7000, 7041, 7060, 7131, 7421, 7470, 7740, and 7841, Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. SW-846, Third Edition. September 1988. Office of Solid Waste and Emergency Response, U. S. Environmental Protection Agency, Washington, D.C. 20460.

9.3 EPA Method 200.7, Code of Federal Regulations, Title 40, Part 136, Appendix C. July 1, 1987.

9.4 EPA Methods 1 through 5, Code of Federal Regulations, Title 40, Part 60, Appendix A, July 1, 1987.

DRAFT

METHOD Cr^{+6} - DETERMINATION OF HEXAVALENT CHROMIUM EMISSIONS FROM STATIONARY SOURCES

EPA Contract No. 68-02-4442
Work Assignment Nos. 37, 43, 69, 76, 96

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METHOD Cr^{+6} - DETERMINATION OF HEXAVALENT CHROMIUM EMISSIONS FROM STATIONARY SOURCES

1. Applicability and Principle

1.1 Applicability. This method applies to the determination of hexavalent chromium (Cr^{+6}) emissions from hazardous waste incinerators, municipal waste combustors, and sewage sludge incinerators. With the approval of the Administrator, this method may also be used to measure total chromium. The sampling train, constructed of Teflon components, has only been evaluated at temperatures less than 300°F. Trains constructed of other materials, for testing at higher temperatures, are currently being evaluated.

1.2 Principle. For incinerators and combustors, the Cr^{+6} emissions are collected isokinetically from the source. To eliminate the possibility of Cr^{+6} reduction between the nozzle and impinger, the emission samples are collected with a recirculatory train where the impinger reagent is continuously recirculated to the nozzle. Recovery procedures include a post-sampling purge and filtration. The impinger train samples are analyzed for Cr^{+6} by an ion chromatograph equipped with a post-column reactor and a visible wavelength detector. The IC/PCR separates the Cr^{+6} as chromate ($CrO_4^{=}$) from other components in the sample matrices that may interfere with the Cr^{+6}-specific diphenylcarbazide reaction that occurs in the post-column reactor. To increase sensitivity for trace levels of chromium, a preconcentration system is also used in conjunction with the IC/PCR.

2. Range, Sensitivity, Precision, and Interference

2.1 Range. Employing a preconcentration procedure, the lower limit of the detection range can be extended to 16 nanograms per dry standard cubic meter (ng/dscm) with a 3 dscm gas sample (0.1 ppb in solution). With sample dilution, there is no upper limit.

2.2 Sensitivity. A minimum detection limit of 8 ng/dscm with a 3 dscm gas sample can be achieved by preconcentration (0.05 ppb in solution).

2.3 Precision. The precision of the IC/PCR with sample preconcentration is 5 to 10 percent. The overall precision for sewage sludge incinerators emitting 120 ng/dscm of Cr^{+6} and 3.5 ug/dscm of total chromium is 25% and 9% for Cr^{+6} and total chromium, respectively; for hazardous waste incinerators emitting 300 ng/dscm of Cr^{+6} it is 20%.

2.4 Interference. Components in the sample matrix may cause Cr^{+6} to convert to trivalent chromium (Cr^{+3}) or cause Cr^{+3} to convert to Cr^{+6}. A post-sampling nitrogen purge and sample filtration are included to eliminate many of these interferences. The chromatographic separation of Cr^{+6} using ion chromatography reduces the potential for other metals to interfere with the

post-column reaction. For the IC/PCR analysis, only compounds that coelute with Cr^{+6} and affect the diphenylcarbazide reaction will cause interference. Periodic analysis of deionized (DI) water blanks is used to demonstrate that the analytical system is essentially free from contamination. Sample cross-contamination that can occur when high-level and low-level samples or standards are analyzed alternately is eliminated by thorough purging of the sample loop. Purging can easily be obtained by increasing the injection volume of the samples to ten times the size of the sample loop.

3. Apparatus

3.1 Sampling Train. Schematics of the recirculatory sampling trains employed in this method are shown in Figures Cr^{+6}-1 and Cr^{+6}-2. The recirculatory train is readily assembled from commercially available components. All portions of the train in contact with the sample are either glass, quartz, Tygon, or Teflon, and are to be cleaned as per subsection 5.1.1.

The metering system is identical to that specified by Method 5 (see section 3.8.1); the sampling train consists of the following components:

3.1.1 Probe Nozzle. Glass or Teflon with a sharp, tapered leading edge. The angle of taper shall be $\leq 30^{o}$ and the taper shall be on the outside to preserve a constant internal diameter. The probe nozzle shall be of the button-hook or elbow design, unless otherwise specified by the Administrator.

A range of nozzle sizes suitable for isokinetic sampling should be available, e.g., 0.32 to 1.27 cm (1/8 to 1/2 in.) — or larger if higher volume sample trains are used — inside diameter (ID) nozzles in increments of 0.16 cm (1/16 in.). Each nozzle shall be calibrated according to the procedures outlined in Section 6.

3.1.2 Teflon Aspirator or Pump/Sprayer Assembly. Teflon aspirator capable of recirculating absorbing reagent at 50 ml/min while operating at 0.75 cfm. Alternatively, a pump/sprayer assembly may be used instead of the Teflon aspirator. A Teflon union-T is connected behind the nozzle to provide the absorbing reagent/sample gas mix; a peristaltic pump is used to recirculate the absorbing reagent at a flow-rate of at least 50 ml/min. Teflon fittings, Teflon ferrules, and Teflon nuts are used to connect a glass or Teflon nozzle, recirculation line, and sample line to the Teflon aspirator or union-T. Tygon, C-flex* or other suitable inert tubing for use with peristaltic pump.

3.1.3 Teflon Sample Line. Teflon, 3/8" outside diameter (OD) and 1/4" inside diameter (ID), or 1/2" OD x 3/8" ID, of suitable length to connect aspirator (or T-union) to first Teflon impinger.

3.1.4 Teflon Recirculation Line. Teflon, 1/4" O.D. and 1/8" I.D., of suitable length to connect first impinger to aspirator (or T-union).

*NOTE: Mention of trade names or specific product does not constitute endorsement by the Enviornmental Protection Agency.

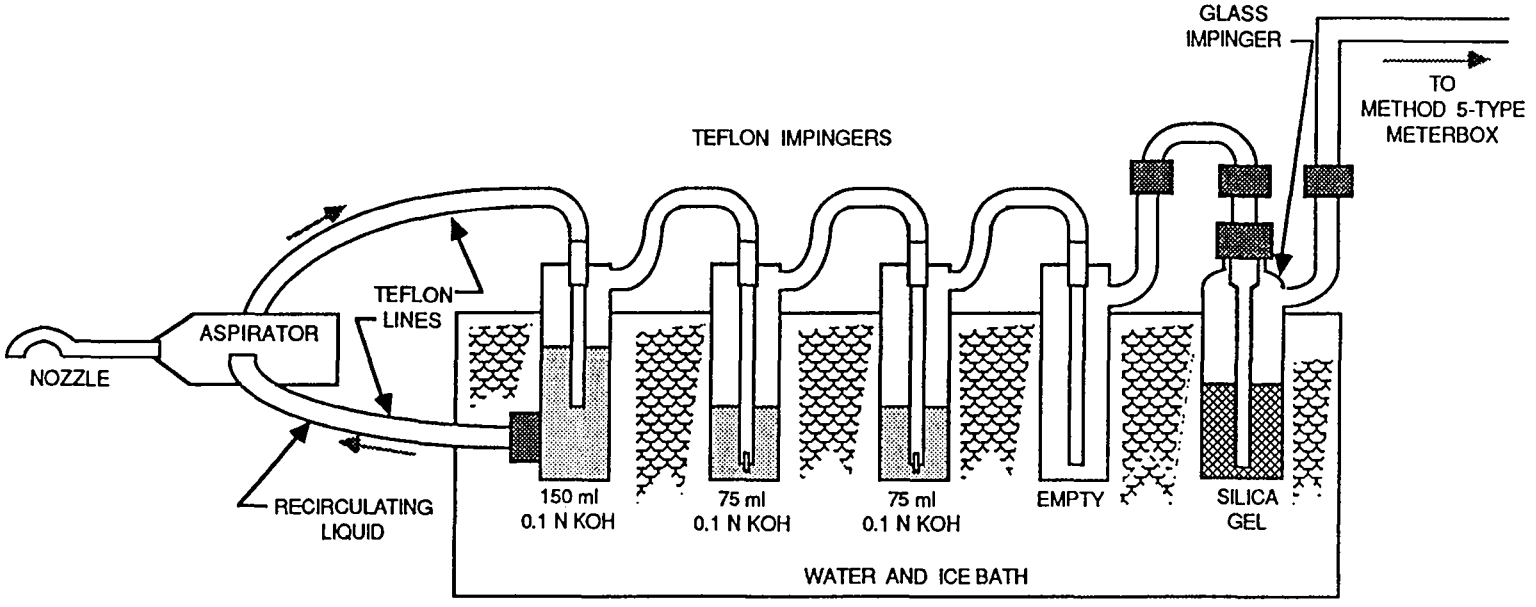


Figure Cr^{+6} -1. Schematic of recirculatory impinger train with aspirator assembly.

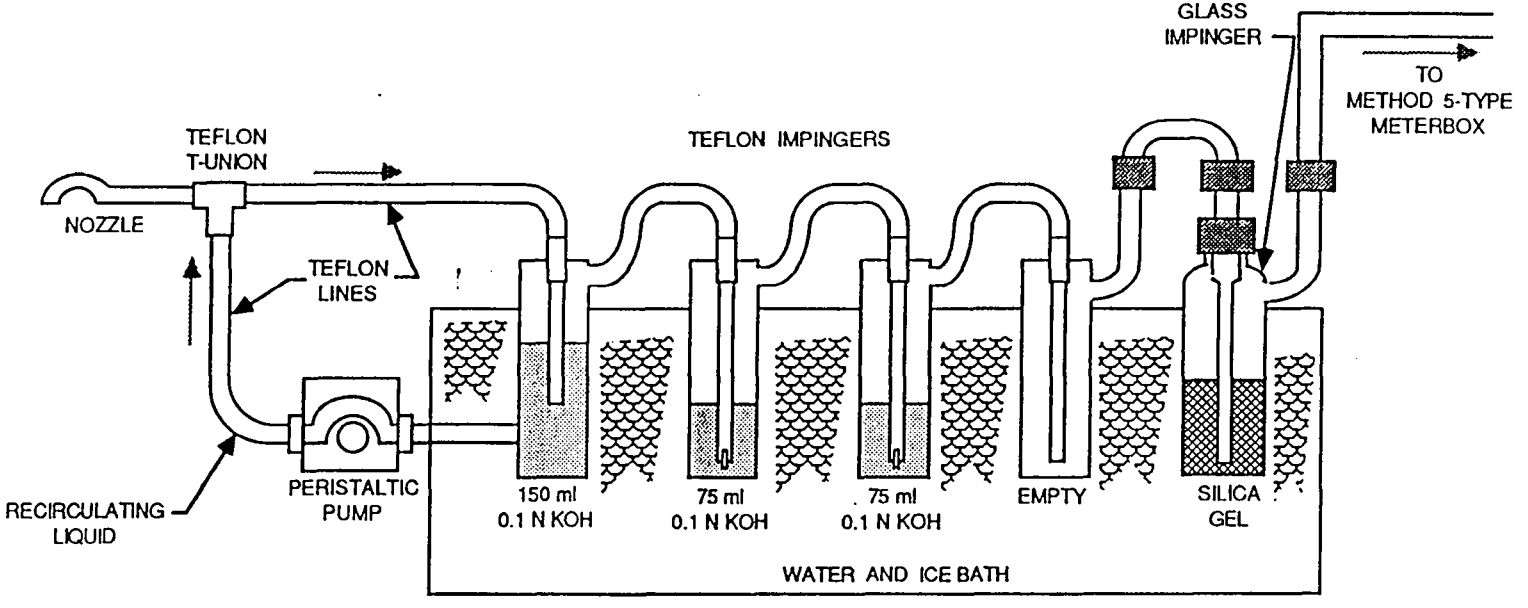


Figure Cr^{+6} -2. Schematic of recirculatory impinger train with pump/sprayer assembly.

3.1.5 Teflon Impingers. Four Teflon impingers; Teflon tubes and fittings, such as made by Savillex*, can be used to construct impingers 2" diameter by 12" long, with vacuum-tight 3/8" O.D. Teflon compression fittings. Alternatively, standard glass impingers that have been Teflon-lined, with Teflon stems and U-tubes, may be used. Inlet fittings on impinger top to be bored through to accept 3/8" O.D. tubing as impinger stem. The second and third 3/8" OD Teflon stem has a 1/4" OD Teflon tube, 2" long, inserted at its end to duplicate the effects of the Greenburg-Smith impinger stem. The first impinger stem should extend to 2" from impinger bottom, high enough in the impinger reagent to prevent air from entering recirculating line; the second and third impinger stems should extend to 1/2" from impinger bottom. The first impinger should include a 1/4" O.D. Teflon compression fitting for recirculation line. The fourth impinger serves as a knockout impinger.

3.1.6 Glass Impinger. Silica gel impinger. Vacuum-tight impingers, capable of containing 400 g. of silica gel, with compatible fittings. The silica gel impinger will have a modified stem (1/2" ID at tip of stem).

3.1.7 Thermometer, (identical to that specified by Method 5) at the outlet of the silica gel impinger, to monitor the exit temperature of the gas.

3.1.8 Metering System, Barometer, and Gas Density Determinations Equipment. Same as Method 5, Section 2.1.8 through 2.1.10, respectively.

3.2 Sample Recovery. Clean all items for sample handling or storage with 10% nitric acid solution by soaking, where possible, and rinse thoroughly with $_{D}$I water before use.

3.2.1 Nitrogen Purge Line. Inert tubing and fittings capable of delivering 0 to 1 scf/min (continuously adjustable) of nitrogen gas to the impinger train from a standard gas cylinder (See Figure Cr^{+6}-3). Standard 3/8-inch Teflon tubing and compression fittings in conjunction with an adjustable pressure regulator and needle valve may be used.

3.2.2 Wash Bottles. Two polyethylene wash bottles, for DI water and nitric rinse solution.

3.2.3 Sample Storage Containers. Polyethylene, with leak-free screw cap, 500-ml or 1000-ml.

3.2.4 1000-ml Graduated Cylinder and Balance.

3.2.5 Plastic Storage Containers. Air tight containers to store silica gel.

3.2.6 Funnel and Rubber Policeman. To aid in transfer of silica gel from impinger to storage container; not necessary if silica gel is weighed directly in the impinger.

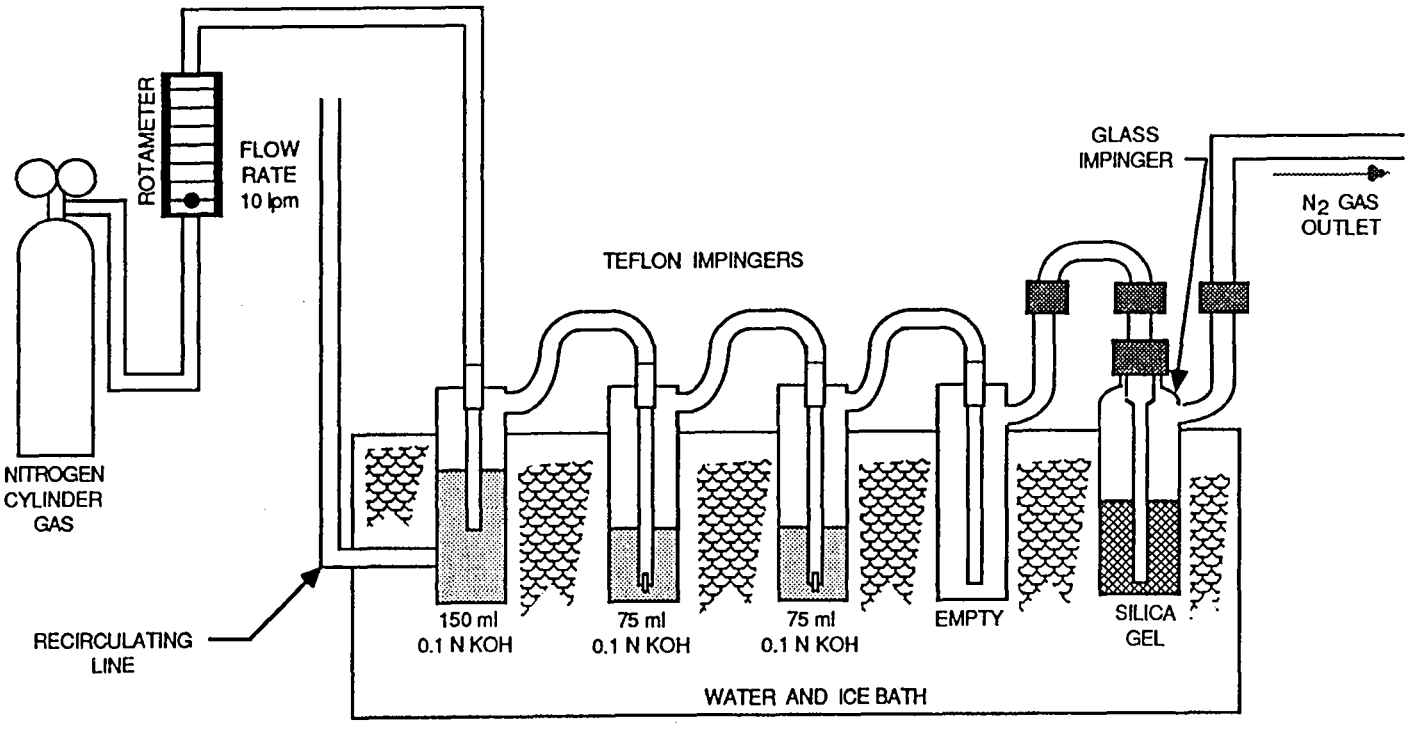


Figure Cr^{+6} -3. Schematic of post test nitrogen purge system.

3.3 Sample Preparation for Analysis. Sample preparation prior to analysis includes purging the sample train immediately following the sample run, and filtering the recovered sample to remove particulate matter immediately following recovery.

3.3.1 Beakers, Funnels, Volumetric Flasks, Volumetric Pipets, and Graduated Cylinders. Assorted sizes, Teflon or glass, for preparation of samples, sample dilution, and preparation of calibration standards. Prepare initially following procedure described in Section 5.1.3 and rinse between use with 0.1 N HNO_3 and DI water.

3.3.2 Filtration Apparatus. Teflon, or equivalent, for filtering samples, and Teflon filter holder. Teflon impinger components have been found to be satisfactory as a sample reservoir for pressure filtration using nitrogen.

3.4 Analysis.

3.4.1 IC/PCR System. High performance liquid chromatograph pump, sample injection valve, post-column reagent delivery and mixing system, and a visible detector, capable of operating at 520 nm, all with a non-metallic (or inert) flow path. An electronic recording integrator operating in the peak area mode is recommended, but other recording devices and integration techniques are acceptable provided the repeatability criteria and the linearity criteria for the calibration curve described in Section 5.5 can be satisfied. A sample loading system will be required if preconcentration is employed.

3.4.2 Analytical Column. A high performance ion chromatograph (HPIC) non-metallic column with anion separation characteristics and a high loading capacity designed for separation of metal chelating compounds to prevent metal interference. Resolution described in Section 5.4 must be obtained. A non-metallic guard column with the same ion-exchange material is recommended.

3.4.3 Preconcentration Column. An HPIC non-metallic column with acceptable anion retention characteristics and sample loading rates as described in Section 5.5.

3.4.4 0.45 um filter cartridge. For the removal of insoluble material. To be used just prior to sample injection/analysis.

4. Reagents

All reagents should, at a minimum, conform to the specifications established by the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. All prepared reagents should be checked by IC/PCR analysis for Cr^{+6} to assure that contamination is below the analytical detection limit for direct injection or, if selected, preconcentration. If total chromium is also to be determined, the reagents should also be checked by the analytical technique selected to assure that contamination is below the analytical detection limit.

4.1 Sampling.

4.1.1 Water. Deionized water. It is recommended that water blanks be checked prior to preparing sampling reagents to ensure that the Cr^{+6} content is less than the analytical detection limit.

4.1.2 Potassium Hydroxide, 0.1 N. Add 5.6 gm of KOH(s) to approximately 900 ml of DI water and let dissolve. Dilute to 1000 ml with DI water. NOTE: At sources with high concentrations of acids and/or SO_2, the concentration of KOH should be increased to 0.5 N to insure that the pH of the solution is above 8.5 after sampling.

4.1.3 Silica Gel and Crushed Ice. Same as Method 5, Sections 3.1.2 and 3.1.4, respectively.

4.2 Sample Recovery. The reagents used in sample recovery are as follows:

4.2.1 Water. Same as subsection 4.1.1.

4.2.2 Nitric Acid, 0.1 N. Add 6.3 ml of concentrated HNO_3 (70 percent) to a graduated cylinder containing approximately 900 ml of DI water. Dilute to 1000 ml with DI water, and mix well.

4.2.3 pH Indicator Strip. pH indicator capable of determining pH of solution between the pH range of 7 and 12, at 0.5 pH intervals.

4.3 Sample Preparation

4.3.1 Water. Same as subsection 4.1.1.

4.3.2 Nitric Acid, 0.1 N. Same as subsection 4.2.2.

4.3.3 Filters. Acetate membrane, or equivalent, filters with 0.45 micrometer or smaller pore size to remove insoluble material.

4.4 Analysis.

4.4.1 Chromatographic Eluent. The eluent used in the analytical system is ammonium sulfate based. It is prepared by adding 6.5 ml of 29% ammonium hydroxide (NH_4OH) and 33 grams of ammonium sulfate [$(NH_4)_2SO_4$] to 500 ml of DI water. The mixture should then be diluted to 1 liter with DI water and mixed well. Other combinations of eluants and/or columns may be employed provided peak resolution, as described in Section 5.4, repeatability and linearity, as described in Section 6.2, and analytical sensitivity are acceptable.

4.4.2 Post-column Reagent. An effective post-column reagent for use with the chromatographic eluent described in Section 4.4.1 is a diphenylcarbazide (DPC) based system. Dissolve 0.5 g of 1,5-diphenylcarbazide (DPC) in 100 ml of ACS grade methanol. Add to 500 ml of degassed containing 50 ml of 96% spectrophotometric grade sulfuric acid. Dilute to 1 liter with degassed DI water.

4.4.4 Cr^{+6} Calibration Standard. Prepare Cr^{+6} standards from potassium dichromate ($K_2Cr_2O_7$, FW 294.19). To prepare a 1000 ug/ml Cr^{+6} stock solution, dissolve 2.829 g of dry $K_2Cr_2O_7$ in 1 liter of DI water. To prepare working standards, dilute the stock solution to the chosen standard concentrations for instrument calibration with 0.05 N KOH to achieve a matrix similar to the actual field samples.

4.4.5 Performance Audit Sample. A performance audit sample shall be obtained from the Quality Assurance Division of EPA and analyzed with the field samples. The mailing address to request audit samples is:

U. S. Environmental Protection Agency
Atmospheric Research And Exposure Assessment Laboratory
Quality Assurance Division
Source Branch, Mail Drop 77-A
Research Triangle Park, North Carolina 27711

The audit sample should be prepared in a suitable sample matrix at a concentration similar to the actual field samples.

5. Procedure

SAFTEY FIRST - WEAR SAFETY GLASSES AT ALL TIMES DURING THIS TEST METHOD.

5.1 Sampling. The complexity of this method is such that to obtain reliable results, testers should be trained and experienced with test procedures.

5.1.1 Pretest Preparation. All components shall be maintained and calibrated according to the procedures described in APTD-0576, unless otherwise specified herein.

Rinse all sample train components from the glass nozzle up to the silica gel impinger and sample containers with hot tap water followed by washing with hot soapy water. Next, rinse the train components and sample containers three times with tap water followed by three rinses with DI water. All the components and containers should then be soaked overnight, or a minimum of 4 hours, in a 10 % (v/v) nitric acid solution, then rinsed three times with DI water. Allow the components to air dry prior to covering all openings with Parafilm, or equivalent.

5.1.2 Preliminary Determinations. Same as Method 5, Section 4.1.2.

5.1.3 Preparation of Sampling Train. Measure 300 ml of 0.1 N KOH into a graduated cylinder (or tare-weighed precleaned polyethylene container). Place approximately 150 ml of the 0.1 N KOH reagent in the first Teflon impinger. Split the rest of the 0.1 N KOH between the second and third Teflon impingers. The next Teflon impinger is left dry. Place a preweighed 200-to 400-g portion of indicating silica gel in the final glass impinger. (For sampling periods in excess of two hours, or for high moisture sites, 400-g of silica gel is recommended.)

Retain reagent blanks of the 0.1 N KOH equal to the volumes used with the field samples.

5.1.4 Leak-Check Procedures. Follow the leak-check procedures given in Method 5, Section 4.1.4.1 (Pretest Leak-Check), Section 4.1.4.2 (Leak-Checks During the Sample Run), and Section 4.1.4.3 (Post-Test Leak-Checks).

5.1.5 Sampling Train Operation. Follow the procedures given in Method 5, Section 4.1.5. The sampling train should be iced down with water and ice to insure heat transfer with the Teflon impingers.

NOTE: If the gas to be sampled is above 200°F, it may be necessary to wrap three or four feet of the Teflon sample and recirculating lines inside the ice bath to keep the recirculated reagent cool enough so it does not turn to steam.

For each run, record the data required on a data sheet such as the one shown in Figure 5-2 of Method 5.

At the end of the sampling run, determine the pH of the reagent in the first impinger using a pH indicator strip. The pH of the solution shall be greater than 8.5.

5.1.6 Calculation of Percent Isokinetic. Same as Method 5, Section 4.1.6.

5.2 Post-test Nitrogen Purge. The nitrogen purge is used as a safeguard against the conversion of hexavalent chromium to the trivalent oxidation state. The purge is effective in the removal of SO_2 from the impinger contents.

Attach the nitrogen purge line to the input of the impinger train. Check to insure the output of the impinger train is open, and that the recirculating line is capped off. Open the nitrogen gas flow slowly and adjust the delivery rate to 10 L/min. Check the recirculating line to insure that the pressure is not forcing the impinger reagent out through this line. Continue the purge under these conditions for one-half hour periodically checking the flow rate.

5.3 Sample Recovery. Begin cleanup procedures as soon as the train assembly has been purged at the end of the sampling run. The probe assembly does may be disconnected from the sample train prior to sample purging.

The probe assembly should be allowed to cool prior to sample recovery. Disconnect the umbilical cord from the sample train. When the probe assembly can be safely handled, wipe off all external particulate matter near the tip of the nozzle, and cap the nozzle prior to transporting the sample train to a clean up area that is clean and protected from the wind and other potential causes of contamination or loss of sample. Inspect the train before and during disassembly and note any abnormal conditions.

5.3.1 Container No. 1 (Impingers 1 through 3). Disconnect the first impinger from the second impinger and disconnect the recirculation line from the aspirator or peristaltic pump. Drain the Teflon impingers into a precleaned graduated cylinder or tare-weighed precleaned polyethylene sample container and measure the volume of the liquid to within 1 ml or 1 gm. Record the volume of liquid present as this information is required to calculate the moisture content of the flue gas sample. If necessary, transfer the sample from the graduated cylinder to a precleaned polyethylene sample container. With DI water, rinse four times the insides of the glass nozzle, the aspirator, the sample and recirculation lines, the impingers, and the

connecting tubing, and combine the rinses with the impinger solution in the sample container.

5.3.2 Container No. 2 (HNO_3 rinse optional for total chromium). With 0.1 N HNO3, rinse three times the **entire train assembly**, from the nozzle to the fourth impinger, and combine the rinses into a separate precleaned polyethylene sample container for possible total chromium analysis. Repeat the rinse procedure a final time with DI water, and discard the water rinses. Mark the height of the fluid level on the container or, alternatively if a balance is available, weigh the container and record the weight to permit determination of any leakage during transport. Label the container clearly to identify its contents.

5.3.3 Container No. 3 (Silica Gel). Note the color of the indicating silica gel to determine if it has been completely spent. Quantitatively transfer the silica gel from its impinger to the original container, and seal the container. A funnel and a rubber policeman may be used to aid in the transfer. The small amount of particulate that may adhere to the impinger wall need not be removed. Do not use water or other liquids to transfer the silica gel. Alternatively, if a balance is available in the field, record the weight of the spent silica gel (or the silica gel plus impinger) to the nearest 0.5 g.

5.3.4 Container No. 4 (0.1 N KOH Blank). Once during each field test, place a volume of reagent equal to the volume placed in the sample train into a precleaned polyethylene sample container, and seal the container. Mark the height of the fluid level on the container or, alternatively if a balance is available, weigh the container and record the weight to permit determination of any leakage during transport. Label the container clearly to identify its contents.

5.3.5 Container No. 5 (DI water Blank). Once during each field test, place a volume of DI water equal to the volume employed to rinse the sample train into a precleaned polyethylene sample container, and seal the container. Mark the height of the fluid level on the container or, alternatively if a balance is available, weigh the container and record the weight to permit determination of any leakage during transport. Label the container clearly to identify its contents.

5.3.6 Container No. 6 (0.1 N HNO_3 Blank). Once during each field test if total chromium is to be determined, place a volume of 0.1 N HNO_3 reagent equal to the volume employed to rinse the sample train into a precleaned polyethylene sample container, and seal the container. Mark the height of the fluid level on the container or, alternatively if a balance is available, weigh the container and record the weight to permit determination of any leakage during transport. Label the container clearly to identify its contents.

5.4 Sample Preparation. For determination of Cr^{+6}, the sample should be filtered immediately following recovery to remove any insoluble matter. Nitrogen gas may be used as a pressure assist to the filtration process (see Figure Cr^{+6}-4).

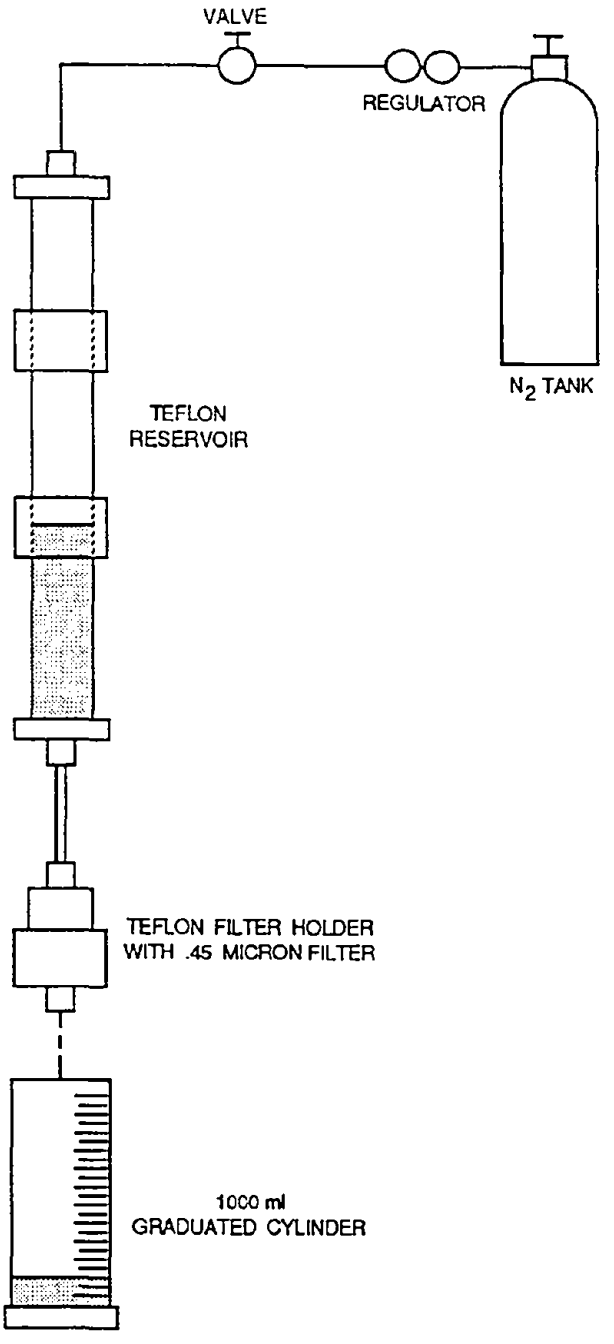


Figure Cr^{+6}-4. Schematic of sample filter system.

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Filter the entire impinger sample through a 0.45 micrometer acetate filter (or equivalent), and collect the filtrate in a 1000-ml graduated cylinder. Rinse the sample container with DI water three separate times and pass these rinses through the filter, and add the rinses to the sample filtrate. Rinse the Teflon reservoir with DI water three separate times and pass these rinses through the filter, and add the rinses to the sample. Determine the final volume of the filtrate and rinses and return them to the rinsed polyethylene sample container. Label the container clearly to identify its contents. Rinse the Teflon reservoir once with 0.1 N HNO_3 and once with DI water and discard these rinses.

If total chromium is to be determined, quantitatively recover the filter and residue and place them in a vial. (The acetate filter may be digested with 5 ml of 70% nitric acid; this digestion solution may then be diluted with DI water for total chromium analysis.)

NOTE: If the source has a large amount of particulate in the effluent stream, testing teams may wish to filter the sample twice, once through a 2-5 micrometer filter, then through the 0.45 micrometer filter.

5.4.1 Container 2 (HNO_3 rinse, optional for total chromium). This sample shall be analyzed in accordance with the selected procedure for total chromium analysis. At a minimum, the sample should be subjected to a digestion procedure sufficient to solubilize all chromium present.

5.4.2 Container 3 (Silica Gel). Weigh the spent silica gel to the nearest 0.5 g using a balance. (This step may be conducted in the field.)

5.5 Sample Analysis. The Cr^{+6} content of the sample filtrate is determined by ion chromatography coupled with a post column reactor (IC/PCR). To increase sensitivity for trace levels of chromium a preconcentration system is also used in conjunction with the IC/PCR.

Prior to preconcentration and/or analysis, all field samples will be filtered through a 0.45 um filter. This filtration should be conducted just prior to sample injection/analysis.

The preconcentration is accomplished by selectively retaining the analyte on a solid absorbent (as described in 3.4.3), followed by removal of the analyte from the absorbent. The sample is injected into a sample loop of the desired size (repeated loadings or larger size loop for greater sensitivity) and the Cr^{+6} is collected on the resin bed of the column. When the injection valve is switched, the eluent displaces the concentrated Cr^{+6} sample moving it off the preconcentration column and onto the IC anion separation column. After separation from other sample components, Cr^{+6} forms a specific complex in the post-column reactor with a diphenylcarbazide reaction solution, and the complex is then detected by visible absorbance at a wavelength of 520 nm. The amount of absorbance measured is proportional to the concentration of the Cr^{+6} complex formed. The IC retention time and absorbance of the Cr^{+6} complex is compared with known Cr^{+6} standards analyzed under identical conditions to provide both qualitative and quantitative analyses.

Prior to sample analysis establish a stable baseline with the detector set at the required attenuation by setting the eluent flowrate at approximately 1 ml/min and post column reagent flow rate at approximately 0.5 ml/min. (Note: As long as the ratio of eluent flowrate to PCR flowrate remains constant, the standard curve should remain linear.) Inject a sample of DI water to insure that no Cr^{+6} appears in the water blank.

First, inject the calibration standards prepared, as described in Section 4.4.4, to cover the appropriate concentration range, starting with the lowest standard first. Next, inject, in duplicate, the performance audit sample, followed by the 0.1 N KOH field blank and the field samples. Finally, repeat the injection of the calibration standards to allow for compensation of instrument drift. Measure areas or heights of the Cr^{+6}/DPC complex chromatogram peak. The response for replicate, consecutive injections of samples must be within 5 percent of the average response, or the injection should be repeated until the 5 percent criteria can be met. Use the average response (peak areas or heights) from the duplicate injections of calibration standards to generate a linear calibration curve. From the calibration curve, determine the concentration of the field samples employing the average response from the duplicate injections.

The results for the analysis of the performance audit sample must be within 10 percent of the reference value for the field sample analysis to be valid.

6. Calibration. Maintain a written log of all calibration activities.

6.1 Sample Train Calibration. Calibrate the sample train components according to the indicated sections of Method 5: Probe Nozzle (Section 5.1); Pitot Tube (Section 5.2); Metering System (Section 5.3); Temperature Gauges (Section 5.5); Leak-Check of the Metering System (Section 5.6); and Barometer (Section 5.7).

6.2 Calibration Curve for the IC/PCR. Prepare working standards from the stock solution described in Section 4.4.4. by dilution with a DI water solution to approximate the field sample matrix. Prepare at least four standards to cover one order of magnitude that bracket the field sample concentrations. Run the standards with the field samples as described in Section 5.5. For each standard, determine the peak areas (recommended) or the peak heights, calculate the average response from the duplicate injections, and plot the average response against the Cr^{+6} concentration in ug/l. The individual responses for each calibration standard determined before and after field sample analysis must be within 5 percent of the average response for the analysis to be valid. If the 5 percent criteria is exceeded, excessive drift and/or instrument degradation may have occurred, and must be corrected before further analyses are performed.

Employing linear regression, calculate a predicted value for each calibration standard with the average response for the duplicate injections. Each predicted value must be within 7 percent of the actual value for the calibration curve to be considered acceptable. Remake and/or rerun the calibration standards. If the calibration curve is still unacceptable, reduce the range of the curve.

7. Calculations

7.1 Dry Gas Volume. Using the data from the test, calculate $V_{m(std)}$, the dry gas sample volume at standard conditions as outlined in Section 6.3 of Method 5.

7.2 Volume of Water Vapor and Moisture Content. Using the data from the test, calculate $V_{w(std)}$ and B_{ws}, the volume of water vapor and the moisture content of the stack gas, respectively, using Equations 5-2 and 5-3 of Method 5.

7.3 Stack Gas Velocity. Using the data from the test and Equation 2-9 of Method 2, calculate the average stack gas velocity.

7.4 Total ug Cr^{+6} Per Sample. Calculate as described below:

$$m = (S-B) \times V_{ls} \times d$$

Where:

m = Mass of Cr^{+6} in the sample, ug,
S = Concentration of sample, ug Cr^{+6}/ml,
B = Concentration of blank, ug Cr^{+6}/ml,
V_{ls} = Volume of sample after filtration, ml, and,
d = Dilution factor (1 if not diluted).

METHOD 0010

MODIFIED METHOD 5 SAMPLING TRAIN

1.0 SCOPE AND APPLICATION

1.1 This method is applicable to the determination of Destruction and Removal Efficiency (DRE) of semivolatile Principal Organic Hazardous Compounds (POHCs) from incineration systems (PHS, 1967). This method also may be used to determine particulate emission rates from stationary sources as per EPA Method 5 (see References at end of this method).

2.0 SUMMARY OF METHOD

2.1 Gaseous and particulate pollutants are withdrawn from an emission source at an isokinetic sampling rate and are collected in a multicomponent sampling train. Principal components of the train include a high-efficiency glass- or quartz-fiber filter and a packed bed of porous polymeric adsorbent resin. The filter is used to collect organic-laden particulate materials and the porous polymeric resin to adsorb semivolatile organic species. Semivolatile species are defined as compounds with boiling points >100°C.

2.2 Comprehensive chemical analyses of the collected sample are conducted to determine the concentration and identity of the organic materials.

3.0 INTERFERENCES

3.1 Oxides of nitrogen (NO_x) are possible interferents in the determination of certain water-soluble compounds such as dioxane, phenol, and urethane; reaction of these compounds with NO_x in the presence of moisture will reduce their concentration. Other possibilities that could result in positive or negative bias are (1) stability of the compounds in methylene chloride, (2) the formation of water-soluble organic salts on the resin in the presence of moisture, and (3) the solvent extraction efficiency of water-soluble compounds from aqueous media. Use of two or more ions per compound for qualitative and quantitative analysis can overcome interference at one mass. These concerns should be addressed on a compound-by-compound basis before using this method.

4.0 APPARATUS AND MATERIALS

4.1 Sampling train:

4.1.1 A schematic of the sampling train used in this method is shown in Figure 1. This sampling train configuration is adapted from EPA Method 5 procedures, and, as such, the majority of the required equipment

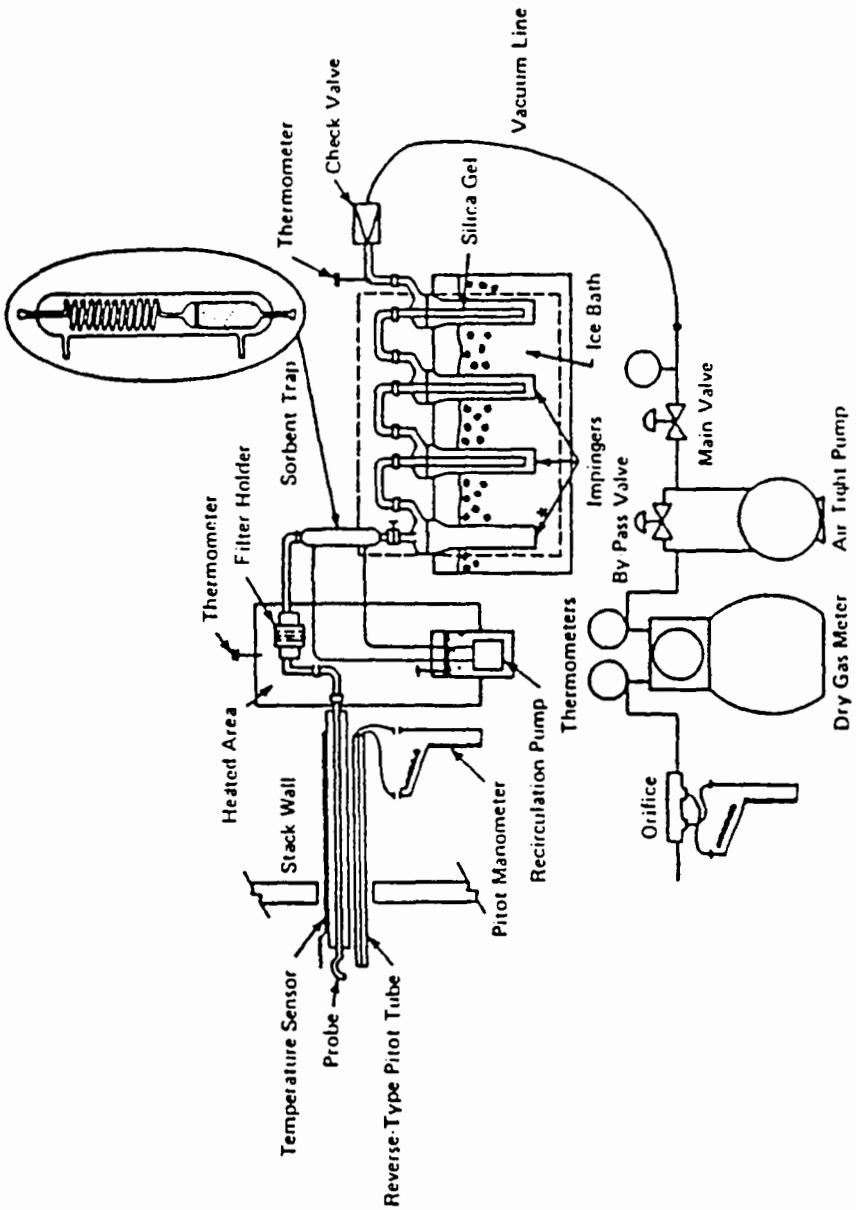


Figure 1. Modified Method 5 Sampling Train.

is identical to that used in EPA Method 5 determinations. The new components required are a condenser coil and a sorbent module, which are used to collect semivolatile organic materials that pass through the glass- or quartz-fiber filter in the gas phase.

4.1.2 Construction details for the basic train components are given in APTD-0581 (see Martin, 1971, in Section 13.0, References); commercial models of this equipment are also available. Specifications for the sorbent module are provided in the following subsections. Additionally, the following subsections list changes to APTD-0581 and identify allowable train configuration modifications.

4.1.3 Basic operating and maintenance procedures for the sampling train are described in APTD-0576 (see Rom, 1972, in Section 13.0, References). As correct usage is important in obtaining valid results, all users should refer to APTD-0576 and adopt the operating and maintenance procedures outlined therein unless otherwise specified. The sampling train consists of the components detailed below.

4.1.3.1 Probe nozzle: Stainless steel (316) or glass with sharp, tapered (30° angle) leading edge. The taper shall be on the outside to preserve a constant I.D. The nozzle shall be buttonhook or elbow design and constructed from seamless tubing (if made of stainless steel). Other construction materials may be considered for particular applications. A range of nozzle sizes suitable for isokinetic sampling should be available in increments of 0.16 cm (1/16 in.), e.g., 0.32-1.27 cm (1/8-1/2 in.), or larger if higher volume sampling trains are used. Each nozzle shall be calibrated according to the procedures outlined in Paragraph 9.1.

4.1.3.2 Probe liner: Borosilicate or quartz-glass tubing with a heating system capable of maintaining a gas temperature of 120 ± 14°C (248 ± 25°F) at the exit end during sampling. (The tester may opt to operate the equipment at a temperature lower than that specified.) Because the actual temperature at the outlet of the probe is not usually monitored during sampling, probes constructed according to APTD-0581 and utilizing the calibration curves of APTD-0576 (or calibrated according to the procedure outlined in APTD-0576) are considered acceptable. Either borosilicate or quartz-glass probe liners may be used for stack temperatures up to about 480°C (900°F). Quartz liners shall be used for temperatures between 480 and 900°C (900 and 1650°F). (The softening temperature for borosilicate is 820°C (1508°F), and for quartz 1500°C (2732°F).) Water-cooling of the stainless steel sheath will be necessary at temperatures approaching and exceeding 500°C.

4.1.3.3 Pitot tube: Type S, as described in Section 2.1 of EPA Method 2, or other appropriate devices (Vollaro, 1976). The pitot tube shall be attached to the probe to allow constant monitoring of the stack-gas velocity. The impact (high-pressure) opening plane of the pitot tube shall be even with or above the nozzle entry plane (see EPA Method 2, Figure 2-6b) during sampling. The Type S pitot tube assembly shall have a known coefficient, determined as outlined in Section 4 of EPA Method 2.

4.1.3.4 Differential pressure gauge: Inclined manometer or equivalent device as described in Section 2.2 of EPA Method 2. One manometer shall be used for velocity-head (ΔP) readings and the other for orifice differential pressure (ΔH) readings.

4.1.3.5 Filter holder: Borosilicate glass, with a glass frit filter support and a sealing gasket. The sealing gasket should be made of materials that will not introduce organic material into the gas stream at the temperature at which the filter holder will be maintained. The gasket shall be constructed of Teflon or materials of equal or better characteristics. The holder design shall provide a positive seal against leakage at any point along the filter circumference. The holder shall be attached immediately to the outlet of the cyclone or cyclone bypass.

4.1.3.6 Filter heating system: Any heating system capable of maintaining a temperature of 120 $\pm$ 14°C (248 $\pm$ 25°F) around the filter holder during sampling. Other temperatures may be appropriate for particular applications. Alternatively, the tester may opt to operate the equipment at temperatures other than that specified. A temperature gauge capable of measuring temperature to within 3°C (5.4°F) shall be installed so that the temperature around the filter holder can be regulated and monitored during sampling. Heating systems other than the one shown in APTD-0581 may be used.

4.1.3.7 Organic sampling module: This unit consists of three sections, including a gas-conditioning section, a sorbent trap, and a condensate knockout trap. The gas-conditioning system shall be capable of conditioning the gas leaving the back half of the filter holder to a temperature not exceeding 20°C (68°F). The sorbent trap shall be sized to contain approximately 20 g of porous polymeric resin (Rohm and Haas XAD-2 or equivalent) and shall be jacketed to maintain the internal gas temperature at 17 $\pm$ 3°C (62.5 $\pm$ 5.4°F). The most commonly used coolant is ice water from the impinger ice-water bath, constantly circulated through the outer jacket, using rubber or plastic tubing and a peristaltic pump. The sorbent trap should be outfitted with a glass well or depression, appropriately sized to accommodate a small thermocouple in the trap for monitoring the gas entry temperature. The condensate knockout trap shall be of sufficient size to collect the condensate following gas conditioning. The organic module components shall be oriented to direct the flow of condensate formed vertically downward from the conditioning section, through the adsorbent media, and into the condensate knockout trap. The knockout trap is usually similar in appearance to an empty impinger directly underneath the sorbent module; it may be oversized but should have a shortened center stem (at a minimum, one-half the length of the normal impinger stems) to collect a large volume of condensate without bubbling and overflowing into the impinger train. All surfaces of the organic module wetted by the gas sample shall be fabricated of borosilicate glass, Teflon, or other inert materials. Commercial versions of the

complete organic module are not currently available, but may be assembled from commercially available laboratory glassware and a custom-fabricated sorbent trap. Details of two acceptable designs are shown in Figures 2 and 3 (the thermocouple well is shown in Figure 2).

4.1.3.8 Impinger train: To determine the stack-gas moisture content, four 500-mL impingers, connected in series with leak-free ground-glass joints, follow the knockout trap. The first, third, and fourth impingers shall be of the Greenburg-Smith design, modified by replacing the tip with a 1.3-cm (1/2-in.) I.D. glass tube extending about 1.3 cm (1/2 in.) from the bottom of the outer cylinder. The second impinger shall be of the Greenburg-Smith design with the standard tip. The first and second impingers shall contain known quantities of water or appropriate trapping solution. The third shall be empty or charged with a caustic solution, should the stack gas contain hydrochloric acid (HCl). The fourth shall contain a known weight of silica gel or equivalent desiccant.

4.1.3.9 Metering system: The necessary components are a vacuum gauge, leak-free pump, thermometers capable of measuring temperature to within 3°C (5.4°F), dry-gas meter capable of measuring volume to within 1%, and related equipment, as shown in Figure 1. At a minimum, the pump should be capable of 4 cfm free flow, and the dry-gas meter should have a recording capacity of 0-999.9 cu ft with a resolution of 0.005 cu ft. Other metering systems capable of maintaining sampling rates within 10% of isokineticity and of determining sample volumes to within 2% may be used. The metering system must be used in conjunction with a pitot tube to enable checks of isokinetic sampling rates. Sampling trains using metering systems designed for flow rates higher than those described in APTD-0581 and APTD-0576 may be used, provided that the specifications of this method are met.

4.1.3.10 Barometer: Mercury, aneroid, or other barometer capable of measuring atmospheric pressure to within 2.5 mm Hg (0.1 in. Hg). In many cases the barometric reading may be obtained from a nearby National Weather Service station, in which case the station value (which is the absolute barometric pressure) is requested and an adjustment for elevation differences between the weather station and sampling point is applied at a rate of minus 2.5 mm Hg (0.1 in. Hg) per 30-m (100 ft) elevation increase (vice versa for elevation decrease).

4.1.3.11 Gas density determination equipment: Temperature sensor and pressure gauge (as described in Sections 2.3 and 2.4 of EPA Method 2), and gas analyzer, if necessary (as described in EPA Method 3). The temperature sensor ideally should be permanently attached to the pitot tube or sampling probe in a fixed configuration such that the tip of the sensor extends beyond the leading edge of the probe sheath and does not touch any metal.

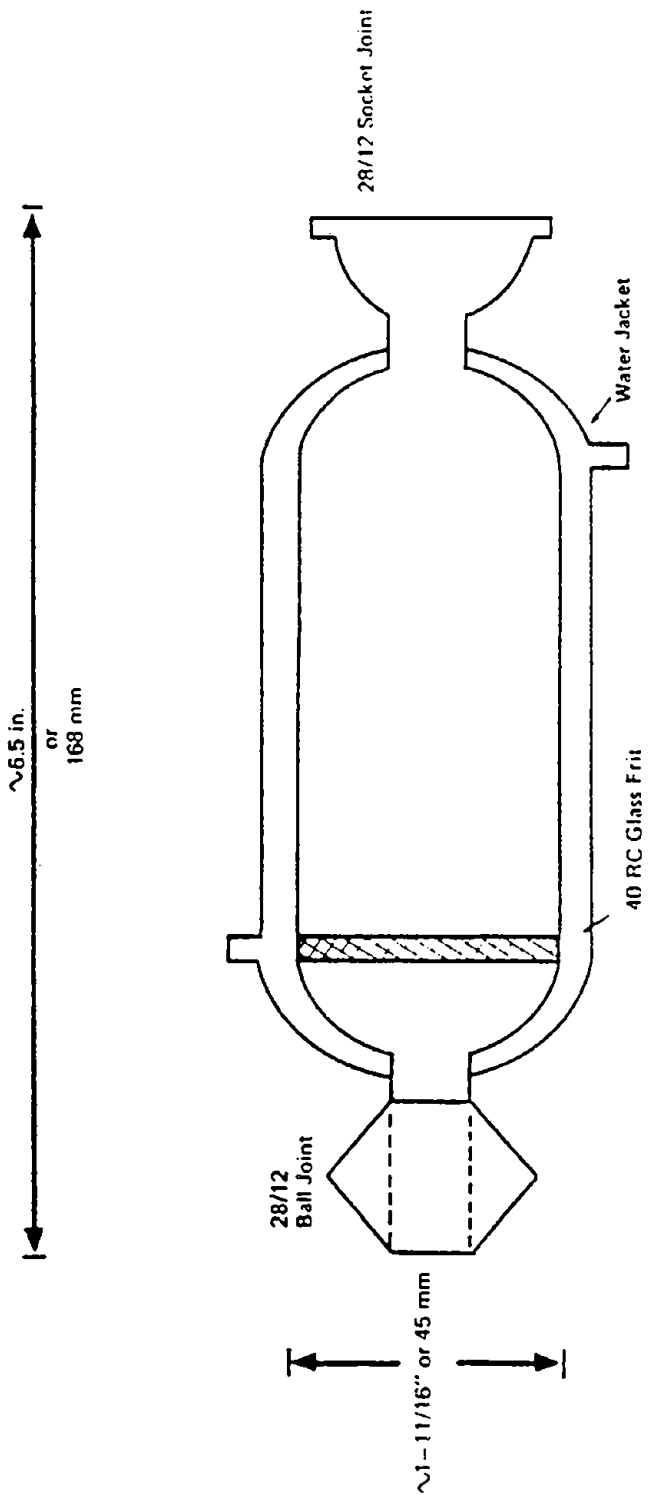


Figure 2. Adsorbent Sampling System.

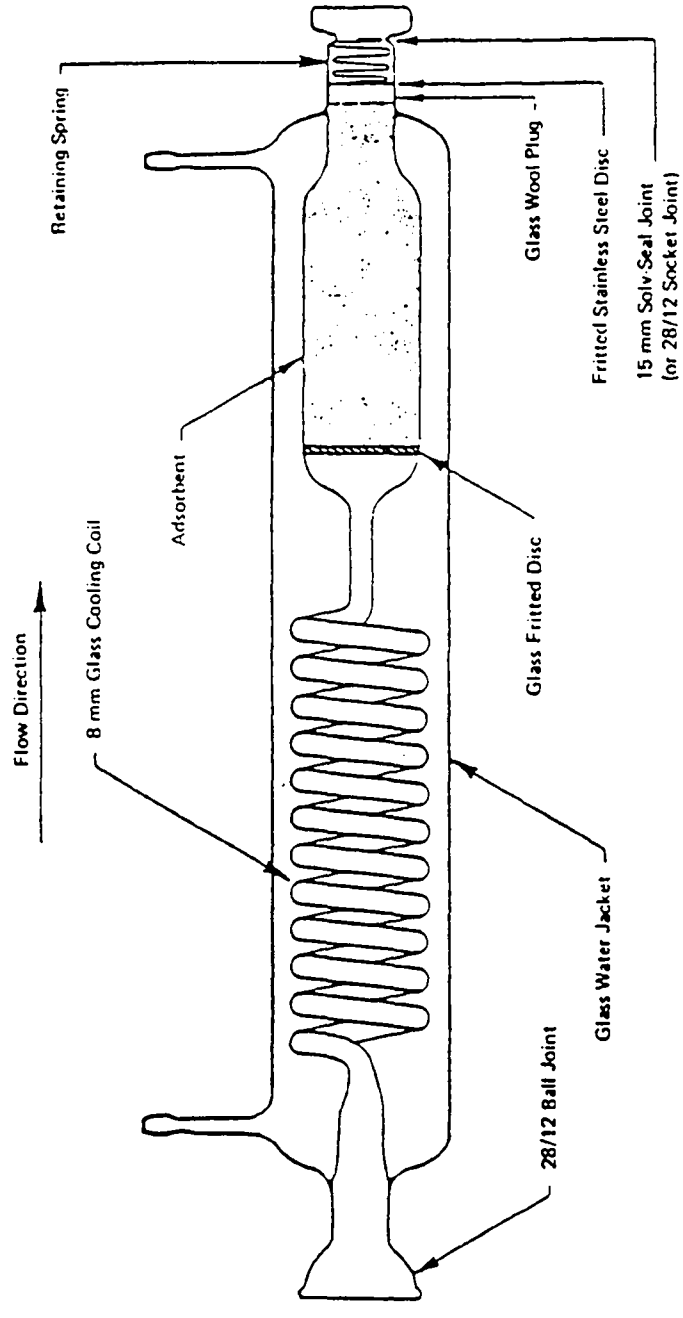


Figure 3. Adsorbent Sampling System.

Alternatively, the sensor may be attached just prior to use in the field. Note, however, that if the temperature sensor is attached in the field, the sensor must be placed in an interference-free arrangement with respect to the Type S pitot tube openings (see EPA Method 2, Figure 2-7). As a second alternative, if a difference of no more than 1% in the average velocity measurement is to be introduced, the temperature gauge need not be attached to the probe or pitot tube.

4.1.3.12 Calibration/field-preparation record: A permanently bound laboratory notebook, in which duplicate copies of data may be made as they are being recorded, is required for documenting and recording calibrations and preparation procedures (i.e., filter and silica gel tare weights, clean XAD-2, quality assurance/quality control check results, dry-gas meter, and thermocouple calibrations, etc.). The duplicate copies should be detachable and should be stored separately in the test program archives.

4.2 Sample Recovery:

4.2.1 **Probe liner:** Probe nozzle and organic module conditioning section brushes; nylon bristle brushes with stainless steel wire handles are required. The probe brush shall have extensions of stainless steel, Teflon, or inert material at least as long as the probe. The brushes shall be properly sized and shaped to brush out the probe liner, the probe nozzle, and the organic module conditioning section.

4.2.2 **Wash bottles:** Three. Teflon or glass wash bottles are recommended; polyethylene wash bottles should not be used because organic contaminants may be extracted by exposure to organic solvents used for sample recovery.

4.2.3 **Glass sample storage containers:** Chemically resistant, borosilicate amber and clear glass bottles, 500-mL or 1,000-mL. Bottles should be tinted to prevent action of light on sample. Screw-cap liners shall be either Teflon or constructed so as to be leak-free and resistant to chemical attack by organic recovery solvents. Narrow-mouth glass bottles have been found to exhibit less tendency toward leakage.

4.2.4 **Petri dishes:** Glass, sealed around the circumference with wide (1-in.) Teflon tape, for storage and transport of filter samples.

4.2.5 **Graduated cylinder and/or balances:** To measure condensed water to the nearest 1 mL or 1 g. Graduated cylinders shall have subdivisions not >2 mL. Laboratory triple-beam balances capable of weighing to ± 0.5 g or better are required.

4.2.6 **Plastic storage containers:** Screw-cap polypropylene or polyethylene containers to store silica gel.

4.2.7 **Funnel and rubber policeman:** To aid in transfer of silica gel to container (not necessary if silica gel is weighed in field).

4.2.8 Funnels: Glass, to aid in sample recovery.

4.3 Filters: Glass- or quartz-fiber filters, without organic binder, exhibiting at least 99.95% efficiency (<0.05% penetration) on 0.3-um dioctyl phthalate smoke particles. The filter efficiency test shall be conducted in accordance with ASTM standard method D2986-71. Test data from the supplier's quality control program are sufficient for this purpose. In sources containing SO_2 or SO_3, the filter material must be of a type that is unreactive to SO_2 or SO_3. Reeve Angel 934 AH or Schleicher and Schwell #3 filters work well under these conditions.

4.4 Crushed ice: Quantities ranging from 10-50 lb may be necessary during a sampling run, depending on ambient air temperature.

4.5 Stopcock grease: Solvent-insoluble, heat-stable silicone grease. Use of silicone grease upstream of the module is not permitted, and amounts used on components located downstream of the organic module shall be minimized. Silicone grease usage is not necessary if screw-on connectors and Teflon sleeves or ground-glass joints are used.

4.6 Glass wool: Used to plug the unfritted end of the sorbent module. The glass-wool fiber should be solvent-extracted with methylene chloride in a Soxhlet extractor for 12 hr and air-dried prior to use.

5.0 REAGENTS

5.1 Adsorbent resin: Porous polymeric resin (XAD-2 or equivalent) is recommended. These resins shall be cleaned prior to their use for sample collection. Appendix A of this method should be consulted to determine appropriate precleaning procedure. For best results, resin used should not exhibit a blank of higher than 4 mg/kg of total chromatographable organics (TCO) (see Appendix B) prior to use. Once cleaned, resin should be stored in an airtight, wide-mouth amber glass container with a Teflon-lined cap or placed in one of the glass sorbent modules tightly sealed with Teflon film and elastic bands. The resin should be used within 4 wk of the preparation.

5.2 Silica gel: Indicating type, 6-16 mesh. If previously used, dry at 175°C (350°F) for 2 hr before using. New silica gel may be used as received. Alternatively, other types of desiccants (equivalent or better) may be used, subject to the approval of the Administrator.

5.3 Impinger solutions: Distilled organic-free water (Type II) shall be used, unless sampling is intended to quantify a particular inorganic gaseous species. If sampling is intended to quantify the concentration of additional species, the impinger solution of choice shall be subject to Administrator approval. This water should be prescreened for any compounds of interest. One hundred mL will be added to the specified impinger; the third impinger in the train may be charged with a basic solution (1 N sodium hydroxide or sodium acetate) to protect the sampling pump from acidic gases. Sodium acetate should be used when large sample volumes are anticipated because sodium hydroxide will react with carbon dioxide in aqueous media to form sodium carbonate, which may possibly plug the impinger.

5.4 Sample recovery reagents:

5.4.1 Methylene chloride: Distilled-in-glass grade is required for sample recovery and cleanup (see Note to 5.4.2 below).

5.4.2 Methyl alcohol: Distilled-in-glass grade is required for sample recovery and cleanup.

NOTE: Organic solvents from metal containers may have a high residue blank and should not be used. Sometimes suppliers transfer solvents from metal to glass bottles; thus blanks shall be run prior to field use and only solvents with low blank value (<0.001%) shall be used.

5.4.3 Water: Water (Type II) shall be used for rinsing the organic module and condenser component.

6.0 SAMPLE COLLECTION, PRESERVATION, AND HANDLING

6.1 Because of complexity of this method, field personnel should be trained in and experienced with the test procedures in order to obtain reliable results.

6.2 Laboratory preparation:

6.2.1 All the components shall be maintained and calibrated according to the procedure described in APTD-0576, unless otherwise specified.

6.2.2 Weigh several 200- to 300-g portions of silica gel in airtight containers to the nearest 0.5 g. Record on each container the total weight of the silica gel plus containers. As an alternative to preweighing the silica gel, it may instead be weighed directly in the impinger or sampling holder just prior to train assembly.

6.2.3 Check filters visually against light for irregularities and flaws or pinhole leaks. Label the shipping containers (glass Petri dishes) and keep the filters in these containers at all times except during sampling and weighing.

6.2.4 Desiccate the filters at 20 ± 5.6°C (68 ± 10°F) and ambient pressure for at least 24 hr, and weigh at intervals of at least 6 hr to a constant weight (i.e., <0.5-mg change from previous weighing), recording results to the nearest 0.1 mg. During each weighing the filter must not be exposed for more than a 2-min period to the laboratory atmosphere and relative humidity above 50%. Alternatively (unless otherwise specified by the Administrator), the filters may be oven-dried at 105°C (220°F) for 2-3 hr, desiccated for 2 hr, and weighed.

6.3 Preliminary field determinations:

6.3.1 Select the sampling site and the minimum number of sampling points according to EPA Method 1 or as specified by the Administrator. Determine the stack pressure, temperature, and range of velocity heads using EPA Method 2. It is recommended that a leak-check of the pitot lines (see EPA Method 2, Section 3.1) be performed. Determine the stack-gas moisture content using EPA Approximation Method 4 or its alternatives to establish estimates of isokinetic sampling-rate settings. Determine the stack-gas dry molecular weight, as described in EPA Method 2, Section 3.6. If integrated EPA Method 3 sampling is used for molecular weight determination, the integrated bag sample shall be taken simultaneously with, and for the same total length of time as, the sample run.

6.3.2 Select a nozzle size based on the range of velocity heads so that it is not necessary to change the nozzle size in order to maintain isokinetic sampling rates. During the run, do not change the nozzle. Ensure that the proper differential pressure gauge is chosen for the range of velocity heads encountered (see Section 2.2 of EPA Method 2).

6.3.3 Select a suitable probe liner and probe length so that all traverse points can be sampled. For large stacks, to reduce the length of the probe, consider sampling from opposite sides of the stack.

6.3.4 A minimum of 3 dscm (105.9 dscf) of sample volume is required for the determination of the Destruction and Removal Efficiency (DRE) of POHCs from incineration systems. Additional sample volume shall be collected as necessitated by analytical detection limit constraints. To determine the minimum sample volume required, refer to sample calculations in Section 10.0.

6.3.5 Determine the total length of sampling time needed to obtain the identified minimum volume by comparing the anticipated average sampling rate with the volume requirement. Allocate the same time to all traverse points defined by EPA Method 1. To avoid timekeeping errors, the length of time sampled at each traverse point should be an integer or an integer plus one-half min.

6.3.6 In some circumstances (e.g., batch cycles) it may be necessary to sample for shorter times at the traverse points and to obtain smaller gas-sample volumes. In these cases, the Administrator's approval must first be obtained.

6.4 Preparation of collection train:

6.4.1 During preparation and assembly of the sampling train, keep all openings where contamination can occur covered with Teflon film or aluminum foil until just prior to assembly or until sampling is about to begin.

6.4.2 Fill the sorbent trap section of the organic module with approximately 20 g of clean adsorbent resin. While filling, ensure that the trap packs uniformly, to eliminate the possibility of channeling. When freshly cleaned, many adsorbent resins carry a static charge, which will cause clinging to trap walls. This may be minimized by filling the trap in the presence of an antistatic device. Commercial antistatic devices include Model-204 and Model-210 manufactured by the 3M Company, St. Paul, Minnesota.

6.4.3 If an impinger train is used to collect moisture, place 100 mL of water in each of the first two impingers, leave the third impinger empty (or charge with caustic solution, as necessary), and transfer approximately 200-300 g of preweighed silica gel from its container to the fourth impinger. More silica gel may be used, but care should be taken to ensure that it is not entrained and carried out from the impinger during sampling. Place the container in a clean place for later use in the sample recovery. Alternatively, the weight of the silica gel plus impinger may be determined to the nearest 0.5 g and recorded.

6.4.4 Using a tweezer or clean disposable surgical gloves, place a labeled (identified) and weighed filter in the filter holder. Be sure that the filter is properly centered and the gasket properly placed to prevent the sample gas stream from circumventing the filter. Check the filter for tears after assembly is completed.

6.4.5 When glass liners are used, install the selected nozzle using a Viton-A O-ring when stack temperatures are <260°C (500°F) and a woven glass-fiber gasket when temperatures are higher. See APTD-0576 (Rom, 1972) for details. Other connecting systems utilizing either 316 stainless steel or Teflon ferrules may be used. When metal liners are used, install the nozzle as above, or by a leak-free direct mechanical connection. Mark the probe with heat-resistant tape or by some other method to denote the proper distance into the stack or duct for each sampling point.

6.4.6 Set up the train as in Figure 1. During assembly, do not use any silicone grease on ground-glass joints that are located upstream of the organic module. A very light coating of silicone grease may be used on all ground-glass joints that are located downstream of the organic module, but it should be limited to the outer portion (see APTD-0576) of the ground-glass joints to minimize silicone-grease contamination. Subject to the approval of the Administrator, a glass cyclone may be used between the probe and the filter holder when the total particulate catch is expected to exceed 100 mg or when water droplets are present in the stack. The organic module condenser must be maintained at a temperature of 17 $\pm$ 3°C. Connect all temperature sensors to an appropriate potentiometer/display unit. Check all temperature sensors at ambient temperature.

6.4.7 Place crushed ice around the impingers and the organic module condensate knockout.

6.4.8 Turn on the sorbent module and condenser coil coolant recirculating pump and begin monitoring the sorbent module gas entry temperature. Ensure proper sorbent module gas entry temperature before proceeding and again before any sampling is initiated. It is extremely important that the XAD-2 resin temperature never exceed 50°C (122°F), because thermal decomposition will occur. During testing, the XAD-2 temperature must not exceed 20°C (68°F) for efficient capture of the semivolatile species of interest.

6.4.9 Turn on and set the filter and probe heating systems at the desired operating temperatures. Allow time for the temperatures to stabilize.

6.5 Leak-check procedures

6.5.1 Pre-test leak-check:

6.5.1.1 Because the number of additional intercomponent connections in the Semi-VOST train (over the M5 Train) increases the possibility of leakage, a pre-test leak-check is required.

6.5.1.2 After the sampling train has been assembled, turn on and set the filter and probe heating systems at the desired operating temperatures. Allow time for the temperatures to stabilize. If a Viton A O-ring or other leak-free connection is used in assembling the probe nozzle to the probe liner, leak-check the train at the sampling site by plugging the nozzle and pulling a 381-mm Hg (15-in. Hg) vacuum.
(NOTE: A lower vacuum may be used, provided that it is not exceeded during the test.)

6.5.1.3 If an asbestos string is used, do not connect the probe to the train during the leak-check. Instead, leak-check the train by first attaching a carbon-filled leak-check impinger (shown in Figure 4) to the inlet of the filter holder (cyclone, if applicable) and then plugging the inlet and pulling a 381-mm Hg (15-in. Hg) vacuum. (Again, a lower vacuum may be used, provided that it is not exceeded during the test.) Then, connect the probe to the train and leak-check at about 25-mm Hg (1-in. Hg) vacuum; alternatively, leak-check the probe with the rest of the sampling train in one step at 381-mm Hg (15-in. Hg) vacuum. Leakage rates in excess of 4% of the average sampling rate or >0.00057 m^3/min (0.02 cfm), whichever is less, are unacceptable.

6.5.1.4 The following leak-check instructions for the sampling train described in APTD-0576 and APTD-0581 may be helpful. Start the pump with fine-adjust valve fully open and coarse-adjust valve completely closed. Partially open the coarse-adjust valve and slowly close the fine-adjust valve until the desired vacuum is reached. Do not reverse direction of the fine-adjust valve; this will cause water to back up into the organic module. If the desired vacuum is exceeded, either leak-check at this higher vacuum or end the leak-check, as shown below, and start over.

CROSS SECTIONAL VIEW

Leak Testing Apparatus

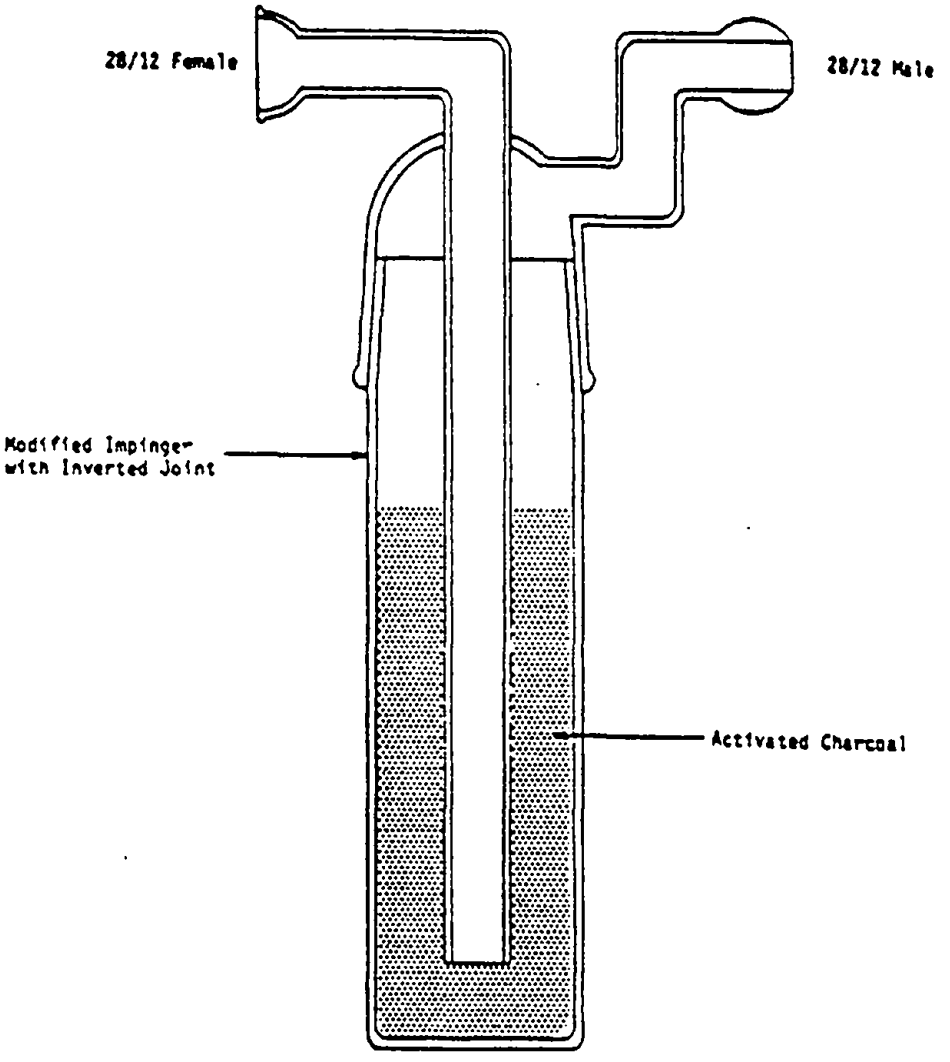


Figure 4. Leak-check impinger.

6.5.1.5 When the leak-check is completed, first slowly remove the plug from the inlet to the probe, filter holder, or cyclone (if applicable). When the vacuum drops to 127 mm (5 in.) Hg or less, immediately close the coarse-adjust valve. Switch off the pumping system and reopen the fine-adjust valve. Do not reopen the fine-adjust valve until the coarse-adjust valve has been closed. This prevents the water in the impingers from being forced backward into the organic module and silica gel from being entrained backward into the third impinger.

6.5.2 Leak-checks during sampling run:

6.5.2.1 If, during the sampling run, a component (e.g., filter assembly, impinger, or sorbent trap) change becomes necessary, a leak-check shall be conducted immediately after the interruption of sampling and before the change is made. The leak-check shall be done according to the procedure outlined in Paragraph 6.5.1, except that it shall be done at a vacuum greater than or equal to the maximum value recorded up to that point in the test. If the leakage rate is found to be no greater than 0.00057 m^3/min (0.02 cfm) or 4% of the average sampling rate (whichever is less), the results are acceptable, and no correction will need to be applied to the total volume of dry gas metered. If a higher leakage rate is obtained, the tester shall void the sampling run. (It should be noted that any "correction" of the sample volume by calculation reduces the integrity of the pollutant concentrations data generated and must be avoided.)

6.5.2.2 Immediately after a component change, and before sampling is reinitiated, a leak-check similar to a pre-test leak-check must also be conducted.

6.5.3 Post-test leak-check:

6.5.3.1 A leak-check is mandatory at the conclusion of each sampling run. The leak-check shall be done with the same procedures as those with the pre-test leak-check, except that it shall be conducted at a vacuum greater than or equal to the maximum value reached during the sampling run. If the leakage rate is found to be no greater than 0.00057 m^3/min (0.02 cfm) or 4% of the average sampling rate (whichever is less), the results are acceptable, and no correction need be applied to the total volume of dry gas metered. If, however, a higher leakage rate is obtained, the tester shall either record the leakage rate, correct the sample volume (as shown in the calculation section of this method), and consider the data obtained of questionable reliability, or void the sampling run.

6.6 Sampling-train operation:

6.6.1 During the sampling run, maintain an isokinetic sampling rate to within 10% of true isokinetic, unless otherwise specified by the Administrator. Maintain a temperature around the filter of 120 ± 14°C (248 ± 25°F) and a gas temperature entering the sorbent trap at a maximum of 20°C (68°F).

6.6.2 For each run, record the data required on a data sheet such as the one shown in Figure 5. Be sure to record the initial dry-gas meter reading. Record the dry-gas meter readings at the beginning and end of each sampling time increment, when changes in flow rates are made before and after each leak-check, and when sampling is halted. Take other readings required by Figure 5 at least once at each sample point during each time increment and additional readings when significant changes (20% variation in velocity-head readings) necessitate additional adjustments in flow rate. Level and zero the manometer. Because the manometer level and zero may drift due to vibrations and temperature changes, make periodic checks during the traverse.

6.6.3 Clean the stack access ports prior to the test run to eliminate the chance of sampling deposited material. To begin sampling, remove the nozzle cap, verify that the filter and probe heating systems are at the specified temperature, and verify that the pitot tube and probe are properly positioned. Position the nozzle at the first traverse point, with the tip pointing directly into the gas stream. Immediately start the pump and adjust the flow to isokinetic conditions. Nomographs, which aid in the rapid adjustment of the isokinetic sampling rate without excessive computations, are available. These nomographs are designed for use when the Type S pitot-tube coefficient is 0.84 $\pm$ 0.02 and the stack-gas equivalent density (dry molecular weight) is equal to 29 $\pm$ 4. APTD-0576 details the procedure for using the nomographs. If the stack-gas molecular weight and the pitot-tube coefficient are outside the above ranges, do not use the nomographs unless appropriate steps (Shigehara, 1974) are taken to compensate for the deviations.

6.6.4 When the stack is under significant negative pressure (equivalent to the height of the impinger stem), take care to close the coarse-adjust valve before inserting the probe into the stack, to prevent water from backing into the organic module. If necessary, the pump may be turned on with the coarse-adjust valve closed.

6.6.5 When the probe is in position, block off the openings around the probe and stack access port to prevent unrepresentative dilution of the gas stream.

6.6.6 Traverse the stack cross section, as required by EPA Method 1 or as specified by the Administrator, being careful not to bump the probe nozzle into the stack walls when sampling near the walls or when removing or inserting the probe through the access port, in order to minimize the chance of extracting deposited material.

6.6.7 During the test run, make periodic adjustments to keep the temperature around the filter holder and the organic module at the proper levels; add more ice and, if necessary, salt to maintain a temperature of <20°C (68°F) at the condenser/silica gel outlet. Also, periodically check the level and zero of the manometer.

Plant _____
Location _____
Operator _____
Date _____
Run No. _____
Sample Box No. _____
Meter Box No. _____
Meter ΔH _____
C Factor _____
Pitot Tube Coefficient C_p _____

Schematic of Stack Cross Section

Ambient Temperature _____
Barometric Pressure _____
Assumed Moisture % _____
Probe Length, m (ft) _____
Nozzle Identification No. _____
Average Calibrated Nozzle Diameter, cm (in) _____
Probe Heater Setting _____
Leak Rate, m^3/min, (cfm) _____
Probe Liner Material _____
Static Pressure, mm Hg (in. Hg) _____
Filter No. _____

Traverse Point Number	Sampling Time (θ) min.	Vacuum mm Hg (in. Hg)	Stack Temperature (T_s) °C(°F)	Velocity Head ($\sqrt{P_s}$) mm (in) H_2O	Pressure Differential Across Orifice Meter mm (H_2O) (in H_2O)	Gas Sample Volume m_3 (ft_3)	Gas Sample Temp. at Dry Gas Meter Inlet °C(°F)	Gas Sample Temp. at Dry Gas Meter Outlet °C(F°)	Filter Holder Temperature °C(F°)	Temperature of Gas Entering Sorbet Trap °C(F°)	Temperature of Gas Leaving Condenser or Last Impinger
Total							Avg.	Avg.			
Average											

Figure 5. Particulate field data.

6.6.8 If the pressure drop across the filter or sorbent trap becomes too high, making isokinetic sampling difficult to maintain, the filter/sorbent trap may be replaced in the midst of a sample run. Using another complete filter holder/sorbent trap assembly is recommended, rather than attempting to change the filter and resin themselves. After a new filter/sorbent trap assembly is installed, conduct a leak-check. The total particulate weight shall include the summation of all filter assembly catches.

6.6.9 A single train shall be used for the entire sample run, except in cases where simultaneous sampling is required in two or more separate ducts or at two or more different locations within the same duct, or in cases where equipment failure necessitates a change of trains. In all other situations, the use of two or more trains will be subject to the approval of the Administrator.

6.6.10 Note that when two or more trains are used, separate analysis of the front-half (if applicable) organic-module and impinger (if applicable) catches from each train shall be performed, unless identical nozzle sizes were used on all trains. In that case, the front-half catches from the individual trains may be combined (as may the impinger catches), and one analysis of front-half catch and one analysis of impinger catch may be performed.

6.6.11 At the end of the sample run, turn off the coarse-adjust valve, remove the probe and nozzle from the stack, turn off the pump, record the final dry-gas meter reading, and conduct a post-test leak-check. Also, leak-check the pitot lines as described in EPA Method 2. The lines must pass this leak-check in order to validate the velocity-head data.

6.6.12 Calculate percent isokineticity (see Section 10.8) to determine whether the run was valid or another test run should be made.

7.0 SAMPLE RECOVERY

7.1 Preparation:

7.1.1 Proper cleanup procedure begins as soon as the probe is removed from the stack at the end of the sampling period. Allow the probe to cool. When the probe can be safely handled, wipe off all external particulate matter near the tip of the probe nozzle and place a cap over the tip to prevent losing or gaining particulate matter. Do not cap the probe tip tightly while the sampling train is cooling down because this will create a vacuum in the filter holder, drawing water from the impingers into the sorbent module.

7.1.2 Before moving the sample train to the cleanup site, remove the probe from the sample train and cap the open outlet, being careful not to lose any condensate that might be present. Cap the filter inlet.

Remove the umbilical cord from the last impinger and cap the impinger. If a flexible line is used between the organic module and the filter holder, disconnect the line at the filter holder and let any condensed water or liquid drain into the organic module.

7.1.3 Cap the filter-holder outlet and the inlet to the organic module. Separate the sorbent trap section of the organic module from the condensate knockout trap and the gas-conditioning section. Cap all organic module openings. Disconnect the organic-module knockout trap from the impinger train inlet and cap both of these openings. Ground-glass stoppers, Teflon caps, or caps of other inert materials may be used to seal all openings.

7.1.4 Transfer the probe, the filter, the organic-module components, and the impinger/condenser assembly to the cleanup area. This area should be clean and protected from the weather to minimize sample contamination or loss.

7.1.5 Save a portion of all washing solutions (methanol/methylene chloride, Type II water) used for cleanup as a blank. Transfer 200 mL of each solution directly from the wash bottle being used and place each in a separate, prelabeled glass sample container.

7.1.6 Inspect the train prior to and during disassembly and note any abnormal conditions.

7.2 Sample containers:

7.2.1 **Container no. 1:** Carefully remove the filter from the filter holder and place it in its identified Petri dish container. Use a pair or pairs of tweezers to handle the filter. If it is necessary to fold the filter, ensure that the particulate cake is inside the fold. Carefully transfer to the Petri dish any particulate matter or filter fibers that adhere to the filter-holder gasket, using a dry nylon bristle brush or sharp-edged blade, or both. Label the container and seal with 1-in.-wide Teflon tape around the circumference of the lid.

7.2.2 **Container no. 2:** Taking care that dust on the outside of the probe or other exterior surfaces does not get into the sample, quantitatively recover particulate matter or any condensate from the probe nozzle, probe fitting, probe liner, and front half of the filter holder by washing these components first with methanol/methylene chloride (1:1 v/v) into a glass container. Distilled water may also be used. Retain a water and solvent blank and analyze in the same manner as with the samples. Perform rinses as follows:

7.2.2.1 Carefully remove the probe nozzle and clean the inside surface by rinsing with the solvent mixture (1:1 v/v methanol/-methylene chloride) from a wash bottle and brushing with a nylon bristle brush. Brush until the rinse shows no visible particles; then make a final rinse of the inside surface with the solvent mix. Brush and rinse the inside parts of the Swagelok fitting with the solvent mix in a similar way until no visible particles remain.

7.2.2.2 Have two people rinse the probe liner with the solvent mix by tilting and rotating the probe while squirting solvent into its upper end so that all inside surfaces will be wetted with solvent. Let the solvent drain from the lower end into the sample container. A glass funnel may be used to aid in transferring liquid washes to the container.

7.2.2.3 Follow the solvent rinse with a probe brush. Hold the probe in an inclined position and squirt solvent into the upper end while pushing the probe brush through the probe with a twisting action; place a sample container underneath the lower end of the probe and catch any solvent and particulate matter that is brushed from the probe. Run the brush through the probe three times or more until no visible particulate matter is carried out with the solvent or until none remains in the probe liner on visual inspection. With stainless steel or other metal probes, run the brush through in the above-prescribed manner at least six times (metal probes have small crevices in which particulate matter can be entrapped). Rinse the brush with solvent and quantitatively collect these washings in the sample container. After the brushing, make a final solvent rinse of the probe as described above.

7.2.2.4 It is recommended that two people work together to clean the probe to minimize sample losses. Between sampling runs, keep brushes clean and protected from contamination.

7.2.2.5 Clean the inside of the front half of the filter holder and cyclone/cyclone flask, if used, by rubbing the surfaces with a nylon bristle brush and rinsing with methanol/methylene chloride (1:1 v/v) mixture. Rinse each surface three times or more if needed to remove visible particulate. Make a final rinse of the brush and filter holder. Carefully rinse out the glass cyclone and cyclone flask (if applicable). Brush and rinse any particulate material adhering to the inner surfaces of these components into the front-half rinse sample. After all solvent washings and particulate matter have been collected in the sample container, tighten the lid on the sample container so that solvent will not leak out when it is shipped to the laboratory. Mark the height of the fluid level to determine whether leakage occurs during transport. Label the container to identify its contents.

7.2.3 **Container no. 3:** The sorbent trap section of the organic module may be used as a sample transport container, or the spent resin may be transferred to a separate glass bottle for shipment. If the sorbent trap itself is used as the transport container, both ends should be sealed with tightly fitting caps or plugs. Ground-glass stoppers or Teflon caps may be used. The sorbent trap should then be labeled, covered with aluminum foil, and packaged on ice for transport to the laboratory. If a separate bottle is used, the spent resin should be quantitatively transferred from the trap into the clean bottle. Resin that adheres to the walls of the trap should be recovered using a rubber policeman or spatula and added to this bottle.

7.2.4 Container no. 4: Measure the volume of condensate collected in the condensate knockout section of the organic module to within ±1 mL by using a graduated cylinder or by weighing to within ±0.5 g using a triple-beam balance. Record the volume or weight of liquid present and note any discoloration or film in the liquid catch. Transfer this liquid to a prelabeled glass sample container. Inspect the back half of the filter housing and the gas-conditioning section of the organic module. If condensate is observed, transfer it to a graduated or weighing bottle and measure the volume, as described above. Add this material to the condensate knockout-trap catch.

7.2.5 Container no. 5: All sampling train components located between the high-efficiency glass- or quartz-fiber filter and the first wet impinger or the final condenser system (including the heated Teflon line connecting the filter outlet to the condenser) should be thoroughly rinsed with methanol/methylene chloride (1:1 v/v) and the rinsings combined. This rinse shall be separated from the condensate. If the spent resin is transferred from the sorbent trap to a separate sample container for transport, the sorbent trap shall be thoroughly rinsed until all sample-wetted surfaces appear clean. Visible films should be removed by brushing. Whenever train components are brushed, the brush should be subsequently rinsed with solvent mixture and the rinsings added to this container.

7.2.6 Container no. 6: Note the color of the indicating silica gel to determine if it has been completely spent and make a notation of its condition. Transfer the silica gel from the fourth impinger to its original container and seal. A funnel may make it easier to pour the silica gel without spilling. A rubber policeman may be used as an aid in removing the silica gel from the impinger. It is not necessary to remove the small amount of dust particles that may adhere strongly to the impinger wall. Because the gain in weight is to be used for moisture calculations, do not use any water or other liquids to transfer the silica gel. If a balance is available in the field, weigh the container and its contents to 0.5 g or better.

7.3 Impinger water:

7.3.1 Make a notation of any color or film in the liquid catch. Measure the liquid in the first three impingers to within ±1 mL by using a graduated cylinder or by weighing it to within ±0.5 g by using a balance (if one is available). Record the volume or weight of liquid present. This information is required to calculate the moisture content of the effluent gas.

7.3.2 Discard the liquid after measuring and recording the volume or weight, unless analysis of the impinger catch is required (see Paragraph 4.1.3.7). Amber glass containers should be used for storage of impinger catch, if required.

7.3.3 If a different type of condenser is used, measure the amount of moisture condensed either volumetrically or gravimetrically.

7.4 Sample preparation for shipment: Prior to shipment, recheck all sample containers to ensure that the caps are well secured. Seal the lids of all containers around the circumference with Teflon tape. Ship all liquid samples upright on ice and all particulate filters with the particulate catch facing upward. The particulate filters should be shipped unrefrigerated.

8.0 ANALYSIS

8.1 Sample preparation:

8.1.1 General: The preparation steps for all samples will result in a finite volume of concentrated solvent. The final sample volume (usually in the 1- to 10-mL range) is then subjected to analysis by GC/MS. All samples should be inspected and the appearance documented. All samples are to be spiked with surrogate standards as received from the field prior to any sample manipulations. The spike should be at a level equivalent to 10 times the MDL when the solvent is reduced in volume to the desired level (i.e., 10 mL). The spiking compounds should be the stable isotopically labeled analog of the compounds of interest or a compound that would exhibit properties similar to the compounds of interest, be easily chromatographed, and not interfere with the analysis of the compounds of interest. Suggested surrogate spiking compounds are: deuterated naphthalene, chrysene, phenol, nitrobenzene, chlorobenzene, toluene, and carbon-13-labeled pentachlorophenol.

8.1.2 Condensate: The "condensate" is the moisture collected in the first impinger following the XAD-2 module. Spike the condensate with the surrogate standards. The volume is measured and recorded and then transferred to a separatory funnel. The pH is to be adjusted to pH 2 with 6 N sulfuric acid, if necessary. The sample container and graduated cylinder are sequentially rinsed with three successive 10-mL aliquots of the extraction solvent and added to the separatory funnel. The ratio of solvent to aqueous sample should be maintained at 1:3. Extract the sample by vigorously shaking the separatory funnel for 5 min. After complete separation of the phases, remove the solvent and transfer to a Kuderna-Danish concentrator (K-D), filtering through a bed of precleaned, dry sodium sulfate. Repeat the extraction step two additional times. Adjust the pH to 11 with 6 N sodium hydroxide and reextract combining the acid and base extracts. Rinse the sodium sulfate into the K-D with fresh solvent and discard the desiccant. Add Teflon boiling chips and concentrate to 10 mL by reducing the volume to slightly less than 10 mL and then bringing to volume with fresh solvent. In order to achieve the necessary detection limit, the sample volume can be further reduced to 1 mL by using a micro column K-D or nitrogen blow-down. Should the sample start to exhibit precipitation, the concentration step should be stopped and the sample redissolved with fresh solvent taking the volume to some finite amount. After adding a standard (for the purpose of quantitation by GC/MS), the sample is ready for analysis, as discussed in Paragraph 8.2.

8.1.3 **Impinger:** Spike the sample with the surrogate standards; measure and record the volume and transfer to a separatory funnel. Proceed as described in Paragraph 8.1.2.

8.1.4 **XAD-2:** Spike the resin directly with the surrogate standards. Transfer the resin to the all-glass thimbles by the following procedure (care should be taken so as not to contaminate the thimble by touching it with anything other than tweezers or other solvent-rinsed mechanical holding devices). Suspend the XAD-2 module directly over the thimble. The glass frit of the module (see Figure 2) should be in the up position. The thimble is contained in a clean beaker, which will serve to catch the solvent rinses. Using a Teflon squeeze bottle, flush the XAD-2 into the thimble. Thoroughly rinse the glass module with solvent into the beaker containing the thimble. Add the XAD-2 glass-wool plug to the thimble. Cover the XAD-2 in the thimble with a precleaned glass-wool plug sufficient to prevent the resin from floating into the solvent reservoir of the extractor. If the resin is wet, effective extraction can be accomplished by loosely packing the resin in the thimble. If a question arises concerning the completeness of the extraction, a second extraction, without a spike, is advised. The thimble is placed in the extractor and the rinse solvent contained in the beaker is added to the solvent reservoir. Additional solvent is added to make the reservoir approximately two-thirds full. Add Teflon boiling chips and assemble the apparatus. Adjust the heat source to cause the extractor to cycle 5-6 times per hr. Extract the resin for 16 hr. Transfer the solvent and three 10-mL rinses of the reservoir to a K-D and concentrate as described in Paragraph 8.1.2.

8.1.5 **Particulate filter (and cyclone catch):** If particulate loading is to be determined, weigh the filter (and cyclone catch, if applicable). The particulate filter (and cyclone catch, if applicable) is transferred to the glass thimble and extracted simultaneously with the XAD-2 resin.

8.1.6 **Train solvent rinses:** All train rinses (i.e., probe, impinger, filter housing) using the extraction solvent and methanol are returned to the laboratory as a single sample. If the rinses are contained in more than one container, the intended spike is divided equally among the containers proportioned from a single syringe volume. Transfer the rinse to a separatory funnel and add a sufficient amount of organic-free water so that the methylene chloride becomes immiscible and its volume no longer increases with the addition of more water. The extraction and concentration steps are then performed as described in Paragraph 8.1.2.

8.2 Sample analysis:

8.2.1 The primary analytical tool for the measurement of emissions from hazardous waste incinerators is GC/MS using fused-silica capillary GC columns, as described in Method 8270 in Chapter Four of this manual. Because of the nature of GC/MS instrumentation and the cost associated

with sample analysis, prescreening of the sample extracts by gas chromatography/flame ionization detection (GC/FID) or with electron capture (GC/ECD) is encouraged. Information regarding the complexity and concentration level of a sample prior to GC/MS analysis can be of enormous help. This information can be obtained by using either capillary columns or less expensive packed columns. However, the FID screen should be performed with a column similar to that used with the GC/MS. Keep in mind that GC/FID has a slightly lower detection limit than GC/MS and, therefore, that the concentration of the sample can be adjusted either up or down prior to analysis by GC/MS.

8.2.2 The mass spectrometer will be operated in a full scan (40-450) mode for most of the analyses. The range for which data are acquired in a GC/MS run will be sufficiently broad to encompass the major ions, as listed in Chapter Four, Method 8270, for each of the designated POHCs in an incinerator effluent analysis.

8.2.3 For most purposes, electron ionization (EI) spectra will be collected because a majority of the POHCs give reasonable EI spectra. Also, EI spectra are compatible with the NBS Library of Mass Spectra and other mass spectral references, which aid in the identification process for other components in the incinerator process streams.

8.2.4 To clarify some identifications, chemical ionization (CI) spectra using either positive ions or negative ions will be used to elucidate molecular-weight information and simplify the fragmentation patterns of some compounds. In no case, however, should CI spectra alone be used for compound identification. Refer to Chapter Four, Method 8270, for complete descriptions of GC conditions, MS conditions, and quantitative and quantitative identification.

9.0 CALIBRATION

9.1 Probe nozzle: Probe nozzles shall be calibrated before their initial use in the field. Using a micrometer, measure the inside diameter of the nozzle to the nearest 0.025 mm (0.001 in.). Make measurements at three separate places across the diameter and obtain the average of the measurements. The difference between the high and low numbers shall not exceed 0.1 mm (0.004 in.). When nozzles become nicked, dented, or corroded, they shall be reshaped, sharpened, and recalibrated before use. Each nozzle shall be permanently and uniquely identified.

9.2 Pitot tube: The Type S pitot tube assembly shall be calibrated according to the procedure outlined in Section 4 of EPA Method 2, or assigned a nominal coefficient of 0.84 if it is not visibly nicked, dented, or corroded and if it meets design and intercomponent spacing specifications.

9.3 Metering system:

9.3.1 Before its initial use in the field, the metering system shall be calibrated according to the procedure outlined in APTD-0576. Instead of physically adjusting the dry-gas meter dial readings to correspond to the wet-test meter readings, calibration factors may be used to correct the gas meter dial readings mathematically to the proper values. Before calibrating the metering system, it is suggested that a leak-check be conducted. For metering systems having diaphragm pumps, the normal leak-check procedure will not detect leakages within the pump. For these cases the following leak-check procedure is suggested: Make a 10-min calibration run at 0.00057 m^3/min (0.02 cfm); at the end of the run, take the difference of the measured wet-test and dry-gas meter volumes and divide the difference by 10 to get the leak rate. The leak rate should not exceed 0.00057 m^3/min (0.02 cfm).

9.3.2 After each field use, the calibration of the metering system shall be checked by performing three calibration runs at a single intermediate orifice setting (based on the previous field test). The vacuum shall be set at the maximum value reached during the test series. To adjust the vacuum, insert a valve between the wet-test meter and the inlet of the metering system. Calculate the average value of the calibration factor. If the calibration has changed by more than 5%, recalibrate the meter over the full range of orifice settings, as outlined in APTD-0576.

9.3.3 Leak-check of metering system: That portion of the sampling train from the pump to the orifice meter (see Figure 1) should be leak-checked prior to initial use and after each shipment. Leakage after the pump will result in less volume being recorded than is actually sampled. The following procedure is suggested (see Figure 6): Close the main valve on the meter box. Insert a one-hole rubber stopper with rubber tubing attached into the orifice exhaust pipe. Disconnect and vent the low side of the orifice manometer. Close off the low side orifice tap. Pressurize the system to 13-18 cm (5-7 in.) water column by blowing into the rubber tubing. Pinch off the tubing and observe the manometer for 1 min. A loss of pressure on the manometer indicates a leak in the meter box. Leaks, if present, must be corrected.

NOTE: If the dry-gas-meter coefficient values obtained before and after a test series differ by >5%, either the test series shall be voided or calculations for test series shall be performed using whichever meter coefficient value (i.e., before or after) gives the lower value of total sample volume.

9.4 Probe heater: The probe-heating system shall be calibrated before its initial use in the field according to the procedure outlined in APTD-0576. Probes constructed according to APTD-0581 need not be calibrated if the calibration curves in APTD-0576 are used.

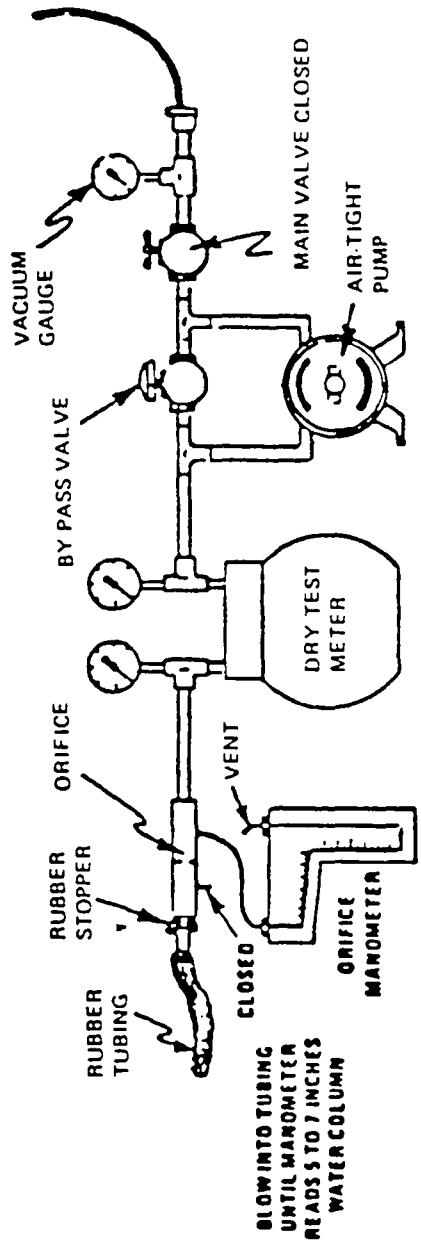


Figure 6. Leak check of meter box.

9.5 Temperature gauges: Each thermocouple must be permanently and uniquely marked on the casting; all mercury-in-glass reference thermometers must conform to ASTM E-1 63C or 63F specifications. Thermocouples should be calibrated in the laboratory with and without the use of extension leads. If extension leads are used in the field, the thermocouple readings at ambient air temperatures, with and without the extension lead, must be noted and recorded. Correction is necessary if the use of an extension lead produces a change >1.5%.

9.5.1 Impinger, organic module, and dry-gas meter thermocouples: For the thermocouples used to measure the temperature of the gas leaving the impinger train and the XAD-2 resin bed, three-point calibration at ice-water, room-air, and boiling-water temperatures is necessary. Accept the thermocouples only if the readings at all three temperatures agree to ±2°C (3.6°F) with those of the absolute value of the reference thermometer.

9.5.2 Probe and stack thermocouple: For the thermocouples used to indicate the probe and stack temperatures, a three-point calibration at ice-water, boiling-water, and hot-oil-bath temperatures must be performed; it is recommended that room-air temperature be added, and that the thermometer and the thermocouple agree to within 1.5% at each of the calibration points. A calibration curve (equation) may be constructed (calculated) and the data extrapolated to cover the entire temperature range suggested by the manufacturer.

9.6 Barometer: Adjust the barometer initially and before each test series to agree to within ±25 mm Hg (0.1 in. Hg) of the mercury barometer or the corrected barometric pressure value reported by a nearby National Weather Service Station (same altitude above sea level).

9.7 Triple-beam balance: Calibrate the triple-beam balance before each test series, using Class-S standard weights; the weights must be within ±0.5% of the standards, or the balance must be adjusted to meet these limits.

10.0 CALCULATIONS

10.1 Carry out calculations. Round off figures after the final calculation to the correct number of significant figures.

10.2 Nomenclature:

A_n = Cross-sectional area of nozzle, m^2 (ft^2).

B_{ws} = Water vapor in the gas stream, proportion by volume.

C_d = Type S pitot tube coefficient (nominally 0.84 ± 0.02), dimensionless.

I = Percent of isokinetic sampling.

L_a = Maximum acceptable leakage rate for a leak-check, either pre-test or following a component change; equal to 0.00057 m^3/min (0.02 cfm) or 4% of the average sampling rate, whichever is less.

L_i = Individual leakage rate observed during the leak-check conducted prior to the "i^{th}" component change (i = 1, 2, 3...n) m^3/min (cfm).

L_p = Leakage rate observed during the post-test leak-check, m^3/min (cfm).

M_d = Stack-gas dry molecular weight, g/g-mole (lb/lb-mole).

M_w = Molecular weight of water, 18.0 g/g-mole (18.0 lb/lb-mole).

P_{bar} = Barometric pressure at the sampling site, mm Hg (in. Hg).

P_s = Absolute stack-gas pressure, mm Hg (in. Hg).

P_{std} = Standard absolute pressure, 760 mm Hg (29.92 in. Hg).

R = Ideal gas constant, 0.06236 mm Hg-m^3/K-g-mole (21.85 in. Hg-ft^3/°R-lb-mole).

T_m = Absolute average dry-gas meter temperature (see Figure 6), K (°R).

T_s = Absolute average stack-gas temperature (see Figure 6), K (°R).

T_{std} = Standard absolute temperature, 293K (528°R).

V_{lc} = Total volume of liquid collected in the organic module condensate knockout trap, the impingers, and silica gel, mL.

V_m = Volume of gas sample as measured by dry-gas meter, dscm (dscf).

$V_{m(std)}$ = Volume of gas sample measured by the dry-gas meter, corrected to standard conditions, dscm (dscf).

$V_{w(std)}$ = Volume of water vapor in the gas sample, corrected to standard conditions, scm (scf).

V_s = Stack-gas velocity, calculated by Method 2, Equation 2-9, using data obtained from Method 5, m/sec (ft/sec).

W_a = Weight of residue in acetone wash, mg.

γ = Dry-gas-meter calibration factor, dimensionless.

ΔH = Average pressure differential across the orifice meter (see Figure 2), mm H_2O (in. H_2O).

ρ_w = Density of water, 0.9982 g/mL (0.002201 lb/mL).

θ = Total sampling time, min.

θ_1 = Sampling time interval from the beginning of a run until the first component change, min.

θ_i = Sampling time interval between two successive component changes, beginning with the interval between the first and second changes, min.

θ_p = Sampling time interval from the final (n^{th}) component change until the end of the sampling run, min.

13.6 = Specific gravity of mercury.

60 = sec/min.

100 = Conversion to percent.

10.3 Average dry-gas-meter temperature and average orifice pressure drop: See data sheet (Figure 5, above).

10.4 Dry-gas volume: Correct the sample measured by the dry-gas meter to standard conditions (20°C, 760 mm Hg [68°F, 29.92 in. Hg]) by using Equation 1:

$$V_{m(std)} = V_m \gamma \frac{T_{std}}{T_m} \frac{P_{bar} + \Delta H/13.6}{P_{std}} = K_1 V_m \gamma \frac{P_{bar} + \Delta H/13.6}{T_m} \qquad (1)$$

where:

K_1 = 0.3858 K/mm Hg for metric units, or
K_1 = 17.64°R/in. Hg for English units.

It should be noted that Equation 1 can be used as written, unless the leakage rate observed during any of the mandatory leak-checks (i.e., the post-test leak-check or leak-checks conducted prior to component changes) exceeds L_a. If L_p or L_i exceeds L_a, Equation 1 must be modified as follows:

a. Case I (no component changes made during sampling run): Replace V_m in Equation 1 with the expression:

$$V_m - (L_p - L_a)$$

b. Case II (one or more component changes made during the sampling run): Replace V_m in Equation 1 by the expression:

$$V_m - (L_1 - L_a)\theta_1 - \sum_{i=2}^{n} (L_i - L_a)\theta_1 - (L_p - L_a)\theta_p$$

and substitute only for those leakage rates (L_1 or L_p) that exceed L_a.

10.5 Volume of water vapor:

$$V_{w(std)} = V_{lc} \frac{P_w}{M_w} \frac{RT_{std}}{P_{std}} = K_2 V_{lc} \quad (2)$$

where:

K_2 = 0.001333 m^3/mL for metric units, or
K_2 = 0.04707 ft^3/mL for English units.

10.6 Moisture content:

$$B_{ws} = \frac{V_{w(std)}}{V_{m(std)} + V_{w(std)}} \quad (3)$$

NOTE: In saturated or water-droplet-laden gas streams, two calculations of the moisture content of the stack gas shall be made, one from the impinger analysis (Equation 3) and a second from the assumption of saturated conditions. The lower of the two values of B_w shall be considered correct. The procedure for determining the moisture content based upon assumption of saturated conditions is given in the Note to Section 1.2 of Method 4. For the purposes of this method, the average stack-gas temperature from Figure 6 may be used to make this determination, provided that the accuracy of the in-stack temperature sensor is ±1°C (2°F).

10.7 Conversion factors:

From	To	Multiply by
scf	m^3	0.02832
g/ft^3	gr/ft^3	15.43
g/ft^3	lb/ft^3	2.205×10^{-3}
g/ft^3	g/m^3	35.31

10.8 Isokinetic variation:

10.8.1 Calculation from raw data:

$$I = \frac{100\ T_s[K_3 F_{1c} + (V_m/T_m)\ (P_{bar} + \Delta H/13.6)]}{60\theta V_s P_s A_n} \qquad (4)$$

where:

K_3 = 0.003454 mm Hg-m^3/mL-K for metric units, or
K_3 = 0.002669 in. Hg-ft^3/mL-°R for English units.

10.8.2 Calculation for intermediate values:

$$I = \frac{T_s V_{m(std)} P_{std} 100}{T_{std} V_s \theta A_n P_s 60(1-B_{ws})} = K_4 \frac{T_s V_{m(std)}}{P_s V_s A_n \theta (1-B_{ws})} \qquad (5)$$

where:

K_4 = 4.320 for metric units, or
K_4 = 0.09450 for English units.

10.8.3 Acceptable results: If 90% $\leq$ I $\leq$ 110%, the results are acceptable. If the results are low in comparison with the standard and I is beyond the acceptable range, or if I is less than 90%, the Administrator may opt to accept the results.

10.9 To determine the minimum sample volume that shall be collected, the following sequence of calculations shall be used.

10.9.1 From prior analysis of the waste feed, the concentration of POHCs introduced into the combustion system can be calculated. The degree of destruction and removal efficiency that is required is used to determine the maximum amount of POHC allowed to be present in the effluent. This may be expressed as:

$$\frac{(WF)\ (POHC_i\ conc)}{100}\ \frac{(100-\%DRE)}{100} = \text{Max } POHC_i \text{ Mass} \qquad (6)$$

where:

WF = mass flow rate of waste feed per hr, g/hr (lb/hr).

$POHC_i$ = concentration of Principal Organic Hazardous Compound (wt %) introduced into the combustion process.

DRE = percent Destruction and Removal Efficiency required.

Max POHC = mass flow rate (g/hr [lb/hr]) of POHC emitted from the combustion source.

10.9.2 The average discharge concentration of the POHC in the effluent gas is determined by comparing the Max POHC with the volumetric flow rate being exhausted from the source. Volumetric flow rate data are available as a result of preliminary Method 1-4 determinations:

$$\frac{\text{Max POHC}_1 \text{ Mass}}{DV_{eff(std)}} = \text{Max POHC}_1 \text{ conc} \qquad (7)$$

where:

$DV_{eff(std)}$ = volumetric flow rate of exhaust gas, dscm (dscf).

$POHC_1$ conc = anticipated concentration of the POHC in the exhaust gas stream, g/dscm (lb/dscf).

10.9.3 In making this calculation, it is recommended that a safety margin of at least ten be included:

$$\frac{LDL_{POHC} \times 10}{POHC_1 \text{ conc}} = V_{TBC} \qquad (8)$$

where:

LDL_{POHC} = detectable amount of POHC in entire sampling train.
NOTE: The whole extract from an XAD-2 cartridge is seldom if ever, injected at once. Therefore, if aliquoting factors are involved, the LDL_{POHC} is not the same as the analytical (or column) detection limit.

V_{TBC} = minimum dry standard volume to be collected at dry-gas meter.

10.10 Concentration of any given POHC in the gaseous emissions of a combustion process:

1) Multiply the concentration of the POHC as determined in Method 8270 by the final concentration volume, typically 10 mL.

C_{POHC} (ug/mL) x sample volume (mL) = amount (ug) of POHC in sample (9)

where:

C_{POHC} = concentration of POHC as analyzed by Method 8270.

2) Sum the amount of POHC found in all samples associated with a single train.

Total (ug) = XAD-2 (ug) + condensate (ug) + rinses (ug) + impinger (ug) (10)

3) Divide the total ug found by the volume of stack gas sampled (m^3).

(Total ug)/(train sample volume) = concentration of POHC (ug/m^3) (11)

11.0 QUALITY CONTROL

11.1 Sampling: See EPA Manual 600/4-77-027b for Method 5 quality control.

11.2 Analysis: The quality assurance program required for this study includes the analysis of field and method blanks, procedure validations, incorporation of stable labeled surrogate compounds, quantitation versus stable labeled internal standards, capillary column performance checks, and external performance tests. The surrogate spiking compounds selected for a particular analysis are used as primary indicators of the quality of the analytical data for a wide range of compounds and a variety of sample matrices. The assessment of combustion data, positive identification, and quantitation of the selected compounds are dependent on the integrity of the samples received and the precision and accuracy of the analytical methods employed. The quality assurance procedures for this method are designed to monitor the performance of the analytical method and to provide the required information to take corrective action if problems are observed in laboratory operations or in field sampling activities.

11.2.1 Field Blanks: Field blanks must be submitted with the samples collected at each sampling site. The field blanks include the sample bottles containing aliquots of sample recovery solvents, unused filters, and resin cartridges. At a minimum, one complete sampling train will be assembled in the field staging area, taken to the sampling area, and leak-checked at the beginning and end of the testing (or for the same total number of times as the actual test train). The filter housing and probe of the blank train will be heated during the sample test. The train will be recovered as if it were an actual test sample. No gaseous sample will be passed through the sampling train.

11.2.2 Method blanks: A method blank must be prepared for each set of analytical operations, to evaluate contamination and artifacts that can be derived from glassware, reagents, and sample handling in the laboratory.

11.2.3 Refer to Method 8270 for additional quality control considerations.

12.0 METHOD PERFORMANCE

12.1 Method performance evaluation: Evaluation of analytical procedures for a selected series of compounds must include the sample-preparation procedures and each associated analytical determination. The analytical procedures should be challenged by the test compounds spiked at appropriate levels and carried through the procedures.

12.2 Method detection limit: The overall method detection limits (lower and upper) must be determined on a compound-by-compound basis because different compounds may exhibit different collection, retention, and extraction efficiencies as well as instrumental minimum detection limit (MDL). The method detection limit must be quoted relative to a given sample volume. The upper limits for the method must be determined relative to compound retention volumes (breakthrough).

12.3 Method precision and bias: The overall method precision and bias must be determined on a compound-by-compound basis at a given concentration level. The method precision value would include a combined variability due to sampling, sample preparation, and instrumental analysis. The method bias would be dependent upon the collection, retention, and extraction efficiency of the train components. From evaluation studies to date using a dynamic spiking system, method biases of -13% and -16% have been determined for toluene and 1,1,2,2-tetrachloroethane, respectively. A precision of 19.9% was calculated from a field test data set representing seven degrees of freedom which resulted from a series of paired, unspiked Semivolatile Organic Sampling trains (Semi-VOST) sampling emissions from a hazardous waste incinerator.

13.0 REFERENCES

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METHOD 0010, APPENDIX A

PREPARATION OF XAD-2 SORBENT RESIN

1.0 SCOPE AND APPLICATION

1.1 XAD-2 resin as supplied by the manufacturer is impregnated with a bicarbonate solution to inhibit microbial growth during storage. Both the salt solution and any residual extractable monomer and polymer species must be removed before use. The resin is prepared by a series of water and organic extractions, followed by careful drying.

2.0 EXTRACTION

2.1 Method 1: The procedure may be carried out in a giant Soxhlet extractor. An all-glass thimble containing an extra-coarse frit is used for extraction of XAD-2. The frit is recessed 10-15 mm above a crenellated ring at the bottom of the thimble to facilitate drainage. The resin must be carefully retained in the extractor cup with a glass-wool plug and stainless steel screen because it floats on methylene chloride. This process involves sequential extraction in the following order.

Solvent	Procedure
Water	Initial rinse: Place resin in a beaker, rinse once with Type II water, and discard. Fill with water a second time, let stand overnight, and discard.
Water	Extract with H_2O for 8 hr.
Methyl alcohol	Extract for 22 hr.
Methylene chloride	Extract for 22 hr.
Methylene chloride (fresh)	Extract for 22 hr.

2.2 Method 2:

2.2.1 As an alternative to Soxhlet extraction, a continuous extractor has been fabricated for the extraction sequence. This extractor has been found to be acceptable. The particular canister used for the apparatus shown in Figure A-1 contains about 500 g of finished XAD-2. Any size may be constructed; the choice is dependent on the needs of the sampling programs. The XAD-2 is held under light spring tension between a pair of coarse and fine screens. Spacers under the bottom screen allow for even distribution of clean solvent. The three-necked flask should be of sufficient size (3-liter in this case) to hold solvent

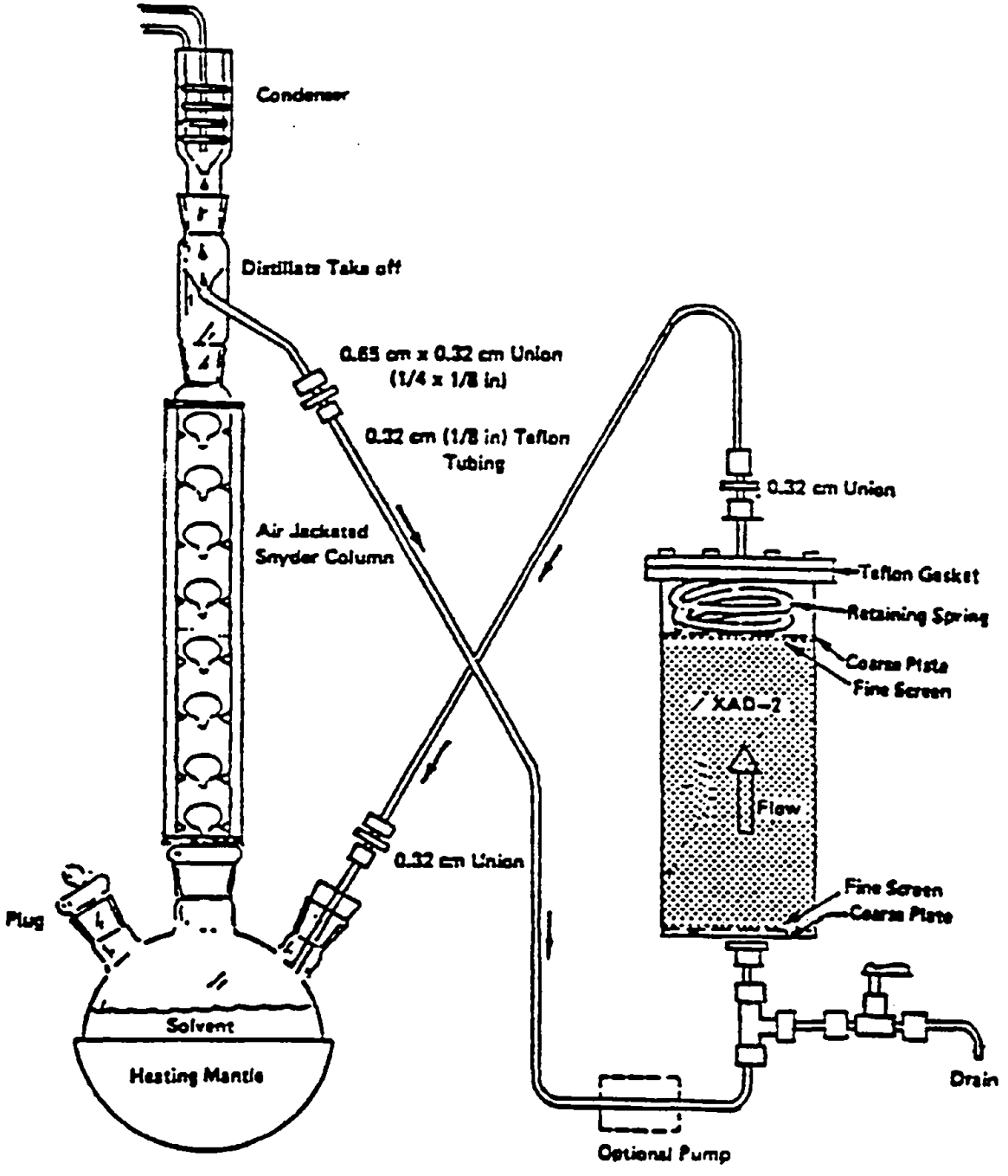


Figure A-1. XAD-2 cleanup extraction apparatus.

equal to twice the dead volume of the XAD-2 canister. Solvent is refluxed through the Snyder column, and the distillate is continuously cycled up through the XAD-2 for extraction and returned to the flask. The flow is maintained upward through the XAD-2 to allow maximum solvent contact and prevent channeling. A valve at the bottom of the canister allows removal of solvent from the canister between changes.

2.2.2 Experience has shown that it is very difficult to cycle sufficient water in this mode. Therefore the aqueous rinse is accomplished by simply flushing the canister with about 20 liters of distilled water. A small pump may be useful for pumping the water through the canister. The water extraction should be carried out at the rate of about 20-40 mL/min.

2.2.3 After draining the water, subsequent methyl alcohol and methylene chloride extractions are carried out using the refluxing apparatus. An overnight or 10- to 20-hr period is normally sufficient for each extraction.

2.2.4 All materials of construction are glass, Teflon, or stainless steel. Pumps, if used, should not contain extractable materials. Pumps are not used with methanol and methylene chloride.

3.0 DRYING

3.1 After evaluation of several methods of removing residual solvent, a fluidized-bed technique has proved to be the fastest and most reliable drying method.

3.2 A simple column with suitable retainers, as shown in Figure A-2, will serve as a satisfactory column. A 10.2-cm (4-in.) Pyrex pipe 0.6 m (2 ft) long will hold all of the XAD-2 from the extractor shown in Figure A-1 or the Soxhlet extractor, with sufficient space for fluidizing the bed while generating a minimum resin load at the exit of the column.

3.3 Method 1: The gas used to remove the solvent is the key to preserving the cleanliness of the XAD-2. Liquid nitrogen from a standard commercial liquid nitrogen cylinder has routinely proved to be a reliable source of large volumes of gas free from organic contaminants. The liquid nitrogen cylinder is connected to the column by a length of precleaned 0.95-cm (3/8-in.) copper tubing, coiled to pass through a heat source. As nitrogen is bled from the cylinder, it is vaporized in the heat source and passes through the column. A convenient heat source is a water bath heated from a steam line. The final nitrogen temperature should only be warm to the touch and not over 40°C. Experience has shown that about 500 g of XAD-2 may be dried overnight by consuming a full 160-liter cylinder of liquid nitrogen.

3.4 Method 2: As a second choice, high-purity tank nitrogen may be used to dry the XAD-2. The high-purity nitrogen must first be passed through a bed

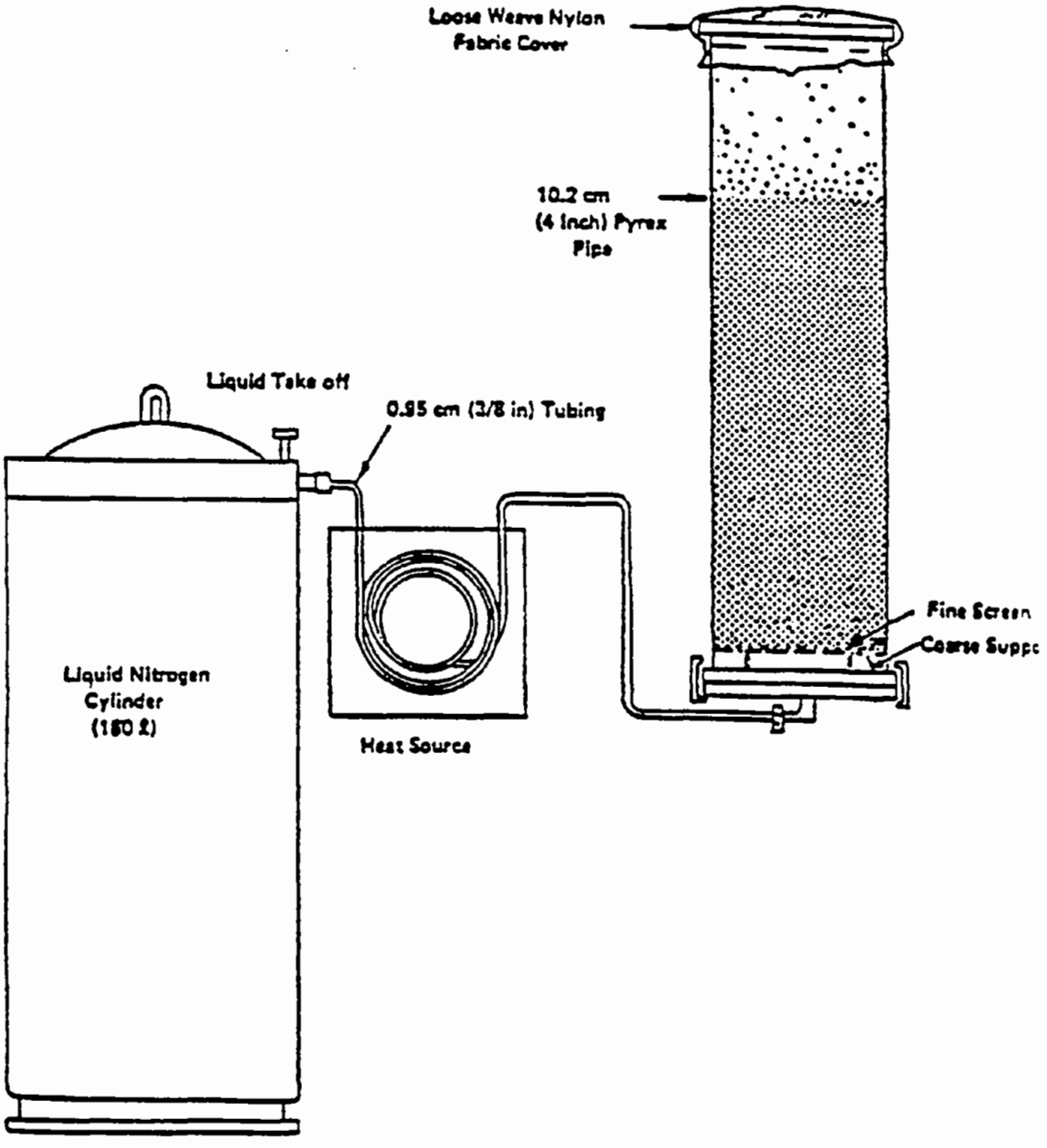


Figure A-2. XAD-2 fluidized-bed drying apparatus.

of activated charcoal approximately 150 mL in volume. With either type of drying method, the rate of flow should gently agitate the bed. Excessive fluidization may cause the particles to break up.

4.0 QUALITY CONTROL PROCEDURES

4.1 For both Methods 1 and 2, the quality control results must be reported for the batch. The batch must be reextracted if the residual extractable organics are >20 ug/mL by TCO analysis or the gravimetric residue is >0.5 mg/20 g XAD-2 extracted. (See also section 5.1, Method 0010.)

4.2 Four control procedures are used with the final XAD-2 to check for (1) residual methylene chloride, (2) extractable organics (TCO), (3) specific compounds of interest as determined by GC/MS, as described in Section 4.5 below, and (4) residue (GRAV).

4.3 Procedure for residual methylene chloride:

4.3.1 **Description:** A 1±0.1-g sample of dried resin is weighed into a small vial, 3 mL of toluene are added, and the vial is capped and well shaken. Five uL of toluene (now containing extracted methylene chloride) are injected into a gas chromatograph, and the resulting integrated area is compared with a reference standard. The reference solution consists of 2.5 uL of methylene chloride in 100 mL of toluene, simulating 100 ug of residual methylene chloride on the resin. The acceptable maximum content is 1,000 ug/g resin.

4.3.2 **Experimental:** The gas chromatograph conditions are as follows:

6-ft x 1/8-in. stainless steel column containing 10% OV-101 on 100/120 Supelcoport;

Helium carrier at 30 mL/min;

FID operated on 4 x 10^{-11} A/mV;

Injection port temperature: 250°C;

Detector temperature: 305°C;

Program: 30°C(4 min) 40°C/min 250°C (hold); and

Program terminated at 1,000 sec.

4.4 Procedure for residual extractable organics:

4.4.1 **Description:** A 20±0.1-g sample of cleaned, dried resin is weighed into a precleaned alundum or cellulose thimble which is plugged with cleaned glass wool. (Note that 20 g of resin will fill a thimble, and the

resin will float out unless well plugged.) The thimble containing the resin is extracted for 24 hr with 200-mL of pesticide- grade methylene chloride (Burdick and Jackson pesticide-grade or equivalent purity). The 200-mL extract is reduced in volume to 10-mL using a Kuderna-Danish concentrator and/or a nitrogen evaporation stream. Five uL of that solution are analyzed by gas chromatography using the TCO analysis procedure. The concentrated solution should not contain >20 ug/mL of TCO extracted from the XAD-2. This is equivalent to 10 ug/g of TCO in the XAD-2 and would correspond to 1.3 mg of TCO in the extract of the 130-g XAD-2 module. Care should be taken to correct the TCO data for a solvent blank prepared (200 mL reduced to 10 mL) in a similar manner.

4.4.2 **Experimental:** Use the TCO analysis conditions described in the revised Level 1 manual (EPA 600/7-78-201).

4.5 GC/MS Screen: The extract, as prepared in paragraph 4.4.1, is subjected to GC/MS analysis for each of the individual compounds of interest. The GC/MS procedure is described in Chapter Four, Method 8270. The extract is screened at the MDL of each compound. The presence of any compound at a concentration >25 ug/mL in the concentrated extract will require the XAD-2 to be recleaned by repeating the methylene chloride step.

4.6 Methodology for residual gravimetric determination: After the TCO value and GC/MS data are obtained for the resin batch by the above procedures, dry the remainder of the extract in a tared vessel. There must be <0.5 mg residue registered or the batch of resin will have to be extracted with fresh methylene chloride again until it meets this criterion. This level corresponds to 25 ug/g in the XAD-2, or about 3.25 mg in a resin charge of 130 g.

METHOD 0030

VOLATILE ORGANIC SAMPLING TRAIN

1.0 PRINCIPLE AND APPLICATION

1.1 Principle

1.1.1 This method describes the collection of volatile principal organic hazardous constituents (POHCs) from the stack gas effluents of hazardous waste incinerators. For the purpose of definition, volatile POHCs are those POHCs with boiling points less than 100°C. If the boiling point of a POHC of interest is less than 30°C, the POHC may break through the sorbent under the conditions of the sample collection procedure.

1.1.2 Field application for POHCs of this type should be supported by laboratory data which demonstrate the efficiency of a volatile organic sampling train (VOST) to collect POHCs with boiling points less than 30°C. This may require using reduced sample volumes collected at flow rates between 250 and 500 mL/min. Many compounds which boil above 100°C (e.g., chlorobenzene) may also be efficiently collected and analyzed using this method. VOST collection efficiency for these compounds should be demonstrated, where necessary, by laboratory data of the type described above.

1.1.3 This method employs a 20-liter sample of effluent gas containing volatile POHCs which is withdrawn from a gaseous effluent source at a flow rate of 1 L/min, using a glass-lined probe and a volatile organic sampling train (VOST). (Operation of the VOST under these conditions has been called FAST-VOST.) The gas stream is cooled to 20°C by passage through a water-cooled condenser and volatile POHCs are collected on a pair of sorbent resin traps. Liquid condensate is collected in an impinger placed between the two resin traps. The first resin trap (front trap) contains approximately 1.6 g Tenax and the second trap (back trap) contains approximately 1 g each of Tenax and petroleum-based charcoal (SKC Lot 104 or equivalent), 3:1 by volume. A total of six pairs of sorbent traps may be used to collect volatile POHCs from the effluent gas stream.

1.1.4 An alternative set of conditions for sample collection has been used. This method involves collecting sample volume of 20 liters or less at reduced flow rate. (Operation of the VOST under these conditions has been referred to as SLO-VOST.) This method has been used to collect 5 liters of sample (0.25 L/min for 20 min) or 20 liters of sample (0.5 L/min for 40 min) on each pair of sorbent cartridges. Smaller sample volumes collected at lower flow rates should be considered when the boiling points of the POHCs of interest are below 35°C. A total of six pairs of sorbent traps may be used to collect volatile POHCs from the effluent gas stream.

1.1.5 Analysis of the traps is carried out by thermal desorption purge-and-trap by gas chromatography/mass spectrometry (see Method 5040). The VOST is designed to be operated at 1 L/min with traps being replaced every 20 min for a total sampling time of 2 hr. Traps may be analyzed separately or combined onto one trap to improve detection limit. However, additional flow rates and sampling times are acceptable. Recent experience has shown that when less than maximum detection ability is required, it is acceptable and probably preferable to operate the VOST at 0.5 L/min for a total of three 40-min periods. This preserves the 2-hr sampling period, but reduces the number of cartridge changes in the field as well as the number of analyses required.

1.2 Application

1.2.1 This method is applicable to the determination of volatile POHCs in the stack gas effluent of hazardous waste incinerators. This method is designed for use in calculating destruction and removal efficiency (DRE) for the volatile POHCs and to enable a determination that DRE values for removal of the volatile POHCs are equal to or greater than 99.99%.

1.2.2 The sensitivity of this method is dependent upon the level of interferences in the sample and the presence of detectable levels of volatile POHCs in blanks. The target detection limit of this method is 0.1 ug/m^3 (ng/L) of flue gas, to permit calculation of a DRE equal to or greater than 99.99% for volatile POHCs which may be present in the waste stream at 100 ppm. The upper end of the range of applicability of this method is limited by breakthrough of the volatile POHCs on the sorbent traps used to collect the sample. Laboratory development data have demonstrated a range of 0.1 to 100 ug/m^3 (ng/L) for selected volatile POHCs collected on a pair of sorbent traps using a total sample volume of 20 liters or less (see Paragraph 1.1.4).

1.2.3 This method is recommended for use only by experienced sampling personnel and analytical chemists or under close supervision by such qualified persons.

1.2.4 Interferences arise primarily from background contamination of sorbent traps prior to or after use in sample collection. Many potential interferences can be due to exposure of the sorbent materials to solvent vapors prior to assembly and exposure to significant concentrations of volatile POHCs in the ambient air at hazardous waste incinerator sites.

1.2.5 To avoid or minimize the low-level contamination of train components with volatile POHCs, care should be taken to avoid contact of all interior surface or train components with synthetic organic materials (e.g., organic solvents, lubricating and sealing greases), and train components should be carefully cleaned and conditioned according to the procedures described in this protocol.

2.0 APPARATUS

2.1 Volatile Organic Sampling Train: A schematic diagram of the principal components of the VOST is shown in Figure 1 and a diagram of one acceptable version of the VOST is shown in Figure 2. The VOST consists of a glass-lined probe followed by an isolation valve, a water-cooled glass condenser, a sorbent cartridge containing Tenax (1.6 g), an empty impinger for condensate removal, a second water-cooled glass condenser, a second sorbent cartridge containing Tenax and petroleum-based charcoal (3:1 by volume; approximately 1 g of each), a silica gel drying tube, a calibrated rotameter, a sampling pump, and a dry gas meter. The gas pressure during sampling and for leak-checking is monitored by pressure gauges which are in line and downstream of the silica gel drying tube. The components of the sampling train are described below.

2.1.1 Probe: The probe should be made of stainless steel with a borosilicate or quartz glass liner. The temperature of the probe is to be maintained above 130°C but low enough to ensure a resin temperature of 20°C. A water-cooled probe may be required at elevated stack temperatures to protect the probe and meet the above requirements. Isokinetic sample collection is not a requirement for the use of VOST since the compounds of interest are in the vapor phase at the point of sample collection.

2.1.2 Isolation valve: The isolation valve should be a greaseless stopcock with a glass bore and sliding Teflon plug with Teflon wipers (Ace 8193 or equivalent).

2.1.3 Condensers: The condensers (Ace 5979-14 or equivalent) should be of sufficient capacity to cool the gas stream to 20°C or less prior to passage through the first sorbent cartridge. The top connection of the condenser should be able to form a leak-free, vacuum-tight seal without using sealing greases.

2.1.4 Sorbent cartridges:

2.1.4.1 The sorbent cartridges used for the VOST may be used in either of two configurations: the inside-outside (I/O) configuration in which the cartridge is held within an outer glass tube and in a metal carrier, and the inside-inside (I/I) configuration in which only a single glass tube is used, with or without a metal carrier. In either case, the sorbent packing will be the same.

2.1.4.1.1 The first of a pair of sorbent cartridges shall be packed with approximately 1.6 g Tenax GC resin and the second cartridge of a pair shall be packed with Tenax GC and petroleum-based charcoal (3:1 by volume; approximately 1 g of each).

2.1.4.1.2 The second sorbent cartridge shall be packed so that the sample gas stream passes through the Tenax layer first and then through the charcoal layer.

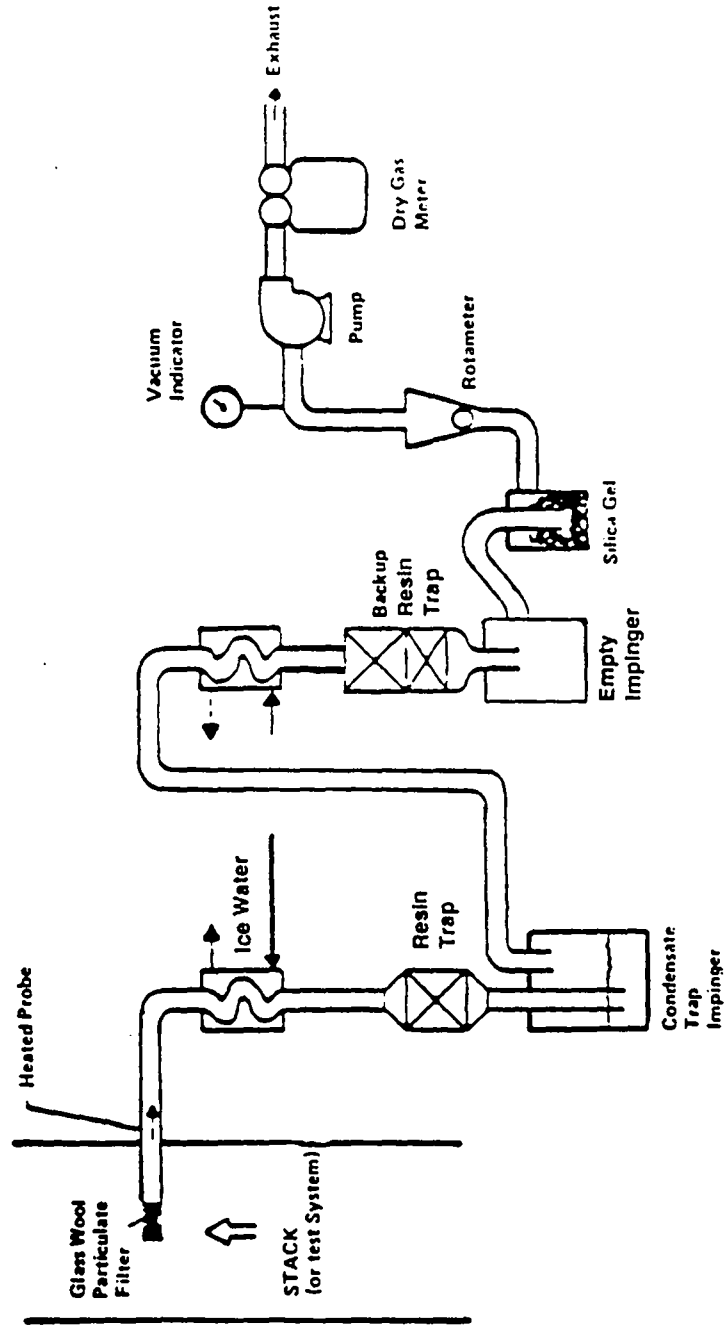


Figure 1. Schematic of Volatile Organic Sampling Train (VOST).

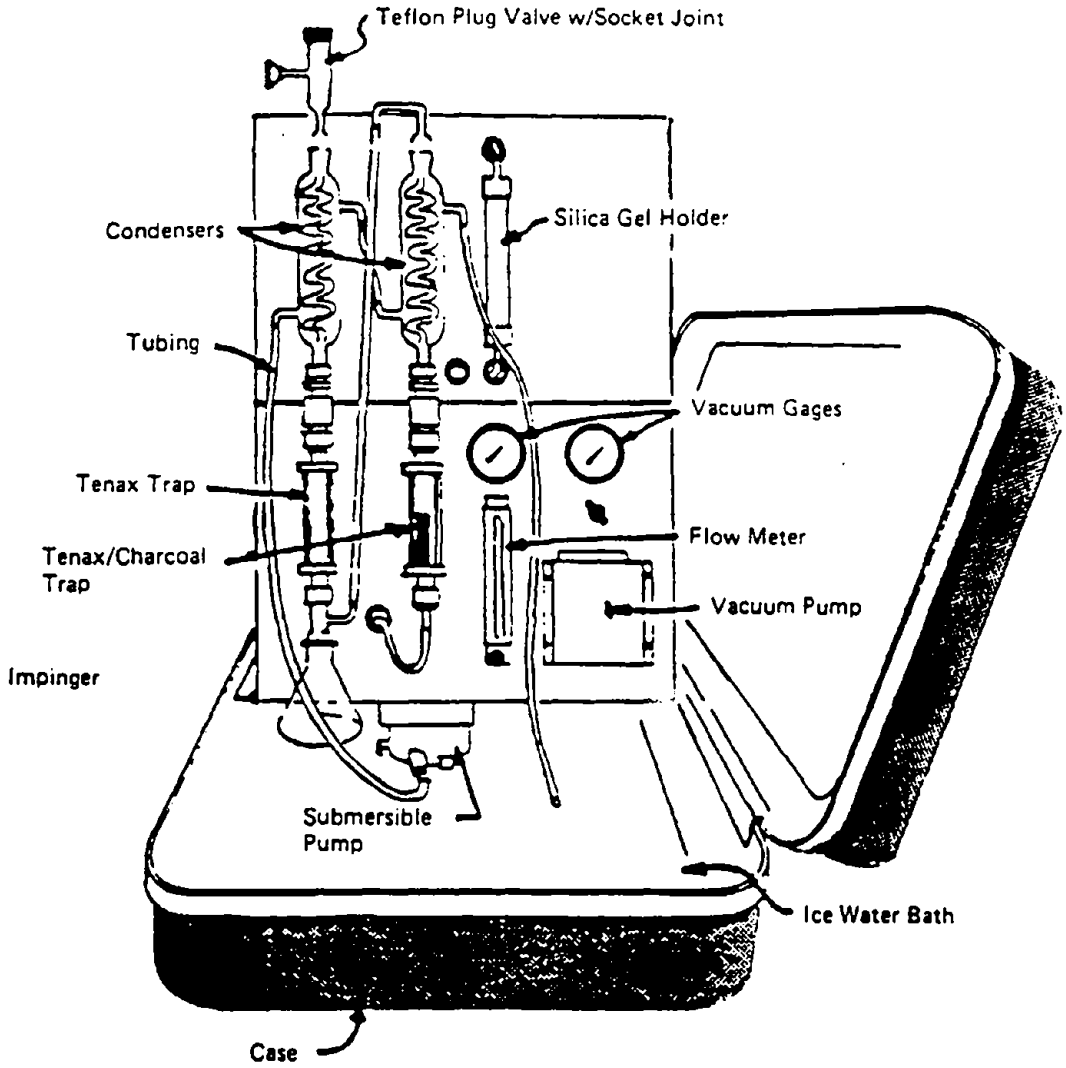


Figure 2. Volatile Organic Sampling Train (VOST).

2.1.4.2 The sorbent cartridges shall be glass tubes with approximate dimensions of 10 cm by 1.6 cm I.D. The two acceptable designs (I/O, I/I) for the sorbent cartridge are described in further detail below.

2.1.4.2.1 **Inside/Inside sorbent cartridge:** A diagram of an I/I sorbent cartridge is shown in Figure 3. This cartridge is a single glass tube (10 cm by 1.6 cm I.D.) which has the ends reduced in size to accommodate a 1/4- or 3/8-in. Swagelok or Cajon gas fitting. The resin is held in place by glass wool at each end of the resin layer. The amounts of each type of sorbent material used in the I/I design are the same as for the I/O design. Threaded end caps are placed on the sorbent cartridge after packing with sorbent to protect the sorbent from contamination during storage and transport.

2.1.4.2.2 **Inside/Outside type sorbent cartridge:** A diagram of an I/O sorbent cartridge is shown in Figure 4. In this design the sorbent materials are held in the glass tube with a fine mesh stainless steel screen and a C-clip. The glass tube is then placed within a larger diameter glass tube and held in place using Viton O-rings. The purpose of the outer glass tube is to protect the exterior of the resin-containing tube from contamination. The two glass tubes are held in a stainless steel cartridge holder, where the ends of the glass tubes are held in place by Viton O-rings placed in machine grooves in each metal end piece. The three cylindrical rods are secured in one of the metal end pieces and fastened to the other end piece using knurled nuts, thus sealing the glass tubes into the cartridge holder. The end pieces are fitted with a threaded nut onto which a threaded end cap is fitted with a Viton O-ring seal, to protect the resin from contamination during transport and storage.

2.1.5 **Metering system:** The metering system for VOST shall consist of vacuum gauges, a leak-free pump (Thomas Model 107 or equivalent, Thomas Industries, Sheboygan, Wisconsin), a calibrated rotameter (Linde Model 150, Linde Division of Union Carbide, Keasbey, New Jersey) for monitoring the gas flow rate, a dry gas meter with 2% accuracy at the required sampling rate, and related valves and equipment. Provisions should be made for monitoring the temperature of the sample gas stream between the first condenser and first sorbent cartridge. This can be done by placing a thermocouple on the exterior glass surface of the outlet from the first condenser. The temperature at that point should be less than 20°C. If it is not, an alternative condenser providing the required cooling capacity must be used.

2.1.6 **Sample transfer lines:** All sample transfer lines to connect the probe to the VOST shall be less than 5 ft in length, and shall be heat-traced Teflon with connecting fittings which are capable of forming leak-free, vacuum-tight connections without the use of sealing grease.

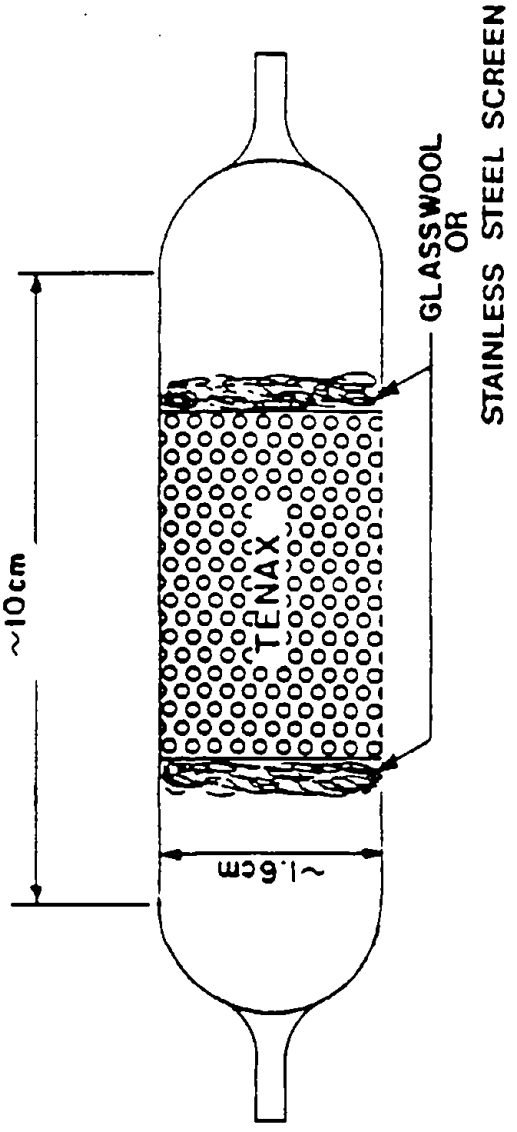
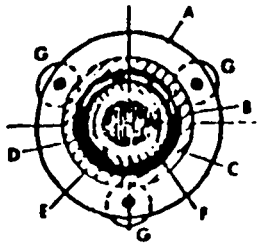


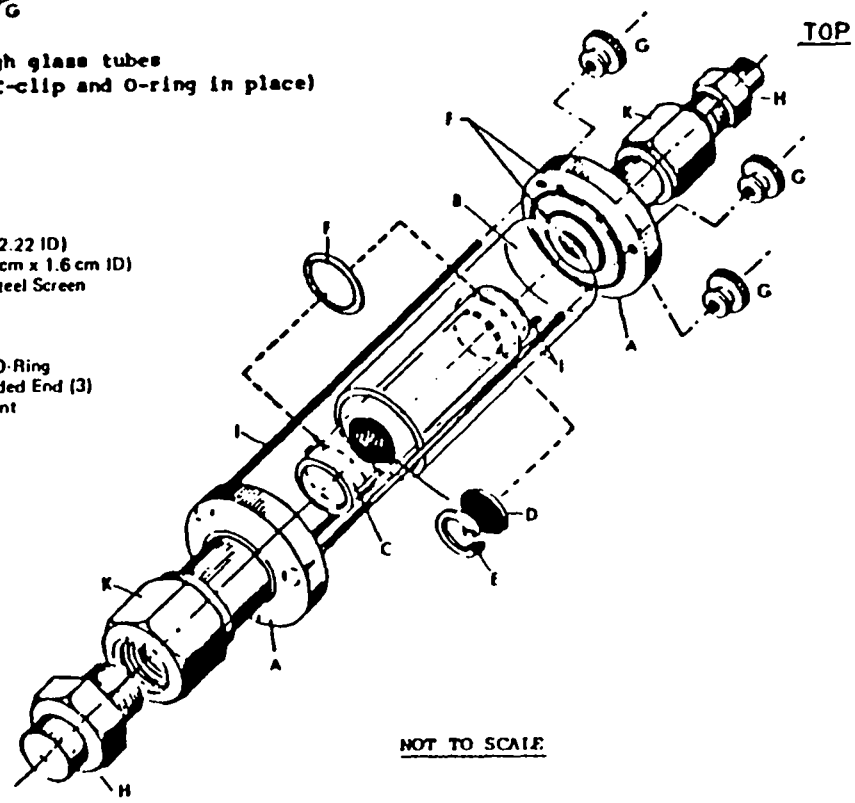
Figure 3. Inside-inside vost cartridge



Section cut through glass tubes
(showing screen, C-clip and O-ring in place)

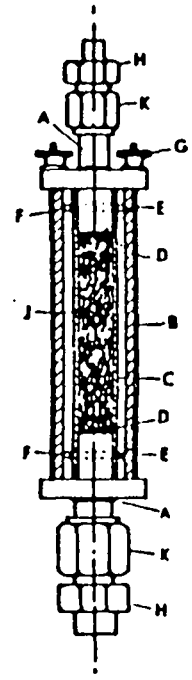
LEGEND

A - Stainless Steel Carrier
B - Glass Tube (9.84 L x 2.22 ID)
C - Small Glass Tube (10 cm x 1.6 cm ID)
D - Fine Mesh Stainless Steel Screen
E - Stainless Steel C-Clip
F - O-Ring (Viton)
G - Nuts (4)
H - End Cap with Viton O-Ring
I - Metal Rod with Threaded End (3)
J - Tenax/Charcoal Sorbent
K - Cajon Fitting



BOTTOM

NOT TO SCALE



Assembled Trap
NTS

Figure 4. Sorbent Trap Assembly (I/O)
Volatile Organic Sampling Train (VOST)

All other sample transfer lines used with the VOST shall be Teflon with connecting fittings that are capable of forming leak-free, vacuum-tight connections without the use of sealing grease.

3.0 REAGENTS AND MATERIALS

3.1 2,6-Diphenylene oxide polymer (Tenax, 35/60 mesh):

3.1.1 The new Tenax is Soxhlet extracted for 24 hr with methanol (Burdick & Jackson, pesticide grade or equivalent). The Tenax is dried for 6 hr in a vacuum oven at 50°C before use. Users of I/O and I/I sorbent cartridges have used slightly different thermal conditioning procedures. I/O sorbent cartridges packed with Tenax are thermally conditioned by flowing organic-free nitrogen (30 mL/min) through the resin while heating to 190°C. Some users have extracted new Tenax and charcoal with pentane to remove nonpolar impurities. However, these users have experienced problems with residual pentane in the sorbents during analysis.

3.1.2 If very high concentrations of volatile POHCs have been collected on the resin (e.g., micrograms of analytes), the sorbent may require Soxhlet extraction as described above. Previously used Tenax cartridges are thermally reconditioned by the method described above.

3.2 Charcoal (SKC petroleum-base or equivalent): New charcoal is prepared and charcoal is reconditioned as described in Paragraph 4.4. New charcoal does not require treatment prior to assembly into sorbent cartridges. Users of VOST have restricted the types of charcoal used in sorbent cartridges to only petroleum-based types. Criteria for other types of charcoal are acceptable if recovery of POHC in laboratory evaluations meet the criteria of 50 to 150%.

3.3 Viton-O-Ring: All O-rings used in VOST shall be Viton. Prior to use, these O-rings should be thermally conditioned at 200°C for 48 hr. O-rings should be stored in clean, screw-capped glass containers prior to use.

3.4 Glass tubes/Condensers: The glass resin tubes and condensers should be cleaned with a nonionic detergent in an ultrasonic bath, rinsed well with organic-free water, and dried at 110°C. Resin tubes of the I/O design should be assembled prior to storage as described in Paragraph 4.1. Resin tubes of the I/I design can be stored in glass culture tube containers with cotton cushioning and Teflon-lined screw caps. Condensers can be capped with appropriate end caps prior to use.

3.5 Metal parts: The stainless steel carriers, C-clips, end plugs, and screens used in the I/O VOST design are cleaned by ultrasonication in a warm nonionic detergent solution, rinsed with distilled water, air-dried, and heated in a muffle furnace for 2 hr at 400°C. Resin tubes of the I/I design require Swagelok or equivalent end caps with Supelco M-1 ferrules. These should be heated at 190°C along with the assembled cartridges.

3.6 Silica gel (Indicating type, 6-16 mesh): New silica gel may be used as received. Silica gel which has been previously used should be dried for 2 hr at 175°C (350°F).

3.7 Cold packs: Any commercially available reusable liquids or gels that can be repeatedly frozen are acceptable. They are typically sold in plastic containers as "Blue Ice" or "Ice-Packs." Enough should be used to keep cartridges at or near 4°C.

3.8 Water: Water used for cooling train components in the field may be tap water; and water used for rinsing glassware should be organic-free.

3.9 Glass wool: Glass wool should be Soxhlet extracted for 8 to 16 hr, using methanol, and oven dried at 110°C before use.

4.0 SAMPLE HANDLING AND PROCEDURE

4.1 Assembly:

4.1.1 The assembly and packing of the sorbent cartridges should be carried out in an area free of volatile organic material, preferably a laboratory in which no organic solvents are handled or stored and in which the laboratory air is charcoal filtered. Alternatively, the assembly procedures can be conducted in a glove box which can be purged with organic-free nitrogen.

4.2 Tenax cartridges:

4.2.1 The Tenax, glass tubes, and metal cartridge parts are cleaned and stored (see Section 3.0). Approximately 1.6 g of Tenax is weighed and packed into the sorbent tube which has a stainless steel screen and C-clip (I/O design) or glass wool (I/I design) in the downstream end. The Tenax is held in place by inserting a stainless steel screen and C-clips in the upstream end (I/O design) or glass wool (I/I design). Each cartridge should be marked, using an engraving tool, with an arrow to indicate the direction of sample flow, and a serial number.

4.2.2 Conditioned resin tubes of the I/O design are then assembled into the metal carriers according to the previously described inside/inside or inside/outside procedures (with end caps) and are placed on cold packs for storage and transport. Conditioned resin tubes of the I/I design are capped and placed on cold packs for storage and transport.

4.3 Tenax/Charcoal tubes

4.3.1 The Tenax, charcoal, and metal cartridge parts are cleaned and stored as previously described (see Section 3.0). The tubes are packed with approximately a 3:1 volume ratio of Tenax and charcoal (approximately 1 g each). The Tenax and charcoal are held in place by the stainless steel screens and C-clips (I/O design) or by glass wool (I/I design). The glass tubes containing the Tenax and charcoal are then

conditioned as described below (see Paragraph 4.4). Place the I/O glass tubes in the metal carriers (see Paragraph 2.1.4.2.2), put end caps on the assembled cartridges, mark direction of sample flow and serial number, and place the assembled cartridges on cold packs for storage and transport.

4.3.2 Glass tubes of the I/I design are conditioned, and stored in the same manner as the I/O tubes.

4.4 Trap Conditioning - QC

4.4.1 Following assembly and leak-checking, the traps are connected in reverse direction to sampling to a source of organic-free nitrogen, and nitrogen is passed through each trap at a flow rate of 40 mL/min, while the traps are heated to 190°C for 12-28 hr. The actual conditioning period may be determined based on adequacy of the resulting blank checks.

4.4.2 The following procedure is used to blank check each set of sampling cartridges prior to sampling to ensure cleanliness. The procedure provides semi-quantitative data for organic compounds with boiling points below 110°C on Tenax and Tenax/Charcoal cartridges. It is not intended as a substitute for Method 5040.

4.4.2.1 The procedure is based on thermal desorption of each set of two cartridges, cryofocusing with liquid nitrogen onto a trap packed with glass beads, followed by thermal desorption from the trap and analysis by GC/FID.

4.4.2.2 The detection limit is based on the analysis of Tenax cartridges spiked with benzene and toluene and is around 2 ng for each compound.

4.4.2.3 The results of analyzing spiked cartridges on a daily basis should not vary by more than 20 percent. If the results are outside this range, the analytical system must be evaluated for the probable cause and a second spiked cartridge analyzed.

4.4.2.4 The GC operating conditions are as follows:

GC Operating Conditions

Column: Packed column 6 ft x 1/8" stainless steel 1.0 percent SP-1000 on Carbopack B 60/80, or equivalent.
Temperature program: 50°C for 5 min, 20°C/min increase to 190°C, hold 13 min.
Injector: 200°C.
Detector: F.I.D. 250°C.
Carrier Gas: Helium at 25 mL/min.
Sample valve: Valco 6-port with 40" x 1/16" stainless steel trap packed with 60/80 mesh glass beads.
Cryogen: Liquid nitrogen.
Trap heater: Boiling water, hot oil, or electrically heated.

Desorption heater: Supelco "clam shell" (high capacity carrier gas purifier) heater and Variac, adjusted to 180°C to 200°C.

4.4.2.5 Calibration is accomplished by preparing a spiked Tenax cartridge with benzene and toluene and analyzing according to the standard operating procedure. A standard of benzene, toluene and bromofluorobenzene (BFB) is prepared by injecting 2.0 uL of benzene and toluene and 1.0 uL of BFB into 10 mL of methanol. The concentration of this stock is 175 ng/uL of benzene and toluene, and 150 ng/uL BFB. One microliter of the stock standard is injected onto a Tenax cartridge through a heated injection port set at 150°C. A GC oven can be used for this with the oven at room temperature. Helium carrier gas is set at 50 mL/min. The solvent flush technique should be used. After two min, remove the Tenax cartridge and place in the desorption heater for analysis. BFB is also used as an internal standard spike for GC/MS analysis which provides a good comparison between GC/FID and GC/MS. The results of this spike analysis should not vary more than 20 percent day to day. Initially and then periodically this spiked Tenax should be reanalyzed a second time to verify that the 10 min desorption time and 180-200°C temperature are adequate to remove all of the spiked components. It should be noted that only one spiked Tenax cartridge need be prepared and analyzed daily unless otherwise needed to ensure proper instrument operation.

An acceptable blank level is left to the discretion of the method analyst. An acceptable level is one that allows adequate determination of expected components emitted from the waste being burned.

4.4.3 After conditioning, traps are sealed and placed on cold packs until sampling is accomplished. Conditioned traps should be held for a minimum amount of time to prevent the possibility of contamination.

4.4.4 It may be useful to spike the Tenax and Tenax/charcoal traps with the compounds of interest to ensure that they can be thermally desorbed under laboratory conditions. After spiked traps are analyzed they may be reconditioned and packed for sampling.

4.5 Pretest preparation:

4.5.1 All train components shall be cleaned and assembled as previously described. A dry gas meter shall have been calibrated within 30 days prior to use, using an EPA-supplied standard orifice.

4.5.2 The VOST is assembled according to the schematic diagram in Figure 1. The cartridges should be positioned so that sample flow is

through the Tenax first and then the Tenax/charcoal. Cooling water should be circulated to the condensers and the temperature of the cooling water should be maintained near 0°C. The end caps of the sorbent cartridges should be placed in a clean screw-capped glass container during sample collection.

4.6 Leak-checking:

4.6.1 The train is leak-checked by closing the valve at the inlet to the first condenser and pulling a vacuum of 250 mm (10 in. Hg) above the normal operating pressure. The traps and condensers are isolated from the pump and the leak rate noted. The leak rate should be less than 2.5 mm Hg after 1 min. The train is then returned to atmospheric pressure by attaching a charcoal-filled tube to the train inlet and admitting ambient air filtered through the charcoal. This procedure will minimize contamination of the VOST components by excessive exposure to the fugitive emissions at hazardous waste incinerator sites.

4.7 Sample Collection

4.7.1 After leak-checking, sample collection is accomplished by opening the valve at the inlet to the first condenser, turning on the pump, and sampling at a rate of 1 liter/min for 20 min. The volume of sample for any pair of traps should not exceed 20 liters.

4.7.2 Following collection of 20 liters of sample, the train is leak-checked a second time at the highest pressure drop encountered during the run to minimize the chance of vacuum desorption of organics from the Tenax. The train is returned to atmospheric pressure, using the method discussed in Paragraph 4.1 and the two sorbent cartridges are removed. The end caps are replaced and the cartridges shall be placed in a suitable environment for storage and transport until analysis. The sample is considered invalid if the leak test does not meet specification.

4.7.3 A new pair of cartridges is placed in the VOST, the VOST leak-checked, and the sample collection process repeated as described above. Sample collection continues until six pairs of traps have been used.

4.7.4 All sample cartridges should be kept on cold packs until they are ready for analysis.

4.8 Blanks

4.8.1 **Field blanks/trip blanks:** Blank Tenax and Tenax/charcoal cartridges are taken to the sampling site and the end caps removed for the period of time required to exchange two pairs of traps on VOST. After the two VOST traps have been exchanged, the end caps are replaced on the blank Tenax and Tenax/charcoal tubes and these are returned to the cold packs and analyzed with the sample traps. At least one pair of field blanks (one Tenax, one Tenax/charcoal) shall be included with each

six pairs of sample cartridges collected (or for each field trial using VOST to collect volatile POHCs).

4.8.2 **Trip blanks:** At least one pair of blank cartridges (one Tenax, one Tenax/charcoal) shall be included with shipment of cartridges to a hazardous waste incinerator site. These "field blanks" will be treated like any other cartridges except that the end caps will not be removed during storage at the site. This pair of traps will be analyzed to monitor potential contamination which may occur during storage and shipment.

4.8.3 **Laboratory blanks:** One pair of blank cartridges (one Tenax, one Tenax/charcoal) will remain in the laboratory using the method of storage which is used for field samples. If the field and trip blanks contain high concentrations of contaminants (e.g., greater than 2 ng of a particular POHC), the laboratory blank shall be analyzed in order to identify the source of contamination.

5.0 CALCULATIONS (for sample volume)

5.1 The following nomenclature are used in the calculation of sample volume:

P_{bar} = Barometric pressure at the exit orifice of the dry gas meter, mm (in.) Hg.

P_{std} = Standard absolute pressure, 760 mm (29.92 in.) Hg.

T_m = Dry gas meter average absolute temperature, K (°R).

T_{std} = Standard absolute temperature, 293K (528°R).

V_m = Dry gas volume measured by dry gas meter, dcm (dcf).

$V_{m(std)}$ = Dry gas volume measured by dry gas meter, corrected to standard conditions, dscm (dscf).

γ = Dry gas meter calibration factor.

5.2 The volume of gas sampled is calculated as follows:

$$V_{m(std)} = V_m \gamma \frac{T_{std}\, P_{bar}}{T_m\, P_{std}} = K_1 \gamma \frac{V_m\, P_{bar}}{T_m}$$

where:

K_1 = 0.3858 K/mm Hg for metric units, or

K_1 = 17.64 °R/in. Hg for English units.

6.0 ANALYTICAL PROCEDURE

See Method 5040.

7.0 PRECISION AND ACCURACY REQUIREMENTS

7.1 Method Performance Check

Prior to field operation of the VOST at a hazardous waste incinerator, a method performance check should be conducted using either selected volatile POHCs of interest or two or more of the volatile POHCs for which data are available. This check may be conducted on the entire system (VOST/GC/MS) by analysis of a gas cylinder containing POHCs of interest or on only the analytical system by spiking of the POHCs onto the traps. The results of this check for replicate pairs of traps should demonstrate that recovery of the analytes fall within 50% to 150% of the expected values.

7.2 Performance Audit

During a trial burn a performance audit must be completed. The audit results should agree within 50% to 150% of the expected value for each specific target compound. This audit consists of collecting a gas sample containing one or more POHCs in the VOST from an EPA ppb gas cylinder. Collection of the audit sample in the VOST may be conducted either in the laboratory or at the trial burn site. Anaysis of the VOST audit sample must be by the same person, at the same time, and with the same analytical procedure as used for the regular VOST trail burn samples. EPA ppb gas cylinders currently available for VOST Audit are shown in Table 1 below.

The audit procedure, audit equipment and audit cylinder may be obtained by writing:

Audit Cylinder Gas Coordinator (MD-77B)
Quality Assurance Division
Environmental Monitoring Systems Laboratory
U.S. Environmental Protection Agency
Research Triangle Park, NC 27711

or by calling the Audit Cylinder Gas Coordinator at (919) 541-4531.

The request for the audit must be made at least 30 days prior to the scheduled trial burn. If a POHC is selected for which EPA does not have an audit cylinder, this audit is not required.

8.0 REFERENCES

1. Protocol for the Collection and Analysis of Volatile POHCs Using VOST. EPA/600/8-84/007, March 1984.

2. Sykes, A.L., Standard Operating Procedure for Blanking Tenax and Tenax/Charcoal Sampling Cartridges for Volatile Organic Sampling Train (VOST), Radion Corporation, P.O. Box 13000, Research Triangle Park, NC 27709.

3. Validation of the Volatile Organic Sampling Train (VOST) Protocol, Vols. I and II, EPA/600/4-86/014a, January 1986.

TABLE 1: Organic Gases in the ppb Audit Repository

Group I	Ranges of cylinders currently available:
5 Organics in N_2:	7 - 90 ppb
Carbon tetrachloride	90 - 430 ppb
Chloroform	430 - 10,000 ppb
Perchloroethylene	
Vinyl chloride	
Benzene	

Group II	Ranges of cylinders currently available:
9 Organics in N_2	7 - 90 ppb
Trichloroethylene	90 - 430 ppb
1,2-Dichloroethane	
1,2-Dibromoethane	
F-12	
F-11	
Bromomethane	
Methyl ethyl ketone	
1,1,1-Trichloroethane	
Acetronitrile	

TABLE 1: Organic Gases in the ppb Audit Repository (Continued)

Group III	Ranges of cylinders currently available:
7 Organics in N_2:	7 - 90 ppb
Vinylidene chloride	90 - 430 ppb
F-113	
F-114	
Acetone	
1,4-Dioxane	
Toluene	
Chlorobenzene	

Group IV	Ranges of cylinders currently available:
6 Organics in N_2:	7 - 90 ppb
Acrylonitrile	430 - 10,000
1,3-Butadiene	
Ethylene oxide	
Methylene chloride	
Propylene oxide	
Ortho-xylene	

CHEMICAL SPECIATION OF NICKEL PHASES IN INDUSTRIAL DUSTS

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SPECIATION OF NICKEL PHASES IN INDUSTRIAL DUSTS

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OUTLINE

Individual nickel phases are extracted from the dust sample (-400 mesh, <0.037 mm) by sequential selective leaching. Four phase categories can be determined:

1) soluble nickel - water soluble normal nickel salts;

2) sulfidic nickel - besides Ni_3S_2 and NiS also dissolved are arsenides NiAs and $Ni_{11}As_8$, and selenide NiSe; phases, such as Ni_5As_2 and NiTe, yield more slowly and, as the rate is particle size dependent, may require longer leaching time than specified in this procedure;

3) metallic nickel - free or alloyed with iron (ferronickel);

4) oxidic nickel - refractory nickel oxide.

The sequential leachings are carried out in an all-Teflon filter holder fitted with a regenerated cellulose membrane filter. The test sample, a portion of bulk dust or a dust-loaded 37 mm membrane or an areal portion of a loaded high-volume fiber filter, is transferred onto the cellulose filter and the individual nickel phases are selectively leached. The 37 mm membrane can be held in place by a glass tripod, and so prevented from floating. Each leach solution is evaporated to dryness and the residues are wet-ashed with nitric and perchloric acids. The leached sample residue and filter(s) are also dissolved in nitric and perchloric acids. Each leach solution is analyzed for nickel by conventional atomic absorption (or plasma emission, if available).

To simplify the final wet-ashing, it is recommended to have the airborne dusts collected on PVC acrylic copolymer filters, such as the Gelman DM Metricel membranes, rather than on plain PVC. For hi-vol sampling, quartz fiber filters, which have a very small surface alkalinity, are preferred to glass fiber filters. High alkalinity of glass fibers has been linked to secondary chemical changes in sampled dusts and to possible formation of basic nickel salts.

Soluble nickel phases, mostly in the form of normal nickel sulfate, are generally leached at pH 4. However, leaching of basic nickel salts at this pH is very slow and, without being completed, may still continue in the next sulfidic group causing false nickel finds. If the sample to be analyzed is known to contain basic nickel salts, leaching of the soluble nickel phases should be done at lower pH of 2.1 (0.1M citric acid solution). This approach ensures dissolution of all nickel salts including the basic salt component, and sulfidic nickel artefacts are so avoided. Surface Ni(III) from black nickel oxide, and nickel hydroxide, if present in the sample, may be leached to a various extent.

Test samples suspected of containing organic matter, such as uncombusted tarry material from incinerator operations, must be leached with methanol before speciation leaching. The organics are so dissolved and removed, and the dust particulates are made readily wettable by the aqueous ammonium citrate solution.

REAGENTS

AMMONIUM CITRATE, 0.1M SOLUTION (pH 4.4)

Dissolve 8.5 g of diammonium citrate, $(NH_4)_2HCit$, and 2.6 g of citric acid monohydrate, $H_3Cit.H_2O$, in distilled water and dilute to 500 mL. Check pH with a meter and adjust, if necessary, to 4.4 with ammonia or citric acid.

CITRATE WASH SOLUTION

Dilute 100 mL of the 0.1M ammonium citrate solution to 500 mL and mix.

PEROXIDE-CITRATE LEACH SOLUTION

Mix two volumes of 0.1M ammonium citrate solution (pH 4.4) and one volume of 30% hydrogen peroxide. The mixed solution should have pH 4.0-4.2. Adjust, if necessary, with ammonia or citric acid. Prepare fresh before use.

STANDARD NICKEL STOCK SOLUTION (1 g Ni/L)

Dissolve 1.00 gram of nickel metal in a minimum of 8M nitric acid. Add 15 mL of sulfuric acid (1+1) and evaporate to dryness. Cool and dissolve the salts in 100 mL of 6M hydrochloric acid. Transfer to a one litre volumetric flask, dilute to volume with water and mix.

DILUTE STANDARD NICKEL SOLUTION (100 µg Ni/mL)

Pipet 50 mL of the 1 g/L standard nickel solution into a 500 mL volumetric flask. Add 25 mL of concentrated hydrochloric acid, dilute to volume with water and mix.

NICKEL WORKING STANDARDS

Prepare 0.5, 1.0, 2.5, 5.0, and 10.0 µg Ni/mL standards by pipetting 1.0-, 2.0-, 5.0-, 10.0-, and 20.0-mL aliquots of the 100 µg/mL dilute standard nickel solution into 200 mL volumetric flasks. Add 8 mL of concentrated hydrochloric acid to each, dilute to volume with water, and mix.

A separate set of working standards with a sodium and calcium matrix is required for the measurement of oxidic nickel in hi-vol dust samples collected on glass fiber filters. The matrix must match the sodium and calcium contribution from the areal portion of the filter used. No matching matrix is required in the analysis of quartz fiber filters.

APPARATUS

TEFLON (PFA) FILTER HOLDER, 47 mm (Savillex No. 4750-47-6) with a rubber stopper and a 500 mL suction flask (Fig. 1). The top funnel of the filter holder should be cut to a height of 30 mm.

SUPPORTING REGENERATED CELLULOSE MEMBRANE, 47 mm, such as the Sartorius SM116-07, 0.2 µm pore size. This type of filter material is required as it is alcohol and bromine resistant. Cellulose ester filters are not suitable.

GLASS TRIPOD, about 34 mm wide, round or triangular, made of a glass rod, about 3 mm in dia.; leg height 7-10 mm.

FLARED GLASS ROD ("Willstätter needle"), 3 mm max. in dia. (Fig. 1), slightly longer than the Teflon outlet tube of the filter holder. The flared top of the rod rests on top of the outlet tube.

DETERMINATION OF NICKEL BY ATOMIC ABSORPTION

Measure the absorbance of each leach solution (Note) and of the working standards at wavelength 232.0 nm using conventional flame atomic absorption spectrometer. Make sure that all solutions are 5% v/v in hydrochloric acid.

Construct a calibration graph of absorbance versus concentration. From the graph obtain the nickel concentration found in each leach solution, correct it for the reagent blank, and calculate the nickel content in the used dust portion or the dust load on the filter.

NOTE - The procedure calls for final volumes of 10 mL each. To measure the very small nickel levels usually found in environmental samples, the AA spectrometer, set in the µg/mL concentration mode, must be calibrated to read to two decimal places. For a satisfactory readout stability of ±0.01 µg/mL, the hollow cathode lamp and the burner assembly have to be at thermal equilibrium. Integration time of 3 sec is recommended. Under these conditions, a limit of determination of 0.02 µg Ni/mL (0.2 µg Ni abs.) can readily be achieved. Only the first two of the working standard solution set may then be needed.

REAGENT BLANK

Carry a blank cellulose filter membrane and a sampling filter blank, if necessary, through the procedure using all scheduled leaching steps. Use the prescribed volumes of all leach solutions and acids. Wet-ash the leached filters. Analyze each final solution for nickel. Special attention should be paid to blanks of fiber filter portions used.

PROCEDURE

Set up the filtering system so that mild suction can be turned on and off at short intervals as necessary. To collect the filtrates, place a test tube 20x150 mm into the suction flask. It is advisable to make a small spout in the test tube rim. Adjust the length of the Teflon holder outlet tube so that it would reach into the test tube. Place the flared glass rod into the tube as shown in Fig. 1 to prevent the outlet tube to stay filled with aqueous filtrates. Fit the Teflon holder with the regenerated cellulose membrane. The filtering system is now ready for use.

To analyze hi-vol samples, only an areal portion, such as a 2x8in. strip, of the 8x10in. fiber filter sheet should be used. Fold the strip onto the supporting cellulose membrane, cover it with the leach solution and, using a glass rod, squeeze out all air bubbles.

Washing and complete removal of the dissolved nickel at each leaching stage is of utmost importance to avoid nickel carryovers between the phase categories, most significantly between the "soluble" and the "sulfidic" groups. Filtrate which tends to accumulate under the filter-supporting disc must always be removed before a new portion of the wash solution is added. With the suction on, use rocking and tapping of the tilted flask to drain all filtrate into the test tube. Special attention has to be paid to washing of folded fiber filters. The technique which

appears to serve best involves squeezing the folded filter with a glass rod and holding for a couple of seconds while the suction is on. Solution squeezed out is then rapidly drawn through the filter. First, the whole surface area of the folded filter has to be treated in this manner. Later, when most of the filter fibers are broken, the original stiffness disappears and the fiber material begins to spread over the supporting membrane filter. Complete removal of the solution by suction then becomes easier. Turn the suction off between the washes, cover the fiber layer with 5 mL of wash solution, and work the layer carefully with the glass rod to get all fibers well soaked. Turn suction on and drain all solution, including that from underneath the support disc, to the test tube. Repeat the wash three times.

WARNING. The procedure involves wet-ashing of organic matter by perchloric acid. The fuming acid is a powerful oxidant and has to be handled with great caution. Organic matter must first be decomposed by conc. nitric acid before it is fumed with perchloric acid. If the hot perchloric acid solution turns dark, add a drop of nitric acid to fully oxidize the carbonaceous material. The evaporations must be carried out in fumehoods specially designed for the use of perchloric acid.

DETERMINATION OF SOLUBLE NICKEL

Weigh differentially approx. 10 mg of the sample dust (-400 mesh, <0.037 mm) and transfer it onto a moistened supporting cellulose membrane in the filter holder (Note). Alternately, use filter, or a part of it, loaded either in a personal filter pump cassette or in a hi-vol sampler. A glass tripod can be used to hold the 37 mm membrane filter in place. Moisten the sample with a few drops of methanol and add 15 mL of 0.1M ammonium citrate solution (Note). Cover the filter funnel and allow the sample to leach for 90 min (Note). Swirl the solution at times or squeeze the filter folds under the leach solution. Apply gentle suction and pass all solution through the filter. Wash the filter thoroughly with the citrate wash solution making sure that all filtrate is fully drained from the bottom of the filter holder before the next wash portion is added. Follow the procedure of washing the folded fiber filter as described earlier. Transfer all filtrates to a 100 mL beaker and evaporate to dryness. Moisten the residue with 1 mL each of conc. HNO_3 and conc. $HClO_4$, and wet-ash by digesting in the covered beaker. If a dark spot developed, add one drop of conc. HNO_3. When contents of the beaker become colorless, evaporate to dryness. Dissolve the warm residue with 1 mL of HCl (1+1) and transfer the solution to a 10 mL volumetric flask. Dilute to volume with water and mix. Reserve the solution for analysis. Return the rinsed empty test tube to the suction flask.

NOTES - Before transferring the bulk sample portion, the cellulose membrane should be moistened with the leach solution to minimize static effects.

- Samples suspected of contamination with hydrophobic organic matter (e.g. from incinerator operations) must first be leached with 15 mL of methanol before adding the ammonium citrate solution. The methanolic and the citrate filtrates are then combined for joint processing.

- During the 90-min period, a portion of the leach solution may pass through the supporting filter membrane. Since the sample must remain covered with the leach solution throughout the operation, return accumulated filtrate onto the filter as necessary.

DETERMINATION OF SULFIDIC NICKEL

To the moist sample from which soluble nickel phases have been leached add 15 mL of the peroxide-citrate leach solution. Cover the filter holder with a watch glass, and allow the dust sample to react for 60 minutes. Keep the sample covered with solution by recycling the filtrate if some has passed through the filter. When finished, apply mild suction and draw all leach solution through the filter. Wash the filters with the citrate wash solution. Remove water from the washed filters by rinsing them twice with methanol (Note). Apply suction and draw all liquid into the test tube. Transfer the filtrates to a 100 mL beaker and evaporate to dryness. Moisten the dry residue with 1 mL each of conc. HNO_3 and conc. $HClO_4$, and wet-ash by digesting in the covered beaker. When contents have turned colorless, evaporate to dryness. Dissolve the warm residue with 1 mL of HCl (1+1) and transfer the solution to a 10 mL volumetric flask. Dilute to volume with water, mix, and reserve the solution for analysis. Return the rinsed empty test tube to the suction flask.

NOTE - Turbidity may occasionally develop in the filtrate after the methanol wash. Produced by leached, water-insoluble organic matter, the turbidity is no cause for concern.

DETERMINATION OF METALLIC NICKEL

To the methanol-washed sample filter(s) from which sulfidic nickel has been leached add 10 mL of anhydrous methanol containing 0.2 mL of bromine (Note). Cover the filter holder and let stand for 5 sec (Note). Apply suction to have the solution slowly pass through the filter. Wash the filter with methanol until bromine-free. Transfer the filtrates to a 100 mL beaker and evaporate to dryness. Moisten the residue with 1 mL

each of conc. HNO_3 and conc. $HClO_4$, wet-ash, and slowly evaporate to dryness. Dissolve the warm residue with 1 mL of HCl (1+1) and transfer the solution to a 10 mL volumetric flask. Dilute to volume with water and mix. Reserve the solution for analysis.

NOTES - The bromine solution must be prepared shortly before use to prevent formation of hydrobromic acid and avoid premature dissolution of some nickel oxides. For the same reason, moisture must be excluded from the bromine-methanol system by using anhydrous alcohol and by avoiding unnecessary contact with moist atmospheric air.

- The leach duration should be kept to the minimum especially in samples suspected of the presence of basic nickel salts. The short reaction time does not inhibit complete dissolution of the metallic phase.

DETERMINATION OF OXIDIC (REFRACTORY) NICKEL

Transfer the leached sample residue and filter(s) to a 150-200 mL tall beaker. Wipe the bottom and inner walls of the Teflon funnel with moist filter paper (Whatman #41) and add it to the beaker. Add 5 mL of conc. HNO_3, cover the beaker and digest on a hot plate until the filters disintegrate. Add 4 mL of conc. $HClO_4$ and continue the digestion to wet-ash the organic matter.

When analyzing a glass or quartz fiber filter strip (hi-vol sample), transfer all filters to a 400 mL heatable Teflon beaker with a graphite base (Nalge P/N 1550). Wipe the bottom and inner walls of the Teflon funnel with moist filter paper (Whatman #41) and add it to the beaker. Add a mixture of 5 mL each of conc. HF and conc. HNO_3. Heat to dissolve the siliceous fibers and the cellulose membrane. Add 5 mL of conc. $HClO_4$ and evaporate to heavy perchloric acid fumes (max. permissible hotplate temperature 280 °C), cool, rinse the beaker walls and the cover with water, and evaporate to heavy fumes again. Repeat the rinse and evaporation to allow for full elimination of the hydrofluoric acid before the perchloric acid is volatilized (Note).

Continue digesting the perchloric acid solution in the covered beaker until all sample particles are dissolved (Note). If the solution darkens, add a few drops of conc. nitric acid to oxidize the residual organic matter. Volatilize the perchloric acid completely and dissolve the warm residue in 1 mL of HCl (1+1). Transfer the solution to a 10 mL volumetric flask, dilute to volume with water and mix (Note). Analyze the solution for nickel using appropriate working standard solutions.

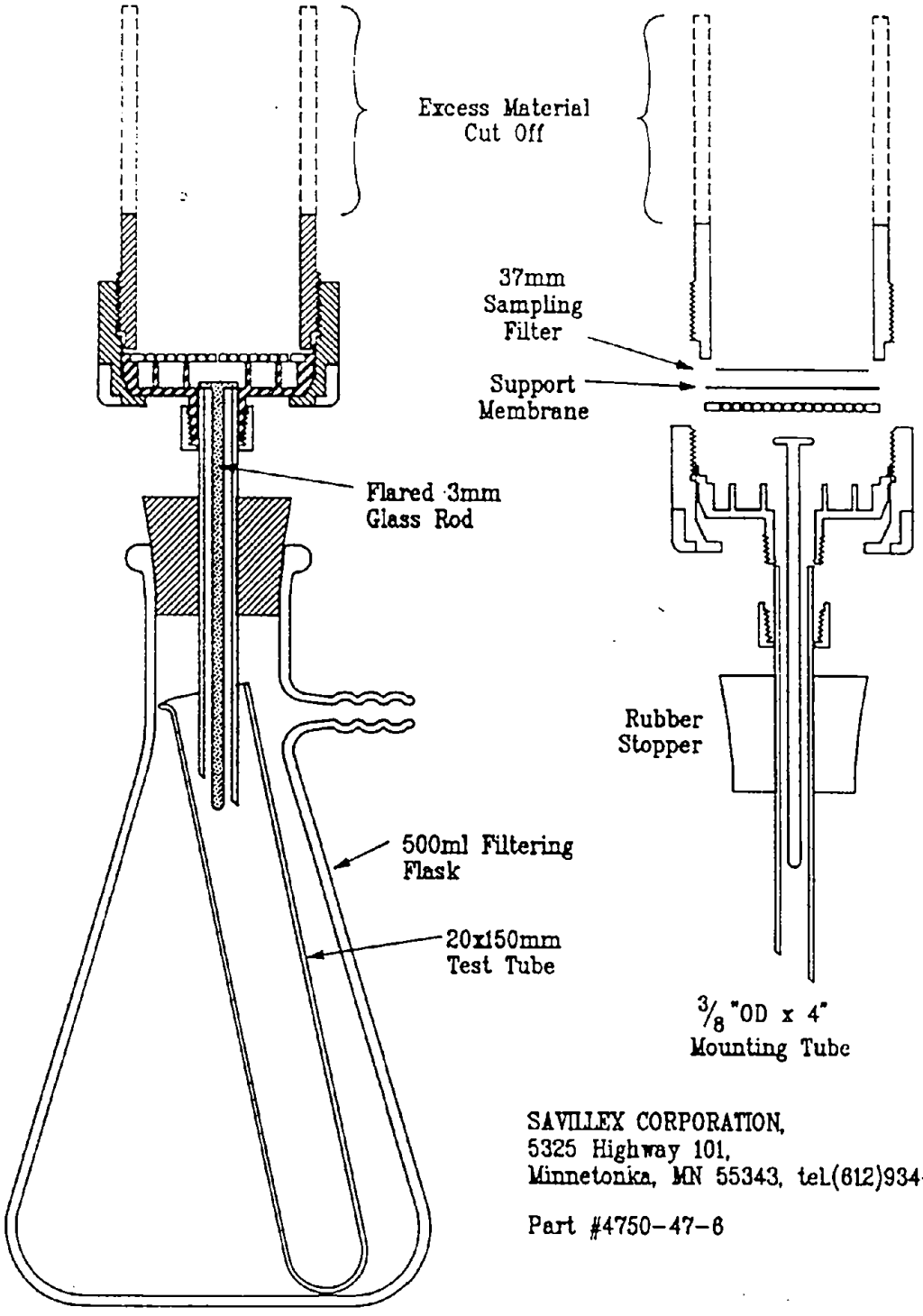
NOTES - An excess of free perchloric acid is required to effect complete volatilization of hydrofluoric acid. More perchloric acid may be added if it happened to evaporate prematurely.

- To dissolve completely, refractory nickel oxide requires fuming with conc. perchloric acid. Hotplate temperatures of less than 210-240 °C will result in low nickel recoveries. It is recommended to check the hot solution for undissolved sample particles before the perchloric acid is finally volatilized. Addition of 1-2 drops of HF may assist the dissolution of residues high in silica.

- In the analysis of hi-vol samples, a complete removal of hydrofluoric acid will produce a clear final solution in the volumetric flask.

Figure 1

ALL TEFLON 47mm FILTER HOLDER FOR FILTERING FLASKS



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CAD TECH1487A

Appendix C

Sample Calculations

FIELD DATA AND RESULTS TABULATION

PLANT: SSI

SAMPLING LOCATION: Site 9

		OUT-MM5-7A	MID-MM5-7A	OUT-MM5-7C	MID-MM5-7C
	Test Date	6/04/90	6/04/90	6/04/90	6/04/90
	Run Start Time	1715	1718	830	817
	Run Finish Time	1915	1918	1015	1017
	Net Traversing Points	8	24	21	24
Theta	Net Run Time, Minutes	120.00	120.00	100.00	120.00
Dia	Nozzle Diameter, Inches	0.242	0.245	0.243	0.245
Cp	Pitot Tube Coefficient	0.84	0.84	0.84	0.84
Y	Dry Gas Meter Calibration Factor	0.9960	1.0240	0.9960	1.0240
Pbar	Barometric Pressure, Inches Hg	29.3	29.2	29.8	29.6
Delta-H	Avg. Pressure Differential of Orifice Meter, Inches H2O	2.496	1.412	1.43	1.323
Vm	Volume Of Metered Gas Sample, Dry ACF	109.922	74.476	71.940	71.261
tm	Dry Gas Meter Temperature, Degrees F	98	98	89	89
Vmstd	Volume Of Metered Gas Sample, Dry SCF*	102.136	70.649	68.850	69.630
Vlc	Total Liquid Collected In Impingers & Silica Gel, grams	81.5	72.0	63.4	91.0
Vwstd	Volume of Water Vapor, SCF*	3.836	3.389	2.984	4.283
%H2O	Moisture Content, Percent by Volume	3.6	4.6	4.2	5.8
Mfd	Dry Mole Fraction	0.964	0.954	0.958	0.942
%CO2	Carbon Dioxide, Percent By Volume, Dry	5.0	5.0	5.0	5.0
%O2	Oxygen, Percent By Volume, Dry	14.0	14.0	14.0	14.0
%CO+N2	CO + N2, Percent By Volume, Dry	81.0	81.0	81.0	81.0
Md	Gas Molecular Weight, Lb/Lb-Mole, Dry	29.36	29.36	29.36	29.36
Ms	Gas Molecular Weight, Lb/Lb-Mole, Wet	28.95	28.84	28.88	28.70
Pg	Flue Gas Static Pressure, Inches H2O	-0.25	-30.00	-0.38	-30.00
Ps	Absolute Flue Gas Pressure, Inches Hg	29.28	26.99	29.77	27.39
ts	Flue Gas Temperature, Degrees F	142	90	136	89
Delta-p	Average Velocity Head, Inches H2O	0.800	0.360	0.450	0.337
vs	Flue Gas Velocity, Feet/Second	54.12	36.22	40.11	34.84
A	Stack/Duct Area, Square Inches	1,320	1,320	1,320	1,320
Qsd	Volumetric Air Flow Rate, Dry SCFM*	24,641	16,452	18,629	15,892
Qaw	Volumetric Air Flow Rate, Wet ACFM	29,766	19,921	22,061	19,162
%I	Isokinetic Sampling Rate, Percent	99.1	100.2	105.2	102.2

* 68° F (20° C) -- 29.92 Inches of Mercury (Hg)

FIELD DATA AND RESULTS TABULATION

Continued

PCDD	OUT-MM5-7A	MID-MM5-7A	OUT-MM5-7C	MID-MM5-7C
Total MCDD				
Formula Weight, Lb/Lb-Mole	218.35	218.35	218.35	218.35
Catch Weight, Nanograms	11.803	33.394	ND (0.008)	0.301
Concentration, ng/DSCM *	4.08E+00	1.67E+01	ND(4.10E-03)	1.53E-01
Emission Rate, Pounds/Hour	3.74E-07	1.03E-06	ND(2.86E-10)	9.09E-09
Emission Rate, Grams/Second	4.71E-08	1.30E-07	ND(3.61E-11)	1.14E-09
Total DCDD				
Formula Weight, Lb/Lb-Mole	252.90	252.90	252.90	252.90
Catch Weight, Nanograms	6.287	17.645	51.391	64.541
Concentration, ng/DSCM *	2.17E+00	8.82E+00	2.64E+01	3.27E+01
Emission Rate, Pounds/Hour	1.99E-07	5.44E-07	1.84E-06	1.95E-06
Emission Rate, Grams/Second	2.51E-08	6.85E-08	2.32E-07	2.46E-07
Total TriCDD				
Formula Weight, Lb/Lb-Mole	287.45	287.45	287.45	287.45
Catch Weight, Nanograms	13.432	53.310	1.668	1.905
Concentration, ng/DSCM *	4.64E+00	2.66E+01	8.55E-01	9.66E-01
Emission Rate, Pounds/Hour	4.26E-07	1.64E-06	5.97E-08	5.75E-08
Emission Rate, Grams/Second	5.36E-08	2.07E-07	7.52E-09	7.25E-09
2378-TCDD				
Formula Weight, Lb/Lb-Mole	322.00	322.00	322.00	322.00
Catch Weight, Nanograms	ND (0.013)	ND (0.025)	ND (0.023)	ND (0.449)
Concentration, ng/DSCM *	ND(4.49E-03)	ND(1.25E-02)	ND(1.18E-02)	ND(2.28E-01)
Emission Rate, Pounds/Hour	ND(4.12E-10)	ND(7.70E-10)	ND(8.23E-10)	ND(1.36E-08)
Emission Rate, Grams/Second	ND(5.19E-11)	ND(9.70E-11)	ND(1.04E-10)	ND(1.71E-09)
Other TCDD				
Formula Weight, Lb/Lb-Mole	322.00	322.00	322.00	322.00
Catch Weight, Nanograms	3.293	14.050	0.294	0.278
Concentration, ng/DSCM *	1.14E+00	7.02E+00	1.51E-01	1.41E-01
Emission Rate, Pounds/Hour	1.04E-07	4.33E-07	1.05E-08	8.39E-09
Emission Rate, Grams/Second	1.31E-08	5.45E-08	1.33E-09	1.06E-09
12378-PeCDD				
Formula Weight, Lb/Lb-Mole	356.44	356.44	356.44	356.44
Catch Weight, Nanograms	ND (0.023)	ND (0.035)	ND (0.023)	ND (0.030)
Concentration, ng/DSCM *	ND(7.95E-03)	ND(1.75E-02)	ND(1.18E-02)	ND(1.52E-02)
Emission Rate, Pounds/Hour	ND(7.29E-10)	ND(1.08E-09)	ND(8.23E-10)	ND(9.06E-10)
Emission Rate, Grams/Second	ND(9.18E-11)	ND(1.36E-10)	ND(1.04E-10)	ND(1.14E-10)
Other PeCDD				
Formula Weight, Lb/Lb-Mole	356.44	356.44	356.44	356.44
Catch Weight, Nanograms	0.147	0.432	ND (0.023)	ND (0.034)
Concentration, ng/DSCM *	5.08E-02	2.16E-01	ND(1.18E-02)	ND(1.72E-02)
Emission Rate, Pounds/Hour	4.66E-09	1.33E-08	ND(8.23E-10)	ND(1.03E-09)
Emission Rate, Grams/Second	5.87E-10	1.68E-09	ND(1.04E-10)	ND(1.29E-10)

FIELD DATA AND RESULTS TABULATION

Continued

PCDD	OUT-MM5-7A	MID-MM5-7A	OUT-MM5-7C	MID-MM5-7C
123478-HxCDD				
Formula Weight, Lb/Lb-Mole	390.88	390.88	390.88	390.88
Catch Weight, Nanograms	ND (0.020)	ND (0.075)	ND (0.035)	ND (0.050)
Concentration, ng/DSCM *	ND(6.91E-03)	ND(3.75E-02)	ND(1.80E-02)	ND(2.54E-02)
Emission Rate, Pounds/Hour	ND(6.34E-10)	ND(2.31E-09)	ND(1.25E-09)	ND(1.51E-09)
Emission Rate, Grams/Second	ND(7.98E-11)	ND(2.91E-10)	ND(1.58E-10)	ND(1.90E-10)
123678-HxCDD				
Formula Weight, Lb/Lb-Mole	390.88	390.88	390.88	390.88
Catch Weight, Nanograms	ND (0.015)	ND (0.060)	ND (0.028)	ND (0.043)
Concentration, ng/DSCM *	ND(5.19E-03)	ND(3.00E-02)	ND(1.44E-02)	ND(2.18E-02)
Emission Rate, Pounds/Hour	ND(4.75E-10)	ND(1.85E-09)	ND(1.00E-09)	ND(1.30E-09)
Emission Rate, Grams/Second	ND(5.99E-11)	ND(2.33E-10)	ND(1.26E-10)	ND(1.64E-10)
123789-HxCDD				
Formula Weight, Lb/Lb-Mole	390.88	390.88	390.88	390.88
Catch Weight, Nanograms	0.084	ND (0.080)	ND (0.038)	ND (0.055)
Concentration, ng/DSCM *	2.90E-02	ND(4.00E-02)	ND(1.95E-02)	ND(2.79E-02)
Emission Rate, Pounds/Hour	2.66E-09	ND(2.46E-09)	ND(1.36E-09)	ND(1.66E-09)
Emission Rate, Grams/Second	3.35E-10	ND(3.10E-10)	ND(1.71E-10)	ND(2.09E-10)
Other HxCDD				
Formula Weight, Lb/Lb-Mole	390.88	390.88	390.88	390.88
Catch Weight, Nanograms	0.377	0.958	ND (0.033)	0.074
Concentration, ng/DSCM *	1.30E-01	4.79E-01	ND(1.69E-02)	3.75E-02
Emission Rate, Pounds/Hour	1.19E-08	2.95E-08	ND(1.18E-09)	2.23E-09
Emission Rate, Grams/Second	1.50E-09	3.72E-09	ND(1.49E-10)	2.81E-10
1234678-HpCDD				
Formula Weight, Lb/Lb-Mole	425.32	425.32	425.32	425.32
Catch Weight, Nanograms	0.850	3.453	ND [0.124]	ND [0.263]
Concentration, ng/DSCM *	2.94E-01	1.73E+00	ND[6.36E-02]	ND[1.33E-01]
Emission Rate, Pounds/Hour	2.69E-08	1.06E-07	ND[4.44E-09]	ND[7.94E-09]
Emission Rate, Grams/Second	3.39E-09	1.34E-08	ND[5.59E-10]	ND[1.00E-09]
Other HpCDD				
Formula Weight, Lb/Lb-Mole	425.32	425.32	425.32	425.32
Catch Weight, Nanograms	0.708	3.003	0.089	ND [0.521]
Concentration, ng/DSCM *	2.45E-01	1.50E+00	4.56E-02	ND[2.64E-01]
Emission Rate, Pounds/Hour	2.24E-08	9.25E-08	3.19E-09	ND[1.57E-08]
Emission Rate, Grams/Second	2.83E-09	1.17E-08	4.01E-10	ND[1.98E-09]
OCDD				
Formula Weight, Lb/Lb-Mole	459.76	459.76	459.76	459.76
Catch Weight, Nanograms	3.902	18.478	0.926	2.864
Concentration, ng/DSCM *	1.35E+00	9.24E+00	4.75E-01	1.45E+00
Emission Rate, Pounds/Hour	1.24E-07	5.69E-07	3.31E-08	8.65E-08
Emission Rate, Grams/Second	1.56E-08	7.17E-08	4.18E-09	1.09E-08

FIELD DATA AND RESULTS TABULATION

Continued

PCDF	OUT-M5-7A	MID-M5-7A	OUT-M5-7C	MID-M5-7C
Total MCDF				
Formula Weight, Lb/Lb-Mole	202.35	202.35	202.35	202.35
Catch Weight, Nanograms	66.623	598.862	ND [2.925]	11.065
Concentration, ng/DSCM *	2.30E+01	2.99E+02	ND[1.50E+00]	5.61E+00
Emission Rate, Pounds/Hour	2.11E-06	1.84E-05	ND[1.05E-07]	3.34E-07
Emission Rate, Grams/Second	2.66E-07	2.32E-06	ND[1.32E-08]	4.21E-08
Total DCDF				
Formula Weight, Lb/Lb-Mole	236.90	236.90	236.90	236.90
Catch Weight, Nanograms	84.585	373.029	6.899	25.597
Concentration, ng/DSCM *	2.92E+01	1.86E+02	3.54E+00	1.30E+01
Emission Rate, Pounds/Hour	2.68E-06	1.15E-05	2.47E-07	7.73E-07
Emission Rate, Grams/Second	3.38E-07	1.45E-06	3.11E-08	9.74E-08
Total TriCDF				
Formula Weight, Lb/Lb-Mole	271.45	271.45	271.45	271.45
Catch Weight, Nanograms	33.212	112.160	7.322	8.567
Concentration, ng/DSCM *	1.15E+01	5.61E+01	3.76E+00	4.34E+00
Emission Rate, Pounds/Hour	1.05E-06	3.45E-06	2.62E-07	2.59E-07
Emission Rate, Grams/Second	1.33E-07	4.35E-07	3.30E-08	3.26E-08
2378-TCDF				
Formula Weight, Lb/Lb-Mole	306.00	306.00	306.00	306.00
Catch Weight, Nanograms	4.028	15.523	0.552	2.208
Concentration, ng/DSCM *	1.39E+00	7.76E+00	2.83E-01	1.12E+00
Emission Rate, Pounds/Hour	1.28E-07	4.78E-07	1.98E-08	6.67E-08
Emission Rate, Grams/Second	1.61E-08	6.02E-08	2.49E-09	8.40E-09
Other TCDF				
Formula Weight, Lb/Lb-Mole	306.00	306.00	306.00	306.00
Catch Weight, Nanograms	13.172	57.877	1.948	6.292
Concentration, ng/DSCM *	4.55E+00	2.89E+01	9.99E-01	3.19E+00
Emission Rate, Pounds/Hour	4.17E-07	1.78E-06	6.97E-08	1.90E-07
Emission Rate, Grams/Second	5.26E-08	2.25E-07	8.78E-09	2.39E-08
12378-PeCDF				
Formula Weight, Lb/Lb-Mole	340.44	340.44	340.44	340.44
Catch Weight, Nanograms	0.717	3.380	0.061	0.198
Concentration, ng/DSCM *	2.48E-01	1.69E+00	3.13E-02	1.00E-01
Emission Rate, Pounds/Hour	2.27E-08	1.04E-07	2.18E-09	5.98E-09
Emission Rate, Grams/Second	2.86E-09	1.31E-08	2.75E-10	7.53E-10
23478-PeCDF				
Formula Weight, Lb/Lb-Mole	340.44	340.44	340.44	340.44
Catch Weight, Nanograms	3.398	14.506	0.229	0.859
Concentration, ng/DSCM *	1.17E+00	7.25E+00	1.17E-01	4.36E-01
Emission Rate, Pounds/Hour	1.08E-07	4.47E-07	8.20E-09	2.59E-08
Emission Rate, Grams/Second	1.36E-08	5.63E-08	1.03E-09	3.27E-09

FIELD DATA AND RESULTS TABULATION

Continued

PCDF	OUT-MM5-7A	MID-MM5-7A	OUT-MM5-7C	MID-MM5-7C
Other PeCDF				
Formula Weight, Lb/Lb-Mole	340.44	340.44	340.44	340.44
Catch Weight, Nanograms	10.473	54.211	1.127	3.686
Concentration, ng/DSCM *	3.62E+00	2.71E+01	5.78E-01	1.87E+00
Emission Rate, Pounds/Hour	3.32E-07	1.67E-06	4.03E-08	1.11E-07
Emission Rate, Grams/Second	4.18E-08	2.10E-07	5.08E-09	1.40E-08
123478-HxCDF				
Formula Weight, Lb/Lb-Mole	374.88	374.88	374.88	374.88
Catch Weight, Nanograms	0.757	3.572	0.048	ND [0.228]
Concentration, ng/DSCM *	2.62E-01	1.79E+00	2.46E-02	ND[1.16E-01]
Emission Rate, Pounds/Hour	2.40E-08	1.10E-07	1.72E-09	ND[6.88E-09]
Emission Rate, Grams/Second	3.02E-09	1.39E-08	2.16E-10	ND[8.67E-10]
123678-HxCDF				
Formula Weight, Lb/Lb-Mole	374.88	374.88	374.88	374.88
Catch Weight, Nanograms	0.269	0.756	ND (0.020)	0.071
Concentration, ng/DSCM *	9.30E-02	3.78E-01	ND(1.03E-02)	3.60E-02
Emission Rate, Pounds/Hour	8.52E-09	2.33E-08	ND(7.16E-10)	2.14E-09
Emission Rate, Grams/Second	1.07E-09	2.93E-09	ND(9.02E-11)	2.70E-10
234678-HxCDF				
Formula Weight, Lb/Lb-Mole	374.88	374.88	374.88	374.88
Catch Weight, Nanograms	0.545	2.282	ND (0.030)	0.114
Concentration, ng/DSCM *	1.88E-01	1.14E+00	ND(1.54E-02)	5.78E-02
Emission Rate, Pounds/Hour	1.73E-08	7.03E-08	ND(1.07E-09)	3.44E-09
Emission Rate, Grams/Second	2.18E-09	8.86E-09	ND(1.35E-10)	4.34E-10
123789-HxCDF				
Formula Weight, Lb/Lb-Mole	374.88	374.88	374.88	374.88
Catch Weight, Nanograms	ND (0.023)	ND (0.090)	ND (0.040)	ND (0.058)
Concentration, ng/DSCM *	ND(7.95E-03)	ND(4.50E-02)	ND(2.05E-02)	ND(2.94E-02)
Emission Rate, Pounds/Hour	ND(7.29E-10)	ND(2.77E-09)	ND(1.43E-09)	ND(1.75E-09)
Emission Rate, Grams/Second	ND(9.18E-11)	ND(3.49E-10)	ND(1.80E-10)	ND(2.21E-10)
Other HxCDF				
Formula Weight, Lb/Lb-Mole	374.88	374.88	374.88	374.88
Catch Weight, Nanograms	1.469	6.245	0.070	0.339
Concentration, ng/DSCM *	5.08E-01	3.12E+00	3.59E-02	1.72E-01
Emission Rate, Pounds/Hour	4.65E-08	1.92E-07	2.51E-09	1.02E-08
Emission Rate, Grams/Second	5.86E-09	2.42E-08	3.16E-10	1.29E-09
1234678-HpCDF				
Formula Weight, Lb/Lb-Mole	409.32	409.32	409.32	409.32
Catch Weight, Nanograms	0.307	ND [1.713]	0.049	0.122
Concentration, ng/DSCM *	1.06E-01	ND[8.56E-01]	2.51E-02	6.19E-02
Emission Rate, Pounds/Hour	9.73E-09	ND[5.28E-08]	1.75E-09	3.68E-09
Emission Rate, Grams/Second	1.23E-09	ND[6.65E-09]	2.21E-10	4.64E-10

FIELD DATA AND RESULTS TABULATION

Continued

PCDF	OUT-M5-7A	MID-M5-7A	OUT-M5-7C	MID-M5-7C
1234789-HpCDF				
Formula Weight, Lb/Lb-Mole	409.32	409.32	409.32	409.32
Catch Weight, Nanograms	0.031	ND (0.115)	ND (0.043)	ND (0.063)
Concentration, ng/DSCM *	1.07E-02	ND(5.75E-02)	ND(2.21E-02)	ND(3.19E-02)
Emission Rate, Pounds/Hour	9.82E-10	ND(3.54E-09)	ND(1.54E-09)	ND(1.90E-09)
Emission Rate, Grams/Second	1.24E-10	ND(4.46E-10)	ND(1.94E-10)	ND(2.40E-10)
Other HpCDF				
Formula Weight, Lb/Lb-Mole	409.32	409.32	409.32	409.32
Catch Weight, Nanograms	0.234	1.197	0.013	0.035
Concentration, ng/DSCM *	8.09E-02	5.98E-01	6.67E-03	1.77E-02
Emission Rate, Pounds/Hour	7.41E-09	3.69E-08	4.65E-10	1.06E-09
Emission Rate, Grams/Second	9.34E-10	4.65E-09	5.86E-11	1.33E-10
OCDF				
Formula Weight, Lb/Lb-Mole	443.76	443.76	443.76	443.76
Catch Weight, Nanograms	0.173	3.333	ND (0.058)	ND (0.206)
Concentration, ng/DSCM *	5.98E-02	1.67E+00	ND(2.97E-02)	ND(1.04E-01)
Emission Rate, Pounds/Hour	5.48E-09	1.03E-07	ND(2.08E-09)	ND(6.22E-09)
Emission Rate, Grams/Second	6.91E-10	1.29E-08	ND(2.62E-10)	ND(7.84E-10)

FIELD DATA AND RESULTS TABULATION

SEMIVOLATILE

Continued

	OUT-M5-7A	MID-M5-7A	OUT-M5-7C	MID-M5-7C
Phenol				
Formula Weight, Lb/Lb-Mole	94.11	94.11	94.11	94.11
Catch Weight, Micrograms	ND (2.410)	ND (2.330)	342.870	320.090
Concentration, ng/DSCM *	ND(8.33E+02)	ND(1.16E+03)	1.76E+05	1.62E+05
Emission Rate, Pounds/Hour	ND(7.63E-05)	ND(7.18E-05)	1.23E-02	9.66E-03
Emission Rate, Grams/Second	ND(9.62E-06)	ND(9.04E-06)	1.55E-03	1.22E-03
bis(2-Chloroethyl)ether				
Formula Weight, Lb/Lb-Mole	143.02	143.02	143.02	143.02
Catch Weight, Micrograms	ND (2.980)	ND (2.880)	ND (4.170)	ND (3.110)
Concentration, ng/DSCM *	ND(1.03E+03)	ND(1.44E+03)	ND(2.14E+03)	ND(1.58E+03)
Emission Rate, Pounds/Hour	ND(9.44E-05)	ND(8.87E-05)	ND(1.49E-04)	ND(9.39E-05)
Emission Rate, Grams/Second	ND(1.19E-05)	ND(1.12E-05)	ND(1.88E-05)	ND(1.18E-05)
2-Chlorophenol				
Formula Weight, Lb/Lb-Mole	128.56	128.56	128.56	128.56
Catch Weight, Micrograms	ND (2.940)	ND (2.850)	ND (4.120)	ND (3.080)
Concentration, ng/DSCM *	ND(1.02E+03)	ND(1.42E+03)	ND(2.11E+03)	ND(1.56E+03)
Emission Rate, Pounds/Hour	ND(9.31E-05)	ND(8.78E-05)	ND(1.47E-04)	ND(9.30E-05)
Emission Rate, Grams/Second	ND(1.17E-05)	ND(1.11E-05)	ND(1.86E-05)	ND(1.17E-05)
1,3-Dichlorobenzene				
Formula Weight, Lb/Lb-Mole	147.00	147.00	147.00	147.00
Catch Weight, Micrograms	ND (2.500)	ND (2.420)	ND (3.500)	ND (2.620)
Concentration, ng/DSCM *	ND(8.64E+02)	ND(1.21E+03)	ND(1.80E+03)	ND(1.33E+03)
Emission Rate, Pounds/Hour	ND(7.92E-05)	ND(7.45E-05)	ND(1.25E-04)	ND(7.91E-05)
Emission Rate, Grams/Second	ND(9.98E-06)	ND(9.39E-06)	ND(1.58E-05)	ND(9.97E-06)
1,4-Dichlorobenzene				
Formula Weight, Lb/Lb-Mole	147.00	147.00	147.00	147.00
Catch Weight, Micrograms	89.010	66.730	ND (3.360)	ND (2.510)
Concentration, ng/DSCM *	3.08E+04	3.34E+04	ND(1.72E+03)	ND(1.27E+03)
Emission Rate, Pounds/Hour	2.82E-03	2.06E-03	ND(1.20E-04)	ND(7.58E-05)
Emission Rate, Grams/Second	3.55E-04	2.59E-04	ND(1.52E-05)	ND(9.55E-06)
Benzyl alcohol				
Formula Weight, Lb/Lb-Mole	108.14	108.14	108.14	108.14
Catch Weight, Micrograms	2315.050	2248.080	7987.230	7755.300
Concentration, ng/DSCM *	8.00E+05	1.12E+06	4.10E+06	3.93E+06
Emission Rate, Pounds/Hour	7.33E-02	6.92E-02	2.86E-01	2.34E-01
Emission Rate, Grams/Second	9.24E-03	8.73E-03	3.60E-02	2.95E-02
1,2-Dichlorobenzene				
Formula Weight, Lb/Lb-Mole	147.00	147.00	147.00	147.00
Catch Weight, Micrograms	74.160	53.450	ND [9.370]	ND [9.760]
Concentration, ng/DSCM *	2.56E+04	2.67E+04	ND[4.81E+03]	ND[4.95E+03]
Emission Rate, Pounds/Hour	2.35E-03	1.65E-03	ND[3.35E-04]	ND[2.95E-04]
Emission Rate, Grams/Second	2.96E-04	2.07E-04	ND[4.23E-05]	ND[3.71E-05]

FIELD DATA AND RESULTS TABULATION

SEMIVOLATILE

Continued

	OUT-MM5-7A	MID-MM5-7A	OUT-MM5-7C	MID-MM5-7C
2-Methylphenol				
Formula Weight, Lb/Lb-Mole	108.14	108.14	108.14	108.14
Catch Weight, Micrograms	ND (3.150)	ND (3.050)	ND [15.200]	ND (3.300)
Concentration, ng/DSCM *	ND(1.09E+03)	ND(1.52E+03)	ND[7.80E+03]	ND(1.67E+03)
Emission Rate, Pounds/Hour	ND(9.98E-05)	ND(9.40E-05)	ND[5.44E-04]	ND(9.96E-05)
Emission Rate, Grams/Second	ND(1.26E-05)	ND(1.18E-05)	ND[6.85E-05]	ND(1.26E-05)
bis(2-Chloroisopropyl)ether				
Formula Weight, Lb/Lb-Mole	171.07	171.07	171.07	171.07
Catch Weight, Micrograms	ND (1.540)	ND (1.490)	ND (2.160)	ND (1.610)
Concentration, ng/DSCM *	ND(5.32E+02)	ND(7.45E+02)	ND(1.11E+03)	ND(8.16E+02)
Emission Rate, Pounds/Hour	ND(4.88E-05)	ND(4.59E-05)	ND(7.73E-05)	ND(4.86E-05)
Emission Rate, Grams/Second	ND(6.15E-06)	ND(5.78E-06)	ND(9.74E-06)	ND(6.12E-06)
4-Methylphenol				
Formula Weight, Lb/Lb-Mole	108.14	108.14	108.14	108.14
Catch Weight, Micrograms	ND (3.580)	ND (3.460)	41.240	40.550
Concentration, ng/DSCM *	ND(1.24E+03)	ND(1.73E+03)	2.12E+04	2.06E+04
Emission Rate, Pounds/Hour	ND(1.13E-04)	ND(1.07E-04)	1.48E-03	1.22E-03
Emission Rate, Grams/Second	ND(1.43E-05)	ND(1.34E-05)	1.86E-04	1.54E-04
N-Nitroso-di-n-propylamine				
Formula Weight, Lb/Lb-Mole	130.22	130.22	130.22	130.22
Catch Weight, Micrograms	ND (3.370)	ND (3.260)	ND (4.720)	ND (3.520)
Concentration, ng/DSCM *	ND(1.17E+03)	ND(1.63E+03)	ND(2.42E+03)	ND(1.79E+03)
Emission Rate, Pounds/Hour	ND(1.07E-04)	ND(1.00E-04)	ND(1.69E-04)	ND(1.06E-04)
Emission Rate, Grams/Second	ND(1.35E-05)	ND(1.27E-05)	ND(2.13E-05)	ND(1.34E-05)
Hexachloroethane				
Formula Weight, Lb/Lb-Mole	236.74	236.74	236.74	236.74
Catch Weight, Micrograms	ND (11.350)	ND (10.970)	ND (15.900)	ND (11.870)
Concentration, ng/DSCM *	ND(3.92E+03)	ND(5.48E+03)	ND(8.15E+03)	ND(6.02E+03)
Emission Rate, Pounds/Hour	ND(3.60E-04)	ND(3.38E-04)	ND(5.69E-04)	ND(3.58E-04)
Emission Rate, Grams/Second	ND(4.53E-05)	ND(4.26E-05)	ND(7.17E-05)	ND(4.52E-05)
Nitrobenzene				
Formula Weight, Lb/Lb-Mole	123.11	123.11	123.11	123.11
Catch Weight, Micrograms	ND (1.030)	ND (1.300)	ND (2.790)	ND (2.840)
Concentration, ng/DSCM *	ND(3.56E+02)	ND(6.50E+02)	ND(1.43E+03)	ND(1.44E+03)
Emission Rate, Pounds/Hour	ND(3.26E-05)	ND(4.00E-05)	ND(9.99E-05)	ND(8.57E-05)
Emission Rate, Grams/Second	ND(4.11E-06)	ND(5.05E-06)	ND(1.26E-05)	ND(1.08E-05)
Isophorone				
Formula Weight, Lb/Lb-Mole	138.21	138.21	138.21	138.21
Catch Weight, Micrograms	ND (0.660)	ND (0.830)	ND (1.790)	ND (1.820)
Concentration, ng/DSCM *	ND(2.28E+02)	ND(4.15E+02)	ND(9.18E+02)	ND(9.23E+02)
Emission Rate, Pounds/Hour	ND(2.09E-05)	ND(2.56E-05)	ND(6.41E-05)	ND(5.49E-05)
Emission Rate, Grams/Second	ND(2.63E-06)	ND(3.22E-06)	ND(8.07E-06)	ND(6.92E-06)

FIELD DATA AND RESULTS TABULATION

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Continued

	OUT-MM5-7A	MID-MM5-7A	OUT-MM5-7C	MID-MM5-7C
2-Nitrophenol				
Formula Weight, Lb/Lb-Mole	139.11	139.11	139.11	139.11
Catch Weight, Micrograms	568.140	567.880	84.070	150.740
Concentration, ng/DSCM *	1.96E+05	2.84E+05	4.31E+04	7.64E+04
Emission Rate, Pounds/Hour	1.80E-02	1.75E-02	3.01E-03	4.55E-03
Emission Rate, Grams/Second	2.27E-03	2.20E-03	3.79E-04	5.73E-04
2,4-Dimethylphenol				
Formula Weight, Lb/Lb-Mole	124.17	124.17	124.17	124.17
Catch Weight, Micrograms	ND (1.640)	ND (2.080)	ND (4.470)	ND (4.560)
Concentration, ng/DSCM *	ND(5.67E+02)	ND(1.04E+03)	ND(2.29E+03)	ND(2.31E+03)
Emission Rate, Pounds/Hour	ND(5.20E-05)	ND(6.41E-05)	ND(1.60E-04)	ND(1.38E-04)
Emission Rate, Grams/Second	ND(6.55E-06)	ND(8.07E-06)	ND(2.02E-05)	ND(1.73E-05)
Benzoic acid				
Formula Weight, Lb/Lb-Mole	122.12	122.12	122.12	122.12
Catch Weight, Micrograms	8242.960	6440.530	9928.190	8364.710
Concentration, ng/DSCM *	2.85E+06	3.22E+06	5.09E+06	4.24E+06
Emission Rate, Pounds/Hour	2.61E-01	1.98E-01	3.55E-01	2.53E-01
Emission Rate, Grams/Second	3.29E-02	2.50E-02	4.48E-02	3.18E-02
bis(2-Chloroethoxy)methane				
Formula Weight, Lb/Lb-Mole	155.04	155.04	155.04	155.04
Catch Weight, Micrograms	ND (1.590)	ND (2.000)	ND (4.310)	ND (4.400)
Concentration, ng/DSCM *	ND(5.50E+02)	ND(1.00E+03)	ND(2.21E+03)	ND(2.23E+03)
Emission Rate, Pounds/Hour	ND(5.04E-05)	ND(6.16E-05)	ND(1.54E-04)	ND(1.33E-04)
Emission Rate, Grams/Second	ND(6.35E-06)	ND(7.76E-06)	ND(1.94E-05)	ND(1.67E-05)
2,4-Dichlorophenol				
Formula Weight, Lb/Lb-Mole	163.00	163.00	163.00	163.00
Catch Weight, Micrograms	ND (1.680)	ND (2.120)	ND (4.560)	ND (4.650)
Concentration, ng/DSCM *	ND(5.81E+02)	ND(1.06E+03)	ND(2.34E+03)	ND(2.36E+03)
Emission Rate, Pounds/Hour	ND(5.32E-05)	ND(6.53E-05)	ND(1.63E-04)	ND(1.40E-04)
Emission Rate, Grams/Second	ND(6.71E-06)	ND(8.23E-06)	ND(2.06E-05)	ND(1.77E-05)
1,2,4-Trichlorobenzene				
Formula Weight, Lb/Lb-Mole	181.45	181.45	181.45	181.45
Catch Weight, Micrograms	2021.010	1536.080	ND (2.710)	ND (2.770)
Concentration, ng/DSCM *	6.99E+05	7.68E+05	ND(1.39E+03)	ND(1.40E+03)
Emission Rate, Pounds/Hour	6.40E-02	4.73E-02	ND(9.70E-05)	ND(8.36E-05)
Emission Rate, Grams/Second	8.07E-03	5.96E-03	ND(1.22E-05)	ND(1.05E-05)
Naphthalene				
Formula Weight, Lb/Lb-Mole	128.17	128.17	128.17	128.17
Catch Weight, Micrograms	2824.160	1729.050	ND (1.410)	ND (1.440)
Concentration, ng/DSCM *	9.76E+05	8.64E+05	ND(7.23E+02)	ND(7.30E+02)
Emission Rate, Pounds/Hour	8.95E-02	5.33E-02	ND(5.05E-05)	ND(4.35E-05)
Emission Rate, Grams/Second	1.13E-02	6.71E-03	ND(6.36E-06)	ND(5.48E-06)

FIELD DATA AND RESULTS TABULATION

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	OUT-MM5-7A	MID-MM5-7A	OUT-MM5-7C	MID-MM5-7C
4-Chloroaniline				
Formula Weight, Lb/Lb-Mole	127.57	127.57	127.57	127.57
Catch Weight, Micrograms	ND (2.460)	ND (3.110)	ND (6.690)	ND (6.830)
Concentration, ng/DSCM *	ND(8.50E+02)	ND(1.55E+03)	ND(3.43E+03)	ND(3.46E+03)
Emission Rate, Pounds/Hour	ND(7.79E-05)	ND(9.58E-05)	ND(2.39E-04)	ND(2.06E-04)
Emission Rate, Grams/Second	ND(9.82E-06)	ND(1.21E-05)	ND(3.02E-05)	ND(2.60E-05)
Hexachlorobutadiene				
Formula Weight, Lb/Lb-Mole	260.76	260.76	260.76	260.76
Catch Weight, Micrograms	ND (2.420)	ND (3.070)	ND (6.590)	ND (6.730)
Concentration, ng/DSCM *	ND(8.37E+02)	ND(1.53E+03)	ND(3.38E+03)	ND(3.41E+03)
Emission Rate, Pounds/Hour	ND(7.67E-05)	ND(9.46E-05)	ND(2.36E-04)	ND(2.03E-04)
Emission Rate, Grams/Second	ND(9.66E-06)	ND(1.19E-05)	ND(2.97E-05)	ND(2.56E-05)
4-Chloro-3-methylphenol				
Formula Weight, Lb/Lb-Mole	142.59	142.59	142.59	142.59
Catch Weight, Micrograms	ND (1.940)	ND (2.450)	ND (5.280)	ND (5.380)
Concentration, ng/DSCM *	ND(6.71E+02)	ND(1.22E+03)	ND(2.71E+03)	ND(2.73E+03)
Emission Rate, Pounds/Hour	ND(6.15E-05)	ND(7.55E-05)	ND(1.89E-04)	ND(1.62E-04)
Emission Rate, Grams/Second	ND(7.74E-06)	ND(9.51E-06)	ND(2.38E-05)	ND(2.05E-05)
2-Methylnaphthalene				
Formula Weight, Lb/Lb-Mole	142.20	142.20	142.20	142.20
Catch Weight, Micrograms	125.400	91.030	ND (2.100)	ND (2.140)
Concentration, ng/DSCM *	4.34E+04	4.55E+04	ND(1.08E+03)	ND(1.09E+03)
Emission Rate, Pounds/Hour	3.97E-03	2.80E-03	ND(7.52E-05)	ND(6.46E-05)
Emission Rate, Grams/Second	5.01E-04	3.53E-04	ND(9.47E-06)	ND(8.14E-06)
Hexachlorocyclopentadiene				
Formula Weight, Lb/Lb-Mole	272.77	272.77	272.77	272.77
Catch Weight, Micrograms	ND (10.660)	ND (12.240)	ND (15.860)	ND (13.820)
Concentration, ng/DSCM *	ND(3.69E+03)	ND(6.12E+03)	ND(8.13E+03)	ND(7.01E+03)
Emission Rate, Pounds/Hour	ND(3.38E-04)	ND(3.77E-04)	ND(5.68E-04)	ND(4.17E-04)
Emission Rate, Grams/Second	ND(4.26E-05)	ND(4.75E-05)	ND(7.15E-05)	ND(5.26E-05)
2,4,6-Trichlorophenol				
Formula Weight, Lb/Lb-Mole	197.45	197.45	197.45	197.45
Catch Weight, Micrograms	ND (3.230)	ND (3.710)	ND (4.820)	ND (4.200)
Concentration, ng/DSCM *	ND(1.12E+03)	ND(1.85E+03)	ND(2.47E+03)	ND(2.13E+03)
Emission Rate, Pounds/Hour	ND(1.02E-04)	ND(1.14E-04)	ND(1.73E-04)	ND(1.27E-04)
Emission Rate, Grams/Second	ND(1.29E-05)	ND(1.44E-05)	ND(2.17E-05)	ND(1.60E-05)
2,4,5-Trichlorophenol				
Formula Weight, Lb/Lb-Mole	197.45	197.45	197.45	197.45
Catch Weight, Micrograms	ND (2.580)	ND (2.960)	ND (3.840)	ND (3.340)
Concentration, ng/DSCM *	ND(8.92E+02)	ND(1.48E+03)	ND(1.97E+03)	ND(1.69E+03)
Emission Rate, Pounds/Hour	ND(8.17E-05)	ND(9.12E-05)	ND(1.37E-04)	ND(1.01E-04)
Emission Rate, Grams/Second	ND(1.03E-05)	ND(1.15E-05)	ND(1.73E-05)	ND(1.27E-05)

FIELD DATA AND RESULTS TABULATION

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	OUT-MM5-7A	MID-MM5-7A	OUT-MM5-7C	MID-MM5-7C
2-Chloronaphthalene				
Formula Weight, Lb/Lb-Mole	162.62	162.62	162.62	162.62
Catch Weight, Micrograms	ND (1.340)	ND (1.540)	ND (1.990)	ND (1.740)
Concentration, ng/DSCM *	ND(4.63E+02)	ND(7.70E+02)	ND(1.02E+03)	ND(8.82E+02)
Emission Rate, Pounds/Hour	ND(4.25E-05)	ND(4.74E-05)	ND(7.12E-05)	ND(5.25E-05)
Emission Rate, Grams/Second	ND(5.35E-06)	ND(5.98E-06)	ND(8.97E-06)	ND(6.62E-06)
2-Nitroaniline				
Formula Weight, Lb/Lb-Mole	138.13	138.13	138.13	138.13
Catch Weight, Micrograms	ND (2.970)	ND (3.410)	ND (4.430)	ND (3.860)
Concentration, ng/DSCM *	ND(1.03E+03)	ND(1.70E+03)	ND(2.27E+03)	ND(1.96E+03)
Emission Rate, Pounds/Hour	ND(9.41E-05)	ND(1.05E-04)	ND(1.59E-04)	ND(1.17E-04)
Emission Rate, Grams/Second	ND(1.19E-05)	ND(1.32E-05)	ND(2.00E-05)	ND(1.47E-05)
Dimethylphthalate				
Formula Weight, Lb/Lb-Mole	194.19	194.19	194.19	194.19
Catch Weight, Micrograms	ND (1.140)	ND (1.310)	ND (1.700)	ND (1.480)
Concentration, ng/DSCM *	ND(3.94E+02)	ND(6.55E+02)	ND(8.72E+02)	ND(7.51E+02)
Emission Rate, Pounds/Hour	ND(3.61E-05)	ND(4.04E-05)	ND(6.08E-05)	ND(4.47E-05)
Emission Rate, Grams/Second	ND(4.55E-06)	ND(5.08E-06)	ND(7.67E-06)	ND(5.63E-06)
Acenaphthylene				
Formula Weight, Lb/Lb-Mole	152.20	152.20	152.20	152.20
Catch Weight, Micrograms	ND (1.040)	ND (1.190)	ND (1.550)	ND (1.350)
Concentration, ng/DSCM *	ND(3.60E+02)	ND(5.95E+02)	ND(7.95E+02)	ND(6.85E+02)
Emission Rate, Pounds/Hour	ND(3.29E-05)	ND(3.67E-05)	ND(5.55E-05)	ND(4.08E-05)
Emission Rate, Grams/Second	ND(4.15E-06)	ND(4.62E-06)	ND(6.99E-06)	ND(5.14E-06)
3-Nitroaniline				
Formula Weight, Lb/Lb-Mole	138.13	138.13	138.13	138.13
Catch Weight, Micrograms	ND (9.520)	ND (10.930)	ND (14.170)	ND (12.340)
Concentration, ng/DSCM *	ND(3.29E+03)	ND(5.46E+03)	ND(7.27E+03)	ND(6.26E+03)
Emission Rate, Pounds/Hour	ND(3.02E-04)	ND(3.37E-04)	ND(5.07E-04)	ND(3.73E-04)
Emission Rate, Grams/Second	ND(3.80E-05)	ND(4.24E-05)	ND(6.39E-05)	ND(4.69E-05)
Acenaphthene				
Formula Weight, Lb/Lb-Mole	154.21	154.21	154.21	154.21
Catch Weight, Micrograms	ND (1.380)	ND (1.580)	ND (2.050)	ND (1.790)
Concentration, ng/DSCM *	ND(4.77E+02)	ND(7.90E+02)	ND(1.05E+03)	ND(9.08E+02)
Emission Rate, Pounds/Hour	ND(4.37E-05)	ND(4.87E-05)	ND(7.34E-05)	ND(5.40E-05)
Emission Rate, Grams/Second	ND(5.51E-06)	ND(6.13E-06)	ND(9.24E-06)	ND(6.81E-06)
2,4-Dinitrophenol				
Formula Weight, Lb/Lb-Mole	184.11	184.11	184.11	184.11
Catch Weight, Micrograms	ND (19.580)	ND (100.990)	ND (29.150)	ND (25.390)
Concentration, ng/DSCM *	ND(6.77E+03)	ND(5.05E+04)	ND(1.50E+04)	ND(1.29E+04)
Emission Rate, Pounds/Hour	ND(6.20E-04)	ND(3.11E-03)	ND(1.04E-03)	ND(7.67E-04)
Emission Rate, Grams/Second	ND(7.82E-05)	ND(3.92E-04)	ND(1.31E-04)	ND(9.66E-05)

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	OUT-MM5-7A	MID-MM5-7A	OUT-MM5-7C	MID-MM5-7C
4-Nitrophenol				
Formula Weight, Lb/Lb-Mole	139.11	139.11	139.11	139.11
Catch Weight, Micrograms	ND (18.340)	ND (21.060)	189.920	2846.330
Concentration, ng/DSCM *	ND(6.34E+03)	ND(1.05E+04)	9.74E+04	1.44E+06
Emission Rate, Pounds/Hour	ND(5.81E-04)	ND(6.49E-04)	6.80E-03	8.59E-02
Emission Rate, Grams/Second	ND(7.32E-05)	ND(8.17E-05)	8.56E-04	1.08E-02
Dibenzofuran				
Formula Weight, Lb/Lb-Mole	168.20	168.20	168.20	168.20
Catch Weight, Micrograms	130.870	89.480	ND [8.890]	ND (1.110)
Concentration, ng/DSCM *	4.52E+04	4.47E+04	ND[4.56E+03]	ND(5.63E+02)
Emission Rate, Pounds/Hour	4.15E-03	2.76E-03	ND[3.18E-04]	ND(3.35E-05)
Emission Rate, Grams/Second	5.22E-04	3.47E-04	ND[4.01E-05]	ND(4.22E-06)
2,4-Dinitrotoluene				
Formula Weight, Lb/Lb-Mole	182.14	182.14	182.14	182.14
Catch Weight, Micrograms	ND (4.800)	ND (5.510)	ND (7.140)	ND (6.220)
Concentration, ng/DSCM *	ND(1.66E+03)	ND(2.75E+03)	ND(3.66E+03)	ND(3.15E+03)
Emission Rate, Pounds/Hour	ND(1.52E-04)	ND(1.70E-04)	ND(2.56E-04)	ND(1.88E-04)
Emission Rate, Grams/Second	ND(1.92E-05)	ND(2.14E-05)	ND(3.22E-05)	ND(2.37E-05)
2,6-Dinitrotoluene				
Formula Weight, Lb/Lb-Mole	182.14	182.14	182.14	182.14
Catch Weight, Micrograms	ND (5.610)	ND (6.440)	ND (8.350)	ND (7.270)
Concentration, ng/DSCM *	ND(1.94E+03)	ND(3.22E+03)	ND(4.28E+03)	ND(3.69E+03)
Emission Rate, Pounds/Hour	ND(1.78E-04)	ND(1.98E-04)	ND(2.99E-04)	ND(2.19E-04)
Emission Rate, Grams/Second	ND(2.24E-05)	ND(2.50E-05)	ND(3.77E-05)	ND(2.77E-05)
Diethylphthalate				
Formula Weight, Lb/Lb-Mole	222.24	222.24	222.24	222.24
Catch Weight, Micrograms	ND (1.500)	ND (1.720)	ND (2.230)	ND (1.950)
Concentration, ng/DSCM *	ND(5.19E+02)	ND(8.60E+02)	ND(1.14E+03)	ND(9.89E+02)
Emission Rate, Pounds/Hour	ND(4.75E-05)	ND(5.30E-05)	ND(7.98E-05)	ND(5.69E-05)
Emission Rate, Grams/Second	ND(5.99E-06)	ND(6.68E-06)	ND(1.01E-05)	ND(7.42E-06)
4-Chlorophenyl-phenylether				
Formula Weight, Lb/Lb-Mole	204.24	204.24	204.24	204.24
Catch Weight, Micrograms	ND (1.540)	ND (1.770)	ND (2.300)	ND (2.000)
Concentration, ng/DSCM *	ND(5.32E+02)	ND(8.85E+02)	ND(1.18E+03)	ND(1.01E+03)
Emission Rate, Pounds/Hour	ND(4.88E-05)	ND(5.45E-05)	ND(8.21E-05)	ND(6.04E-05)
Emission Rate, Grams/Second	ND(6.15E-06)	ND(6.87E-06)	ND(1.04E-05)	ND(7.61E-06)
Fluorene				
Formula Weight, Lb/Lb-Mole	166.22	166.22	166.22	166.22
Catch Weight, Micrograms	ND (1.090)	ND (1.250)	ND (1.620)	ND (1.410)
Concentration, ng/DSCM *	ND(3.77E+02)	ND(6.25E+02)	ND(8.31E+02)	ND(7.15E+02)
Emission Rate, Pounds/Hour	ND(3.45E-05)	ND(3.85E-05)	ND(5.80E-05)	ND(4.26E-05)
Emission Rate, Grams/Second	ND(4.35E-06)	ND(4.85E-06)	ND(7.31E-06)	ND(5.36E-06)

FIELD DATA AND RESULTS TABULATION

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	OUT-MM5-7A	MID-MM5-7A	OUT-MM5-7C	MID-MM5-7C
4-Nitroaniline				
Formula Weight, Lb/Lb-Mole	138.13	138.13	138.13	138.13
Catch Weight, Micrograms	ND (10.470)	ND (12.020)	ND (15.590)	ND (13.580)
Concentration, ng/DSCM *	ND(3.62E+03)	ND(6.01E+03)	ND(8.00E+03)	ND(6.89E+03)
Emission Rate, Pounds/Hour	ND(3.32E-04)	ND(3.70E-04)	ND(5.58E-04)	ND(4.10E-04)
Emission Rate, Grams/Second	ND(4.18E-05)	ND(4.67E-05)	ND(7.03E-05)	ND(5.17E-05)
4,6-Dinitro-2-methylphenol				
Formula Weight, Lb/Lb-Mole	198.13	198.13	198.13	198.13
Catch Weight, Micrograms	ND (21.140)	ND (19.530)	ND (22.830)	ND (16.310)
Concentration, ng/DSCM *	ND(7.31E+03)	ND(9.76E+03)	ND(1.17E+04)	ND(8.27E+03)
Emission Rate, Pounds/Hour	ND(6.70E-04)	ND(6.02E-04)	ND(8.17E-04)	ND(4.92E-04)
Emission Rate, Grams/Second	ND(8.44E-05)	ND(7.58E-05)	ND(1.03E-04)	ND(6.20E-05)
N-Nitrosodiphenylamine(1)				
Formula Weight, Lb/Lb-Mole	198.13	198.13	198.13	198.13
Catch Weight, Micrograms	ND (1.970)	ND (1.820)	ND (2.120)	ND (1.520)
Concentration, ng/DSCM *	ND(6.81E+02)	ND(9.10E+02)	ND(1.09E+03)	ND(7.71E+02)
Emission Rate, Pounds/Hour	ND(6.24E-05)	ND(5.61E-05)	ND(7.59E-05)	ND(4.59E-05)
Emission Rate, Grams/Second	ND(7.86E-06)	ND(7.06E-06)	ND(9.56E-06)	ND(5.78E-06)
4-Bromophenyl-phenylether				
Formula Weight, Lb/Lb-Mole	249.11	249.11	249.11	249.11
Catch Weight, Micrograms	ND (4.620)	ND (4.450)	ND (5.210)	ND (3.720)
Concentration, ng/DSCM *	ND(1.67E+03)	ND(2.22E+03)	ND(2.67E+03)	ND(1.89E+03)
Emission Rate, Pounds/Hour	ND(1.53E-04)	ND(1.37E-04)	ND(1.86E-04)	ND(1.12E-04)
Emission Rate, Grams/Second	ND(1.92E-05)	ND(1.73E-05)	ND(2.35E-05)	ND(1.42E-05)
Hexachlorobenzene				
Formula Weight, Lb/Lb-Mole	284.78	284.78	284.78	284.78
Catch Weight, Micrograms	ND (5.370)	ND (4.960)	ND (5.800)	ND (4.140)
Concentration, ng/DSCM *	ND(1.86E+03)	ND(2.48E+03)	ND(2.97E+03)	ND(2.10E+03)
Emission Rate, Pounds/Hour	ND(1.70E-04)	ND(1.53E-04)	ND(2.08E-04)	ND(1.25E-04)
Emission Rate, Grams/Second	ND(2.14E-05)	ND(1.93E-05)	ND(2.62E-05)	ND(1.57E-05)
Pentachlorophenol				
Formula Weight, Lb/Lb-Mole	266.34	266.34	266.34	266.34
Catch Weight, Micrograms	ND (24.690)	ND (22.820)	ND (26.670)	ND (19.040)
Concentration, ng/DSCM *	ND(8.54E+03)	ND(1.14E+04)	ND(1.37E+04)	ND(9.66E+03)
Emission Rate, Pounds/Hour	ND(7.82E-04)	ND(7.03E-04)	ND(9.55E-04)	ND(5.75E-04)
Emission Rate, Grams/Second	ND(9.86E-05)	ND(8.86E-05)	ND(1.20E-04)	ND(7.24E-05)
Phenanthrene				
Formula Weight, Lb/Lb-Mole	178.23	178.23	178.23	178.23
Catch Weight, Micrograms	129.940	66.870	26.770	ND (0.500)
Concentration, ng/DSCM *	4.49E+04	3.34E+04	1.37E+04	ND(2.54E+02)
Emission Rate, Pounds/Hour	4.12E-03	2.06E-03	9.58E-04	ND(1.51E-05)
Emission Rate, Grams/Second	5.19E-04	2.60E-04	1.21E-04	ND(1.90E-06)

FIELD DATA AND RESULTS TABULATION

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	OUT-MM5-7A	MID-MM5-7A	OUT-MM5-7C	MID-MM5-7C
Anthracene				
Formula Weight, Lb/Lb-Mole	178.23	178.23	178.23	178.23
Catch Weight, Micrograms	ND (0.670)	ND (0.620)	ND (0.730)	ND (0.520)
Concentration, ng/DSCM *	ND(2.32E+02)	ND(3.10E+02)	ND(3.74E+02)	ND(2.64E+02)
Emission Rate, Pounds/Hour	ND(2.12E-05)	ND(1.91E-05)	ND(2.61E-05)	ND(1.57E-05)
Emission Rate, Grams/Second	ND(2.67E-06)	ND(2.41E-06)	ND(3.29E-06)	ND(1.98E-06)
Di-n-butylphthalate				
Formula Weight, Lb/Lb-Mole	278.35	278.35	278.35	278.35
Catch Weight, Micrograms	ND (1.130)	ND (1.050)	ND (10.200)	ND (0.870)
Concentration, ng/DSCM *	ND(3.91E+02)	ND(5.25E+02)	ND[5.23E+03]	ND(4.41E+02)
Emission Rate, Pounds/Hour	ND(3.58E-05)	ND(3.23E-05)	ND[3.65E-04]	ND(2.63E-05)
Emission Rate, Grams/Second	ND(4.51E-06)	ND(4.08E-06)	ND[4.60E-05]	ND(3.31E-06)
Fluoranthene				
Formula Weight, Lb/Lb-Mole	202.26	202.26	202.26	202.26
Catch Weight, Micrograms	ND [14.290]	26.620	ND [4.350]	ND (0.340)
Concentration, ng/DSCM *	ND[4.94E+03]	1.33E+04	ND[2.23E+03]	ND(1.72E+02)
Emission Rate, Pounds/Hour	ND[4.53E-04]	8.20E-04	ND[1.56E-04]	ND(1.03E-05)
Emission Rate, Grams/Second	ND[5.70E-05]	1.03E-04	ND[1.96E-05]	ND(1.29E-06)
Pyrene				
Formula Weight, Lb/Lb-Mole	202.26	202.26	202.26	202.26
Catch Weight, Micrograms	ND (0.230)	ND [14.050]	ND (0.280)	ND (0.160)
Concentration, ng/DSCM *	ND(7.95E+01)	ND[7.02E+03]	ND(1.44E+02)	ND(8.11E+01)
Emission Rate, Pounds/Hour	ND(7.29E-06)	ND[4.33E-04]	ND(1.00E-05)	ND(4.83E-06)
Emission Rate, Grams/Second	ND(9.18E-07)	ND[5.45E-05]	ND(1.26E-06)	ND(6.09E-07)
Butylbenzylphthalate				
Formula Weight, Lb/Lb-Mole	312.39	312.39	312.39	312.39
Catch Weight, Micrograms	ND (0.820)	ND (1.210)	ND (1.000)	ND (0.560)
Concentration, ng/DSCM *	ND(2.83E+02)	ND(6.05E+02)	ND(5.13E+02)	ND(2.84E+02)
Emission Rate, Pounds/Hour	ND(2.60E-05)	ND(3.73E-05)	ND(3.58E-05)	ND(1.69E-05)
Emission Rate, Grams/Second	ND(3.27E-06)	ND(4.70E-06)	ND(4.51E-06)	ND(2.13E-06)
3,3'-Dichlorobenzidine				
Formula Weight, Lb/Lb-Mole	253.13	253.13	253.13	253.13
Catch Weight, Micrograms	ND (3.790)	ND (5.580)	ND (4.640)	ND (2.610)
Concentration, ng/DSCM *	ND(1.31E+03)	ND(2.79E+03)	ND(2.38E+03)	ND(1.32E+03)
Emission Rate, Pounds/Hour	ND(1.20E-04)	ND(1.72E-04)	ND(1.66E-04)	ND(7.88E-05)
Emission Rate, Grams/Second	ND(1.51E-05)	ND(2.17E-05)	ND(2.09E-05)	ND(9.93E-06)
Benzo(a)anthracene				
Formula Weight, Lb/Lb-Mole	228.30	228.30	228.30	228.30
Catch Weight, Micrograms	ND (0.300)	ND [4.410]	ND (0.360)	ND (0.200)
Concentration, ng/DSCM *	ND(1.04E+02)	ND[2.20E+03]	ND[1.85E+02]	ND(1.01E+02)
Emission Rate, Pounds/Hour	ND(9.50E-06)	ND[1.36E-04]	ND[1.29E-05]	ND(6.04E-06)
Emission Rate, Grams/Second	ND(1.20E-06)	ND[1.71E-05]	ND(1.62E-06)	ND(7.61E-07)

FIELD DATA AND RESULTS TABULATION

SEMIVOLATILE

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	OUT-MM5-7A	MID-MM5-7A	OUT-MM5-7C	MID-MM5-7C
Chrysene				
Formula Weight, Lb/Lb-Mole	228.29	228.29	228.29	228.29
Catch Weight, Micrograms	ND (0.310)	ND (0.460)	ND (0.380)	ND (0.210)
Concentration, ng/DSCM *	ND(1.07E+02)	ND(2.30E+02)	ND(1.95E+02)	ND(1.06E+02)
Emission Rate, Pounds/Hour	ND(9.82E-06)	ND(1.42E-05)	ND(1.36E-05)	ND(6.34E-06)
Emission Rate, Grams/Second	ND(1.24E-06)	ND(1.79E-06)	ND(1.71E-06)	ND(7.99E-07)
bis(2-Ethylhexyl)phthalate				
Formula Weight, Lb/Lb-Mole	390.56	390.56	390.56	390.56
Catch Weight, Micrograms	84.370	52.210	ND [10.260]	141.180
Concentration, ng/DSCM *	2.92E+04	2.61E+04	ND[5.26E+03]	7.16E+04
Emission Rate, Pounds/Hour	2.67E-03	1.61E-03	ND[3.67E-04]	4.26E-03
Emission Rate, Grams/Second	3.37E-04	2.03E-04	ND[4.63E-05]	5.37E-04
Di-n-octylphthalate				
Formula Weight, Lb/Lb-Mole	390.62	390.62	390.62	390.62
Catch Weight, Micrograms	ND [4.910]	ND (0.910)	ND (0.380)	ND (1396.850)
Concentration, ng/DSCM *	ND[1.70E+03]	ND(4.55E+02)	ND(1.95E+02)	ND(7.08E+05)
Emission Rate, Pounds/Hour	ND[1.56E-04]	ND(2.80E-05)	ND(1.36E-05)	ND(4.22E-02)
Emission Rate, Grams/Second	ND[1.96E-05]	ND(3.53E-06)	ND(1.71E-06)	ND(5.31E-03)
Benzo(b)fluoranthene				
Formula Weight, Lb/Lb-Mole	252.32	252.32	252.32	252.32
Catch Weight, Micrograms	ND (0.580)	ND (1.290)	ND (0.550)	ND (1657.480)
Concentration, ng/DSCM *	ND(2.01E+02)	ND(6.45E+02)	ND(2.82E+02)	ND(8.41E+05)
Emission Rate, Pounds/Hour	ND(1.84E-05)	ND(3.97E-05)	ND(1.97E-05)	ND(5.00E-02)
Emission Rate, Grams/Second	ND(2.32E-06)	ND(5.01E-06)	ND(2.48E-06)	ND(6.30E-03)
Benzo(k)fluoranthene				
Formula Weight, Lb/Lb-Mole	252.32	252.32	252.32	252.32
Catch Weight, Micrograms	ND (0.500)	ND (1.120)	ND (0.470)	ND (809.160)
Concentration, ng/DSCM *	ND(1.73E+02)	ND(5.60E+02)	ND(2.41E+02)	ND(4.10E+05)
Emission Rate, Pounds/Hour	ND(1.58E-05)	ND(3.45E-05)	ND(1.68E-05)	ND(2.44E-02)
Emission Rate, Grams/Second	ND(2.00E-06)	ND(4.35E-06)	ND(2.12E-06)	ND(3.08E-03)
Benzo(a)pyrene				
Formula Weight, Lb/Lb-Mole	252.32	252.32	252.32	252.32
Catch Weight, Micrograms	ND (0.730)	ND (1.630)	ND (0.690)	ND (955.720)
Concentration, ng/DSCM *	ND(2.52E+02)	ND(8.15E+02)	ND(3.54E+02)	ND(4.85E+05)
Emission Rate, Pounds/Hour	ND(2.31E-05)	ND(5.02E-05)	ND(2.47E-05)	ND(2.89E-02)
Emission Rate, Grams/Second	ND(2.91E-06)	ND(6.33E-06)	ND(3.11E-06)	ND(3.64E-03)
Indeno(1,2,3-cd)pyrene				
Formula Weight, Lb/Lb-Mole	288.35	288.35	288.35	288.35
Catch Weight, Micrograms	ND (1.560)	ND (3.470)	ND (1.470)	ND (2346.940)
Concentration, ng/DSCM *	ND(5.39E+02)	ND(1.73E+03)	ND(7.54E+02)	ND(1.19E+06)
Emission Rate, Pounds/Hour	ND(4.94E-05)	ND(1.07E-04)	ND(5.26E-05)	ND(7.09E-02)
Emission Rate, Grams/Second	ND(6.23E-06)	ND(1.35E-05)	ND(6.63E-06)	ND(8.93E-03)

FIELD DATA AND RESULTS TABULATION

SEMIVOLATILE

Continued

	OUT-M5-7A	MID-M5-7A	OUT-M5-7C	MID-M5-7C
Dibenz(a,h)anthracene				
Formula Weight, Lb/Lb-Mole	278.35	278.35	278.35	278.35
Catch Weight, Micrograms	ND (1.270)	ND (2.830)	ND (1.200)	ND (2150.640)
Concentration, ng/DSCM *	ND(4.39E+02)	ND(1.41E+03)	ND(6.15E+02)	ND(1.09E+06)
Emission Rate, Pounds/Hour	ND(4.02E-05)	ND(8.72E-05)	ND(4.29E-05)	ND(6.49E-02)
Emission Rate, Grams/Second	ND(5.07E-06)	ND(1.10E-05)	ND(5.41E-06)	ND(8.18E-03)
Benzo(g,h,i)perylene				
Formula Weight, Lb/Lb-Mole	276.34	276.34	276.34	276.34
Catch Weight, Micrograms	ND (1.130)	ND (2.510)	ND (1.060)	ND (1266.860)
Concentration, ng/DSCM *	ND(3.91E+02)	ND(1.25E+03)	ND(5.44E+02)	ND(6.42E+05)
Emission Rate, Pounds/Hour	ND(3.58E-05)	ND(7.73E-05)	ND(3.79E-05)	ND(3.82E-02)
Emission Rate, Grams/Second	ND(4.51E-06)	ND(9.74E-06)	ND(4.78E-06)	ND(4.82E-03)

FIELD DATA AND RESULTS TABULATION
Continued

Plant: SSI, Site 9
Sampling Location: Multiple Hearth Incinerator Stack Operator: Richard L. Moreno

	7A-O-V-1	7B-O-V-1	7C-O-V-1
Date	5/30/90	5/30/90	5/30/90
Start Time	2015	2036	2117
Finish Time	2035	2056	2137
Net Sampling Time, Minutes	20	20	20
Dry Gas Meter Coefficient	0.9970	1.0114	0.9970
Barometric Pressure, In. Hg.	29.20	29.20	29.20
Meter Temperature, Deg. F	69	68	65
Volume Metered, DSCF *	0.687	0.681	0.694
Flue Gas Flow Rate, Dry SCFM *	19500	19500	19500
Acrylonitrile			
Formula Weight, Lb/Lb-Mole	53.06	53.06	53.06
Catch Weight, Micrograms	41.166	12.841	27.909
Concentration, ng/DSCM *	2.11E+06	6.66E+05	1.42E+06
Emission Rate, Pounds/Hour	1.54E-01	4.86E-02	1.04E-01
Emission Rate, Grams/Second	1.95E-02	6.13E-03	1.31E-02
Vinyl Chloride			
Formula Weight, Lb/Lb-Mole	62.50	62.50	62.50
Catch Weight, Micrograms	ND (0.005)	ND (0.005)	ND (0.006)
Concentration, ng/DSCM *	ND(2.57E+02)	ND(2.59E+02)	ND(3.05E+02)
Emission Rate, Pounds/Hour	ND(1.88E-05)	ND(1.89E-05)	ND(2.23E-05)
Emission Rate, Grams/Second	ND(2.36E-06)	ND(2.39E-06)	ND(2.81E-06)
Methylene Chloride			
Formula Weight, Lb/Lb-Mole	84.94	84.94	84.94
Catch Weight, Micrograms	2.054	1.982	0.856
Concentration, ng/DSCM *	1.06E+05	1.03E+05	4.36E+04
Emission Rate, Pounds/Hour	7.71E-03	7.51E-03	3.18E-03
Emission Rate, Grams/Second	9.71E-04	9.46E-04	4.01E-04
Chloroform			
Formula Weight, Lb/Lb-Mole	119.38	119.38	119.38
Catch Weight, Micrograms	0.592	ND (0.002)	0.818
Concentration, ng/DSCM *	3.04E+04	ND(1.04E+02)	4.16E+04
Emission Rate, Pounds/Hour	2.22E-03	ND(7.56E-06)	3.04E-03
Emission Rate, Grams/Second	2.80E-04	ND(9.55E-07)	3.83E-04
1,2-Dichloroethane			
Formula Weight, Lb/Lb-Mole	98.96	98.96	98.96
Catch Weight, Micrograms	ND (0.003)	ND (0.003)	ND (0.003)
Concentration, ng/DSCM *	ND(1.54E+02)	ND(1.56E+02)	ND(1.53E+02)
Emission Rate, Pounds/Hour	ND(1.13E-05)	ND(1.14E-05)	ND(1.12E-05)
Emission Rate, Grams/Second	ND(1.42E-06)	ND(1.43E-06)	ND(1.41E-06)

FIELD DATA AND RESULTS TABULATION
Continued

	7A-O-V-1	7B-O-V-1	7C-O-V-1
1,1,1-Trichloroethane			
Formula Weight, Lb/Lb-Mole	133.41	133.41	133.41
Catch Weight, Micrograms	ND (0.002)	0.624	0.740
Concentration, ng/DSCM *	ND(1.03E+02)	3.24E+04	3.77E+04
Emission Rate, Pounds/Hour	ND(7.51E-06)	2.36E-03	2.75E-03
Emission Rate, Grams/Second	ND(9.46E-07)	2.98E-04	3.47E-04
Carbon Tetrachloride			
Formula Weight, Lb/Lb-Mole	153.82	153.82	153.82
Catch Weight, Micrograms	ND (0.002)	ND (0.003)	ND (0.003)
Concentration, ng/DSCM *	ND(1.03E+02)	ND(1.56E+02)	ND(1.53E+02)
Emission Rate, Pounds/Hour	ND(7.51E-06)	ND(1.14E-05)	ND(1.12E-05)
Emission Rate, Grams/Second	ND(9.46E-07)	ND(1.43E-06)	ND(1.41E-06)
Trichloroethene			
Formula Weight, Lb/Lb-Mole	131.40	131.40	131.40
Catch Weight, Micrograms	ND (0.002)	0.592	0.720
Concentration, ng/DSCM *	ND(1.03E+02)	3.07E+04	3.66E+04
Emission Rate, Pounds/Hour	ND(7.51E-06)	2.24E-03	2.68E-03
Emission Rate, Grams/Second	ND(9.46E-07)	2.83E-04	3.37E-04
Benzene			
Formula Weight, Lb/Lb-Mole	78.12	78.12	78.12
Catch Weight, Micrograms	401.912	68.153	137.402
Concentration, ng/DSCM *	2.06E+07	3.53E+06	6.99E+06
Emission Rate, Pounds/Hour	1.51E+00	2.58E-01	5.11E-01
Emission Rate, Grams/Second	1.90E-01	3.25E-02	6.44E-02
Tetrachloroethene			
Formula Weight, Lb/Lb-Mole	163.85	163.85	163.85
Catch Weight, Micrograms	ND [0.032]	0.591	0.635
Concentration, ng/DSCM *	ND[1.64E+03]	3.06E+04	3.23E+04
Emission Rate, Pounds/Hour	ND[1.20E-04]	2.24E-03	2.36E-03
Emission Rate, Grams/Second	ND[1.51E-05]	2.82E-04	2.97E-04
Toluene			
Formula Weight, Lb/Lb-Mole	92.13	92.13	92.13
Catch Weight, Micrograms	108.201	61.346	178.215
Concentration, ng/DSCM *	5.56E+06	3.18E+06	9.07E+06
Emission Rate, Pounds/Hour	4.06E-01	2.32E-01	6.63E-01
Emission Rate, Grams/Second	5.12E-02	2.93E-02	8.35E-02
Chlorobenzene			
Formula Weight, Lb/Lb-Mole	112.56	112.56	112.56
Catch Weight, Micrograms	ND [0.023]	0.424	1.605
Concentration, ng/DSCM *	ND[1.18E+03]	2.20E+04	8.17E+04
Emission Rate, Pounds/Hour	ND[8.63E-05]	1.61E-03	5.97E-03
Emission Rate, Grams/Second	ND[1.09E-05]	2.02E-04	7.52E-04

FIELD DATA AND RESULTS TABULATION
Continued

	7A-O-V-1	7B-O-V-1	7C-O-V-1
Ethylbenzene			
Formula Weight, Lb/Lb-Mole	106.16	106.16	106.16
Catch Weight, Micrograms	0.070	0.780	7.234
Concentration, ng/DSCM *	3.60E+03	4.04E+04	3.68E+05
Emission Rate, Pounds/Hour	2.63E-04	2.95E-03	2.69E-02
Emission Rate, Grams/Second	3.31E-05	3.72E-04	3.39E-03

FIELD DATA AND RESULTS TABULATION
Continued

Plant: SSI, Site 9
Sampling Location: Multiple Hearth Incinerator Stack Operator: Richard L. Moreno

	7A-O-V-2	7B-O-V-2	7C-O-V-2
Date	5/31/90	5/31/90	5/31/90
Start Time	1645	1705	1725
Finish Time	1705	1725	1745
Net Sampling Time, Minutes	20	20	20
Dry Gas Meter Coefficient	1.0114	0.9970	1.0114
Barometric Pressure, In. Hg.	29.70	29.70	29.70
Meter Temperature, Deg. F	77	78	82
Volume Metered, DSCF *	0.699	0.671	0.690
Flue Gas Flow Rate, Dry SCFM *	18800	18800	18800
Acrylonitrile			
Formula Weight, Lb/Lb-Mole	53.06	53.06	53.06
Catch Weight, Micrograms	23.804	18.357	22.722
Concentration, ng/DSCM *	1.20E+06	9.66E+05	1.16E+06
Emission Rate, Pounds/Hour	8.47E-02	6.80E-02	8.19E-02
Emission Rate, Grams/Second	1.07E-02	8.57E-03	1.03E-02
Vinyl Chloride			
Formula Weight, Lb/Lb-Mole	62.50	62.50	62.50
Catch Weight, Micrograms	4.282	ND (0.004)	4.150
Concentration, ng/DSCM *	2.16E+05	ND(2.10E+02)	2.13E+05
Emission Rate, Pounds/Hour	1.52E-02	ND(1.48E-05)	1.50E-02
Emission Rate, Grams/Second	1.92E-03	ND(1.87E-06)	1.89E-03
Methylene Chloride			
Formula Weight, Lb/Lb-Mole	84.94	84.94	84.94
Catch Weight, Micrograms	0.303	0.149	0.491
Concentration, ng/DSCM *	1.53E+04	7.84E+03	2.51E+04
Emission Rate, Pounds/Hour	1.08E-03	5.52E-04	1.77E-03
Emission Rate, Grams/Second	1.36E-04	6.96E-05	2.23E-04
Chloroform			
Formula Weight, Lb/Lb-Mole	119.38	119.38	119.38
Catch Weight, Micrograms	0.594	0.475	0.323
Concentration, ng/DSCM *	3.00E+04	2.50E+04	1.65E+04
Emission Rate, Pounds/Hour	2.11E-03	1.76E-03	1.16E-03
Emission Rate, Grams/Second	2.66E-04	2.22E-04	1.47E-04
1,2-Dichloroethane			
Formula Weight, Lb/Lb-Mole	98.96	98.96	98.96
Catch Weight, Micrograms	ND (0.002)	ND (0.002)	ND (0.002)
Concentration, ng/DSCM *	ND(1.01E+02)	ND(1.05E+02)	ND(1.02E+02)
Emission Rate, Pounds/Hour	ND(7.12E-06)	ND(7.41E-06)	ND(7.21E-06)
Emission Rate, Grams/Second	ND(8.97E-07)	ND(9.34E-07)	ND(9.09E-07)

FIELD DATA AND RESULTS TABULATION
Continued

	7A-O-V-2	7B-O-V-2	7C-O-V-2
1,1,1-Trichloroethane			
Formula Weight, Lb/Lb-Mole	133.41	133.41	133.41
Catch Weight, Micrograms	0.524	0.418	0.352
Concentration, ng/DSCM *	2.65E+04	2.20E+04	1.80E+04
Emission Rate, Pounds/Hour	1.86E-03	1.55E-03	1.27E-03
Emission Rate, Grams/Second	2.35E-04	1.95E-04	1.60E-04
Carbon Tetrachloride			
Formula Weight, Lb/Lb-Mole	153.82	153.82	153.82
Catch Weight, Micrograms	ND (0.002)	ND (0.002)	ND (0.002)
Concentration, ng/DSCM *	ND(1.01E+02)	ND(1.05E+02)	ND(1.02E+02)
Emission Rate, Pounds/Hour	ND(7.12E-06)	ND(7.41E-06)	ND(7.21E-06)
Emission Rate, Grams/Second	ND(8.97E-07)	ND(9.34E-07)	ND(9.09E-07)
Trichloroethene			
Formula Weight, Lb/Lb-Mole	131.40	131.40	131.40
Catch Weight, Micrograms	0.603	0.576	0.422
Concentration, ng/DSCM *	3.05E+04	3.03E+04	2.16E+04
Emission Rate, Pounds/Hour	2.15E-03	2.13E-03	1.52E-03
Emission Rate, Grams/Second	2.70E-04	2.69E-04	1.92E-04
Benzene			
Formula Weight, Lb/Lb-Mole	78.12	78.12	78.12
Catch Weight, Micrograms	93.053	95.659	108.263
Concentration, ng/DSCM *	4.70E+06	5.03E+06	5.54E+06
Emission Rate, Pounds/Hour	3.31E-01	3.55E-01	3.90E-01
Emission Rate, Grams/Second	4.17E-02	4.47E-02	4.92E-02
Tetrachloroethene			
Formula Weight, Lb/Lb-Mole	163.85	163.85	163.85
Catch Weight, Micrograms	0.740	0.749	0.481
Concentration, ng/DSCM *	3.74E+04	3.94E+04	2.46E+04
Emission Rate, Pounds/Hour	2.63E-03	2.78E-03	1.73E-03
Emission Rate, Grams/Second	3.32E-04	3.50E-04	2.19E-04
Toluene			
Formula Weight, Lb/Lb-Mole	92.13	92.13	92.13
Catch Weight, Micrograms	76.782	97.151	42.503
Concentration, ng/DSCM *	3.88E+06	5.11E+06	2.18E+06
Emission Rate, Pounds/Hour	2.73E-01	3.60E-01	1.53E-01
Emission Rate, Grams/Second	3.44E-02	4.54E-02	1.93E-02
Chlorobenzene			
Formula Weight, Lb/Lb-Mole	112.56	112.56	112.56
Catch Weight, Micrograms	0.826	2.775	1.009
Concentration, ng/DSCM *	4.17E+04	1.46E+05	5.17E+04
Emission Rate, Pounds/Hour	2.94E-03	1.03E-02	3.64E-03
Emission Rate, Grams/Second	3.70E-04	1.30E-03	4.58E-04

FIELD DATA AND RESULTS TABULATION
Continued

	7A-O-V-2	7B-O-V-2	7C-O-V-2
Ethylbenzene			
Formula Weight, Lb/Lb-Mole	106.16	106.16	106.16
Catch Weight, Micrograms	0.977	3.930	1.237
Concentration, ng/DSCM *	4.94E+04	2.07E+05	6.33E+04
Emission Rate, Pounds/Hour	3.48E-03	1.46E-02	4.46E-03
Emission Rate, Grams/Second	4.38E-04	1.84E-03	5.62E-04

FIELD DATA AND RESULTS TABULATION
Continued

Plant: SSI, Site 9
Sampling Location: Multiple Hearth Incinerator Stack Operator: Richard L. Moreno

	7A-O-V-3	7B-O-V-3	7C-O-V-3
Date	5/31/90	5/31/90	5/31/90
Start Time	1745	1805	1825
Finish Time	1805	1825	1845
Net Sampling Time, Minutes	20	20	20
Dry Gas Meter Coefficient	1.0114	0.9970	1.0114
Barometric Pressure, In. Hg.	29.70	29.70	29.70
Meter Temperature, Deg. F	84	84	84
Volume Metered, DSCF *	0.680	0.686	0.682
Flue Gas Flow Rate, Dry SCFM *	18800	18800	18800
Acrylonitrile			
Formula Weight, Lb/Lb-Mole	53.06	53.06	53.06
Catch Weight, Micrograms	12.599	10.915	15.325
Concentration, ng/DSCM *	6.54E+05	5.62E+05	7.94E+05
Emission Rate, Pounds/Hour	4.61E-02	3.96E-02	5.59E-02
Emission Rate, Grams/Second	5.81E-03	4.99E-03	7.04E-03
Vinyl Chloride			
Formula Weight, Lb/Lb-Mole	62.50	62.50	62.50
Catch Weight, Micrograms	ND (0.003)	3.246	ND (0.004)
Concentration, ng/DSCM *	ND(1.56E+02)	1.67E+05	ND(2.07E+02)
Emission Rate, Pounds/Hour	ND(1.10E-05)	1.18E-02	ND(1.46E-05)
Emission Rate, Grams/Second	ND(1.38E-06)	1.48E-03	ND(1.84E-06)
Methylene Chloride			
Formula Weight, Lb/Lb-Mole	84.94	84.94	84.94
Catch Weight, Micrograms	0.249	0.285	0.320
Concentration, ng/DSCM *	1.29E+04	1.47E+04	1.66E+04
Emission Rate, Pounds/Hour	9.11E-04	1.03E-03	1.17E-03
Emission Rate, Grams/Second	1.15E-04	1.30E-04	1.47E-04
Chloroform			
Formula Weight, Lb/Lb-Mole	119.38	119.38	119.38
Catch Weight, Micrograms	0.420	0.503	0.493
Concentration, ng/DSCM *	2.18E+04	2.59E+04	2.55E+04
Emission Rate, Pounds/Hour	1.54E-03	1.82E-03	1.80E-03
Emission Rate, Grams/Second	1.94E-04	2.30E-04	2.27E-04
1,2-Dichloroethane			
Formula Weight, Lb/Lb-Mole	98.96	98.96	98.96
Catch Weight, Micrograms	ND (0.002)	ND (0.002)	ND (0.002)
Concentration, ng/DSCM *	ND(1.04E+02)	ND(1.03E+02)	ND(1.04E+02)
Emission Rate, Pounds/Hour	ND(7.32E-06)	ND(7.25E-06)	ND(7.29E-06)
Emission Rate, Grams/Second	ND(9.22E-07)	ND(9.14E-07)	ND(9.19E-07)

FIELD DATA AND RESULTS TABULATION

Continued

	7A-O-V-3	7B-O-V-3	7C-O-V-3
1,1,1-Trichloroethane			
Formula Weight, Lb/Lb-Mole	133.41	133.41	133.41
Catch Weight, Micrograms	ND (0.002)	ND (0.002)	0.401
Concentration, ng/DSCM *	ND(1.04E+02)	ND(1.03E+02)	2.08E+04
Emission Rate, Pounds/Hour	ND(7.32E-06)	ND(7.25E-06)	1.46E-03
Emission Rate, Grams/Second	ND(9.22E-07)	ND(9.14E-07)	1.84E-04
Carbon Tetrachloride			
Formula Weight, Lb/Lb-Mole	153.82	153.82	153.82
Catch Weight, Micrograms	ND (0.002)	ND (0.002)	ND (0.003)
Concentration, ng/DSCM *	ND(1.04E+02)	ND(1.03E+02)	ND(1.55E+02)
Emission Rate, Pounds/Hour	ND(7.32E-06)	ND(7.25E-06)	ND(1.09E-05)
Emission Rate, Grams/Second	ND(9.22E-07)	ND(9.14E-07)	ND(1.38E-06)
Trichloroethene			
Formula Weight, Lb/Lb-Mole	131.40	131.40	131.40
Catch Weight, Micrograms	0.336	0.513	0.536
Concentration, ng/DSCM *	1.75E+04	2.64E+04	2.78E+04
Emission Rate, Pounds/Hour	1.23E-03	1.86E-03	1.95E-03
Emission Rate, Grams/Second	1.55E-04	2.34E-04	2.46E-04
Benzene			
Formula Weight, Lb/Lb-Mole	78.12	78.12	78.12
Catch Weight, Micrograms	105.261	45.380	61.855
Concentration, ng/DSCM *	5.47E+06	2.34E+06	3.20E+06
Emission Rate, Pounds/Hour	3.85E-01	1.65E-01	2.26E-01
Emission Rate, Grams/Second	4.85E-02	2.07E-02	2.84E-02
Tetrachloroethene			
Formula Weight, Lb/Lb-Mole	163.85	163.85	163.85
Catch Weight, Micrograms	0.464	0.675	0.721
Concentration, ng/DSCM *	2.41E+04	3.48E+04	3.73E+04
Emission Rate, Pounds/Hour	1.70E-03	2.45E-03	2.63E-03
Emission Rate, Grams/Second	2.14E-04	3.08E-04	3.31E-04
Toluene			
Formula Weight, Lb/Lb-Mole	92.13	92.13	92.13
Catch Weight, Micrograms	20.349	55.218	74.745
Concentration, ng/DSCM *	1.06E+06	2.84E+06	3.87E+06
Emission Rate, Pounds/Hour	7.44E-02	2.00E-01	2.73E-01
Emission Rate, Grams/Second	9.38E-03	2.52E-02	3.43E-02
Chlorobenzene			
Formula Weight, Lb/Lb-Mole	112.56	112.56	112.56
Catch Weight, Micrograms	0.894	0.760	1.368
Concentration, ng/DSCM *	4.64E+04	3.91E+04	7.08E+04
Emission Rate, Pounds/Hour	3.27E-03	2.76E-03	4.99E-03
Emission Rate, Grams/Second	4.12E-04	3.47E-04	6.29E-04

FIELD DATA AND RESULTS TABULATION

Continued

	7A-O-V-3	7B-O-V-3	7C-O-V-3
Ethylbenzene			
Formula Weight, Lb/Lb-Mole	106.16	106.16	106.16
Catch Weight, Micrograms	0.586	0.903	1.821
Concentration, ng/DSCM *	3.04E+04	4.65E+04	9.43E+04
Emission Rate, Pounds/Hour	2.14E-03	3.27E-03	6.64E-03
Emission Rate, Grams/Second	2.70E-04	4.13E-04	8.37E-04

FIELD DATA AND RESULTS TABULATION

PLANT: SSI

SAMPLING LOCATION: Site 9

		7A-O-V-3	7B-O-V-3	7C-O-V-3
	Test Date	5/31/90	5/31/90	5/31/90
	Sample Start Time	1745	1805	1825
	Sample Finish Time	1805	1825	1845
Theta	Net Sample Time, Minutes	20	20	20
Y	Dry Gas Meter Calibration Factor	1.0114	0.9970	1.0114
Pbar	Barometric Pressure, Inches Hg	29.7	29.7	29.7
Vm	Volume of Metered Gas Sample, Liters	19.705	20.155	19.762
tm	Dry Gas Meter Temperature, Degrees F	84	84	84
Delta-H	Avg. Pressure Differential of Meter, Inches H2O	1.30	1.50	1.30
Vmstd	Volume of Metered Gas Sample, SL^3	19.260	19.420	19.310

FIELD DATA AND RESULTS TABULATION

PLANT: SSI

SAMPLING LOCATION: Site 9

		7A-O-V-1	7B-O-V-1	7C-O-V-1
	Test Date	5/30/90	5/30/90	5/30/90
	Sample Start Time	2015	2036	2117
	Sample Finish Time	2035	2056	2137
Theta	Net Sample Time, Minutes	20	20	20
Y	Dry Gas Meter Calibration Factor	0.9970	1.0114	0.9970
Pbar	Barometric Pressure, Inches Hg	29.2	29.2	29.2
Vm	Volume of Metered Gas Sample, Liters	19.972	19.481	20.010
tm	Dry Gas Meter Temperature, Degrees F	69	68	65
Delta-H	Avg. Pressure Differential of Meter, Inches H2O	1.60	1.30	1.55
Vmstd	Volume of Metered Gas Sample, SL*	19.470	19.280	19.650

FIELD DATA AND RESULTS TABULATION

PLANT: SSI

SAMPLING LOCATION: Site 9

		7A-O-V-2	7B-O-V-2	7C-O-V-2
	Test Date	5/31/90	5/31/90	5/31/90
	Sample Start Time	1645	1705	1725
	Sample Finish Time	1705	1725	1745
Theta	Net Sample Time, Minutes	20	20	20
Y	Dry Gas Meter Calibration Factor	1.0114	0.9970	1.0114
Pbar	Barometric Pressure, Inches Hg	29.7	29.7	29.7
Vm	Volume of Metered Gas Sample, Liters	19.983	19.510	19.901
tm	Dry Gas Meter Temperature, Degrees F	77	78	82
Delta-H	Avg. Pressure Differential of Meter, Inches H2O	1.50	1.30	1.50
Vmstd	Volume of Metered Gas Sample, SL*	19.790	19.000	19.530

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: site9 mttl Run No.: IN-MMTL-2B Date: 5/30/90
Sampling Location: inlet Operator: l.t.
Net Run Time: 120 min Run Start Time: 12:31
Num Sampling Points: 9 Run Stop Time: 2:31

Pressures:

Pbar	Barometric Pressure, in Hg:	29.100
Pg	Flue Gas Static Press. in H2O:	-0.500
Ps	Absolute Flue Gas Press. in Hg:	29.063

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	258.1
Vw(std)	Volume of Water Vapor, SCF:	12.149
%H2O	Moisture Content, % by Vol.:	19.69
%CO2	Percent CO2 by Volume, Dry:	6.50
%O2	Percent O2 by Volume, Dry:	12.50
Mfd	Dry Mole Fraction:	0.803
Fo	Orsat Validation Value:	1.29
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	27.64

ISOKINETIC DATA

	Nozzle Number:	0
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	14400.0
Vs	Flue Gas Velocity, Ft/sec:	28.9
Qsd	Volumetric Air Flow Rate, Dry SCFM:	54863.5
Qaw	Volumetric Air Flow Rate, Wet ACFM:	173524.5
%I	Isokinetic Sampling Rate, %:	98.1
Vm(Dry)	Volume Gas Metered, Dry:	48.651
Vm(Std)	Volume Gas Metered, Std:	49.555

FIELD DATA

Meter Box Number: rac-5 Meter Box dHa: 1.869
Dry Gas Meter Cal. Y: 1.061 Assumed Moisture: 7.00
Leak Test Rate, CFM: 0.010 Leak Test Vac, in Hg: 10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0:00	269.397	0.100	0.500	0.0	885.0
2	0:15	275.428	0.100	0.500	0.0	0.0
3	0:30	282.154	0.100	0.500	90.0	1148.0
4	0:45	289.220	0.100	0.500	90.0	1120.0
5	0:60	294.937	0.100	0.500	91.0	974.0
6	0:75	301.680	0.100	0.500	98.0	940.0
7	0:90	307.820	0.100	0.500	100.0	914.0
8	1:05	313.852	0.100	0.500	105.0	752.0
9	1:20	318.048	0.100	0.500	103.0	852.0
10	120/OFF	318.048				
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
15	--	--	--	--	--	--
16	--	--	--	--	--	--
17	--	--	--	--	--	--
18	--	--	--	--	--	--
19	--	--	--	--	--	--
20	--	--	--	--	--	--
21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	48.651	0.100	0.500	75.2	842.8

EMISSIONS RESULTS

ug	chrome	100.000ug
mg/dscm	Concentration, mg/dscm:	71.263x 10-3
gr/dscf	Concentration, gr/dscf:	0.031x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	14.642x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	6.642x 10-3
ug	nickel	100.000ug
mg/dscm	Concentration, mg/dscm:	71.263x 10-3
gr/dscf	Concentration, gr/dscf:	0.031x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	14.642x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	6.642x 10-3
ug	metal	100.000ug
mg/dscm	Concentration, mg/dscm:	71.263x 10-3
gr/dscm	Concentration, gr/dscm:	0.031x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	14.642x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	6.642x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: site9 Run No.: IN-NI-2C Date: 5/30/90
Sampling Location: inlet Operator: l.t.
Net Run Time: 120 min Run Start Time: 12:32
Num Sampling Points: 9 Run Stop Time: 2:32

Pressures:

Pbar	Barometric Pressure, in Hg:	29.100
Pg	Flue Gas Static Press. in H2O:	-0.500
Ps	Absolute Flue Gas Press. in Hg:	29.063

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	262.9
Vw(std)	Volume of Water Vapor, SCF:	12.375
%H2O	Moisture Content, % by Vol.:	20.30
%CO2	Percent CO2 by Volume, Dry:	6.50
%O2	Percent O2 by Volume, Dry:	12.50
Mfd	Dry Mole Fraction:	0.797
Fo	Orsat Validation Value:	1.29
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	27.56

FIELD DATA

Meter Box Number:	rac-2	Meter Box dHa:	1.858
Dry Gas Meter Cal. Y:	1.006	Assumed Moisture:	7.00
Leak Test Rate, CFM:	0.008	Leak Test Vac, in Hg:	10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0:00	74.395	0.100	0.500	0.0	0.0
2	0:15	76.022	0.100	0.500	0.0	0.0
3	0:30	88.321	0.100	0.500	80.0	1192.0
4	0:45	94.651	0.100	0.500	87.0	1112.0
5	0:60	100.672	0.100	0.500	88.0	911.0
6	0:75	107.468	0.100	0.500	97.0	940.0
7	0:90	113.340	0.100	0.500	101.0	921.0
8	1:05	119.750	0.100	0.500	103.0	751.0
9	1:20	124.490	0.100	0.500	99.0	834.0
10	120/OFF	124.490				
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
15	--	--	--	--	--	--
16	--	--	--	--	--	--
17	--	--	--	--	--	--
18	--	--	--	--	--	--
19	--	--	--	--	--	--
20	--	--	--	--	--	--
21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	50.095	0.100	0.500	72.8	740.1

ISOKINETIC DATA

	Nozzle Number:	0
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	14400.0
Vs	Flue Gas Velocity, Ft/sec:	27.8
Qsd	Volumetric Air Flow Rate, Dry SCFM:	56804.9
Qaw	Volumetric Air Flow Rate, Wet ACFM:	166766.7
%I	Isokinetic Sampling Rate, %:	93.0
Vm(Dry)	Volume Gas Metered, Dry:	50.095
Vm(Std)	Volume Gas Metered, Std:	48.597

EMISSIONS RESULTS

ug	chrome	100.000ug
mg/dscm	Concentration, mg/dscm:	72.668x 10-3
gr/dscf	Concentration, gr/dscf:	0.032x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	15.459x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	7.012x 10-3

ug	nickel	100.000ug
mg/dscm	Concentration, mg/dscm:	72.668x 10-3
gr/dscf	Concentration, gr/dscf:	0.032x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	15.459x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	7.012x 10-3

ug	metal	100.000ug
mg/dscm	Concentration, mg/dscm:	72.668x 10-3
gr/dscm	Concentration, gr/dscm:	0.032x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	15.459x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	7.012x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: site9 Run No.: IN-NI-2D Date: 5/30/90
Sampling Location: inlet Operator: l.t.
Net Run Time: 120 min Run Start Time: 12:33
Num Sampling Points: 9 Run Stop Time: 2:33

Pressures:

Pbar	Barometric Pressure, in Hg:	29.100
Pg	Flue Gas Static Press. in H2O:	-0.500
Ps	Absolute Flue Gas Press. in Hg:	29.063

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	316.1
Vw(std)	Volume of Water Vapor, SCF:	14.879
%H2O	Moisture Content, % by Vol.:	24.04
%CO2	Percent CO2 by Volume, Dry:	6.50
%O2	Percent O2 by Volume, Dry:	12.50
Mfd	Dry Mole Fraction:	0.760
Fo	Orsat Validation Value:	1.29
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	27.12

ISOKINETIC DATA

	Nozzle Number:	0
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	14400.0
Vs	Flue Gas Velocity, Ft/sec:	28.1
Qsd	Volumetric Air Flow Rate, Dry SCFM:	54532.3
Qaw	Volumetric Air Flow Rate, Wet ACFM:	168304.8
%I	Isokinetic Sampling Rate, %:	93.7
Vm(Dry)	Volume Gas Metered, Dry:	46.935
Vm(Std)	Volume Gas Metered, Std:	47.023

FIELD DATA

Meter Box Number: rac-3 Meter Box dHa: 1.849
Dry Gas Meter Cal. Y: 1.062 Assumed Moisture: 7.00
Leak Test Rate, CFM: 0.011 Leak Test Vac, in Hg: 10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0:00	809.439	0.100	0.500	85.0	0.0
2	0:15	810.188	0.100	0.500	0.0	0.0
3	0:30	821.156	0.100	0.500	92.0	1148.0
4	0:45	827.923	0.100	0.500	91.0	1109.0
5	0:60	833.376	0.100	0.500	90.0	965.6
6	0:75	839.860	0.100	0.500	96.0	940.0
7	0:90	845.600	0.100	0.500	102.0	921.0
8	1:05	852.120	0.100	0.500	104.0	767.0
9	1:20	856.374	0.100	0.500	102.0	831.4
10	120/OFF	856.374				
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
15	--	--	--	--	--	--
16	--	--	--	--	--	--
17	--	--	--	--	--	--
18	--	--	--	--	--	--
19	--	--	--	--	--	--
20	--	--	--	--	--	--
21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	46.935	0.100	0.500	84.7	742.4

EMISSIONS RESULTS

ug	chrome	100.000ug
mg/dscm	Concentration, mg/dscm:	75.101x 10-3
gr/dscf	Concentration, gr/dscf:	0.033x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	15.338x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	6.957x 10-3
ug	nickel	100.000ug
mg/dscm	Concentration, mg/dscm:	75.101x 10-3
gr/dscf	Concentration, gr/dscf:	0.033x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	15.338x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	6.957x 10-3
ug	metal	100.000ug
mg/dscm	Concentration, mg/dscm:	75.101x 10-3
gr/dscm	Concentration, gr/dscm:	0.033x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	15.338x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	6.957x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **site9** Run No.: **OUT-MMTL-2A** Date: 5/30/90
Sampling Location: outlet Operator: rlm
Net Run Time: 120 min Run Start Time: 12:30
Num Sampling Points: 8 Run Stop Time: 14:30

Pressures:

Pbar	Barometric Pressure, in Hg:	28.800
Pg	Flue Gas Static Press. in H2O:	-0.180
Ps	Absolute Flue Gas Press. in Hg:	28.787

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	75.1
Vw(std)	Volume of Water Vapor, SCF:	3.535
%H2O	Moisture Content, % by Vol.:	4.20
%CO2	Percent CO2 by Volume, Dry:	4.30
%O2	Percent O2 by Volume, Dry:	14.70
Mfd	Dry Mole Fraction:	0.958
Fo	Orsat Validation Value:	1.44
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.50

ISOKINETIC DATA

	Nozzle Number:	t-7
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.242
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	42.2
Qsd	Volumetric Air Flow Rate, Dry SCFM:	19673.6
Qsw	Volumetric Air Flow Rate, Wet ACFM:	23213.4
%I	Isokinetic Sampling Rate, %:	98.1
Vm(Dry)	Volume Gas Metered, Dry:	88.427
Vm(Std)	Volume Gas Metered, Std:	80.697

FIELD DATA

Meter Box Number: en-2 Meter Box dHa: 2.004
Dry Gas Meter Cal. Y: 0.985 Assumed Moisture: 7.00
Leak Test Rate, CFM: 0.008 Leak Test Vac, in Hg: 15.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0:00	346.436	0.420	1.490	66.0	115.0
2	0:15	356.420	0.550	1.950	75.0	117.0
3	0:30	367.420	0.490	1.730	85.0	117.0
4	0:45	378.260	0.550	1.950	93.0	116.0
5	0:60	389.560	0.580	2.050	98.0	113.0
6	0:75	401.350	0.480	1.700	102.0	117.0
7	0:90	412.360	0.560	1.980	104.0	115.0
8	1:05	424.080	0.470	1.660	105.0	104.0
9	120/OFF	434.863				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
15	--	--	--	--	--	--
16	--	--	--	--	--	--
17	--	--	--	--	--	--
18	--	--	--	--	--	--
19	--	--	--	--	--	--
20	--	--	--	--	--	--
21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	88.427	0.511	1.814	91.0	114.2

EMISSIONS RESULTS

ug	chrome	100.000ug
mg/dscm	Concentration, mg/dscm:	43.762x 10-3
gr/dscf	Concentration, gr/dscf:	0.019x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	3.224x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	1.463x 10-3
ug	nickel	100.000ug
mg/dscm	Concentration, mg/dscm:	43.762x 10-3
gr/dscf	Concentration, gr/dscf:	0.019x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	3.224x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	1.463x 10-3
ug	metal	100.000ug
mg/dscm	Concentration, mg/dscm:	43.762x 10-3
gr/dscm	Concentration, gr/dscm:	0.019x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	3.224x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	1.463x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: site9 Run No.: OUT-MMTL-2B Date: 5/30/90
Sampling Location: outlet Operator: rlm
Net Run Time: 120 min Run Start Time: 12:31
Num Sampling Points: 8 Run Stop Time: 14:31

Pressures:

Pbar	Barometric Pressure, in Hg:	28.800
Pg	Flue Gas Static Press. in H20:	-0.180
Ps	Absolute Flue Gas Press. in Hg:	28.787

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	71.8
Vw(std)	Volume of Water Vapor, SCF:	3.380
%H20	Moisture Content, % by Vol.:	3.98
%C02	Percent C02 by Volume, Dry:	4.30
%02	Percent 02 by Volume, Dry:	14.70
Mfd	Dry Mole Fraction:	0.960
Fo	Orsat Validation Value:	1.44
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.52

ISOKINETIC DATA

	Nozzle Number:	t-8
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.243
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	41.9
Qsd	Volumetric Air Flow Rate, Dry SCFM:	19583.5
Qaw	Volumetric Air Flow Rate, Wet ACFM:	23054.2
%I	Isokinetic Sampling Rate, %:	98.8
Vm(Dry)	Volume Gas Metered, Dry:	94.731
Vm(Std)	Volume Gas Metered, Std:	81.603

FIELD DATA

Meter Box Number: en-1 Meter Box dHa: 1.934
Dry Gas Meter Cal. Y: 0.932 Assumed Moisture: 7.00
Leak Test Rate, CFM: 0.008 Leak Test Vac, in Hg: 15.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H20)	Delta H (in H20)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0:00	586.172	0.420	1.490	67.0	115.0
2	0:15	596.710	0.550	1.950	76.0	117.0
3	0:30	608.520	0.440	1.730	85.0	117.0
4	0:45	619.940	0.550	1.950	93.0	116.0
5	0:60	632.090	0.580	2.050	99.0	113.0
6	0:75	644.840	0.480	1.700	104.0	117.0
7	0:90	656.620	0.560	1.980	107.0	115.0
8	1:05	669.230	0.470	1.660	109.0	104.0
9	120/OFF	680.903				
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23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	94.731	0.505	1.814	92.5	114.2

EMISSIONS RESULTS

ug	chrome	100.000ug
mg/dscm	Concentration, mg/dscm:	43.276x 10-3
gr/dscf	Concentration, gr/dscf:	0.019x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	3.174x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	1.440x 10-3
ug	nickel	100.000ug
mg/dscm	Concentration, mg/dscm:	43.276x 10-3
gr/dscf	Concentration, gr/dscf:	0.019x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	3.174x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	1.440x 10-3
ug	metal	100.000ug
mg/dscm	Concentration, mg/dscm:	43.276x 10-3
gr/dscm	Concentration, gr/dscm:	0.019x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	3.174x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	1.440x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **site9** Run No.: **OUT-NI-C-2** Date: 5/30/90
Sampling Location: outlet Operator: rlm
Net Run Time: 120 min Run Start Time: 12:30
Num Sampling Points: 8 Run Stop Time: 18:39

Pressures:

Pbar	Barometric Pressure, in Hg:	28.800
Pg	Flue Gas Static Press. in H20:	-0.180
Ps	Absolute Flue Gas Press. in Hg:	28.787

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	73.4
Vw(std)	Volume of Water Vapor, SCF:	3.455
%H20	Moisture Content, % by Vol.:	4.07
%CO2	Percent CO2 by Volume, Dry:	4.30
%O2	Percent O2 by Volume, Dry:	14.70
Mfd	Dry Mole Fraction:	0.959
Fo	Orsat Validation Value:	1.44
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.51

FIELD DATA

Meter Box Number: n-16 Meter Box dHa: 1.762
Dry Gas Meter Cal. Y: 0.996 Assumed Moisture: 7.00
Leak Test Rate, CFM: 0.008 Leak Test Vac, in Hg: 15.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H20)	Delta H (in H20)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0:00	867.500	0.420	1.360	68.0	115.0
2	0:15	877.461	0.550	1.780	74.0	117.0
3	0:30	888.757	0.490	1.580	84.0	117.0
4	0;45	899.470	0.550	1.780	94.0	116.0
5	1;00	909.995	0.580	1.900	102.0	113.0
6	1:15	922.015	0.480	1.550	105.0	117.0
7	1:30	930.949	0.560	1.810	110.0	115.0
8	1:45	944.716	0.470	1.520	112.0	104.0
9	120/OFF	956.278				
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FINAL/AVG	120	88.778	0.511	1.660	93.6	114.2

ISOKINETIC DATA

	Nozzle Number:	t-5
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.244
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	42.2
Qsd	Volumetric Air Flow Rate, Dry SCFM:	19694.7
Qsw	Volumetric Air Flow Rate, Wet ACFM:	23207.4
%I	Isokinetic Sampling Rate, %:	97.3
Vm(Dry)	Volume Gas Metered, Dry:	88.778
Vm(Std)	Volume Gas Metered, Std:	81.460

EMISSIONS RESULTS

ug	chrome	100.000ug
mg/dscm	Concentration, mg/dscm:	43.352x 10-3
gr/dscf	Concentration, gr/dscf:	0.019x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	3.198x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	1.450x 10-3
ug	nickel	100.000ug
mg/dscm	Concentration, mg/dscm:	43.352x 10-3
gr/dscf	Concentration, gr/dscf:	0.019x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	3.198x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	1.450x 10-3
ug	metal	100.000ug
mg/dscm	Concentration, mg/dscm:	43.352x 10-3
gr/dscm	Concentration, gr/dscm:	0.019x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	3.198x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	1.450x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: site9 Run No.: OUT-NI-2D Date: 5/30/90
Sampling Location: outlet Operator: rlm
Net Run Time: 120 min Run Start Time: 12:31
Num Sampling Points: 8 Run Stop Time: 18:40

Pressures:

Pbar	Barometric Pressure, in Hg:	28.800
Pg	Flue Gas Static Press. in H2O:	-0.180
Ps	Absolute Flue Gas Press. in Hg:	28.787

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	70.3
Vw(std)	Volume of Water Vapor, SCF:	3.309
%H2O	Moisture Content, % by Vol.:	4.70
%CO2	Percent CO2 by Volume, Dry:	4.30
%O2	Percent O2 by Volume, Dry:	14.70
Mfd	Dry Mole Fraction:	0.953
Fo	Orsat Validation Value:	1.44
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.44

FIELD DATA

Meter Box Number: nu-7 Meter Box dHa: 1.887
Dry Gas Meter Cal. Y: 0.969 Assumed Moisture: 7.00
Leak Test Rate, CFM: 0.007 Leak Test Vac, in Hg: 15.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0:00	605.325	0.420	1.360	65.0	115.0
2	0:15	615.009	0.550	1.780	75.0	117.0
3	0:30	626.118	0.490	1.580	86.0	117.0
4	0:45	636.444	0.550	1.780	94.0	116.0
5	1:00	646.777	0.580	1.900	102.0	113.0
6	1:15	658.219	0.480	1.550	106.0	117.0
7	1:30	668.909	0.560	1.810	110.0	115.0
8	1:45	680.420	0.470	1.520	112.0	104.0
9	120/OFF	680.420				
10	--	--	--	--	--	--
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25	--	--	--	--	--	--
FINAL/AVG	120	75.095	0.511	1.660	93.8	114.2

ISOKINETIC DATA

	Nozzle Number:	t-6
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.239
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	42.3
Qsd	Volumetric Air Flow Rate, Dry SCFM:	19590.0
Qsw	Volumetric Air Flow Rate, Wet ACFM:	23237.3
%I	Isokinetic Sampling Rate, %:	83.9
Vm(Dry)	Volume Gas Metered, Dry:	75.095
Vm(Std)	Volume Gas Metered, Std:	67.070

EMISSIONS RESULTS

ug	chrome	100.000ug
mg/dscm	Concentration, mg/dscm:	52.654x 10-3
gr/dscf	Concentration, gr/dscf:	0.023x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	3.863x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	1.752x 10-3
ug	nickel	100.000ug
mg/dscm	Concentration, mg/dscm:	52.654x 10-3
gr/dscf	Concentration, gr/dscf:	0.023x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	3.863x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	1.752x 10-3
ug	metal	100.000ug
mg/dscm	Concentration, mg/dscm:	52.654x 10-3
gr/dscm	Concentration, gr/dscm:	0.023x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	3.863x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	1.752x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **IN-MMTL-4A** Date: 6/4/90
Sampling Location: inlet Operator: LT
Net Run Time: 60 min Run Start Time: 1205
Num Sampling Points: 4 Run Stop Time: 1305

Pressures:

Pbar	Barometric Pressure, in Hg:	29.200
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.200

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	166.5
Vw(std)	Volume of Water Vapor, SCF:	7.837
%H2O	Moisture Content, % by Vol.:	25.82
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.742
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	26.90

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	14400.0
Vs	Flue Gas Velocity, Ft/sec:	27.3
Qsd	Volumetric Air Flow Rate, Dry SCFM:	42693.7
Qaw	Volumetric Air Flow Rate, Wet ACFM:	163535.0
%I	Isokinetic Sampling Rate, %:	114.6
Vm(Dry)	Volume Gas Metered, Dry:	24.596
Vm(Std)	Volume Gas Metered, Std:	22.521

FIELD DATA

Meter Box Number: RAC 1 Meter Box dHa: 1.851
Dry Gas Meter Cal. Y: 1.000 Assumed Moisture: 30.00
Leak Test Rate, CFM: 0.016 Leak Test Vac, in Hg: 3.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	312.725	0.070	0.500	102.0	929.0
2	15	318.821	0.080	0.500	103.0	1182.0
3	30	325.987	0.090	0.500	103.0	1206.0
4	45	331.218	0.070	0.500	105.0	700.0
5	60/OFF	337.321				
6	--	--	--	--	--	--
7	--	--	--	--	--	--
8	--	--	--	--	--	--
9	--	--	--	--	--	--
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24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	60	24.596	0.077	0.500	103.2	1004.2

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	156.807
gr/dscf	Concentration, gr/dscf:	0.069
Lb/hr	Emission Rate,lb/hr PMRc:	25.072
Kg/hr	Emission Rate,Kg/hr PMRc:	11.373

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	156.807
gr/dscf	Concentration, gr/dscf:	0.069
Lb/hr	Emission Rate,Lb/hr PMRc:	25.072
Kg/hr	Emission Rate,Kg/hr PMRc:	11.373

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	156.807

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **IN-MMTL-4B** Date: 6/4/90
Sampling Location: Inlet Operator: LT
Net Run Time: 60 min Run Start Time: 1220
Num Sampling Points: 4 Run Stop Time: 1320

Pressures:

Pbar	Barometric Pressure, in Hg:	29.200
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.200

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	145.0
Vw(std)	Volume of Water Vapor, SCF:	6.825
%H2O	Moisture Content, % by Vol.:	23.66
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.763
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	27.16

FIELD DATA

Meter Box Number: RAC 5 Meter Box dHa: 1.869
Dry Gas Meter Cal. Y: 1.000 Assumed Moisture: 30.00
Leak Test Rate, CFM: 0.009 Leak Test Vac, in Hg: 2.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	459.314	0.090	0.500	103.0	1132.0
2	15	465.140	0.090	0.500	103.0	1135.0
3	30	470.921	0.090	0.500	107.0	690.0
4	45	477.160	0.070	0.500	110.0	621.0
5	60/OFF	483.474				
6	--	--	--	--	--	--
7	--	--	--	--	--	--
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25	--	--	--	--	--	--
FINAL/AVG	60	24.160	0.085	0.500	105.7	894.5

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	14400.0
Vs	Flue Gas Velocity, Ft/sec:	27.3
Qsd	Volumetric Air Flow Rate, Dry SCFM:	47612.2
Qaw	Volumetric Air Flow Rate, Wet ACFM:	163937.4
%I	Isokinetic Sampling Rate, %:	100.5
Vm(Dry)	Volume Gas Metered, Dry:	24.160
Vm(Std)	Volume Gas Metered, Std:	22.024

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	160.345
gr/dscf	Concentration, gr/dscf:	0.070
Lb/hr	Emission Rate,lb/hr PMRc:	28.592
Kg/hr	Emission Rate,Kg/hr PMRc:	12.969

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	160.345
gr/dscf	Concentration, gr/dscf:	0.070
Lb/hr	Emission Rate,Lb/hr PMRc:	28.592
Kg/hr	Emission Rate,Kg/hr PMRc:	12.969

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	160.345

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **IN-NI-4C** Date: 6/4/90
Sampling Location: Inlet Operator: LT
Net Run Time: 60 min Run Start Time: 1206
Num Sampling Points: 4 Run Stop Time: 1306

Pressures:

Pbar	Barometric Pressure, in Hg:	29.200
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.200

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	243.0
Vw(std)	Volume of Water Vapor, SCF:	11.438
%H2O	Moisture Content, % by Vol.:	33.13
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.669
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	26.02

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	14400.0
Vs	Flue Gas Velocity, Ft/sec:	28.2
Qsd	Volumetric Air Flow Rate, Dry SCFM:	42110.9
Qaw	Volumetric Air Flow Rate, Wet ACFM:	169174.1
%I	Isokinetic Sampling Rate, %:	119.1
Vm(Dry)	Volume Gas Metered, Dry:	25.066
Vm(Std)	Volume Gas Metered, Std:	23.085

FIELD DATA

Meter Box Number: RAC 2 Meter Box dHa: 1.858
Dry Gas Meter Cal. Y: 1.000 Assumed Moisture: 30.00
Leak Test Rate, CFM: 0.011 Leak Test Vac, in Hg: 3.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	259.154	0.080	0.500	100.0	1018.0
2	15	265.762	0.090	0.500	100.0	1000.0
3	30	271.730	0.100	0.500	100.0	1004.0
4	45	277.390	0.070	0.500	100.0	675.0
5	60/OFF	284.220				
6	--	--	--	--	--	--
7	--	--	--	--	--	--
8	--	--	--	--	--	--
9	--	--	--	--	--	--
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24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	60	25.066	0.085	0.500	100.0	924.2

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	152.979
gr/dscf	Concentration, gr/dscf:	0.067
Lb/hr	Emission Rate,Lb/hr PMRc:	24.126
Kg/hr	Emission Rate,Kg/hr PMRc:	10.943
mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	152.979
gr/dscf	Concentration, gr/dscf:	0.067
Lb/hr	Emission Rate,Lb/hr PMRc:	24.126
Kg/hr	Emission Rate,Kg/hr PMRc:	10.943
mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	152.979

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: Site 9 Run No.: IN-NI-4D Date: 6/4/90
Sampling Location: Inlet Operator: LT
Net Run Time: 60 min Run Start Time: 1207
Num Sampling Points: 4 Run Stop Time: 1307

Pressures:

Pbar	Barometric Pressure, in Hg:	29.200
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.200

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	156.0
Vw(std)	Volume of Water Vapor, SCF:	7.343
%H2O	Moisture Content, % by Vol.:	25.04
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.750
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	27.00

FIELD DATA

Meter Box Number:	RAC 3	Meter Box dHa:	1.849
Dry Gas Meter Cal. Y:	1.000	Assumed Moisture:	30.00
Leak Test Rate, CFM:	0.013	Leak Test Vac, in Hg:	5.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	6.862	0.090	0.500	100.0	1042.0
2	15	12.763	0.100	0.500	100.0	1067.0
3	30	18.351	0.100	0.500	100.0	1035.0
4	45	23.930	0.070	0.500	100.0	670.0
5	60/OFF	30.736				
6	--	--	--	--	--	--
7	--	--	--	--	--	--
8	--	--	--	--	--	--
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23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	60	23.874	0.090	0.500	100.0	953.5

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	14400.0
Vs	Flue Gas Velocity, Ft/sec:	28.8
Qsd	Volumetric Air Flow Rate, Dry SCFM:	47186.1
Qaw	Volumetric Air Flow Rate, Wet ACFM:	172663.3
%I	Isokinetic Sampling Rate, %:	101.3
Vm(Dry)	Volume Gas Metered, Dry:	23.874
Vm(Std)	Volume Gas Metered, Std:	21.987

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	160.617
gr/dscf	Concentration, gr/dscf:	0.070
Lb/hr	Emission Rate,lb/hr PMRc:	28.384
Kg/hr	Emission Rate,Kg/hr PMRc:	12.875

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	160.617
gr/dscf	Concentration, gr/dscf:	0.070
Lb/hr	Emission Rate,Lb/hr PMRc:	28.384
Kg/hr	Emission Rate,Kg/hr PMRc:	12.875

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	160.617

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-MMTL-4A** Date: 6/4/90
Sampling Location: Mid point Operator: GCB
Net Run Time: 45 min Run Start Time: 1229
Num Sampling Points: 3 Run Stop Time: 1314

Pressures:

Pbar	Barometric Pressure, in Hg:	29.200
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	26.994

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	19.0
Vw(std)	Volume of Water Vapor, SCF:	0.894
%H2O	Moisture Content, % by Vol.:	4.74
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.953
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.43

ISOKINETIC DATA

	Nozzle Number:	T27
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	31.6
Qsd	Volumetric Air Flow Rate, Dry SCFM:	14597.5
Qaw	Volumetric Air Flow Rate, Wet ACFM:	17349.3
%I	Isokinetic Sampling Rate, %:	76.6
Vm(Dry)	Volume Gas Metered, Dry:	19.610
Vm(Std)	Volume Gas Metered, Std:	17.977

FIELD DATA

Meter Box Number: A-1 Meter Box dHa: 2.270
Dry Gas Meter Cal. Y: 0.986 Assumed Moisture: 7.00
Leak Test Rate, CFM: 0.003 Leak Test Vac, in Hg: 10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	56.210	0.160	0.650	95.0	82.0
2	15	62.459	0.360	1.500	95.0	78.0
3	30	71.862	0.360	1.500	98.0	78.0
4	45/OFF	75.820				
5	--	--	--	--	--	--
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23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	45	19.610	0.284	1.217	96.0	79.3

EMISSIONS RESULTS

mg	100.	100.000mg
mg/dscm	Concentration, mg/dscm:	196.447
gr/dscf	Concentration, gr/dscf:	0.086
Lb/hr	Emission Rate,Lb/hr PMRc:	10.740
Kg/hr	Emission Rate,Kg/hr PMRc:	4.871

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	196.447
gr/dscf	Concentration, gr/dscf:	0.086
Lb/hr	Emission Rate,Lb/hr PMRc:	10.740
Kg/hr	Emission Rate,Kg/hr PMRc:	4.871

mg	100.0	100.000mg

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-MMTL-4B** Date: 6/4/90
Sampling Location: Midpoint Operator: GCB
Net Run Time: 45 min Run Start Time: 1231
Num Sampling Points: 3 Run Stop Time: 1316

Pressures:

Pbar	Barometric Pressure, in Hg:	29.200
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	26.994

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	19.0
Vw(std)	Volume of Water Vapor, SCF:	0.894
%H2O	Moisture Content, % by Vol.:	4.58
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.954
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.45

FIELD DATA

Meter Box Number:	A-2	Meter Box dHa:	2.047
Dry Gas Meter Cal. Y:	1.024	Assumed Moisture:	7.00
Leak Test Rate, CFM:	0.001	Leak Test Vac, in Hg:	10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	2	867.430	0.160	0.650	95.0	90.0
2	17	873.703	0.360	1.500	95.0	76.0
3	32	883.001	0.340	0.800	100.0	74.0
4	45/OFF	887.056				
5	--	--	--	--	--	--
6	--	--	--	--	--	--
7	--	--	--	--	--	--
8	--	--	--	--	--	--
9	--	--	--	--	--	--
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21	--	--	--	--	--	--
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23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	45	19.626	0.278	0.983	96.7	80.0

ISOKINETIC DATA

	Nozzle Number:	T29
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.265
A	Stack/Duct Area, fn2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	31.2
Qsd	Volumetric Air Flow Rate, Dry SCFM:	14454.2
Qsw	Volumetric Air Flow Rate, Wet ACFM:	17170.9
%I	Isokinetic Sampling Rate, %:	80.2
Vm(Dry)	Volume Gas Metered, Dry:	19.626
Vm(Std)	Volume Gas Metered, Std:	18.647

EMISSIONS RESULTS

mg	100.	100.000mg
mg/dscm	Concentration, mg/dscm:	189.381
gr/dscf	Concentration, gr/dscf:	0.083
Lb/hr	Emission Rate,lb/hr PMRc:	10.252
Kg/hr	Emission Rate,Kg/hr PMRc:	4.650
mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	189.381
gr/dscf	Concentration, gr/dscf:	0.083
Lb/hr	Emission Rate,Lb/hr PMRc:	10.252
Kg/hr	Emission Rate,Kg/hr PMRc:	4.650
mg	100.0	100.000mg

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-NI-4C** Date: 6/4/90
Sampling Location: Midpoint Operator: GCB
Net Run Time: 45 min Run Start Time: 1233
Num Sampling Points: 3 Run Stop Time: 1318

Pressures:

Pbar	Barometric Pressure, in Hg:	29.200
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	26.994

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	17.0
Vw(std)	Volume of Water Vapor, SCF:	0.800
%H2O	Moisture Content, % by Vol.:	4.98
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.950
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.40

ISOKINETIC DATA

	Nozzle Number:	T30
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	32.9
Qsd	Volumetric Air Flow Rate, Dry SCFM:	15106.7
Qaw	Volumetric Air Flow Rate, Wet ACFM:	18067.4
%I	Isokinetic Sampling Rate, %:	62.8
Vm(Dry)	Volume Gas Metered, Dry:	15.895
Vm(Std)	Volume Gas Metered, Std:	15.256

FIELD DATA

Meter Box Number: B-1 Meter Box dHa: 2.043
Dry Gas Meter Cal. Y: 1.034 Assumed Moisture: 7.00
Leak Test Rate, CFM: 0.001 Leak Test Vac, in Hg: 10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H20)	Delta H (in H20)	Gas Meter Temp (oF)	Stack Temp (oF)
1	4	290.525	0.230	0.900	95.0	94.0
2	19	297.657	0.370	1.550	95.0	76.0
3	34	304.582	0.330	1.400	100.0	74.0
4	45/OFF	306.420				
5	--	--	--	--	--	--
6	--	--	--	--	--	--
7	--	--	--	--	--	--
8	--	--	--	--	--	--
9	--	--	--	--	--	--
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22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	45	15.895	0.307	1.283	96.7	81.3

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	231.488
gr/dscf	Concentration, gr/dscf:	0.101
Lb/hr	Emission Rate,Lb/hr PMRc:	13.097
Kg/hr	Emission Rate,Kg/hr PMRc:	5.941

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	231.488
gr/dscf	Concentration, gr/dscf:	0.101
Lb/hr	Emission Rate,Lb/hr PMRc:	13.097
Kg/hr	Emission Rate,Kg/hr PMRc:	5.941

mg	100.0	100.000mg

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: Site 9 Run No.: MID-NI-4D Date: 6/4/90
Sampling Location: Midpoint Operator: GCB
Net Run Time: 45 min Run Start Time: 1236
Num Sampling Points: 3 Run Stop Time: 1320

Pressures:

Pbar	Barometric Pressure, in Hg:	29.200
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	26.994

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	15.5
Vw(std)	Volume of Water Vapor, SCF:	0.730
%H2O	Moisture Content, % by Vol.:	4.61
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.954
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.45

FIELD DATA

Meter Box Number: 8-2 Meter Box dHa: 2.125
Dry Gas Meter Cal. Y: 1.131 Assumed Moisture: 7.00
Leak Test Rate, CFM: 0.001 Leak Test Vac, in Hg: 10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	6	657.195	0.180	0.700	95.0	87.0
2	21	663.343	0.370	1.550	95.0	75.0
3	36	670.283	0.330	0.200	100.0	74.0
4	45/OFF	671.596				
5	--	--	--	--	--	--
6	--	--	--	--	--	--
7	--	--	--	--	--	--
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24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	45	14.401	0.287	0.817	96.7	78.7

ISOKINETIC DATA

	Nozzle Number:	T31
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	31.7
Qsd	Volumetric Air Flow Rate, Dry SCFM:	14686.5
Qaw	Volumetric Air Flow Rate, Wet ACFM:	17409.7
%I	Isokinetic Sampling Rate, %:	63.9
Vm(Dry)	Volume Gas Metered, Dry:	14.401
Vm(Std)	Volume Gas Metered, Std:	15.098

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	233.904
gr/dscf	Concentration, gr/dscf:	0.102
Lb/hr	Emission Rate,Lb/hr PMRc:	12.865
Kg/hr	Emission Rate,Kg/hr PMRc:	5.836

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	233.904
gr/dscf	Concentration, gr/dscf:	0.102
Lb/hr	Emission Rate,Lb/hr PMRc:	12.865
Kg/hr	Emission Rate,Kg/hr PMRc:	5.836

mg	100.0	100.000mg

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: Site 9 Run No.: OUT-MMTL-4A Date: 6/4/90
Sampling Location: Outlet Operator: RLM
Net Run Time: 60 min Run Start Time: 1218
Num Sampling Points: 4 Run Stop Time: 1318

Pressures:

Pbar	Barometric Pressure, in Hg:	29.300
Pg	Flue Gas Static Press. in H2O:	-0.300
Ps	Absolute Flue Gas Press. in Hg:	29.278

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	34.5
Vw(std)	Volume of Water Vapor, SCF:	1.624
%H2O	Moisture Content, % by Vol.:	3.98
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.960
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.52

ISOKINETIC DATA

	Nozzle Number:	T-7
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.242
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	39.7
Qsd	Volumetric Air Flow Rate, Dry SCFM:	18288.3
Qaw	Volumetric Air Flow Rate, Wet ACFM:	21831.9
%I	Isokinetic Sampling Rate, %:	102.5
Vm(Dry)	Volume Gas Metered, Dry:	41.500
Vm(Std)	Volume Gas Metered, Std:	39.204

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	90.079
gr/dscf	Concentration, gr/dscf:	0.039
Lb/hr	Emission Rate,Lb/hr PMRc:	6.170
Kg/hr	Emission Rate,Kg/hr PMRc:	2.798

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	90.079
gr/dscf	Concentration, gr/dscf:	0.039
Lb/hr	Emission Rate,Lb/hr PMRc:	6.170
Kg/hr	Emission Rate,Kg/hr PMRc:	2.798

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	90.079

FIELD DATA

Meter Box Number: EN-2 Meter Box dHa: 1.969
Dry Gas Meter Cal. Y: 0.985 Assumed Moisture: 7.00
Leak Test Rate, CFM: 0.001 Leak Test Vac, in Hg: 8.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H20)	Delta H (in H20)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	797.720	0.380	1.400	76.0	128.0
2	15	807.200	0.430	1.580	79.0	139.0
3	30	817.390	0.500	1.840	83.0	131.0
4	45	828.560	0.480	1.770	87.0	131.0
5	60/OFF	839.220				
6	--	--	--	--	--	--
7	--	--	--	--	--	--
8	--	--	--	--	--	--
9	--	--	--	--	--	--
10	--	--	--	--	--	--
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12	--	--	--	--	--	--
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22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	60	41.500	0.446	1.647	81.3	132.2

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: Site 9 Run No.: OUT-MMTL-4B Date: 6/4/90
Sampling Location: OUtlet Operator: RLM
Net Run Time: 60 min Run Start Time: 1219
Num Sampling Points: 4 Run Stop Time: 1319

Pressures:

Pbar	Barometric Pressure, in Hg:	29.300
Pg	Flue Gas Static Press. in H2O:	-0.300
Ps	Absolute Flue Gas Press. in Hg:	29.278

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	38.5
Vw(std)	Volume of Water Vapor, SCF:	1.812
%H2O	Moisture Content, % by Vol.:	4.34
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.957
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.48

ISOKINETIC DATA

	Nozzle Number:	T-7
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.243
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	39.7
Qsd	Volumetric Air Flow Rate, Dry SCFM:	18232.5
Qsw	Volumetric Air Flow Rate, Wet ACFM:	21848.0
%I	Isokinetic Sampling Rate, %:	103.9

Vm(Dry)	Volume Gas Metered, Dry:	44.829
Vm(Std)	Volume Gas Metered, Std:	39.936

FIELD DATA

Meter Box Number:	EN-4	Meter Box dHa:	1.969
Dry Gas Meter Cal. Y:	0.932	Assumed Moisture:	7.00
Leak Test Rate, CFM:	0.001	Leak Test Vac, in Hg:	5.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	54.034	0.360	1.400	77.0	128.0
2	15	64.170	0.430	1.580	80.0	139.0
3	30	75.060	0.500	1.840	86.0	131.0
4	45	87.070	0.480	1.770	90.0	131.0
5	60/OFF	98.863				
6	--	--	--	--	--	--
7	--	--	--	--	--	--
8	--	--	--	--	--	--
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18	--	--	--	--	--	--
19	--	--	--	--	--	--
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22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	60	44.829	0.446	1.647	83.2	132.2

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	88.428
gr/dscf	Concentration, gr/dscf:	0.039
Lb/hr	Emission Rate,lb/hr PMRc:	6.038
Kg/hr	Emission Rate,Kg/hr PMRc:	2.739

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	88.428
gr/dscf	Concentration, gr/dscf:	0.039
Lb/hr	Emission Rate,Lb/hr PMRc:	6.038
Kg/hr	Emission Rate,Kg/hr PMRc:	2.739

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	88.428

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **OUT-NI-4C** Date: 6/4/90
Sampling Location: Outlet Operator: RLM
Net Run Time: 60 min Run Start Time: 1218
Num Sampling Points: 4 Run Stop Time: 1318

Pressures:

Pbar	Barometric Pressure, in Hg:	29.300
Pg	Flue Gas Static Press. in H2O:	-0.300
Ps	Absolute Flue Gas Press. in Hg:	29.278

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	31.0
Vw(std)	Volume of Water Vapor, SCF:	1.459
%H2O	Moisture Content, % by Vol.:	3.58
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.964
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.57

ISOKINETIC DATA

	Nozzle Number:	T-5
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.244
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	39.7
Qsd	Volumetric Air Flow Rate, Dry SCFM:	18349.4
Qaw	Volumetric Air Flow Rate, Wet ACFM:	21814.2
%I	Isokinetic Sampling Rate, %:	100.8
Vm(Dry)	Volume Gas Metered, Dry:	42.360
Vm(Std)	Volume Gas Metered, Std:	39.320

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	89.813
gr/dscf	Concentration, gr/dscf:	0.039
Lb/hr	Emission Rate,lb/hr PMRc:	6.172
Kg/hr	Emission Rate,Kg/hr PMRc:	2.800

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	89.813
gr/dscf	Concentration, gr/dscf:	0.039
Lb/hr	Emission Rate,Lb/hr PMRc:	6.172
Kg/hr	Emission Rate,Kg/hr PMRc:	2.800

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	89.813

FIELD DATA

Meter Box Number:	N-16	Meter Box dHa:	1.820
Dry Gas Meter Cal. Y:	0.996	Assumed Moisture:	7.00
Leak Test Rate, CFM:	0.002	Leak Test Vac, in Hg:	15.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	312.154	0.380	1.270	84.0	128.0
2	15	321.022	0.430	1.440	92.0	139.0
3	30	332.315	0.500	1.670	101.0	131.0
4	45	343.350	0.480	1.610	109.0	131.0
5	60/OFF	354.514				
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24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	60	42.360	0.446	1.497	96.5	132.2

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **OUT-NI-4D** Date: 6/4/90
Sampling Location: Outlet Operator: RLM
Net Run Time: 60 min Run Start Time: 1219
Num Sampling Points: 4 Run Stop Time: 1319

Pressures:

Pbar	Barometric Pressure, in Hg:	29.300
Pg	Flue Gas Static Press. in H2O:	-0.300
Ps	Absolute Flue Gas Press. in Hg:	29.278

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	34.0
Vw(std)	Volume of Water Vapor, SCF:	1.600
%H2O	Moisture Content, % by Vol.:	4.11
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.959
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.51

ISOKINETIC DATA

	Nozzle Number:	T-6
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.239
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	39.7
Qsd	Volumetric Air Flow Rate, Dry SCFM:	18264.7
Qaw	Volumetric Air Flow Rate, Wet ACFM:	21842.2
%I	Isokinetic Sampling Rate, %:	100.3
Vm(Dry)	Volume Gas Metered, Dry:	41.416
Vm(Std)	Volume Gas Metered, Std:	37.378

FIELD DATA

Meter Box Number: MU-7 Meter Box dHa: 1.820
Dry Gas Meter Cal. Y: 0.969 Assumed Moisture: 7.00
Leak Test Rate, CFM: 0.002 Leak Test Vac, in Hg: 15.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	41.940	0.380	1.270	85.0	129.0
2	15	51.518	0.430	1.440	93.0	139.0
3	30	61.681	0.500	1.670	103.0	131.0
4	45	72.508	0.480	1.610	108.0	131.0
5	60/OFF	83.356				
6	--	--	--	--	--	--
7	--	--	--	--	--	--
8	--	--	--	--	--	--
9	--	--	--	--	--	--
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
15	--	--	--	--	--	--
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18	--	--	--	--	--	--
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21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	60	41.416	0.446	1.497	97.2	132.5

EMISSIONS RESULTS

mg	100.	100.000mg
mg/dscm	Concentration, mg/dscm:	94.480
gr/dscf	Concentration, gr/dscf:	0.041
Lb/hr	Emission Rate,lb/hr PMRc:	6.463
Kg/hr	Emission Rate,Kg/hr PMRc:	2.931
mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	94.480
gr/dscf	Concentration, gr/dscf:	0.041
Lb/hr	Emission Rate,Lb/hr PMRc:	6.463
Kg/hr	Emission Rate,Kg/hr PMRc:	2.931
mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	94.480

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **IN-MMTL-9A** Date: 6/5/90
Sampling Location: Inlet Operator: LT
Net Run Time: 117 min Run Start Time: 1850
Num Sampling Points: 8 Run Stop Time: 2050

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.600

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	408.3
Vw(std)	Volume of Water Vapor, SCF:	19.219
%H2O	Moisture Content, % by Vol.:	27.89
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.721
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	26.65

FIELD DATA

Meter Box Number:	RAC 1	Meter Box dHa:	1.851
Dry Gas Meter Cal. Y:	1.000	Assumed Moisture:	30.00
Leak Test Rate, CFM:	0.016	Leak Test Vac, in Hg:	5.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta h (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	402.128	0.060	0.600	90.0	1285.0
2	15	409.150	0.070	0.600	91.0	1289.0
3	30	415.800	0.070	0.600	97.0	1290.0
4	45	422.450	0.050	0.600	98.0	1311.0
5	60	429.560	0.050	0.600	110.0	1370.0
6	75	436.480	0.050	0.600	114.0	1354.0
7	90	443.310	0.060	0.600	115.0	1319.0
8	105	455.701	0.060	0.600	116.0	1383.0
9	117/OFF	455.701				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
15	--	--	--	--	--	--
16	--	--	--	--	--	--
17	--	--	--	--	--	--
18	--	--	--	--	--	--
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20	--	--	--	--	--	--
21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	117	53.573	0.058	0.600	103.9	1325.1

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	14400.0
Vs	Flue Gas Velocity, Ft/sec:	26.1
Qsd	Volumetric Air Flow Rate, Dry SCFM:	33073.8
Qaw	Volumetric Air Flow Rate, Wet ACFM:	156751.9
%I	Isokinetic Sampling Rate, %:	167.4
Vm(Dry)	Volume Gas Metered, Dry:	53.573
Vm(Std)	Volume Gas Metered, Std:	49.682

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	71.081
gr/dscf	Concentration, gr/dscf:	0.031
Lb/hr	Emission Rate,Lb/hr PMRc:	8.804
Kg/hr	Emission Rate,Kg/hr PMRc:	3.994

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	71.081
gr/dscf	Concentration, gr/dscf:	0.031
Lb/hr	Emission Rate,Lb/hr PMRc:	8.804
Kg/hr	Emission Rate,Kg/hr PMRc:	3.994

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	71.081
gr/dscm	Concentration, gr/dscm:	0.031
Lb/hr	Emission Rate,Lb/hr PMRc:	8.804
Kg/hr	Emission Rate,Kg/hr PMRc:	3.994

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **IN-MMTL-9B** Date: 6/5/90
Sampling Location: Inlet Operator: LT
Net Run Time: 116 min Run Start Time: 1851
Num Sampling Points: 8 Run Stop Time: 2051

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.600

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	390.0
Vw(std)	Volume of Water Vapor, SCF:	18.357
%H2O	Moisture Content, % by Vol.:	26.68
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.733
fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	26.80

FIELD DATA

Meter Box Number:	RAC 5	Meter Box dHa:	1.869
Dry Gas Meter Cal. Y:	1.000	Assumed Moisture:	30.00
Leak Test Rate, CFM:	0.017	Leak Test Vac, in Hg:	5.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	553.273	0.070	0.600	90.0	1288.0
2	15	560.500	0.060	0.600	91.0	1284.0
3	30	567.390	0.070	0.600	97.0	1278.0
4	45	574.480	0.040	0.600	101.0	1369.0
5	60	580.915	0.060	0.600	107.0	1311.0
6	75	587.750	0.070	0.600	111.0	1358.0
7	90	594.825	0.060	0.600	113.0	1340.0
8	105	602.300	0.060	0.600	114.0	1393.0
9	116/OFF	607.601				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
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18	--	--	--	--	--	--
19	--	--	--	--	--	--
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23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	116	54.328	0.061	0.600	103.0	1327.6

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	14400.0
Vs	Flue Gas Velocity, Ft/sec:	26.6
Qsd	Volumetric Air Flow Rate, Dry SCFM:	34187.7
Qaw	Volumetric Air Flow Rate, Wet ACFM:	159562.5
%I	Isokinetic Sampling Rate, %:	165.9
Vm(Dry)	Volume Gas Metered, Dry:	54.328
Vm(Std)	Volume Gas Metered, Std:	50.461

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	69.985
gr/dscf	Concentration, gr/dscf:	0.031
Lb/hr	Emission Rate,lb/hr PMRc:	8.961
Kg/hr	Emission Rate,Kg/hr PMRc:	4.064

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	69.985
gr/dscf	Concentration, gr/dscf:	0.031
Lb/hr	Emission Rate,Lb/hr PMRc:	8.961
Kg/hr	Emission Rate,Kg/hr PMRc:	4.064

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	69.985
gr/dscf	Concentration, gr/dscf:	0.031
Lb/hr	Emission Rate,Lb/hr PMRc:	8.961
Kg/hr	Emission Rate,Kg/hr PMRc:	4.064

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **IN-NI-9C** Date: 6/5/90
Sampling Location: Inlet Operator: LT
Net Run Time: 115 min Run Start Time: 1852
Num Sampling Points: 8 Run Stop Time: 2052

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.600

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	382.0
Vw(std)	Volume of Water Vapor, SCF:	17.981
%H2O	Moisture Content, % by Vol.:	27.05
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.730
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	26.75

FIELD DATA

Meter Box Number:	RAC 2	Meter Box dHa:	1.858
Dry Gas Meter Cal. Y:	1.000	Assumed Moisture:	30.00
Leak Test Rate, CFM:	0.019	Leak Test Vac, in Hg:	5.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	347.340	0.060	0.600	91.0	1290.0
2	15	354.300	0.070	0.600	92.0	1289.0
3	30	360.900	0.070	0.600	98.0	1285.0
4	45	367.660	0.060	0.600	101.0	1311.0
5	60	374.600	0.050	0.600	108.0	1355.0
6	75	381.550	0.070	0.600	113.0	1364.0
7	90	388.310	0.070	0.600	113.0	1346.0
8	105	394.950	0.060	0.600	115.0	1398.0
9	115/OFF	399.640				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
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21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	115	52.300	0.064	0.600	103.9	1329.7

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	14400.0
Vs	Flue Gas Velocity, Ft/sec:	27.2
Qsd	Volumetric Air Flow Rate, Dry SCFM:	34768.2
Qaw	Volumetric Air Flow Rate, Wet ACFM:	163290.5
%I	Isokinetic Sampling Rate, %:	158.2
Vm(Dry)	Volume Gas Metered, Dry:	52.300
Vm(Std)	Volume Gas Metered, Std:	48.502

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	72.811
gr/dscf	Concentration, gr/dscf:	0.032
Lb/hr	Emission Rate,lb/hr PMRc:	9.481
Kg/hr	Emission Rate,Kg/hr PMRc:	4.300

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	72.811
gr/dscf	Concentration, gr/dscf:	0.032
Lb/hr	Emission Rate,Lb/hr PMRc:	9.481
Kg/hr	Emission Rate,Kg/hr PMRc:	4.300

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	72.811
gr/dscm	Concentration, gr/dscm:	0.032
Lb/hr	Emission Rate,Lb/hr PMRc:	9.481
Kg/hr	Emission Rate,Kg/hr PMRc:	4.300

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **IN-NI-9D** Date: 6/5/90

Sampling Location: Inlet Operator: LT

Net Run Time: 117 min Run Start Time: 1853

Num Sampling Points: 8 Run Stop Time: 2053

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.600

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	400.9
Vw(std)	Volume of Water Vapor, SCF:	18.870
%H2O	Moisture Content, % by Vol.:	29.34
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.707
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	26.48

FIELD DATA

Meter Box Number:	RAC 3	Meter Box dHa:	1.849
Dry Gas Meter Cal. Y:	1.000	Assumed Moisture:	30.00
Leak Test Rate, CFM:	0.013	Leak Test Vac, in Hg:	5.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	59.577	0.060	0.600	89.0	1290.0
2	15	66.000	0.070	0.600	91.0	1288.0
3	30	72.190	0.060	0.600	98.0	1285.0
4	45	78.750	0.050	0.600	102.0	1310.0
5	60	85.210	0.070	0.600	104.0	1359.0
6	75	91.521	0.060	0.600	106.0	1324.0
7	90	98.120	0.070	0.600	110.0	1340.0
8	105	104.400	0.070	0.600	114.0	1396.0
9	117/OFF	108.395				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
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23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	117	48.818	0.064	0.600	101.7	1324.0

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	14400.0
Vs	Flue Gas Velocity, Ft/sec:	27.3
Qsd	Volumetric Air Flow Rate, Dry SCFM:	33903.6
Qaw	Volumetric Air Flow Rate, Wet ACFM:	163873.6
%I	Isokinetic Sampling Rate, %:	149.4
Vm(Dry)	Volume Gas Metered, Dry:	48.818
Vm(Std)	Volume Gas Metered, Std:	45.444

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	77.711
gr/dscf	Concentration, gr/dscf:	0.034
Lb/hr	Emission Rate,lb/hr PMRc:	9.867
Kg/hr	Emission Rate,Kg/hr PMRc:	4.476

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	77.711
gr/dscf	Concentration, gr/dscf:	0.034
Lb/hr	Emission Rate,Lb/hr PMRc:	9.867
Kg/hr	Emission Rate,Kg/hr PMRc:	4.476

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	77.711
gr/dscm	Concentration, gr/dscm:	0.034
Lb/hr	Emission Rate,Lb/hr PMRc:	9.867
Kg/hr	Emission Rate,Kg/hr PMRc:	4.476

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: Site 9 Run No.: MID-MMTL-9A Date: 6/5/90
Sampling Location: Midpoint Operator: GCB
Net Run Time: 111 min Run Start Time: 1857
Num Sampling Points: 8 Run Stop Time: 2048

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.394

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	74.0
Vw(std)	Volume of Water Vapor, SCF:	3.483
%H2O	Moisture Content, % by Vol.:	5.43
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.946
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.35

ISOKINETIC DATA

	Nozzle Number:	T 27
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	33.1
Qsd	Volumetric Air Flow Rate, Dry SCFM:	15098.3
Qaw	Volumetric Air Flow Rate, Wet ACFM:	18183.5
%I	Isokinetic Sampling Rate, %:	101.4
Vm(Dry)	Volume Gas Metered, Dry:	64.960
Vm(Std)	Volume Gas Metered, Std:	60.723

FIELD DATA

Meter Box Number: A-1 Meter Box dHa: 2.270
Dry Gas Meter Cal. Y: 0.986 Assumed Moisture: 7.00
Leak Test Rate, CFM: 0.004 Leak Test Vac, in Hg: 10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	235.740	0.360	1.400	90.0	88.0
2	15	244.805	0.300	1.200	90.0	91.0
3	30	253.248	0.300	1.200	90.0	91.0
4	45	261.794	0.300	1.200	90.0	91.0
5	60	270.365	0.300	1.200	94.0	91.0
6	75	278.978	0.310	1.300	96.0	91.0
7	90	287.864	0.310	1.300	96.0	91.0
8	105	296.726	0.300	1.200	96.0	91.0
9	111/OFF	300.700				
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24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	111	64.960	0.310	1.250	92.7	90.6

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	58.157
gr/dscf	Concentration, gr/dscf:	0.025
Lb/hr	Emission Rate, lb/hr PMRc:	3.288
Kg/hr	Emission Rate, Kg/hr PMRc:	1.492

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	58.157
gr/dscf	Concentration, gr/dscf:	0.025
Lb/hr	Emission Rate, Lb/hr PMRc:	3.288
Kg/hr	Emission Rate, Kg/hr PMRc:	1.492

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	58.157
gr/dscm	Concentration, gr/dscm:	0.025
Lb/hr	Emission Rate, Lb/hr PMRc:	3.288
Kg/hr	Emission Rate, Kg/hr PMRc:	1.492

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-MMTL-9B** Date: 6/6/90
Sampling Location: Midpoint Operator: GCb
Net Run Time: 111 min Run Start Time: 1859
Num Sampling Points: 8 Run Stop Time: 2048

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.394

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	82.3
Vw(std)	Volume of Water Vapor, SCF:	3.874
%H2O	Moisture Content, % by Vol.:	5.81
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.942
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.30

FIELD DATA

Meter Box Number:	A-2	Meter Box dHa:	2.047
Dry Gas Meter Cal. Y:	1.024	Assumed Moisture:	7.00
Leak Test Rate, CFM:	0.001	Leak Test Vac, in Hg:	10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	49.662	0.320	1.300	90.0	90.0
2	17	58.546	0.300	1.200	90.0	91.0
3	32	67.292	0.300	1.200	90.0	91.0
4	47	76.017	0.300	1.200	92.0	91.0
5	62	84.802	0.300	1.200	94.0	90.0
6	77	93.637	0.300	1.200	96.0	91.0
7	92	102.392	0.310	1.300	96.0	91.0
8	107	111.449	0.310	1.300	96.0	91.0
9	111/OFF	114.408				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
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19	--	--	--	--	--	--
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22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	111	64.746	0.305	1.237	93.0	90.7

ISOKINETIC DATA

	Nozzle Number:	T 28
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	32.8
Qsd	Volumetric Air Flow Rate, Dry SCFM:	14931.1
Qaw	Volumetric Air Flow Rate, Wet ACFM:	18059.6
%I	Isokinetic Sampling Rate, %:	106.1
Vm(Dry)	Volume Gas Metered, Dry:	64.746
Vm(Std)	Volume Gas Metered, Std:	62.811

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	56.223
gr/dscf	Concentration, gr/dscf:	0.025
Lb/hr	Emission Rate,lb/hr PMRc:	3.144
Kg/hr	Emission Rate,Kg/hr PMRc:	1.426

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	56.223
gr/dscf	Concentration, gr/dscf:	0.025
Lb/hr	Emission Rate,Lb/hr PMRc:	3.144
Kg/hr	Emission Rate,Kg/hr PMRc:	1.426

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	56.223
gr/dscm	Concentration, gr/dscm:	0.025
Lb/hr	Emission Rate,Lb/hr PMRc:	3.144
Kg/hr	Emission Rate,Kg/hr PMRc:	1.426

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-NI-9C** Date: 6/5/90
Sampling Location: Midpoint Operator: GCB
Net Run Time: 107 min Run Start Time: 1901
Num Sampling Points: 8 Run Stop Time: 2048

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.394

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	75.3
Vw(std)	Volume of Water Vapor, SCF:	3.544
%H2O	Moisture Content, % by Vol.:	5.49
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.945
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.34

FIELD DATA

Meter Box Number:	B-1	Meter Box dHa:	2.043
Dry Gas Meter Cal. Y:	1.034	Assumed Moisture:	7.00
Leak Test Rate, CFM:	0.001	Leak Test Vac, in Hg:	10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	4	378.749	0.320	1.300	90.0	91.0
2	19	387.515	0.300	1.200	90.0	91.0
3	34	396.208	0.300	1.200	90.0	91.0
4	49	404.875	0.300	1.200	92.0	91.0
5	64	413.432	0.300	1.200	94.0	91.0
6	79	422.098	0.300	1.200	96.0	91.0
7	94	430.793	0.310	1.300	96.0	91.0
8	109	439.648	0.300	1.200	96.0	91.0
9	107/OFF	441.100				
10	--	--	--	--	--	--
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12	--	--	--	--	--	--
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23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	107	62.351	0.304	1.225	93.0	91.0

ISOKINETIC DATA

	Nozzle Number:	T 30
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	32.8
Qsd	Volumetric Air Flow Rate, Dry SCFM:	14938.2
Qaw	Volumetric Air Flow Rate, Wet ACFM:	18014.8
%I	Isokinetic Sampling Rate, %:	106.9
Vm(Dry)	Volume Gas Metered, Dry:	62.351
Vm(Std)	Volume Gas Metered, Std:	61.053

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	57.843
gr/dscf	Concentration, gr/dscf:	0.025
Lb/hr	Emission Rate,lb/hr PMRc:	3.236
Kg/hr	Emission Rate,Kg/hr PMRc:	1.468

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	57.843
gr/dscf	Concentration, gr/dscf:	0.025
Lb/hr	Emission Rate,Lb/hr PMRc:	3.236
Kg/hr	Emission Rate,Kg/hr PMRc:	1.468

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	57.843
gr/dscm	Concentration, gr/dscm:	0.025
Lb/hr	Emission Rate,Lb/hr PMRc:	3.236
Kg/hr	Emission Rate,Kg/hr PMRc:	1.468

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-NI-9D** Date: 6/5/90
Sampling Location: Midpoint Operator: GCB
Net Run Time: 105 min Run Start Time: 1903
Num Sampling Points: 7 Run Stop Time: 2048

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.394

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	73.2
Vw(std)	Volume of Water Vapor, SCF:	3.446
%H2O	Moisture Content, % by Vol.:	5.54
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.945
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.33

FIELD DATA

Meter Box Number:	B-2	Meter Box dHa:	2.125
Dry Gas Meter Cal. Y:	1.131	Assumed Moisture:	7.00
Leak Test Rate, CFM:	0.001	Leak Test Vac, in Hg:	10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	6	735.561	0.320	1.300	90.0	91.0
2	21	743.521	0.300	1.300	90.0	91.0
3	36	751.539	0.300	1.200	90.0	91.0
4	51	759.305	0.300	1.200	92.0	91.0
5	66	767.078	0.300	1.200	94.0	91.0
6	81	774.889	0.300	1.200	96.0	91.0
7	96	782.525	0.300	1.200	96.0	91.0
8	105/OFF	790.343				
9	--	--	--	--	--	--
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
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23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	105	54.782	0.303	1.229	92.6	91.0

ISOKINETIC DATA

	Nozzle Number:	T 31
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	32.7
Qsd	Volumetric Air Flow Rate, Dry SCFM:	14909.0
Qaw	Volumetric Air Flow Rate, Wet ACFM:	17990.3
%I	Isokinetic Sampling Rate, %:	105.0
Vm(Dry)	Volume Gas Metered, Dry:	54.782
Vm(Std)	Volume Gas Metered, Std:	58.710

EMISSIONS RESULTS

mg	100.	100.000mg
mg/dscm	Concentration, mg/dscm:	60.151
gr/dscf	Concentration, gr/dscf:	0.026
Lb/hr	Emission Rate,lb/hr PMRc:	3.359
Kg/hr	Emission Rate,Kg/hr PMRc:	1.523

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	60.151
gr/dscf	Concentration, gr/dscf:	0.026
Lb/hr	Emission Rate,Lb/hr PMRc:	3.359
Kg/hr	Emission Rate,Kg/hr PMRc:	1.523

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	60.151
gr/dscm	Concentration, gr/dscm:	0.026
Lb/hr	Emission Rate,Lb/hr PMRc:	3.359
Kg/hr	Emission Rate,Kg/hr PMRc:	1.523

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **OUT-MMTL-9A** Date: 6/5/90
Sampling Location: OUtlet Operator: MLH
Net Run Time: 118 min Run Start Time: 1850
Num Sampling Points: 8 Run Stop Time: 2048

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	-0.320
Ps	Absolute Flue Gas Press. in Hg:	29.576

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	66.5
Vw(std)	Volume of Water Vapor, SCF:	3.130
%H20	Moisture Content, % by Vol.:	4.32
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.957
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.48

FIELD DATA

Meter Box Number:	EN-2	Meter Box dHa:	1.969
Dry Gas Meter Cal. Y:	0.985	Assumed Moisture:	6.00
Leak Test Rate, CFM:	0.008	Leak Test Vac, in Hg:	15.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	914.518	0.360	1.270	80.0	145.0
2	15	923.650	0.380	1.340	84.0	149.0
3	30	933.100	0.350	1.240	85.0	157.0
4	45	942.200	0.370	1.310	85.0	160.0
5	60	951.500	0.360	1.270	87.0	160.0
6	75	960.660	0.370	1.310	88.0	162.0
7	90	969.950	0.380	1.340	88.0	161.0
8	105	979.450	0.380	1.340	87.0	163.0
9	118/OFF	987.840				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
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23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	118	73.322	0.369	1.302	85.5	157.1

ISOKINETIC DATA

	Nozzle Number:	T-7
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.242
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	36.7
Qsd	Volumetric Air Flow Rate, Dry SCFM:	16320.3
Qaw	Volumetric Air Flow Rate, Wet ACFM:	20167.4
%I	Isokinetic Sampling Rate, %:	103.3
Vm(Dry)	Volume Gas Metered, Dry:	73.322
Vm(Std)	Volume Gas Metered, Std:	69.368

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	50.909
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,lb/hr PMRc:	3.112
Kg/hr	Emission Rate,Kg/hr PMRc:	1.411

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	50.909
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	3.112
Kg/hr	Emission Rate,Kg/hr PMRc:	1.411

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	50.909
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	3.112
Kg/hr	Emission Rate,Kg/hr PMRc:	1.411

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: Site 9 Run No.: OUT-MMTL-9B Date: 6/5/90
Sampling Location: Outlet Operator: MLH
Net Run Time: 117 min Run Start Time: 1851
Num Sampling Points: 8 Run Stop Time: 2048

Pressures:

Pbar	Barometric Pressure, in Hg:	29.500
Pg	Flue Gas Static Press. in H2O:	-0.320
Ps	Absolute Flue Gas Press. in Hg:	29.476

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	69.1
Vw(std)	Volume of Water Vapor, SCF:	3.253
%H2O	Moisture Content, % by Vol.:	4.49
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.955
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.46

ISOKINETIC DATA

	Nozzle Number:	T-8
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.243
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	36.8
Qsd	Volumetric Air Flow Rate, Dry SCFM:	16269.5
Qaw	Volumetric Air Flow Rate, Wet ACFM:	20208.5
%I	Isokinetic Sampling Rate, %:	103.5
Vm(Dry)	Volume Gas Metered, Dry:	78.052
Vm(Std)	Volume Gas Metered, Std:	69.245

FIELD DATA

Meter Box Number:	EN-1	Meter Box dHa:	1.969
Dry Gas Meter Cal. Y:	0.932	Assumed Moisture:	6.00
Leak Test Rate, CFM:	0.007	Leak Test Vac, in Hg:	15.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	179.538	0.360	1.270	81.0	145.0
2	15	189.230	0.380	1.340	85.0	149.0
3	30	199.360	0.350	1.240	87.0	157.0
4	45	209.120	0.370	1.310	88.0	160.0
5	60	219.110	0.360	1.270	91.0	160.0
6	75	228.980	0.370	1.310	93.0	162.0
7	90	239.010	0.380	1.340	93.0	161.0
8	105	249.160	0.380	1.340	92.0	163.0
9	117/OFF	257.590				
10	--	--	--	--	--	--
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25	--	--	--	--	--	--
FINAL/AVG	117	78.052	0.369	1.302	88.7	157.1

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	51.000
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,lb/hr PMRc:	3.107
Kg/hr	Emission Rate,Kg/hr PMRc:	1.410

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	51.000
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	3.107
Kg/hr	Emission Rate,Kg/hr PMRc:	1.410

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	51.000
gr/dscm	Concentration, gr/dscm:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	3.107
Kg/hr	Emission Rate,Kg/hr PMRc:	1.410

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: Site 9 Run No.: OUT-NI-9C Date: 6/5/90
Sampling Location: Outlet Operator: RLM
Net Run Time: 118 min Run Start Time: 1850
Num Sampling Points: 8 Run Stop Time: 2048

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in h2O:	-0.320
Ps	Absolute Flue Gas Press. in Hg:	29.576

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	64.1
Vw(std)	Volume of Water Vapor, SCF:	3.017
%H2O	Moisture Content, % by Vol.:	4.16
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.958
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.50

FIELD DATA

Meter Box Number: N-16 Meter Box dHa: 1.820
Dry Gas Meter Cal. Y: 0.996 Assumed Moisture: 6.00
Leak Test Rate, CFM: 0.007 Leak Test Vac, in Hg: 15.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	555.283	0.360	1.160	78.0	145.0
2	15	564.473	0.380	1.230	83.0	149.0
3	30	574.089	0.350	1.130	92.0	157.0
4	45	583.332	0.370	1.190	98.0	160.0
5	60	593.257	0.360	1.160	104.0	160.0
6	75	602.260	0.370	1.190	108.0	162.0
7	90	611.906	0.380	1.230	110.0	161.0
8	105	621.679	0.370	1.190	112.0	163.0
9	118/OFF	629.700				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
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FINAL/AVG	118	74.417	0.367	1.185	98.1	157.1

ISOKINETIC DATA

	Nozzle Number:	T-7
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.244
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, ft/sec:	36.6
Qsd	Volumetric Air Flow Rate, Dry SCFM:	16314.6
Qaw	Volumetric Air Flow Rate, Wet ACFM:	20127.0
%I	Isokinetic Sampling Rate, %:	101.9
Vm(Dry)	Volume Gas Metered, Dry:	74.417
Vm(Std)	Volume Gas Metered, Std:	69.524

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	50.795
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,lb/hr PMRc:	3.104
Kg/hr	Emission Rate,Kg/hr PMRc:	1.408

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	50.795
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	3.104
Kg/hr	Emission Rate,Kg/hr PMRc:	1.408

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	50.795
gr/dscm	Concentration, gr/dscm:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	3.104
Kg/hr	Emission Rate,Kg/hr PMRc:	1.408

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: Site 9 Run No.: OUT-NI-9D Date: 6/5/90
Sampling Location: Outlet Operator: RLM
Net Run Time: 118 min Run Start Time: 1851
Num Sampling Points: 8 Run Stop Time: 2049

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	-0.350
Ps	Absolute Flue Gas Press. in Hg:	29.574

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	59.8
Vw(std)	Volume of Water Vapor, SCF:	2.815
%H2O	Moisture Content, % by Vol.:	4.12
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.959
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.51

FIELD DATA

Meter Box Number: NU-7 Meter Box dHa: 1.820
Dry Gas Meter Cal. Y: 0.969 Assumed Moisture: 6.00
Leak Test Rate, CFM: 0.009 Leak Test Vac, in Hg: 15.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	161.686	0.360	1.160	76.0	145.0
2	15	170.762	0.380	1.230	82.0	150.0
3	30	180.051	0.350	1.130	92.0	157.0
4	45	189.055	0.370	1.190	97.0	160.0
5	60	198.274	0.360	1.160	103.0	160.0
6	75	207.435	0.370	1.190	107.0	162.0
7	90	216.830	0.380	1.230	110.0	161.0
8	105	226.337	0.370	1.190	114.0	163.0
9	118/OFF	233.595				
10	--	--	--	--	--	--
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24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	118	71.909	0.367	1.185	97.6	157.2

ISOKINETIC DATA

	Nozzle Number:	T-8
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.239
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	36.6
Qsd	Volumetric Air Flow Rate, Dry SCFM:	16317.3
Qaw	Volumetric Air Flow Rate, Wet ACFM:	20128.3
%I	Isokinetic Sampling Rate, %:	100.0
Vm(Dry)	Volume Gas Metered, Dry:	71.909
Vm(Std)	Volume Gas Metered, Std:	65.465

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	53.944
gr/dscf	Concentration, gr/dscf:	0.024
Lb/hr	Emission Rate,lb/hr PMRc:	3.297
Kg/hr	Emission Rate,Kg/hr PMRc:	1.495

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	53.944
gr/dscf	Concentration, gr/dscf:	0.024
Lb/hr	Emission Rate,Lb/hr PMRc:	3.297
Kg/hr	Emission Rate,Kg/hr PMRc:	1.495

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	53.944
gr/dscm	Concentration, gr/dscm:	0.024
Lb/hr	Emission Rate,Lb/hr PMRc:	3.297
Kg/hr	Emission Rate,Kg/hr PMRc:	1.495

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **IN-MMTL-11A** Date: 6/6/90
Sampling Location: INLET Operator: LT
Net Run Time: 90 min Run Start Time: 1615
Num Sampling Points: 6 Run Stop Time: 1745

Pressures:

Pbar	Barometric Pressure, in Hg:	29.800
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.800

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	353.9
Vw(std)	Volume of Water Vapor, SCF:	16.658
%H2O	Moisture Content, % by Vol.:	29.62
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.704
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	26.45

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	14400.0
Vs	Flue Gas Velocity, Ft/sec:	27.9
Qsd	Volumetric Air Flow Rate, Dry SCFM:	36361.8
Qaw	Volumetric Air Flow Rate, Wet ACFM:	167564.5
%I	Isokinetic Sampling Rate, %:	157.7
Vm(Dry)	Volume Gas Metered, Dry:	42.388
Vm(Std)	Volume Gas Metered, Std:	39.587

FIELD DATA

Meter Box Number: RAC-1 Meter Box dHa: 1.851
Dry Gas Meter Cal. Y: 1.000 Assumed Moisture: 30.00
Leak Test Rate, CFM: 0.012 Leak Test Vac, in Hg: 5.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H20)	Delta H (in H20)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	489.546	0.070	0.700	92.0	1272.0
2	15	496.610	0.070	0.700	96.0	1260.0
3	30	503.720	0.070	0.700	102.0	1228.0
4	45	510.713	0.060	0.700	107.0	1237.0
5	60	517.630	0.070	0.700	112.0	1260.0
6	75	524.814	0.080	0.700	114.0	1217.0
7	90/OFF	531.934				
8	--	--	--	--	--	--
9	--	--	--	--	--	--
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
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23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	90	42.388	0.070	0.700	103.8	1245.7

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	89.207
gr/dscf	Concentration, gr/dscf:	0.039
Lb/hr	Emission Rate,lb/hr PMRc:	12.148
Kg/hr	Emission Rate,Kg/hr PMRc:	5.510

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	89.207
gr/dscf	Concentration, gr/dscf:	0.039
Lb/hr	Emission Rate,Lb/hr PMRc:	12.148
Kg/hr	Emission Rate,Kg/hr PMRc:	5.510

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	89.207
gr/dscm	Concentration, gr/dscm:	0.039
Lb/hr	Emission Rate,Lb/hr PMRc:	12.148

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **IN-MMTL-11B** Date: 6/6/90
Sampling Location: Inlet Operator: LT
Net Run Time: 90 min Run Start Time: 1615
Num Sampling Points: 6 Run Stop Time: 1745

Pressures:

Pbar	Barometric Pressure, in Hg:	29.800
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.800

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	360.6
Vw(std)	Volume of Water Vapor, SCF:	16.973
%H2O	Moisture Content, % by Vol.:	29.04
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.710
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	26.52

FIELD DATA

Meter Box Number: RAC 5 Meter Box dHa: 1.869
Dry Gas Meter Cal. Y: 1.000 Assumed Moisture: 30.00
Leak Test Rate, CFM: 0.013 Leak Test Vac, in Hg: 4.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	641.760	0.070	0.700	97.0	1260.0
2	15	649.750	0.070	0.700	98.0	1216.0
3	30	657.100	0.080	0.700	102.0	1258.0
4	45	664.400	0.060	0.700	106.0	1240.0
5	60	671.920	0.070	0.700	110.0	1247.0
6	75	679.400	0.080	0.700	115.0	1250.0
7	90/OFF	686.242				
8	--	--	--	--	--	--
9	--	--	--	--	--	--
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
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25	--	--	--	--	--	--
FINAL/AVG	90	44.482	0.071	0.700	104.7	1245.2

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	14400.0
Vs	Flue Gas Velocity, Ft/sec:	28.2
Qsd	Volumetric Air Flow Rate, Dry SCFM:	37040.5
Qaw	Volumetric Air Flow Rate, Wet ACFM:	169247.0
%I	Isokinetic Sampling Rate, %:	162.2
Vm(Dry)	Volume Gas Metered, Dry:	44.482
Vm(Std)	Volume Gas Metered, Std:	41.482

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	85.133
gr/dscf	Concentration, gr/dscf:	0.037
Lb/hr	Emission Rate,lb/hr PMRc:	11.810
Kg/hr	Emission Rate,Kg/hr PMRc:	5.357

mg	100.	100.000mg
mg/dscm	Concentration, mg/dscm:	85.133
gr/dscf	Concentration, gr/dscf:	0.037
Lb/hr	Emission Rate,Lb/hr PMRc:	11.810
Kg/hr	Emission Rate,Kg/hr PMRc:	5.357

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	85.133
gr/dscm	Concentration, gr/dscm:	0.037
Lb/hr	Emission Rate,Lb/hr PMRc:	11.810

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **IN-NI-11C** Date: 6/6/90
Sampling Location: Inlet Operator: LT
Net Run Time: 90 min Run Start Time: 1616
Num Sampling Points: 6 Run Stop Time: 1616

Pressures:

Pbar	Barometric Pressure, in Hg:	29.800
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.800

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	311.9
Vw(std)	Volume of Water Vapor, SCF:	14.681
%H2O	Moisture Content, % by Vol.:	26.57
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.734
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	26.81

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	14400.0
Vs	Flue Gas Velocity, Ft/sec:	28.7
Qsd	Volumetric Air Flow Rate, Dry SCFM:	39000.8
Qaw	Volumetric Air Flow Rate, Wet ACFM:	172346.1
%I	Isokinetic Sampling Rate, %:	150.7
Vm(Dry)	Volume Gas Metered, Dry:	43.588
Vm(Std)	Volume Gas Metered, Std:	40.564

FIELD DATA

Meter Box Number: RAC-2 Meter Box dHa: 1.858
Dry Gas Meter Cal. Y: 1.000 Assumed Moisture: 30.00
Leak Test Rate, CFM: 0.011 Leak Test Vac, in Hg: 4.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	436.325	0.070	0.700	97.0	1280.0
2	15	443.765	0.080	0.700	99.0	1202.0
3	30	450.831	0.080	0.700	106.0	1226.0
4	45	458.210	0.070	0.700	107.0	1248.0
5	60	465.413	0.070	0.700	111.0	1272.0
6	75	473.100	0.080	0.700	115.0	1250.0
7	90/OFF	479.913				
8	--	--	--	--	--	--
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25	--	--	--	--	--	--
FINAL/AVG	90	43.588	0.075	0.700	105.8	1246.3

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	87.059
gr/dscf	Concentration, gr/dscf:	0.038
Lb/hr	Emission Rate,lb/hr PMRc:	12.716
Kg/hr	Emission Rate,Kg/hr PMRc:	5.768

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	87.059
gr/dscf	Concentration, gr/dscf:	0.038
Lb/hr	Emission Rate,Lb/hr PMRc:	12.716
Kg/hr	Emission Rate,Kg/hr PMRc:	5.768

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	87.059
gr/dscm	Concentration, gr/dscm:	0.038
Lb/hr	Emission Rate,Lb/hr PMRc:	12.716

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **IN-NI-11D** Date: 6/6/90
Sampling Location: Inlet Operator: LT
Net Run Time: 90 min Run Start Time: 1616
Num Sampling Points: 6 Run Stop Time: 1816

Pressures:

Pbar	Barometric Pressure, in Hg:	29.800
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.800

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	333.1
Vw(std)	Volume of Water Vapor, SCF:	15.679
%H2O	Moisture Content, % by Vol.:	29.57
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.704
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	26.45

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	14400.0
Vs	Flue Gas Velocity, Ft/sec:	28.4
Qsd	Volumetric Air Flow Rate, Dry SCFM:	36629.8
Qaw	Volumetric Air Flow Rate, Wet ACFM:	170269.4
%I	Isokinetic Sampling Rate, %:	147.7
Vm(Dry)	Volume Gas Metered, Dry:	40.164
Vm(Std)	Volume Gas Metered, Std:	37.345

FIELD DATA

Meter Box Number:	RAC 3	Meter Box dHa:	1.849
Dry Gas Meter Cal. Y:	1.000	Assumed Moisture:	30.00
Leak Test Rate, CFM:	0.009	Leak Test Vac, in Hg:	6.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (of)	Stack Temp (of)
1	0	138.853	0.070	0.700	96.0	1268.0
2	15	145.290	0.060	0.700	98.0	1298.0
3	30	152.180	0.080	0.700	107.0	1250.0
4	45	159.082	0.070	0.700	108.0	1230.0
5	60	165.678	0.070	0.700	113.0	1289.0
6	75	172.614	0.080	0.700	116.0	1235.0
7	90/OFF	179.017				
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FINAL/AVG	90	40.164	0.071	0.700	106.3	1261.7

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	94.564
gr/dscf	Concentration, gr/dscf:	0.041
Lb/hr	Emission Rate,lb/hr PMRc:	12.973
Kg/hr	Emission Rate,Kg/hr PMRc:	5.884

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	94.564
gr/dscf	Concentration, gr/dscf:	0.041
Lb/hr	Emission Rate,lb/hr PMRc:	12.973
Kg/hr	Emission Rate,Kg/hr PMRc:	5.884

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	94.564
gr/dscm	Concentration, gr/dscm:	0.041
Lb/hr	Emission Rate,Lb/hr PMRc:	12.973

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-MMTL-11A** Date: 6/6/90
Sampling Location: MIDPOINT Operator: GCB
Net Run Time: 105 min Run Start Time: 1554
Num Sampling Points: 7 Run Stop Time: 1739

Pressures:

Pbar	Barometric Pressure, in Hg:	29.550
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.344

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	89.6
Vw(std)	Volume of Water Vapor, SCF:	4.217
%H2O	Moisture Content, % by Vol.:	6.40
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.936
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.23

FIELD DATA

Meter Box Number:	A-1	Meter Box dHa:	2.270
Dry Gas Meter Cal. Y:	0.986	Assumed Moisture:	7.00
Leak Test Rate, CFM:	0.002	Leak Test Vac, in Hg:	9.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	433.605	0.360	1.460	96.0	94.0
2	5	442.989	0.360	1.500	96.0	94.0
3	30	452.568	0.360	1.500	96.0	94.0
4	45	462.192	0.360	1.500	98.0	92.0
5	60	471.697	0.360	1.500	98.0	92.0
6	75	481.242	0.360	1.500	98.0	92.0
7	90	490.744	0.360	1.500	100.0	92.0
8	105/OFF	500.252				
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25	--	--	--	--	--	--
FINAL/AVG	105	66.647	0.360	1.494	97.4	92.9

ISOKINETIC DATA

	Nozzle Number:	127
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	35.8
Qsd	Volumetric Air Flow Rate, Dry SCFM:	16095.3
Qaw	Volumetric Air Flow Rate, Wet ACFM:	19700.9
%I	Isokinetic Sampling Rate, %:	102.2
Vm(Dry)	Volume Gas Metered, Dry:	66.647
Vm(Std)	Volume Gas Metered, Std:	61.710

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	57.227
gr/dscf	Concentration, gr/dscf:	0.025
Lb/hr	Emission Rate,lb/hr PMRc:	3.450
Kg/hr	Emission Rate,Kg/hr PMRc:	1.565
mg		0.000 mg
mg/dscm	Concentration, mg/dscm:	0.000
gr/dscf	Concentration, gr/dscf:	0.000
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000
mg		0.000 mg
mg/dscm	Concentration, mg/dscm:	0.000
gr/dscm	Concentration, gr/dscm:	0.000
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-MMTL-11B** Date: 6/6/90
Sampling Location: Midpoint Operator: GCB
Net Run Time: 105 min Run Start Time: 1556
Num Sampling Points: 7 Run Stop Time: 1741

Pressures:

Pbar	Barometric Pressure, in Hg:	29.550
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.344

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	92.7
Vw(std)	Volume of Water Vapor, SCF:	4.363
%H2O	Moisture Content, % by Vol.:	6.26
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.937
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.25

ISOKINETIC DATA

	Nozzle Number:	T28
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	35.8
Qsd	Volumetric Air Flow Rate, Dry SCFM:	16110.8
Qaw	Volumetric Air Flow Rate, Wet ACFM:	19700.3
%I	Isokinetic Sampling Rate, %:	108.2
Vm(Dry)	Volume Gas Metered, Dry:	68.016
Vm(Std)	Volume Gas Metered, Std:	65.392

FIELD DATA

Meter Box Number: A-2 Meter Box dHa: 2.047
Dry Gas Meter Cal. Y: 1.024 Assumed Moisture: 7.00
Leak Test Rate, CFM: 0.001 Leak Test Vac, in Hg: 8.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	2	255.562	0.360	1.500	96.0	94.0
2	17	265.126	0.360	1.500	96.0	94.0
3	32	274.878	0.360	1.500	96.0	94.0
4	47	284.655	0.360	1.500	98.0	94.0
5	62	294.462	0.360	1.500	98.0	92.0
6	77	304.154	0.360	1.500	98.0	92.0
7	92	313.925	0.360	1.500	100.0	92.0
8	105/OFF	323.578				
9	--	--	--	--	--	--
10	--	--	--	--	--	--
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12	--	--	--	--	--	--
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25	--	--	--	--	--	--
FINAL/AVG	105	68.016	0.360	1.500	97.4	93.1

EMISSIONS RESULTS

mg	100.	100.000mg
mg/dscm	Concentration, mg/dscm:	54.005
gr/dscf	Concentration, gr/dscf:	0.024
Lb/hr	Emission Rate,lb/hr PMRc:	3.258
Kg/hr	Emission Rate,Kg/hr PMRc:	1.478

mg	100.00	100.000mg
mg/dscm	Concentration, mg/dscm:	54.005
gr/dscf	Concentration, gr/dscf:	0.024
Lb/hr	Emission Rate,Lb/hr PMRc:	3.258
Kg/hr	Emission Rate,Kg/hr PMRc:	1.478

mg	100.00	100.000mg
mg/dscm	Concentration, mg/dscm:	54.005
gr/dscm	Concentration, gr/dscm:	0.024
Lb/hr	Emission Rate,Lb/hr PMRc:	3.258
Kg/hr	Emission Rate,Kg/hr PMRc:	1.478

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-NI-11C** Date: 6/6/90
Sampling Location: Midpoint Operator: GCB
Net Run Time: 105 min Run Start Time: 1558
Num Sampling Points: 7 Run Stop Time: 1743

Pressures:

Pbar	Barometric Pressure, in Hg:	29.550
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.344

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	91.5
Vw(std)	Volume of Water Vapor, SCF:	4.307
%H2O	Moisture Content, % by Vol.:	6.44
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.936
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.23

ISOKINETIC DATA

	Nozzle Number:	T30
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	35.8
Qsd	Volumetric Air Flow Rate, Dry SCFM:	16088.9
Qaw	Volumetric Air Flow Rate, Wet ACFM:	19702.8
%I	Isokinetic Sampling Rate, %:	103.6
Vm(Dry)	Volume Gas Metered, Dry:	66.631
Vm(Std)	Volume Gas Metered, Std:	62.540

FIELD DATA

Meter Box Number: B-1 Meter Box dHa: 2.043
Dry Gas Meter Cal. Y: 1.000 Assumed Moisture: 7.00
Leak Test Rate, CFM: 0.001 Leak Test Vac, in Hg: 9.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	4	510.311	0.360	1.500	96.0	94.0
2	19	519.738	0.360	1.500	96.0	94.0
3	34	529.234	0.360	1.500	96.0	94.0
4	49	538.702	0.360	1.500	98.0	92.0
5	64	548.218	0.360	1.500	98.0	92.0
6	79	557.687	0.360	1.500	98.0	92.0
7	94	567.367	0.360	1.500	100.0	92.0
8	105/OFF	576.942				
9	--	--	--	--	--	--
10	--	--	--	--	--	--
11	--	--	--	--	--	--
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24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	105	66.631	0.360	1.500	97.4	92.9

EMISSIONS RESULTS

mg	100.00	100.000mg
mg/dscm	Concentration, mg/dscm:	56.467
gr/dscf	Concentration, gr/dscf:	0.025
Lb/hr	Emission Rate,lb/hr PMRc:	3.402
Kg/hr	Emission Rate,Kg/hr PMRc:	1.543

mg	100.00	100.000mg
mg/dscm	Concentration, mg/dscm:	56.467
gr/dscf	Concentration, gr/dscf:	0.025
Lb/hr	Emission Rate,Lb/hr PMRc:	3.402
Kg/hr	Emission Rate,Kg/hr PMRc:	1.543

mg	100.00	100.000mg
mg/dscm	Concentration, mg/dscm:	56.467
gr/dscm	Concentration, gr/dscm:	0.025
Lb/hr	Emission Rate,Lb/hr PMRc:	3.402
Kg/hr	Emission Rate,Kg/hr PMRc:	1.543

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-NI-11D** Date: 6/6/90
Sampling Location: Mid point Operator: GCB
Net Run Time: 105 min Run Start Time: 1600
Num Sampling Points: 7 Run Stop Time: 1745

Pressures:

Pbar	Barometric Pressure, in Hg:	29.550
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.344

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	91.5
Vw(std)	Volume of Water Vapor, SCF:	4.307
%H2O	Moisture Content, % by Vol.:	6.32
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.937
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.24

FIELD DATA

Meter Box Number:	B-2	Meter Box dHa:	2.125
Dry Gas Meter Cal. Y:	1.131	Assumed Moisture:	7.00
Leak Test Rate, CFM:	0.001	Leak Test Vac, in Hg:	8.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	6	849.354	0.360	1.500	96.0	94.0
2	21	857.901	0.360	1.500	96.0	94.0
3	36	866.514	0.360	1.500	96.0	94.0
4	51	875.138	0.360	1.500	98.0	92.0
5	66	883.746	0.360	1.500	98.0	92.0
6	81	892.242	0.360	1.500	98.0	92.0
7	96	900.844	0.360	1.500	100.0	92.0
8	105/OFF	909.491				
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10	--	--	--	--	--	--
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25	--	--	--	--	--	--
FINAL/AVG	105	60.137	0.360	1.500	97.4	92.9

ISOKINETIC DATA

	Nozzle Number:	131
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	35.8
Qsd	Volumetric Air Flow Rate, Dry SCFM:	16105.8
Qaw	Volumetric Air Flow Rate, Wet ACFM:	19697.9
%I	Isokinetic Sampling Rate, %:	105.6
Vm(Dry)	Volume Gas Metered, Dry:	60.137
Vm(Std)	Volume Gas Metered, Std:	63.823

EMISSIONS RESULTS

mg	100.00	100.000mg
mg/dscm	Concentration, mg/dscm:	55.333
gr/dscf	Concentration, gr/dscf:	0.024
Lb/hr	Emission Rate,lb/hr PMRc:	3.338
Kg/hr	Emission Rate,Kg/hr PMRc:	1.514

mg	100.00	100.000mg
mg/dscm	Concentration, mg/dscm:	55.333
gr/dscf	Concentration, gr/dscf:	0.024
Lb/hr	Emission Rate,Lb/hr PMRc:	3.338
Kg/hr	Emission Rate,Kg/hr PMRc:	1.514

mg	100.00	100.000mg
mg/dscm	Concentration, mg/dscm:	55.333
gr/dscm	Concentration, gr/dscm:	0.024
Lb/hr	Emission Rate,Lb/hr PMRc:	3.338
Kg/hr	Emission Rate,Kg/hr PMRc:	1.514

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **OUT-MMTL-11A** Date: 6/6/90
Sampling Location: Outlet Operator: MLH
Net Run Time: 120 min Run Start Time: 1545
Num Sampling Points: 8 Run Stop Time: 1745

Pressures:

Pbar	Barometric Pressure, in Hg:	29.800
Pg	Flue Gas Static Press. in H2O:	-0.370
Ps	Absolute Flue Gas Press. in Hg:	29.773

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	85.2
Vw(std)	Volume of Water Vapor, SCF:	4.010
%H2O	Moisture Content, % by Vol.:	5.05
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.950
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.39

ISOKINETIC DATA

	Nozzle Number:	T-7
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.242
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	38.4
Qsd	Volumetric Air Flow Rate, Dry SCFM:	17353.5
Qaw	Volumetric Air Flow Rate, Wet ACFM:	21114.5
%I	Isokinetic Sampling Rate, %:	103.9
Vm(Dry)	Volume Gas Metered, Dry:	79.341
Vm(Std)	Volume Gas Metered, Std:	75.429

FIELD DATA

Meter Box Number:	EN 2	Meter Box dHa:	2.004
Dry Gas Meter Cal. Y:	0.985	Assumed Moisture:	6.00
Leak Test Rate, CFM:	0.006	Leak Test Vac, in Hg:	5.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	49.523	0.400	1.440	77.0	140.0
2	15	59.250	0.430	1.550	83.0	140.0
3	30	69.320	0.410	1.480	85.0	146.0
4	45	79.220	0.390	1.410	87.0	150.0
5	60	88.940	0.420	1.520	87.0	149.0
6	75	99.000	0.410	1.480	90.0	150.0
7	90	108.950	0.440	1.590	92.0	149.0
8	105	119.230	0.400	1.440	93.0	152.0
9	120/OFF	128.864				
10	--	--	--	--	--	--
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FINAL/AVG	120	79.341	0.412	1.489	86.7	147.0

EMISSIONS RESULTS

mg	100.	100.000mg
mg/dscm	Concentration, mg/dscm:	46.818
gr/dscf	Concentration, gr/dscf:	0.020
Lb/hr	Emission Rate,lb/hr PMRc:	3.043
Kg/hr	Emission Rate,Kg/hr PMRc:	1.380

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	46.818
gr/dscf	Concentration, gr/dscf:	0.020
Lb/hr	Emission Rate,Lb/hr PMRc:	3.043
Kg/hr	Emission Rate,Kg/hr PMRc:	1.380

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	46.818
gr/dscm	Concentration, gr/dscm:	0.020
Lb/hr	Emission Rate,Lb/hr PMRc:	3.043
Kg/hr	Emission Rate,Kg/hr PMRc:	1.380

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: Site 9 Run No.: OUT-MMTL-11B Date: 6/6/90
Sampling Location: outlet Operator: MLH
Net Run Time: 120 min Run Start Time: 1546
Num Sampling Points: 8 Run Stop Time: 1746

Pressures:

Pbar	Barometric Pressure, in Hg:	29.800
Pg	Flue Gas Static Press. in H2O:	-0.370
Ps	Absolute Flue Gas Press. in Hg:	29.773

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	85.1
Vw(std)	Volume of Water Vapor, SCF:	4.006
%H2O	Moisture Content, % by Vol.:	4.96
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
M'd	Dry Mole Fraction:	0.950
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.40

ISOKINETIC DATA

	Nozzle Number:	T-8
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.243
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	38.4
Qsd	Volumetric Air Flow Rate, Dry SCFM:	17366.0
Qaw	Volumetric Air Flow Rate, Wet ACFM:	21110.9
%I	Isokinetic Sampling Rate, %:	104.7
Vm(Dry)	Volume Gas Metered, Dry:	85.170
Vm(Std)	Volume Gas Metered, Std:	76.692

FIELD DATA

Meter Box Number: EN-1 Meter Box dHa: 1.969
Dry Gas Meter Cal. Y: 0.932 Assumed Moisture: 6.00
Leak Test Rate, CFM: 0.009 Leak Test Vac, in Hg: 5.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	322.395	0.400	1.440	77.0	140.0
2	15	332.930	0.430	1.550	81.0	140.0
3	30	343.730	0.410	1.480	85.0	146.0
4	45	354.300	0.390	1.410	86.0	150.0
5	60	364.640	0.420	1.520	87.0	149.0
6	75	375.300	0.410	1.480	90.0	150.0
7	90	385.980	0.440	1.590	92.0	149.0
8	105	396.980	0.400	1.440	93.0	152.0
9	120/OFF	407.565				
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25	--	--	--	--	--	--
FINAL/AVG	120	85.170	0.412	1.489	86.4	147.0

EMISSIONS RESULTS

mg	100.	100.000mg
mg/dscm	Concentration, mg/dscm:	46.047
gr/dscf	Concentration, gr/dscf:	0.020
Lb/hr	Emission Rate,lb/hr PMRc:	2.995
Kg/hr	Emission Rate,Kg/hr PMRc:	1.358

mg	100.	100.000mg
mg/dscm	Concentration, mg/dscm:	46.047
gr/dscf	Concentration, gr/dscf:	0.020
Lb/hr	Emission Rate,Lb/hr PMRc:	2.995
Kg/hr	Emission Rate,Kg/hr PMRc:	1.358

mg	100.	100.000mg
mg/dscm	Concentration, mg/dscm:	46.047
gr/dscm	Concentration, gr/dscm:	0.020
Lb/hr	Emission Rate,Lb/hr PMRc:	2.995
Kg/hr	Emission Rate,Kg/hr PMRc:	1.358

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: Site 9 Run No.: OUT-NI-11C Date: 6/6/90
Sampling Location: Outlet Operator: RLM
Net Run Time: 120 min Run Start Time: 1545
Num Sampling Points: 8 Run Stop Time: 1745

Pressures:

Pbar	Barometric Pressure, in Hg:	29.800
Pg	Flue Gas Static Press. in H2O:	-0.370
Ps	Absolute Flue Gas Press. in Hg:	29.773

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	78.8
Vw(std)	Volume of Water Vapor, SCF:	3.709
%H2O	Moisture Content, % by Vol.:	4.66
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.953
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.44

FIELD DATA

Meter Box Number:	M-16	Meter Box dHa:	1.820
Dry Gas Meter Cal. Y:	0.996	Assumed Moisture:	6.00
Leak Test Rate, CFM:	0.007	Leak Test Vac, in Hg:	5.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	762.608	0.400	1.310	84.0	140.0
2	15	772.565	0.430	1.410	90.0	140.0
3	30	782.778	0.410	1.350	98.0	146.0
4	45	792.855	0.390	1.260	102.0	150.0
5	60	802.616	0.420	1.360	105.0	149.0
6	75	812.763	0.410	1.320	108.0	150.0
7	90	822.865	0.440	1.420	110.0	149.0
8	105	832.262	0.400	1.290	112.0	152.0
9	120/OFF	843.645				
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25	--	--	--	--	--	--
FINAL/AVG	120	81.037	0.412	1.340	101.1	147.0

ISOKINETIC DATA

	Nozzle Number:	T-5
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.244
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	38.4
Qsd	Volumetric Air Flow Rate, Dry SCFM:	17410.3
Qaw	Volumetric Air Flow Rate, Wet ACFM:	21097.9
%I	Isokinetic Sampling Rate, %:	102.4
Vm(Dry)	Volume Gas Metered, Dry:	81.037
Vm(Std)	Volume Gas Metered, Std:	75.840

EMISSIONS RESULTS

mg	100.	100.000mg
mg/dscm	Concentration, mg/dscm:	46.565
gr/dscf	Concentration, gr/dscf:	0.020
Lb/hr	Emission Rate,Lb/hr PMRc:	3.036
Kg/hr	Emission Rate,Kg/hr PMRc:	1.377

mg	100.	100.000mg
mg/dscm	Concentration, mg/dscm:	46.565
gr/dscf	Concentration, gr/dscf:	0.020
Lb/hr	Emission Rate,Lb/hr PMRc:	3.036
Kg/hr	Emission Rate,Kg/hr PMRc:	1.377

mg	100.	100.000mg
mg/dscm	Concentration, mg/dscm:	46.565
gr/dscm	Concentration, gr/dscm:	0.020
Lb/hr	Emission Rate,Lb/hr PMRc:	3.036
Kg/hr	Emission Rate,Kg/hr PMRc:	1.377

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: Site 9 Run No.: OUT-NI-11 D Date: 6/6/90
Sampling Location: outlet Operator: RLM
Net Run Time: 120 min Run Start Time: 1546
Num Sampling Points: 8 Run Stop Time: 1746

Pressures:

Pbar	Barometric Pressure, in Hg:	29.800
Pg	Flue Gas Static Press. in H2O:	-0.370
Ps	Absolute Flue Gas Press. in Hg:	29.773

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	80.0
Vw(std)	Volume of Water Vapor, SCF:	3.766
%H2O	Moisture Content, % by Vol.:	5.01
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.950
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.40

FIELD DATA

Meter Box Number: NU 7 Meter Box dHa: 1.820
Dry Gas Meter Cal. Y: 0.961 Assumed Moisture: 6.00
Leak Test Rate, CFM: 0.008 Leak Test Vac, in Hg: 5.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (of)	Stack Temp (of)
1	0	292.567	0.400	1.310	82.0	140.0
2	15	302.182	0.430	1.410	88.0	140.0
3	30	312.194	0.410	1.350	96.0	147.0
4	45	322.035	0.390	1.260	100.0	151.0
5	60	331.555	0.420	1.360	104.0	149.0
6	75	341.462	0.410	1.320	106.0	150.0
7	90	351.275	0.440	1.420	108.0	150.0
8	105	361.464	0.400	1.290	110.0	152.0
9	120/OFF	371.335				
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FINAL/AVG	120	78.768	0.412	1.340	99.2	147.4

ISOKINETIC DATA

	Nozzle Number:	T-5
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.239
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	38.4
Qsd	Volumetric Air Flow Rate, Dry SCFM:	17353.8
Qaw	Volumetric Air Flow Rate, Wet ACFM:	21119.4
%I	Isokinetic Sampling Rate, %:	100.8
Vm(Dry)	Volume Gas Metered, Dry:	78.768
Vm(Std)	Volume Gas Metered, Std:	71.394

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	49.465
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	3.215
Kg/hr	Emission Rate,Kg/hr PMRc:	1.458
mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	49.465
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	3.215
Kg/hr	Emission Rate,Kg/hr PMRc:	1.458
mg	100.	100.000mg
mg/dscm	Concentration, mg/dscm:	49.465
gr/dscm	Concentration, gr/dscm:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	3.215
Kg/hr	Emission Rate,Kg/hr PMRc:	1.458

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **IN-MMTL-12A** Date: 6/7/90
Sampling Location: INlet Operator: LT
Net Run Time: 120 min Run Start Time: 1001
Num Sampling Points: 8 Run Stop Time: 1201

Pressures:

Pbar	Barometric Pressure, in Hg:	29.800
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.800

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	450.0
Vw(std)	Volume of Water Vapor, SCF:	21.181
%H2O	Moisture Content, % by Vol.:	28.71
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.713
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	26.55

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	14400.0
Vs	Flue Gas Velocity, Ft/sec:	26.4
Qsd	Volumetric Air Flow Rate, Dry SCFM:	33619.3
Qaw	Volumetric Air Flow Rate, Wet ACFM:	158430.4
%I	Isokinetic Sampling Rate, %:	169.9
Vm(Dry)	Volume Gas Metered, Dry:	56.785
Vm(Std)	Volume Gas Metered, Std:	52.586

FIELD DATA

Meter Box Number: RAC-1 Meter Box dHa: 1.851
Dry Gas Meter Cal. Y: 1.000 Assumed Moisture: 30.00
Leak Test Rate, CFM: 0.013 Leak Test Vac, in Hg: 6.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	554.245	0.070	0.700	97.0	1168.0
2	15	561.356	0.070	0.700	101.0	1345.0
3	30	568.550	0.060	0.700	104.0	1309.0
4	45	575.610	0.050	0.700	106.0	1322.0
5	60	582.652	0.050	0.700	112.0	1344.0
6	75	589.580	0.040	0.700	115.0	1342.0
7	90	597.000	0.080	0.700	116.0	1311.0
8	105	604.100	0.070	0.700	118.0	1312.0
9	120/OFF	611.030				
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11	--	--	--	--	--	--
12	--	--	--	--	--	--
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25	--	--	--	--	--	--
FINAL/AVG	120	56.785	0.061	0.700	108.6	1306.6

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	67.156
gr/dscf	Concentration, gr/dscf:	0.029
Lb/hr	Emission Rate,lb/hr PMRc:	8.455
Kg/hr	Emission Rate,Kg/hr PMRc:	3.835

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	67.156
gr/dscf	Concentration, gr/dscf:	0.029
Lb/hr	Emission Rate,Lb/hr PMRc:	8.455
Kg/hr	Emission Rate,Kg/hr PMRc:	3.835

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	67.156
gr/dscm	Concentration, gr/dscm:	0.029
Lb/hr	Emission Rate,Lb/hr PMRc:	8.455
Kg/hr	Emission Rate,Kg/hr PMRc:	3.835

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **IN-MMTL-12B** Date: 6/7/90
Sampling Location: Inlet Operator: LT
Net Run Time: 120 min Run Start Time: 1001
Num Sampling Points: 8 Run Stop Time: 1201

Pressures:

Pbar	Barometric Pressure, in Hg:	29.800
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.800

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	450.0
Vw(std)	Volume of Water Vapor, SCF:	21.181
%H20	Moisture Content, % by Vol.:	27.66
%C02	Percent C02 by Volume, Dry:	5.00
%02	Percent 02 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.723
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	26.68

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	14400.0
Vs	Flue Gas Velocity, Ft/sec:	28.1
Qsd	Volumetric Air Flow Rate, Dry SCFM:	36116.0
Qaw	Volumetric Air Flow Rate, Wet ACFM:	168769.5
%I	Isokinetic Sampling Rate, %:	166.7
Vm(Dry)	Volume Gas Metered, Dry:	59.890
Vm(Std)	Volume Gas Metered, Std:	55.401

FIELD DATA

Meter Box Number:	RAC 5	Meter Box dHa:	1.869
Dry Gas Meter Cal. Y:	1.000	Assumed Moisture:	30.00
Leak Test Rate, CFM:	0.014	Leak Test Vac, in Hg:	5.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H20)	Delta H (in H20)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	701.637	0.070	0.700	98.0	1165.0
2	15	709.573	0.070	0.700	102.0	1340.0
3	30	716.700	0.060	0.700	106.0	1300.0
4	45	724.250	0.070	0.700	108.0	1322.0
5	60	732.100	0.070	0.700	112.0	1343.0
6	75	739.150	0.060	0.700	114.0	1352.0
7	90	746.532	0.070	0.700	116.0	1360.0
8	105	754.100	0.080	0.700	118.0	1360.0
9	120/OFF	761.527				
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25	--	--	--	--	--	--
FINAL/AVG	120	59.890	0.069	0.700	109.2	1317.7

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	63.744
gr/dscf	Concentration, gr/dscf:	0.028
Lb/hr	Emission Rate,Lb/hr PMRc:	8.622
Kg/hr	Emission Rate,Kg/hr PMRc:	3.911

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	63.744
gr/dscf	Concentration, gr/dscf:	0.028
Lb/hr	Emission Rate,Lb/hr PMRc:	8.622
Kg/hr	Emission Rate,Kg/hr PMRc:	3.911

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	63.744
gr/dscm	Concentration, gr/dscm:	0.028
Lb/hr	Emission Rate,Lb/hr PMRc:	8.622
Kg/hr	Emission Rate,Kg/hr PMRc:	3.911

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **IN-NI-12C** Date: 6/7/90
Sampling Location: Inlet Operator: LT
Net Run Time: 120 min Run Start Time: 1001
Num Sampling Points: 8 Run Stop Time: 1201

Pressures:

Pbar	Barometric Pressure, in Hg:	29.800
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.800

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	465.9
Vw(std)	Volume of Water Vapor, SCF:	21.930
%H2O	Moisture Content, % by Vol.:	29.75
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.703
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	26.43

FIELD DATA

Meter Box Number: RAC-2 Meter Box dHa: 1.858
Dry Gas Meter Cal. Y: 1.000 Assumed Moisture: 30.00
Leak Test Rate, CFM: 0.015 Leak Test Vac, in Hg: 5.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	497.244	0.070	0.700	96.0	1161.0
2	15	504.420	0.070	0.700	98.0	1340.0
3	30	511.625	0.060	0.700	109.0	1300.0
4	45	518.910	0.070	0.700	113.0	1335.0
5	60	526.212	0.050	0.700	120.0	1339.0
6	75	532.560	0.070	0.700	122.0	1360.0
7	90	539.400	0.060	0.700	124.0	1367.0
8	105	546.700	0.060	0.700	124.0	1360.0
9	120/OFF	553.626				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
15	--	--	--	--	--	--
16	--	--	--	--	--	--
17	--	--	--	--	--	--
18	--	--	--	--	--	--
19	--	--	--	--	--	--
20	--	--	--	--	--	--
21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	56.382	0.064	0.700	113.2	1320.2

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	14400.0
Vs	Flue Gas Velocity, Ft/sec:	27.2
Qsd	Volumetric Air Flow Rate, Dry SCFM:	33889.3
Qaw	Volumetric Air Flow Rate, Wet ACFM:	163301.3
%I	Isokinetic Sampling Rate, %:	166.0
Vm(Dry)	Volume Gas Metered, Dry:	56.382
Vm(Std)	Volume Gas Metered, Std:	51.792

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	68.186
gr/dscf	Concentration, gr/dscf:	0.030
Lb/hr	Emission Rate,Lb/hr PMRc:	8.654
Kg/hr	Emission Rate,Kg/hr PMRc:	3.925

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	68.186
gr/dscf	Concentration, gr/dscf:	0.030
Lb/hr	Emission Rate,Lb/hr PMRc:	8.654
Kg/hr	Emission Rate,Kg/hr PMRc:	3.925

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	68.186
gr/dscm	Concentration, gr/dscm:	0.030
Lb/hr	Emission Rate,Lb/hr PMRc:	8.654
Kg/hr	Emission Rate,Kg/hr PMRc:	3.925

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **IN-NI-12D** Date: 6/7/90
Sampling Location: Inlet Operator: LT
Net Run Time: 120 min Run Start Time: 1001
Num Sampling Points: 8 Run Stop Time: 1201

Pressures:

Pbar	Barometric Pressure, in Hg:	29.800
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.800

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	493.1
Vw(std)	Volume of Water Vapor, SCF:	23.210
%H2O	Moisture Content, % by Vol.:	31.72
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.683
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	26.19

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	1440.0
Vs	Flue Gas Velocity, Ft/sec:	27.4
Qsd	Volumetric Air Flow Rate, Dry SCFM:	33058.8
Qaw	Volumetric Air Flow Rate, Wet ACFM:	164175.3
%I	Isokinetic Sampling Rate, %:	164.2
Vm(Dry)	Volume Gas Metered, Dry:	54.275
Vm(Std)	Volume Gas Metered, Std:	49.965

FIELD DATA

Meter Box Number: RAC 3 Meter Box dHa: 1.849
Dry Gas Meter Cal. Y: 1.000 Assumed Moisture: 30.00
Leak Test Rate, CFM: 0.025 Leak Test Vac, in Hg: 6.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	192.950	0.070	0.700	99.0	1168.0
2	15	199.930	0.070	0.700	101.0	1340.0
3	30	206.630	0.060	0.700	110.0	1297.0
4	45	213.360	0.050	0.700	112.0	1330.0
5	60	221.502	0.060	0.700	117.0	1341.0
6	75	227.631	0.070	0.700	118.0	1362.0
7	90	234.000	0.060	0.700	119.0	1370.0
8	105	240.615	0.070	0.700	120.0	1378.0
9	120/OFF	247.225				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
15	--	--	--	--	--	--
16	--	--	--	--	--	--
17	--	--	--	--	--	--
18	--	--	--	--	--	--
19	--	--	--	--	--	--
20	--	--	--	--	--	--
21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	54.275	0.064	0.700	112.0	1323.2

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	70.679
gr/dscf	Concentration, gr/dscf:	0.031
Lb/hr	Emission Rate,lb/hr PMRc:	8.751
Kg/hr	Emission Rate,Kg/hr PMRc:	3.969

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	70.679
gr/dscf	Concentration, gr/dscf:	0.031
Lb/hr	Emission Rate,Lb/hr PMRc:	8.751
Kg/hr	Emission Rate,Kg/hr PMRc:	3.969

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	70.679
gr/dscm	Concentration, gr/dscm:	0.031
Lb/hr	Emission Rate,Lb/hr PMRc:	8.751
Kg/hr	Emission Rate,Kg/hr PMRc:	3.969

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-MMTL-12A** Date: 6/7/90
Sampling Location: Midpoint Operator: GCB
Net Run Time: 120 min Run Start Time: 1015
Num Sampling Points: 8 Run Stop Time: 1215

Pressures:

Pbar	Barometric Pressure, in Hg:	29.500
Pg	Flue Gas Static Press. in H20:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.294

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	100.0
Vw(std)	Volume of Water Vapor, SCF:	4.707
%H20	Moisture Content, % by Vol.:	6.50
%C02	Percent CC2 by Volume, Dry:	5.00
%02	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.935
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.22

ISOKINETIC DATA

	Nozzle Number:	T 27
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	35.0
Qsd	Volumetric Air Flow Rate, Dry SCFM:	15680.5
Qaw	Volumetric Air Flow Rate, Wet ACFM:	19219.2
%I	Isokinetic Sampling Rate, %:	100.7
Vm(Dry)	Volume Gas Metered, Dry:	73.287
Vm(Std)	Volume Gas Metered, Std:	67.732

FIELD DATA

Meter Box Number: A-1 Meter Box dHa: 2.270
Dry Gas Meter Cal. Y: 0.986 Assumed Moisture: 7.00
Leak Test Rate, CFM: 0.004 Leak Test Vac, in Hg: 10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H20)	Delta H (in H20)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	503.265	0.320	1.300	96.0	92.0
2	15	512.501	0.320	1.300	96.0	92.0
3	30	520.882	0.350	1.400	96.0	92.0
4	45	530.076	0.350	1.400	96.0	92.0
5	60	539.324	0.350	1.400	97.0	92.0
6	75	548.548	0.350	1.400	98.0	92.0
7	90	557.798	0.350	1.450	100.0	92.0
8	105	567.158	0.350	1.450	100.0	92.0
9	120/OFF	576.552				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
15	--	--	--	--	--	--
16	--	--	--	--	--	--
17	--	--	--	--	--	--
18	--	--	--	--	--	--
19	--	--	--	--	--	--
20	--	--	--	--	--	--
21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	73.287	0.342	1.387	97.4	92.0

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	52.139
gr/dscf	Concentration, gr/dscf:	0.023
Lb/hr	Emission Rate,lb/hr PMRc:	3.062
Kg/hr	Emission Rate,Kg/hr PMRc:	1.389

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	52.139
gr/dscf	Concentration, gr/dscf:	0.023
Lb/hr	Emission Rate,Lb/hr PMRc:	3.062
Kg/hr	Emission Rate,Kg/hr PMRc:	1.389

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	52.139
gr/dscm	Concentration, gr/dscm:	0.023
Lb/hr	Emission Rate,Lb/hr PMRc:	3.062
Kg/hr	Emission Rate,Kg/hr PMRc:	1.389

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-MMTL-12B** Date: 6/7/90
Sampling Location: Midpoint Operator: GCB
Net Run Time: 120 min Run Start Time: 1017
Num Sampling Points: 8 Run Stop Time: 1217

Pressures:

Pbar	Barometric Pressure, in Hg:	29.500
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.294

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	100.0
Vw(std)	Volume of Water Vapor, SCF:	4.707
%H2O	Moisture Content, % by Vol.:	6.17
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.938
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.26

ISOKINETIC DATA

	Nozzle Number:	T 28
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	35.1
Qsd	Volumetric Air Flow Rate, Dry SCFM:	15811.5
Qaw	Volumetric Air Flow Rate, Wet ACFM:	19312.8
%I	Isokinetic Sampling Rate, %:	105.5
Vm(Dry)	Volume Gas Metered, Dry:	74.560
Vm(Std)	Volume Gas Metered, Std:	71.536

FIELD DATA

Meter Box Number: A-2 Meter Box dHa: 2.047
Dry Gas Meter Cal. Y: 1.024 Assumed Moisture: 7.00
Leak Test Rate, CFM: 0.001 Leak Test Vac, in Hg: 10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	2	326.302	0.320	1.300	96.0	92.0
2	17	335.920	0.350	1.400	96.0	92.0
3	32	344.550	0.350	1.400	96.0	92.0
4	47	353.892	0.350	1.400	96.0	92.0
5	62	363.262	0.350	1.400	98.0	92.0
6	77	372.548	0.350	1.400	98.0	92.0
7	92	381.911	0.350	1.450	100.0	92.0
8	107	391.421	0.350	1.450	100.0	92.0
9	120/OFF	400.862				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
15	--	--	--	--	--	--
16	--	--	--	--	--	--
17	--	--	--	--	--	--
18	--	--	--	--	--	--
19	--	--	--	--	--	--
20	--	--	--	--	--	--
21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	74.560	0.346	1.400	97.5	92.0

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	49.367
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,lb/hr PMRc:	2.923
Kg/hr	Emission Rate,Kg/hr PMRc:	1.326
mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	49.367
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	2.923
Kg/hr	Emission Rate,Kg/hr PMRc:	1.326
mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	49.367
gr/dscm	Concentration, gr/dscm:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	2.923
Kg/hr	Emission Rate,Kg/hr PMRc:	1.326

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-NI-12D** Date: 6/7/90
Sampling Location: Midpoint Operator: GCB
Net Run Time: 120 min Run Start Time: 1021
Num Sampling Points: 8 Run Stop Time: 1221

Pressures:

Pbar	Barometric Pressure, in Hg:	29.500
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.294

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	100.0
Vw(std)	Volume of Water Vapor, SCF:	4.707
%H2O	Moisture Content, % by Vol.:	6.25
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.938
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.25

FIELD DATA

Meter Box Number:	B-2	Meter Box dHa:	2.125
Dry Gas Meter Cal. Y:	1.131	Assumed Moisture:	7.00
Leak Test Rate, CFM:	0.001	Leak Test Vac, in Hg:	10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H20)	Delta H (in H20)	Gas Meter Temp (oF)	Stack Temp (oF)
1	6	911.894	0.320	1.300	96.0	92.0
2	21	919.812	0.350	1.400	96.0	92.0
3	36	928.121	0.350	1.400	96.0	92.0
4	51	936.511	0.350	1.400	96.0	92.0
5	66	944.872	0.350	1.400	98.0	92.0
6	81	953.272	0.350	1.400	98.0	92.0
7	96	961.601	0.350	1.450	100.0	92.0
8	111	970.132	0.350	1.450	100.0	92.0
9	120/OFF	978.565				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
15	--	--	--	--	--	--
16	--	--	--	--	--	--
17	--	--	--	--	--	--
18	--	--	--	--	--	--
19	--	--	--	--	--	--
20	--	--	--	--	--	--
21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	66.671	0.346	1.400	97.5	92.0

ISOKINETIC DATA

	Nozzle Number:	I 31
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	35.1
Qsd	Volumetric Air Flow Rate, Dry SCFM:	15801.2
Qaw	Volumetric Air Flow Rate, Wet ACFM:	19315.8
%I	Isokinetic Sampling Rate, %:	104.2
Vm(Dry)	Volume Gas Metered, Dry:	66.671
Vm(Std)	Volume Gas Metered, Std:	70.611

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	50.013
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	2.960
Kg/hr	Emission Rate,Kg/hr PMRc:	1.342

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	50.013
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	2.960
Kg/hr	Emission Rate,Kg/hr PMRc:	1.342

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	50.013
gr/dscm	Concentration, gr/dscm:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	2.960
Kg/hr	Emission Rate,Kg/hr PMRc:	1.342

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **OUT-MMTL-12A** Date: 6/7/90
Sampling Location: Outlet Operator: MLH
Net Run Time: 120 min Run Start Time: 1015
Num Sampling Points: 8 Run Stop Time: 1215

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	-0.380
Ps	Absolute Flue Gas Press. in Hg:	29.572

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	75.7
Vw(std)	Volume of Water Vapor, SCF:	3.563
%H2O	Moisture Content, % by Vol.:	4.73
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.953
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.43

FIELD DATA

Meter Box Number:	EW-2	Meter Box dHa:	1.969
Dry Gas Meter Cal. Y:	0.985	Assumed Moisture:	6.00
Leak Test Rate, CFM:	0.012	Leak Test Vac, in Hg:	15.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	201.753	0.350	1.240	80.0	146.0
2	15	210.820	0.370	1.310	83.0	145.0
3	30	220.180	0.360	1.270	87.0	144.0
4	45	229.380	0.380	1.340	87.0	144.0
5	60	238.920	0.400	1.420	87.0	142.0
6	75	248.770	0.380	1.340	89.0	147.0
7	90	258.330	0.390	1.380	92.0	152.0
8	105	268.020	0.400	1.420	92.0	160.0
9	120/OFF	277.873				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
15	--	--	--	--	--	--
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FINAL/AVG	120	76.120	0.379	1.340	87.1	147.5

ISOKINETIC DATA

	Nozzle Number:	T-7
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.242
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	36.9
Qsd	Volumetric Air Flow Rate, Dry SCFM:	16609.3
Qaw	Volumetric Air Flow Rate, Wet ACFM:	20294.5
%I	Isokinetic Sampling Rate, %:	103.4
Vm(Dry)	Volume Gas Metered, Dry:	76.120
Vm(Std)	Volume Gas Metered, Std:	71.808

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	49.180
gr/dscf	Concentration, gr/dscf:	0.021
Lb/hr	Emission Rate,Lb/hr PMRc:	3.059
Kg/hr	Emission Rate,Kg/hr PMRc:	1.388

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	49.180
gr/dscf	Concentration, gr/dscf:	0.021
Lb/hr	Emission Rate,Lb/hr PMRc:	3.059
Kg/hr	Emission Rate,Kg/hr PMRc:	1.388

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	49.180
gr/dscm	Concentration, gr/dscm:	0.021
Lb/hr	Emission Rate,Lb/hr PMRc:	3.059
Kg/hr	Emission Rate,Kg/hr PMRc:	1.388

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: Site 9 Run No.: OUT-MMTL-12B Date: 6/7/90
Sampling Location: Outlet Operator: MLH
Net Run Time: 120 min Run Start Time: 1016
Num Sampling Points: 8 Run Stop Time: 1216

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	-0.380
Ps	Absolute Flue Gas Press. in Hg:	29.572

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	74.0
Vw(std)	Volume of Water Vapor, SCF:	3.483
%H2O	Moisture Content, % by Vol.:	4.59
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.954
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.45

ISOKINETIC DATA

	Nozzle Number:	T-8
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.243
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	36.9
Qsd	Volumetric Air Flow Rate, Dry SCFM:	16629.0
Qaw	Volumetric Air Flow Rate, Wet ACFM:	20288.7
%I	Isokinetic Sampling Rate, %:	103.3
Vm(Dry)	Volume Gas Metered, Dry:	81.468
Vm(Std)	Volume Gas Metered, Std:	72.444

FIELD DATA

Meter Box Number: EM-1 Meter Box dHa: 1.969
Dry Gas Meter Cal. Y: 0.932 Assumed Moisture: 6.00
Leak Test Rate, CFM: 0.140 Leak Test Vac, in Hg: 15.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	485.004	0.350	1.240	80.0	146.0
2	15	494.620	0.370	1.310	83.0	145.0
3	30	504.550	0.360	1.270	88.0	144.0
4	45	514.410	0.380	1.340	90.0	144.0
5	60	524.630	0.400	1.420	91.0	142.0
6	75	535.210	0.380	1.340	93.0	147.0
7	90	545.510	0.390	1.380	95.0	152.0
8	105	555.910	0.400	1.420	95.0	160.0
9	120/OFF	566.472				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
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23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	81.468	0.379	1.340	89.4	147.5

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	48.748
gr/dscf	Concentration, gr/dscf:	0.021
Lb/hr	Emission Rate,lb/hr PMRc:	3.036
Kg/hr	Emission Rate,Kg/hr PMRc:	1.377

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	48.748
gr/dscf	Concentration, gr/dscf:	0.021
Lb/hr	Emission Rate,Lb/hr PMRc:	3.036
Kg/hr	Emission Rate,Kg/hr PMRc:	1.377

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	48.748
gr/dscm	Concentration, gr/dscm:	0.021
Lb/hr	Emission Rate,Lb/hr PMRc:	3.036
Kg/hr	Emission Rate,Kg/hr PMRc:	1.377

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **OUT-NI-12C** Date: 6/7/90
Sampling Location: Outlet Operator: RLM
Net Run Time: 120 min Run Start Time: 1015
Num Sampling Points: 8 Run Stop Time: 1215

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	-0.380
Ps	Absolute Flue Gas Press. in Hg:	29.572

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	75.0
Vw(std)	Volume of Water Vapor, SCF:	3.530
%H2O	Moisture Content, % by Vol.:	4.66
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.953
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.44

ISOKINETIC DATA

	Nozzle Number:	T-5
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.244
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	36.9
Qsd	Volumetric Air Flow Rate, Dry SCFM:	16618.8
Qaw	Volumetric Air Flow Rate, Wet ACFM:	20291.7
%I	Isokinetic Sampling Rate, %:	102.2
Vm(Dry)	Volume Gas Metered, Dry:	78.789
Vm(Std)	Volume Gas Metered, Std:	72.221

FIELD DATA

Meter Box Number: M-16 Meter Box dHa: 1.820
Dry Gas Meter Cal. Y: 0.986 Assumed Moisture: 6.00
Leak Test Rate, CFM: 0.011 Leak Test Vac, in Hg: 5.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	918.510	0.350	1.170	84.0	146.0
2	15	927.872	0.370	1.240	93.0	145.0
3	30	937.541	0.360	1.200	100.0	144.0
4	45	947.133	0.380	1.270	105.0	144.0
5	60	956.982	0.400	1.340	108.0	142.0
6	75	967.235	0.380	1.270	110.0	147.0
7	90	977.203	0.390	1.300	112.0	152.0
8	105	987.122	0.400	1.340	114.0	160.0
9	120/OFF	997.299				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
15	--	--	--	--	--	--
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18	--	--	--	--	--	--
19	--	--	--	--	--	--
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21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	78.789	0.379	1.266	103.2	147.5

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	48.898
gr/dscf	Concentration, gr/dscf:	0.021
Lb/hr	Emission Rate,Lb/hr PMRc:	3.043
Kg/hr	Emission Rate,Kg/hr PMRc:	1.380

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	48.898
gr/dscf	Concentration, gr/dscf:	0.021
Lb/hr	Emission Rate,Lb/hr PMRc:	3.043
Kg/hr	Emission Rate,Kg/hr PMRc:	1.380

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	48.898
gr/dscm	Concentration, gr/dscm:	0.021
Lb/hr	Emission Rate,Lb/hr PMRc:	3.043
Kg/hr	Emission Rate,Kg/hr PMRc:	1.380

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: Site 9 Run No.: OUT-NI-12C Date: 6/7/90
Sampling Location: Outlet Operator: RLM
Net Run Time: 120 min Run Start Time: 1015
Num Sampling Points: 8 Run Stop Time: 1215

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	-0.380
Ps	Absolute Flue Gas Press. in Hg:	29.572

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	75.0
Vw(std)	Volume of Water Vapor, SCF:	3.530
%H2O	Moisture Content, % by Vol.:	4.66
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.953
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.44

ISOKINETIC DATA

	Nozzle Number:	T-5
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.244
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	36.9
Qsd	Volumetric Air Flow Rate, Dry SCFM:	16618.8
Qaw	Volumetric Air Flow Rate, Wet ACFM:	20291.7
%I	Isokinetic Sampling Rate, %:	102.2
Vm(Dry)	Volume Gas Metered, Dry:	78.789
Vm(Std)	Volume Gas Metered, Std:	72.221

FIELD DATA

Meter Box Number:	N-16	Meter Box dHa:	1.820
Dry Gas Meter Cal. Y:	0.986	Assumed Moisture:	6.00
Leak Test Rate, CFM:	0.011	Leak Test Vac, in Hg:	5.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	918.510	0.350	1.170	84.0	146.0
2	15	927.872	0.370	1.240	93.0	145.0
3	30	937.541	0.360	1.200	100.0	144.0
4	45	947.133	0.380	1.270	105.0	144.0
5	60	956.982	0.400	1.340	108.0	142.0
6	75	967.235	0.380	1.270	110.0	147.0
7	90	977.203	0.390	1.300	112.0	152.0
8	105	987.122	0.400	1.340	114.0	160.0
9	120/OFF	997.299				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
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21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	78.789	0.379	1.266	103.2	147.5

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	48.898
gr/dscf	Concentration, gr/dscf:	0.021
Lb/hr	Emission Rate,Lb/hr PMRc:	3.043
Kg/hr	Emission Rate,Kg/hr PMRc:	1.380

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	48.898
gr/dscf	Concentration, gr/dscf:	0.021
Lb/hr	Emission Rate,Lb/hr PMRc:	3.043
Kg/hr	Emission Rate,Kg/hr PMRc:	1.380

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	48.898
gr/dscm	Concentration, gr/dscm:	0.021
Lb/hr	Emission Rate,Lb/hr PMRc:	3.043
Kg/hr	Emission Rate,Kg/hr PMRc:	1.380

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **OUT-NI-12D** Date: 6/7/90
Sampling Location: OUtlet Operator: RLM
Net Run Time: 120 min Run Start Time: 1016
Num Sampling Points: 8 Run Stop Time: 1216

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	-0.400
Ps	Absolute Flue Gas Press. in Hg:	29.571

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	75.0
Vw(std)	Volume of Water Vapor, SCF:	3.530
%H2O	Moisture Content, % by Vol.:	4.89
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.951
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.41

FIELD DATA

Meter Box Number:	NU-7	Meter Box dHa:	1.820
Dry Gas Meter Cal. Y:	0.969	Assumed Moisture:	6.00
Leak Test Rate, CFM:	0.009	Leak Test Vac, in Hg:	5.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	445.160	0.350	1.170	85.0	146.0
2	15	453.942	0.370	1.240	94.0	144.0
3	30	463.327	0.360	1.200	100.0	145.0
4	45	472.637	0.380	1.270	105.0	143.0
5	60	482.147	0.400	1.340	107.0	143.0
6	75	492.056	0.380	1.270	109.0	148.0
7	90	501.682	0.390	1.300	112.0	154.0
8	105	511.450	0.400	1.340	114.0	158.0
9	120/OFF	521.362				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
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19	--	--	--	--	--	--
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21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	76.202	0.379	1.266	103.2	147.6

ISOKINETIC DATA

	Nozzle Number:	T-6
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.239
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	36.9
Qsd	Volumetric Air Flow Rate, Dry SCFM:	16584.7
Qaw	Volumetric Air Flow Rate, Wet ACFM:	20303.7
%I	Isokinetic Sampling Rate, %:	101.5
Vm(Dry)	Volume Gas Metered, Dry:	76.202
Vm(Std)	Volume Gas Metered, Std:	68.695

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	51.408
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,lb/hr PMRc:	3.193
Kg/hr	Emission Rate,Kg/hr PMRc:	1.448

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	51.408
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	3.193
Kg/hr	Emission Rate,Kg/hr PMRc:	1.448

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	51.408
gr/dscm	Concentration, gr/dscm:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	3.193
Kg/hr	Emission Rate,Kg/hr PMRc:	1.448

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **IN-MMTL-13A** Date: 6/7/90
Sampling Location: Inlet Operator: LT
Net Run Time: 100 min Run Start Time: 1620
Num Sampling Points: 7 Run Stop Time: 1800

Pressures:

Pbar	Barometric Pressure, in Hg:	29.850
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.850

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	537.5
Vw(std)	Volume of Water Vapor, SCF:	25.300
%H2O	Moisture Content, % by Vol.:	36.22
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.638
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	25.65

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	14400.0
Vs	Flue Gas Velocity, Ft/sec:	25.7
Qsd	Volumetric Air Flow Rate, Dry SCFM:	29958.1
Qaw	Volumetric Air Flow Rate, Wet ACFM:	154369.1
%I	Isokinetic Sampling Rate, %:	193.9
Vm(Dry)	Volume Gas Metered, Dry:	47.850
Vm(Std)	Volume Gas Metered, Std:	44.547

FIELD DATA

Meter Box Number: RAC 1 Meter Box dHa: 1.851
Dry Gas Meter Cal. Y: 1.000 Assumed Moisture: 30.00
Leak Test Rate, CFM: 0.015 Leak Test Vac, in Hg: 6.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	611.370	0.060	0.700	101.0	1250.0
2	15	618.830	0.070	0.700	103.0	1250.0
3	30	625.914	0.060	0.700	105.0	1284.0
4	45	633.200	0.040	0.700	105.0	1284.0
5	60	640.250	0.050	0.700	107.0	1280.0
6	75	647.300	0.060	0.700	110.0	1280.0
7	90	657.200	0.060	0.700	115.0	1270.0
8	100/OFF	659.220				
9	--	--	--	--	--	--
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
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20	--	--	--	--	--	--
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22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	100	47.850	0.057	0.700	106.6	1271.1

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	79.275
gr/dscf	Concentration, gr/dscf:	0.035
Lb/hr	Emission Rate,Lb/hr PMRc:	8.894
Kg/hr	Emission Rate,Kg/hr PMRc:	4.034
mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	79.275
gr/dscf	Concentration, gr/dscf:	0.035
Lb/hr	Emission Rate,Lb/hr PMRc:	8.894
Kg/hr	Emission Rate,Kg/hr PMRc:	4.034
mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	79.275
gr/dscm	Concentration, gr/dscm:	0.035
Lb/hr	Emission Rate,Lb/hr PMRc:	8.894
Kg/hr	Emission Rate,Kg/hr PMRc:	4.034

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **IN-MMTL-13B** Date: 6/7/90
Sampling Location: Inlet Operator: LT
Net Run Time: 100 min Run Start Time: 1620
Num Sampling Points: 7 Run Stop Time: 1800

Pressures:

Pbar	Barometric Pressure, in Hg:	29.850
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.850

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	608.0
Vw(std)	Volume of Water Vapor, SCF:	28.619
%H2O	Moisture Content, % by Vol.:	37.99
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfc	Dry Mole Fraction:	0.620
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	25.44

FIELD DATA

Meter Box Number: RAC 2 Meter Box dHa: 1.869
Dry Gas Meter Cal. Y: 1.000 Assumed Moisture: 30.00
Leak Test Rate, CFM: 0.007 Leak Test Vac, in Hg: 5.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	761.777	0.070	0.700	98.0	1250.0
2	15	768.780	0.070	0.700	99.0	1250.0
3	30	777.120	0.040	0.700	101.0	1284.0
4	45	784.540	0.050	0.700	106.0	1284.0
5	60	792.150	0.050	0.700	107.0	1280.0
6	75	799.534	0.060	0.700	111.0	1280.0
7	90	807.016	0.060	0.700	114.0	1270.0
8	100/OFF	811.830				
9	--	--	--	--	--	--
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
15	--	--	--	--	--	--
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21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	100	50.053	0.057	0.700	105.1	1271.1

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	1440C.0
Vs	Flue Gas Velocity, Ft/sec:	25.8
Qsd	Volumetric Air Flow Rate, Dry SCFM:	29219.3
Qaw	Volumetric Air Flow Rate, Wet ACFM:	154851.5
%I	Isokinetic Sampling Rate, %:	208.5
Vm(Dry)	Volume Gas Metered, Dry:	50.053
Vm(Std)	Volume Gas Metered, Std:	46.716

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	75.595
gr/dscf	Concentration, gr/dscf:	0.033
Lb/hr	Emission Rate,lb/hr PMRc:	8.272
Kg/hr	Emission Rate,Kg/hr PMRc:	3.752

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	75.595
gr/dscf	Concentration, gr/dscf:	0.033
Lb/hr	Emission Rate,lb/hr PMRc:	8.272
Kg/hr	Emission Rate,Kg/hr PMRc:	3.752

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	75.595
gr/dscm	Concentration, gr/dscm:	0.033
Lb/hr	Emission Rate,Lb/hr PMRc:	8.272
Kg/hr	Emission Rate,Kg/hr PMRc:	3.752

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **IN-NI-13C** Date: 6/7/90
Sampling Location: Inlet Operator: LT
Net Run Time: 100 min Run Start Time: 1620
Num Sampling Points: 7 Run Stop Time: 1800

Pressures:

Pbar	Barometric Pressure, in Hg:	29.850
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.850

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	395.0
Vw(std)	Volume of Water Vapor, SCF:	18.593
%H2O	Moisture Content, % by Vol.:	28.62
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.714
Fo	Orsat Validation Value:	1.38
Mc	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	26.57

FIELD DATA

Meter Box Number:	RAC-2	Meter Box dHa:	1.858
Dry Gas Meter Cal. Y:	1.000	Assumed Moisture:	30.00
Leak Test Rate, CFM:	0.011	Leak Test Vac, in Hg:	6.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	553.818	0.060	0.700	97.0	1250.0
2	15	561.384	0.060	0.700	99.0	1250.0
3	30	568.621	0.070	0.700	102.0	1284.0
4	45	575.546	0.060	0.700	104.0	1284.0
5	60	582.934	0.050	0.700	106.0	1280.0
6	75	590.126	0.050	0.700	112.0	1280.0
7	90	597.520	0.060	0.700	13.0	1270.0
8	100/OFF	602.218				
9	--	--	--	--	--	--
10	--	--	--	--	--	--
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12	--	--	--	--	--	--
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23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	100	48.400	0.058	0.700	90.4	1271.1

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	14400.0
Vs	Flue Gas Velocity, Ft/sec:	25.6
Qsd	Volumetric Air Flow Rate, Dry SCFM:	33416.2
Qaw	Volumetric Air Flow Rate, Wet ACFM:	153841.0
%I	Isokinetic Sampling Rate, %:	181.0
Vm(Dry)	Volume Gas Metered, Dry:	48.400
Vm(Std)	Volume Gas Metered, Std:	46.381

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	76.141
gr/dscf	Concentration, gr/dscf:	0.033
Lb/hr	Emission Rate,lb/hr PMRc:	9.529
Kg/hr	Emission Rate,Kg/hr PMRc:	4.322

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	76.141
gr/dscf	Concentration, gr/dscf:	0.033
Lb/hr	Emission Rate,Lb/hr PMRc:	9.529
Kg/hr	Emission Rate,Kg/hr PMRc:	4.322

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	76.141
gr/dscm	Concentration, gr/dscm:	0.033
Lb/hr	Emission Rate,Lb/hr PMRc:	9.529
Kg/hr	Emission Rate,Kg/hr PMRc:	4.322

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **IN-NI-13D** Date: 6/7/90
Sampling Location: inlet Operator: LT
Net Run Time: 100 min Run Start Time: 1620
Num Sampling Points: 7 Run Stop Time: 1800

Pressures:

Pbar	Barometric Pressure, in Hg:	29.850
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.850

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	407.5
Vw(std)	Volume of Water Vapor, SCF:	19.181
%H2O	Moisture Content, % by Vol.:	29.05
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.709
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	26.51

FIELD DATA

Meter Box Number:	RAC3	Meter Box dHa:	1.849
Dry Gas Meter Cal. Y:	1.000	Assumed Moisture:	30.00
Leak Test Rate, CFM:	0.014	Leak Test Vac, in Hg:	8.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	248.337	0.060	0.700	101.0	1250.0
2	15	255.000	0.060	0.700	102.0	1250.0
3	30	261.914	0.070	0.700	104.0	1284.0
4	45	268.432	0.060	0.700	106.0	1284.0
5	60	275.418	0.050	0.700	109.0	1280.0
6	75	282.316	0.060	0.700	113.0	1280.0
7	90	289.273	0.060	0.700	115.0	1270.0
8	100/OFF	298.700				
9	--	--	--	--	--	--
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
15	--	--	--	--	--	--
16	--	--	--	--	--	--
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21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	100	50.363	0.060	0.700	107.1	1271.1

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	14400.0
Vs	Flue Gas Velocity, Ft/sec:	26.0
Qsd	Volumetric Air Flow Rate, Dry SCFM:	33663.8
Qaw	Volumetric Air Flow Rate, Wet ACFM:	155936.0
%I	Isokinetic Sampling Rate, %:	181.4
Vm(Dry)	Volume Gas Metered, Dry:	50.363
Vm(Std)	Volume Gas Metered, Std:	46.839

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	75.396
gr/dscf	Concentration, gr/dscf:	0.033
Lb/hr	Emission Rate,lb/hr PMRc:	9.505
Kg/hr	Emission Rate,Kg/hr PMRc:	4.312

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	75.396
gr/dscf	Concentration, gr/dscf:	0.033
Lb/hr	Emission Rate,Lb/hr PMRc:	9.505
Kg/hr	Emission Rate,Kg/hr PMRc:	4.312

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	75.396
gr/dscm	Concentration, gr/dscm:	0.033
Lb/hr	Emission Rate,Lb/hr PMRc:	9.505
Kg/hr	Emission Rate,Kg/hr PMRc:	4.312

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-MMTL-13A** Date: 6/7/90
Sampling Location: Midpoint Operator: GCB
Net Run Time: 120 min Run Start Time: 1602
Num Sampling Points: 8 Run Stop Time: 1802

Pressures:

Pbar	Barometric Pressure, in Hg:	29.850
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.644

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	98.9
Vw(std)	Volume of Water Vapor, SCF:	4.655
%H2O	Moisture Content, % by Vol.:	6.27
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.937
Fc	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.25

FIELD DATA

Meter Box Number:	A-1	Meter Box dHa:	2.270
Dry Gas Meter Cal. Y:	0.986	Assumed Moisture:	7.00
Leak Test Rate, CFM:	0.003	Leak Test Vac, in Hg:	10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	579.605	0.360	1.500	102.0	98.0
2	15	589.132	0.340	1.400	102.0	98.0
3	30	598.351	0.350	1.400	104.0	98.0
4	45	607.595	0.360	1.500	106.0	98.0
5	60	616.869	0.360	1.500	106.0	98.0
6	75	626.329	0.360	1.500	106.0	98.0
7	90	635.912	0.360	1.500	106.0	98.0
8	105	645.414	0.360	1.500	106.0	98.0
9	120/OFF	654.987				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
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21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	75.382	0.356	1.475	104.7	98.0

ISOKINETIC DATA

	Nozzle Number:	T27
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	35.6
Qsd	Volumetric Air Flow Rate, Dry SCFM:	16041.2
Qaw	Volumetric Air Flow Rate, Wet ACFM:	19575.8
%I	Isokinetic Sampling Rate, %:	101.2
Vm(Dry)	Volume Gas Metered, Dry:	75.382
Vm(Std)	Volume Gas Metered, Std:	69.587

EMISSIONS RESULTS

mg	100.	100.000mg
mg/dscm	Concentration, mg/dscm:	50.749
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	3.049
Kg/hr	Emission Rate,Kg/hr PMRc:	1.383

mg	100.	100.000mg
mg/dscm	Concentration, mg/dscm:	50.749
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	3.049
Kg/hr	Emission Rate,Kg/hr PMRc:	1.383

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	50.749
gr/dscm	Concentration, gr/dscm:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	3.049
Kg/hr	Emission Rate,Kg/hr PMRc:	1.383

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-MMTL-13B** Date: 6/7/90
Sampling Location: Midpoint Operator: GCB
Net Run Time: 120 min Run Start Time: 1604
Num Sampling Points: 8 Run Stop Time: 1804

Pressures:

Pbar	Barometric Pressure, in Hg:	29.850
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.644

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	107.2
Vw(std)	Volume of Water Vapor, SCF:	5.046
%H2O	Moisture Content, % by Vol.:	6.49
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.935
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.22

FIELD DATA

Meter Box Number:	A-2	Meter Box dHa:	2.047
Dry Gas Meter Cal. Y:	1.024	Assumed Moisture:	7.00
Leak Test Rate, CFM:	0.001	Leak Test Vac, in Hg:	10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H20)	Delta H (in H20)	Gas Meter Temp (oF)	Stack Temp (oF)
1	2	404.621	0.360	1.500	102.0	88.0
2	17	141.209	0.340	1.400	102.0	98.0
3	32	423.422	0.350	1.400	104.0	98.0
4	47	432.626	0.360	1.500	106.0	98.0
5	62	442.085	0.360	1.500	106.0	98.0
6	77	451.609	0.360	1.500	106.0	98.0
7	92	461.168	0.360	1.500	106.0	98.0
8	107	470.898	0.360	1.500	106.0	98.0
9	120/OFF	480.412				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
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23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	75.791	0.356	1.475	104.7	96.7

ISOKINETIC DATA

	Nozzle Number:	T 28
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	35.6
Qsd	Volumetric Air Flow Rate, Dry SCFM:	16028.2
Qaw	Volumetric Air Flow Rate, Wet ACFM:	19562.9
%I	Isokinetic Sampling Rate, %:	105.7
Vm(Dry)	Volume Gas Metered, Dry:	75.791
Vm(Std)	Volume Gas Metered, Std:	72.645

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	48.613
gr/dscf	Concentration, gr/dscf:	0.021
Lb/hr	Emission Rate,Lb/hr PMRc:	2.918
Kg/hr	Emission Rate,Kg/hr PMRc:	1.324

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	48.613
gr/dscf	Concentration, gr/dscf:	0.021
Lb/hr	Emission Rate,Lb/hr PMRc:	2.918
Kg/hr	Emission Rate,Kg/hr PMRc:	1.324

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	48.613
gr/dscm	Concentration, gr/dscm:	0.021
Lb/hr	Emission Rate,Lb/hr PMRc:	2.918
Kg/hr	Emission Rate,Kg/hr PMRc:	1.324

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-NI-13C** Date: 6/7/90
Sampling Location: MIdpoint Operator: GCB
Net Run Time: 120 min Run Start Time: 1606
Num Sampling Points: 8 Run Stop Time: 2006

Pressures:

Pbar	Barometric Pressure, in Hg:	29.850
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.644

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	103.0
Vw(std)	Volume of Water Vapor, SCF:	4.848
%H2O	Moisture Content, % by Vol.:	6.18
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.938
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.26

FIELD DATA

Meter Box Number: B-1 Meter Box dHa: 2.043
Dry Gas Meter Cal. Y: 1.034 Assumed Moisture: 7.00
Leak Test Rate, CFM: 0.001 Leak Test Vac, in Hg: 10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	4	655.901	0.360	1.500	102.0	88.0
2	19	665.367	0.340	1.400	102.0	98.0
3	34	674.481	0.350	1.400	104.0	98.0
4	49	683.682	0.360	1.500	106.0	98.0
5	64	692.260	0.360	1.500	106.0	98.0
6	79	702.821	0.360	1.500	106.0	98.0
7	94	712.478	0.360	1.500	106.0	98.0
8	109	722.289	0.360	1.500	106.0	98.0
9	120/OFF	732.027				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
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23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	76.126	0.356	1.475	104.7	96.7

ISOKINETIC DATA

	Nozzle Number:	T 30
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	35.6
Qsd	Volumetric Air Flow Rate, Dry SCFM:	16072.3
Qaw	Volumetric Air Flow Rate, Wet ACFM:	19550.1
%I	Isokinetic Sampling Rate, %:	106.9
Vm(Dry)	Volume Gas Metered, Dry:	76.126
Vm(Std)	Volume Gas Metered, Std:	73.650

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	47.949
gr/dscf	Concentration, gr/dscf:	0.021
Lb/hr	Emission Rate,lb/hr PMRc:	2.886
Kg/hr	Emission Rate,Kg/hr PMRc:	1.309

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	47.949
gr/dscf	Concentration, gr/dscf:	0.021
Lb/hr	Emission Rate,Lb/hr PMRc:	2.886
Kg/hr	Emission Rate,Kg/hr PMRc:	1.309

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	47.949
gr/dscm	Concentration, gr/dscm:	0.021
Lb/hr	Emission Rate,Lb/hr PMRc:	2.886
Kg/hr	Emission Rate,Kg/hr PMRc:	1.309

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-NI-13D** Date: 6/7/90
Sampling Location: Midpoint Operator: GC8
Net Run Time: 120 min Run Start Time: 1608
Num Sampling Points: 8 Run Stop Time: 1808

Pressures:

Pbar	Barometric Pressure, in Hg:	29.850
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.644

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	102.3
Vw(std)	Volume of Water Vapor, SCF:	4.815
%H2O	Moisture Content, % by Vol.:	6.30
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.937
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.24

FIELD DATA

Meter Box Number:	B-2	Meter Box dHa:	2.125
Dry Gas Meter Cal. Y:	1.131	Assumed Moisture:	7.00
Leak Test Rate, CFM:	0.001	Leak Test Vac, in Hg:	10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	6	981.921	0.360	1.500	102.0	88.0
2	21	990.406	0.340	1.400	102.0	98.0
3	36	998.472	0.350	1.400	104.0	98.0
4	51	1006.659	0.360	1.500	106.0	98.0
5	66	1015.261	0.360	1.500	106.0	98.0
6	82	1023.368	0.360	1.500	106.0	98.0
7	96	1032.368	0.360	1.500	106.0	98.0
8	111	1041.012	0.360	1.500	106.0	98.0
9	120/OFF	1049.639				
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25	--	--	--	--	--	--
FINAL/AVG	120	67.718	0.356	1.475	104.7	96.7

ISOKINETIC DATA

	Nozzle Number:	T 31
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	35.6
Qsd	Volumetric Air Flow Rate, Dry SCFM:	16055.5
Qaw	Volumetric Air Flow Rate, Wet ACFM:	19555.0
%I	Isokinetic Sampling Rate, %:	104.1
Vm(Dry)	Volume Gas Metered, Dry:	67.718
Vm(Std)	Volume Gas Metered, Std:	71.650

EMISSIONS RESULTS

mg	100.	100.000mg
mg/dscm	Concentration, mg/dscm:	49.288
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,lb/hr PMRc:	2.964
Kg/hr	Emission Rate,Kg/hr PMRc:	1.344

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	49.288
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	2.964
Kg/hr	Emission Rate,Kg/hr PMRc:	1.344

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	49.288
gr/dscm	Concentration, gr/dscm:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	2.964
Kg/hr	Emission Rate,Kg/hr PMRc:	1.344

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **OUT-MMTL-13A** Date: 6/7/90
Sampling Location: Outlet Operator: MLH
Net Run Time: 120 min Run Start Time: 1600
Num Sampling Points: 8 Run Stop Time: 1800

Pressures:

Pbar	Barometric Pressure, in Hg:	29.850
Pg	Flue Gas Static Press. in H2O:	-0.360
Ps	Absolute Flue Gas Press. in Hg:	29.824

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	90.9
Vw(std)	Volume of Water Vapor, SCF:	4.279
%H2O	Moisture Content, % by Vol.:	5.42
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.946
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.35

ISOKINETIC DATA

	Nozzle Number:	T-7
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.242
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	37.8
Qsd	Volumetric Air Flow Rate, Dry SCFM:	16841.3
Qaw	Volumetric Air Flow Rate, Wet ACFM:	20783.0
%I	Isokinetic Sampling Rate, %:	105.9
Vm(Dry)	Volume Gas Metered, Dry:	78.868
Vm(Std)	Volume Gas Metered, Std:	74.602

FIELD DATA

Meter Box Number: EN-2 Meter Box dHa: 1.969
Dry Gas Meter Cal. Y: 1.000 Assumed Moisture: 6.00
Leak Test Rate, CFM: 0.038 Leak Test Vac, in Hg: 5.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	277.873	0.380	1.390	84.0	136.0
2	15	287.400	0.400	1.440	90.0	139.0
3	30	297.240	0.410	1.480	95.0	150.0
4	45	307.230	0.390	1.410	100.0	159.0
5	60	317.040	0.400	1.440	104.0	162.0
6	75	327.010	0.370	1.330	105.0	161.0
7	90	336.640	0.390	1.410	106.0	165.0
8	105	346.520	0.420	1.520	105.0	162.0
9	120/OFF	356.741				
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25	--	--	--	--	--	--
FINAL/AVG	120	78.868	0.395	1.427	98.6	154.2

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	47.338
gr/dscf	Concentration, gr/dscf:	0.021
Lb/hr	Emission Rate,lb/hr PMRc:	2.986
Kg/hr	Emission Rate,Kg/hr PMRc:	1.354

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	47.338
gr/dscf	Concentration, gr/dscf:	0.021
Lb/hr	Emission Rate,lb/hr PMRc:	2.986
Kg/hr	Emission Rate,Kg/hr PMRc:	1.354

mg	100	1000.000mg
mg/dscm	Concentration, mg/dscm:	473.378
gr/dscm	Concentration, gr/dscm:	0.207
Lb/hr	Emission Rate,Lb/hr PMRc:	29.857
Kg/hr	Emission Rate,Kg/hr PMRc:	13.543

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **OUT-MMTL-13B** Date: 6/7/90
Sampling Location: OUtlet Operator: MLH
Net Run Time: 120 min Run Start Time: 1601
Num Sampling Points: 8 Run Stop Time: 1801

Pressures:

Pbar	Barometric Pressure, in Hg:	29.700
Pg	Flue Gas Static Press. in H2O:	-0.360
Ps	Absolute Flue Gas Press. in Hg:	29.674

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	81.3
Vw(std)	Volume of Water Vapor, SCF:	3.827
%H2O	Moisture Content, % by Vol.:	4.91
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.951
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.41

ISOKINETIC DATA

	Nozzle Number:	T-8
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.243
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	37.9
Qsd	Volumetric Air Flow Rate, Dry SCFM:	16872.4
Qaw	Volumetric Air Flow Rate, Wet ACFM:	20813.6
%I	Isokinetic Sampling Rate, %:	104.1
Vm(Dry)	Volume Gas Metered, Dry:	84.319
Vm(Std)	Volume Gas Metered, Std:	74.101

FIELD DATA

Meter Box Number: EN-1 Meter Box dHa: 1.934
Dry Gas Meter Cal. Y: 0.932 Assumed Moisture: 6.00
Leak Test Rate, CFM: 0.009 Leak Test Vac, in Hg: 5.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	566.472	0.380	1.370	86.0	136.0
2	15	576.600	0.400	1.440	89.0	139.0
3	30	587.100	0.410	1.480	94.0	150.0
4	45	597.720	0.390	1.410	98.0	159.0
5	60	608.240	0.400	1.440	102.0	162.0
6	75	618.910	0.370	1.330	105.0	161.0
7	90	629.230	0.390	1.410	105.0	165.0
8	105	639.890	0.420	1.520	104.0	162.0
9	120/OFF	650.791				
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25	--	--	--	--	--	--
FINAL/AVG	120	84.319	0.395	1.425	97.9	154.2

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	47.658
gr/dscf	Concentration, gr/dscf:	0.021
Lb/hr	Emission Rate,lb/hr PMRc:	3.011
Kg/hr	Emission Rate,Kg/hr PMRc:	1.366

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	47.658
gr/dscf	Concentration, gr/dscf:	0.021
Lb/hr	Emission Rate,Lb/hr PMRc:	3.011
Kg/hr	Emission Rate,Kg/hr PMRc:	1.366

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	47.658
gr/dscm	Concentration, gr/dscm:	0.021
Lb/hr	Emission Rate,Lb/hr PMRc:	3.011
Kg/hr	Emission Rate,Kg/hr PMRc:	1.366

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **OUT-NI-13C** Date: 6/7/90
Sampling Location: Outlet Operator: RLM
Net Run Time: 120 min Run Start Time: 1600
Num Sampling Points: 8 Run Stop Time: 1800

Pressures:

Pbar	Barometric Pressure, in Hg:	29.850
Pg	Flue Gas Static Press. in H2O:	-0.320
Ps	Absolute Flue Gas Press. in Hg:	29.826

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	81.7
Vw(std)	Volume of Water Vapor, SCF:	3.846
%H2O	Moisture Content, % by Vol.:	5.33
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.947
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.36

ISOKINETIC DATA

	Nozzle Number:	T-5
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.244
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	37.8
Qsd	Volumetric Air Flow Rate, Dry SCFM:	16853.9
Qaw	Volumetric Air Flow Rate, Wet ACFM:	20780.1
%I	Isokinetic Sampling Rate, %:	95.3
Vm(Dry)	Volume Gas Metered, Dry:	73.985
Vm(Std)	Volume Gas Metered, Std:	68.303

FIELD DATA

Meter Box Number: N-16 Meter Box dHa: 1.820
Dry Gas Meter Cal. Y: 0.996 Assumed Moisture: 6.00
Leak Test Rate, CFM: 0.009 Leak Test Vac, in Hg: 5.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	997.500	0.380	1.270	88.0	136.0
2	15	1007.325	0.400	1.340	98.0	139.0
3	30	1017.419	0.410	1.370	106.0	151.0
4	45	1027.796	0.390	1.300	112.0	159.0
5	60	1037.847	0.400	1.340	116.0	162.0
6	75	1048.115	0.370	1.240	118.0	161.0
7	90	1057.971	0.390	1.300	120.0	165.0
8	105	1068.064	0.420	1.400	120.0	162.0
9	120/OFF	1071.485				
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25	--	--	--	--	--	--
FINAL/AVG	120	73.985	0.395	1.320	109.7	154.4

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	51.703
gr/dscf	Concentration, gr/dscf:	0.023
Lb/hr	Emission Rate,Lb/hr PMRc:	3.263
Kg/hr	Emission Rate,Kg/hr PMRc:	1.480

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	51.703
gr/dscf	Concentration, gr/dscf:	0.023
Lb/hr	Emission Rate,Lb/hr PMRc:	3.263
Kg/hr	Emission Rate,Kg/hr PMRc:	1.480

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	51.703
gr/dscm	Concentration, gr/dscm:	0.023
Lb/hr	Emission Rate,Lb/hr PMRc:	3.263
Kg/hr	Emission Rate,Kg/hr PMRc:	1.480

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **OUT-NI-13D** Date: 6/7/90
Sampling Location: Outlet Operator: RLM
Net Run Time: 120 min Run Start Time: 1601
Num Sampling Points: 8 Run Stop Time: 1801

Pressures:

Pbar	Barometric Pressure, in Hg:	29.850
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.850

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	79.7
Vw(std)	Volume of Water Vapor, SCF:	3.751
%H2O	Moisture Content, % by Vol.:	5.03
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.950
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.40

ISOKINETIC DATA

	Nozzle Number:	T-6
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.239
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	37.8
Qsd	Volumetric Air Flow Rate, Dry SCFM:	16896.5
Qaw	Volumetric Air Flow Rate, Wet ACFM:	20767.7
%I	Isokinetic Sampling Rate, %:	102.7
Vm(Dry)	Volume Gas Metered, Dry:	78.530
Vm(Std)	Volume Gas Metered, Std:	70.802

FIELD DATA

Meter Box Number: WU-7 Meter Box dHa: 1.820
Dry Gas Meter Cal. Y: 0.969 Assumed Moisture: 6.00
Leak Test Rate, CFM: 0.008 Leak Test Vac, in Hg: 5.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	521.400	0.380	1.270	86.0	138.0
2	15	530.969	0.400	1.340	99.0	141.0
3	30	540.805	0.410	1.370	104.0	151.0
4	45	550.705	0.390	1.300	110.0	159.0
5	60	560.434	0.400	1.340	114.0	162.0
6	75	570.385	0.370	1.240	116.0	161.0
7	90	580.014	0.390	1.300	117.0	165.0
8	105	589.795	0.420	1.400	118.0	162.0
9	120/OFF	599.930				
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24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	78.530	0.395	1.320	108.0	154.9

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	49.878
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,lb/hr PMRc:	3.156
Kg/hr	Emission Rate,Kg/hr PMRc:	1.432

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	49.878
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	3.156
Kg/hr	Emission Rate,Kg/hr PMRc:	1.432

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	49.878
gr/dscm	Concentration, gr/dscm:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	3.156
Kg/hr	Emission Rate,Kg/hr PMRc:	1.432

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **site9** Run No.: **IN-CR-3A** Date: 6/2/90
Sampling Location: inlet Operator: mac
Net Run Time: 120 min Run Start Time: 18:30
Num Sampling Points: 8 Run Stop Time: 20:30

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.600

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	58.6
Vw(std)	Volume of Water Vapor, SCF:	2.758
%H2O	Moisture Content, % by Vol.:	5.34
%CO2	Percent CO2 by Volume, Dry:	6.50
%O2	Percent O2 by Volume, Dry:	12.50
Mfd	Dry Mole Fraction:	0.947
Fo	Orsat Validation Value:	1.29
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.36

FIELD DATA

Meter Box Number:	rac-1	Meter Box dHa:	1.850
Dry Gas Meter Cal. Y:	1.034	Assumed Moisture:	200.00
Leak Test Rate, CFM:	0.004	Leak Test Vac, in Hg:	10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0:00	207.189	0.100	0.580	130.0	800.0
2	0:15	0.000	0.100	0.580	130.0	756.0
3	0:30	220.210	0.100	0.580	130.0	777.0
4	0:45	226.839	0.100	0.580	130.0	757.0
5	0:60	233.491	0.100	0.560	130.0	813.0
6	0:75	240.245	0.100	0.560	130.0	611.0
7	0:90	246.108	0.100	0.850	130.0	384.0
8	1:05	254.124	0.100	0.600	135.0	760.0
9	120/OFF	260.632				
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22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	53.443	0.100	0.611	130.6	707.2

ISOKINETIC DATA

	Nozzle Number:	.375
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	26.3
Qsd	Volumetric Air Flow Rate, Dry SCFM:	6129.6
Qaw	Volumetric Air Flow Rate, Wet ACFM:	14469.5
%I	Isokinetic Sampling Rate, %:	79.5
Vm(Dry)	Volume Gas Metered, Dry:	53.443
Vm(Std)	Volume Gas Metered, Std:	48.927

EMISSIONS RESULTS

ug	chrome	100.000ug
mg/dscm	Concentration, mg/dscm:	72.178x 10-3
gr/dscf	Concentration, gr/dscf:	0.032x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	1.657x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.752x 10-3
ug	nickel	100.000ug
mg/dscm	Concentration, mg/dscm:	72.178x 10-3
gr/dscf	Concentration, gr/dscf:	0.032x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	1.657x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.752x 10-3
ug	metal	100.000ug
mg/dscm	Concentration, mg/dscm:	72.178x 10-3
gr/dscm	Concentration, gr/dscm:	0.032x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	1.657x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.752x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site9** Run No.: **IN-CR-3B** Date: 6/2/90
Sampling Location: inlet Operator: mac
Net Run Time: 120 min Run Start Time: 18:31
Num Sampling Points: 8 Run Stop Time: 20:31

Pressures:

Pbar	Barometric Pressure, in Hg:	29.60C
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.60C

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	56.5
Vw(std)	Volume of Water Vapor, SCF:	2.659
%H2O	Moisture Content, % by Vol.:	5.06
%CO2	Percent CO2 by Volume, Dry:	6.50
%O2	Percent O2 by Volume, Dry:	12.50
Mfd	Dry Mole Fraction:	0.949
Fo	Orsat Validation Value:	1.29
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.39

FIELD DATA

Meter Box Number:	rac-5	Meter Box dHa:	1.869
Dry Gas Meter Cal. Y:	1.061	Assumed Moisture:	200.00
Leak Test Rate, CFM:	0.005	Leak Test Vac, in Hg:	10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0:01	330.014	0.100	0.560	127.0	800.0
2	0:16	0.000	0.100	0.560	0.0	756.0
3	0:31	343.093	0.100	0.560	132.0	777.0
4	0:46	349.762	0.100	0.560	0.0	757.0
5	0:61	356.455	0.100	0.500	130.0	813.0
6	0:76	363.181	0.100	0.500	130.0	611.0
7	0:91	369.885	0.100	0.850	130.0	384.0
8	1:06	379.883	0.100	0.600	135.0	760.0
9	120/OFF	380.256				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
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22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	50.242	0.100	0.586	98.0	707.2

ISOKINETIC DATA

	Nozzle Number:	0
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	26.3
Qsd	Volumetric Air Flow Rate, Dry SCFM:	6144.3
Qaw	Volumetric Air Flow Rate, Wet ACFM:	14461.2
%I	Isokinetic Sampling Rate, %:	80.9
Vm(Dry)	Volume Gas Metered, Dry:	50.242
Vm(Std)	Volume Gas Metered, Std:	49.940

EMISSIONS RESULTS

ug	chrome	100.000ug
mg/dscm	Concentration, mg/dscm:	70.714x 10-3
gr/dscf	Concentration, gr/dscf:	0.031x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	1.627x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.738x 10-3
ug	nickel	100.000ug
mg/dscm	Concentration, mg/dscm:	70.714x 10-3
gr/dscf	Concentration, gr/dscf:	0.031x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	1.627x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.738x 10-3
ug	metal	100.000ug
mg/dscm	Concentration, mg/dscm:	70.714x 10-3
gr/dscm	Concentration, gr/dscm:	0.031x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	1.627x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.738x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: Site9 Run No.: IN-CR-3C Date: 6/2/90
Sampling Location: inlet Operator: mac
Net Run Time: 120 min Run Start Time: 18:32
Num Sampling Points: 8 Run Stop Time: 20:32

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.600

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	132.1
Vw(std)	Volume of Water Vapor, SCF:	6.218
%H2O	Moisture Content, % by Vol.:	11.05
%CO2	Percent CO2 by Volume, Dry:	6.50
%O2	Percent O2 by Volume, Dry:	12.50
Mfd	Dry Mole Fraction:	0.889
Fo	Orsat Validation Value:	1.29
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	28.67

FIELD DATA

Meter Box Number: rac-2 Meter Box dHa: 1.858
Dry Gas Meter Cal. Y: 1.006 Assumed Moisture: 200.00
Leak Test Rate, CFM: 0.002 Leak Test Vac, in Hg: 10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0:02	145.203	0.100	0.580	128.0	800.0
2	0:17	0.000	0.100	0.580	130.0	756.0
3	0:32	158.781	0.100	0.580	131.0	777.0
4	0:47	165.701	0.100	0.590	0.0	757.0
5	0:62	172.582	0.100	0.560	130.0	813.0
6	0:77	179.585	0.100	0.560	130.0	611.0
7	0:92	186.500	0.100	0.850	130.0	384.0
8	1:07	193.643	0.100	0.600	135.0	760.0
9	120/OFF	199.860				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
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22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	54.657	0.100	0.612	114.2	707.2

ISOKINETIC DATA

	Nozzle Number:	0
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	26.6
Qsd	Volumetric Air Flow Rate, Dry SCFM:	5828.1
Qaw	Volumetric Air Flow Rate, Wet ACFM:	14641.5
%I	Isokinetic Sampling Rate, %:	85.5
Vm(Dry)	Volume Gas Metered, Dry:	54.657
Vm(Std)	Volume Gas Metered, Std:	50.052

EMISSIONS RESULTS

ug	chrome	100.000ug
mg/dscm	Concentration, mg/dscm:	70.556x 10-3
gr/dscf	Concentration, gr/dscf:	0.031x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	1.540x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.699x 10-3
ug	nickel	100.000ug
mg/dscm	Concentration, mg/dscm:	70.556x 10-3
gr/dscf	Concentration, gr/dscf:	0.031x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	1.540x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.699x 10-3
ug	metal	100.000ug
mg/dscm	Concentration, mg/dscm:	70.556x 10-3
gr/dscm	Concentration, gr/dscm:	0.031x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	1.540x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.699x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: site9 Run No.: MID-CR6-3-A Date: 6/2/90
Sampling Location: midpoint Operator: g.c.b.
Net Run Time: 75 min Run Start Time: 8:33
Num Sampling Points: 5 Run Stop Time: 9:45

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.600

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	33.4
Vw(std)	Volume of Water Vapor, SCF:	1.572
%H2O	Moisture Content, % by Vol.:	3.35
%CO2	Percent CO2 by Volume, Dry:	4.30
%O2	Percent O2 by Volume, Dry:	14.70
Mfd	Dry Mole Fraction:	0.966
Fo	Orsat Validation Value:	1.44
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.60

FIELD DATA

Meter Box Number:	a-1	Meter Box dHa:	2.125
Dry Gas Meter Cal. Y:	1.131	Assumed Moisture:	7.00
Leak Test Rate, CFM:	0.001	Leak Test Vac, in Hg:	10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0:00	937.942	0.500	1.980	104.0	80.0
2	0:15	964.808	0.500	1.990	104.0	80.0
3	0:30	955.791	0.480	1.910	104.0	80.0
4	0:45	964.836	0.500	1.990	104.0	80.0
5	0:60	973.802	0.520	2.060	104.0	80.0
6	75/OFF	981.001				
7	--	--	--	--	--	--
8	--	--	--	--	--	--
9	--	--	--	--	--	--
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
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23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	75	43.059	0.500	1.986	104.0	80.0

ISOKINETIC DATA

	Nozzle Number:	t26
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1257.0
Vs	Flue Gas Velocity, Ft/sec:	39.9
Qsd	Volumetric Air Flow Rate, Dry SCFM:	19518.4
Qaw	Volumetric Air Flow Rate, Wet ACFM:	20878.2
XI	Isokinetic Sampling Rate, %:	82.5
Vm(Dry)	Volume Gas Metered, Dry:	43.059
Vm(Std)	Volume Gas Metered, Std:	45.296

EMISSIONS RESULTS

ug	Cr+6	1.772 ug
mg/dscm	Concentration, mg/dscm:	1.382x 10-3
gr/dscf	Concentration, gr/dscf:	0.001x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.101x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.046x 10-3
ug	Cr	15.082 ug
mg/dscm	Concentration, mg/dscm:	11.759x 10-3
gr/dscf	Concentration, gr/dscf:	0.005x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.860x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.390x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: site9 Run No.: MID-CR6-3B Date: 6/2/90
Sampling Location: midpoint Operator: g.c.b.
Net Run Time: 73 min Run Start Time: 8:35
Num Sampling Points: 5 Run Stop Time: 9:45

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.600

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	96.1
Vw(std)	Volume of Water Vapor, SCF:	4.523
%H2O	Moisture Content, % by Vol.:	8.22
%CO2	Percent CO2 by Volume, Dry:	4.30
%O2	Percent O2 by Volume, Dry:	14.70
Mfd	Dry Mole Fraction:	0.918
Fo	Orsat Validation Value:	1.44
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.01

FIELD DATA

Meter Box Number: s-2 Meter Box dHa: 2.125
Dry Gas Meter Cal. Y: 1.131 Assumed Moisture: 7.00
Leak Test Rate, CFM: 0.002 Leak Test Vac, in Hg: 10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0:02	720.220	0.490	1.500	104.0	80.0
2	0:17	730.411	0.480	1.750	104.0	80.0
3	0:32	740.696	0.480	1.750	104.0	80.0
4	0:47	751.062	0.500	1.750	104.0	80.0
5	0:62	761.262	0.520	1.700	104.0	80.0
6	73/OFF	768.262				
7	--	--	--	--	--	--
8	--	--	--	--	--	--
9	--	--	--	--	--	--
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
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22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	73	48.042	0.494	1.690	104.0	80.0

ISOKINETIC DATA

	Nozzle Number:	t27
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1257.0
Vs	Flue Gas Velocity, Ft/sec:	40.0
Qsd	Volumetric Air Flow Rate, Dry SCFM:	18607.9
Qaw	Volumetric Air Flow Rate, Wet ACFM:	20959.6
%I	Isokinetic Sampling Rate, %:	99.1
Vm(Dry)	Volume Gas Metered, Dry:	48.042
Vm(Std)	Volume Gas Metered, Std:	50.501

EMISSIONS RESULTS

ug	Cr+6	1.896 ug
mg/dscm	Concentration, mg/dscm:	1.326x 10-3
gr/dscf	Concentration, gr/dscf:	0.001x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.092x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.042x 10-3
ug	Cr	15.272 ug
mg/dscm	Concentration, mg/dscm:	10.680x 10-3
gr/dscf	Concentration, gr/dscf:	0.005x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.744x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.338x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **site9** Run No.: **MID-CR6-3C** Date: 6/2/90
Sampling Location: midpoint Operator: g.c.b.
Net Run Time: 71 min Run Start Time: 8:37
Num Sampling Points: 5 Run Stop Time: 9:45

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.600

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	84.9
Vw(std)	Volume of Water Vapor, SCF:	3.996
%H2O	Moisture Content, % by Vol.:	7.95
%CO2	Percent CO2 by Volume, Dry:	4.30
%O2	Percent O2 by Volume, Dry:	14.70
Mfd	Dry Mole Fraction:	0.921
Fo	Orsat Validation Value:	1.44
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.05

FIELD DATA

Meter Box Number:	b-1	Meter Box dHa:	2.125
Dry Gas Meter Cal. Y:	1.131	Assumed Moisture:	7.00
Leak Test Rate, CFM:	0.001	Leak Test Vac, in Hg:	10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0:04	134.612	0.500	1.980	104.0	80.0
2	0:19	145.611	0.480	1.910	104.0	80.0
3	0:34	156.538	0.480	1.910	104.0	80.0
4	0:49	167.508	0.500	1.980	104.0	80.0
5	0:64	178.602	0.520	2.060	104.0	80.0
6	71/OFF	178.602				
7	--	--	--	--	--	--
8	--	--	--	--	--	--
9	--	--	--	--	--	--
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
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23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	71	43.990	0.496	1.968	104.0	80.0

ISOKINETIC DATA

	Nozzle Number:	t29
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1257.0
Vs	Flue Gas Velocity, Ft/sec:	40.1
Qsd	Volumetric Air Flow Rate, Dry SCFM:	18690.2
Qaw	Volumetric Air Flow Rate, Wet ACFM:	20990.3
%I	Isokinetic Sampling Rate, %:	93.0
Vm(Dry)	Volume Gas Metered, Dry:	43.990
Vm(Std)	Volume Gas Metered, Std:	46.273

EMISSIONS RESULTS

ug	Cr+6	3.061 ug
mg/dscm	Concentration, mg/dscm:	2.336x 10-3
gr/dscf	Concentration, gr/dscf:	0.001x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.164x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.074x 10-3
ug	Cr	16.202 ug
mg/dscm	Concentration, mg/dscm:	12.365x 10-3
gr/dscf	Concentration, gr/dscf:	0.005x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.866x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.393x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **netco site9** Run No.: **OUT-CR-3A** Date: 6/2/90
Sampling Location: outlet Operator: b.d.
Net Run Time: 135 min Run Start Time: 7:33
Num Sampling Points: 9 Run Stop Time: 9:48

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.600

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	27.7
Vw(std)	Volume of Water Vapor, SCF:	1.304
%H2O	Moisture Content, % by Vol.:	1.55
%CO2	Percent CO2 by Volume, Dry:	4.30
%O2	Percent O2 by Volume, Dry:	14.70
Mfd	Dry Mole Fraction:	0.984
Fo	Orsat Validation Value:	1.44
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.81

ISOKINETIC DATA

	Nozzle Number:	0
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.250
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	37.9
Qsd	Volumetric Air Flow Rate, Dry SCFM:	18353.5
Qaw	Volumetric Air Flow Rate, Wet ACFM:	20822.8
%I	Isokinetic Sampling Rate, %:	89.8
Vm(Dry)	Volume Gas Metered, Dry:	86.606
Vm(Std)	Volume Gas Metered, Std:	82.803

FIELD DATA

Meter Box Number: en-2 Meter Box dHa: 1.985
Dry Gas Meter Cal. Y: 1.015 Assumed Moisture: 7.00
Leak Test Rate, CFM: 0.001 Leak Test Vac, in Hg: 15.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	7:33	618.307	0.420	1.500	81.0	123.0
2	7:48	628.002	0.360	1.200	84.0	128.0
3	8:03	637.000	0.400	1.200	90.0	125.0
4	8:18	646.002	0.430	1.300	97.0	120.0
5	8:33	655.835	0.430	1.400	100.0	123.0
6	8:48	665.668	0.440	1.400	103.0	125.0
7	9:03	675.468	0.430	1.400	104.0	123.0
8	9:18	685.000	0.440	1.300	104.0	124.0
9	9:33	694.697	0.440	1.400	104.0	120.0
10	135/OFF	704.913				
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
15	--	--	--	--	--	--
16	--	--	--	--	--	--
17	--	--	--	--	--	--
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21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	135	86.606	0.421	1.344	96.3	123.4

EMISSIONS RESULTS

ug	chrome	100.000ug
mg/dscm	Concentration, mg/dscm:	42.649x 10-3
gr/dscf	Concentration, gr/dscf:	0.019x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	2.932x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	1.330x 10-3
ug	nickel	100.000ug
mg/dscm	Concentration, mg/dscm:	42.649x 10-3
gr/dscf	Concentration, gr/dscf:	0.019x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	2.932x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	1.330x 10-3
ug	metal	100.000ug
mg/dscm	Concentration, mg/dscm:	42.649x 10-3
gr/dscm	Concentration, gr/dscm:	0.019x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	2.932x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	1.330x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **netco site9** Run No.: **OUT-CR-3B** Date: 6/2/90
Sampling Location: outlet Operator: b.d.
Net Run Time: 135 min Run Start Time: 7:34
Num Sampling Points: 9 Run Stop Time: 9:49

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.600

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	23.1
Vw(std)	Volume of Water Vapor, SCF:	1.087
%H2O	Moisture Content, % by Vol.:	1.33
%CO2	Percent CO2 by Volume, Dry:	4.30
%O2	Percent O2 by Volume, Dry:	14.70
Mfd	Dry Mole Fraction:	0.987
Fo	Orsat Validation Value:	1.44
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.84

FIELD DATA

Meter Box Number: en-1 Meter Box dHa: 1.934
Dry Gas Meter Cal. Y: 0.932 Assumed Moisture: 7.00
Leak Test Rate, CFM: 0.001 Leak Test Vac, in Hg: 15.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	7:34	863.655	0.440	1.200	84.0	123.0
2	7:49	873.792	0.370	1.200	85.0	126.0
3	8:04	883.585	0.420	1.300	94.0	121.0
4	8:19	893.328	0.450	1.400	99.0	121.0
5	8:34	903.135	0.430	1.400	103.0	123.0
6	8:49	914.185	0.430	1.400	105.0	124.0
7	9:04	924.668	0.430	1.400	107.0	124.0
8	9:19	934.052	0.450	1.400	107.0	124.0
9	9:34	945.400	0.440	1.400	108.0	120.0
10	135/OFF	956.300				
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
15	--	--	--	--	--	--
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19	--	--	--	--	--	--
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23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	135	92.645	0.429	1.344	99.1	122.9

ISOKINETIC DATA

	Nozzle Number:	0
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.250
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	38.2
Qsd	Volumetric Air Flow Rate, Dry SCFM:	18566.4
Qaw	Volumetric Air Flow Rate, Wet ACFM:	20996.4
%I	Isokinetic Sampling Rate, %:	86.8
Vm(Dry)	Volume Gas Metered, Dry:	92.645
Vm(Std)	Volume Gas Metered, Std:	80.949

EMISSIONS RESULTS

ug	chrome	100.000ug
mg/dscm	Concentration, mg/dscm:	43.626x 10-3
gr/dscf	Concentration, gr/dscf:	0.019x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	3.033x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	1.376x 10-3
ug	nickel	100.000ug
mg/dscm	Concentration, mg/dscm:	43.626x 10-3
gr/dscf	Concentration, gr/dscf:	0.019x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	3.033x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	1.376x 10-3
ug	metal	100.000ug
mg/dscm	Concentration, mg/dscm:	43.626x 10-3
gr/dscm	Concentration, gr/dscm:	0.019x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	3.033x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	1.376x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **site9** Run No.: **OUT-CR-3C** Date: 6/2/90
Sampling Location: outlet Operator: b.d.
Net Run Time: 135 min Run Start Time: 7:35
Num Sampling Points: 9 Run Stop Time: 9:50

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.600

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	47.8
Vw(std)	Volume of Water Vapor, SCF:	2.250
%H2O	Moisture Content, % by Vol.:	2.58
%CO2	Percent CO2 by Volume, Dry:	4.30
%O2	Percent O2 by Volume, Dry:	14.70
Mfd	Dry Mole Fraction:	0.974
Fo	Orsat Validation Value:	1.44
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.69

FIELD DATA

Meter Box Number: n-16 Meter Box dHa: 1.762
Dry Gas Meter Cal. Y: 0.996 Assumed Moisture: 7.00
Leak Test Rate, CFM: 0.001 Leak Test Vac, in Hg: 15.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	7:35	127.830	0.420	1.200	83.0	123.0
2	7:50	137.862	0.370	1.200	84.0	125.0
3	8:05	147.355	0.430	1.300	97.0	121.0
4	8:20	157.185	0.450	1.400	104.0	121.0
5	8:35	167.500	0.430	1.400	110.0	123.0
6	8:50	177.978	0.430	1.400	111.0	124.0
7	9:05	188.350	0.430	1.400	117.0	125.0
8	9:20	198.453	0.430	1.400	117.0	124.0
9	9:35	208.995	0.440	1.400	117.0	119.0
10	135/OFF	219.838				
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
15	--	--	--	--	--	--
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17	--	--	--	--	--	--
18	--	--	--	--	--	--
19	--	--	--	--	--	--
20	--	--	--	--	--	--
21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	135	92.008	0.425	1.344	104.4	122.8

ISOKINETIC DATA

	Nozzle Number:	0
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.250
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	38.1
Qsd	Volumetric Air Flow Rate, Dry SCFM:	18308.2
Qaw	Volumetric Air Flow Rate, Wet ACFM:	20966.5
%I	Isokinetic Sampling Rate, %:	92.5
Vm(Dry)	Volume Gas Metered, Dry:	92.008
Vm(Std)	Volume Gas Metered, Std:	85.030

EMISSIONS RESULTS

ug	chrome	100.000ug
mg/dscm	Concentration, mg/dscm:	41.532x 10-3
gr/dscf	Concentration, gr/dscf:	0.018x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	2.848x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	1.292x 10-3
ug	nickel	100.000ug
mg/dscm	Concentration, mg/dscm:	41.532x 10-3
gr/dscf	Concentration, gr/dscf:	0.018x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	2.848x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	1.292x 10-3
ug	metal	100.000ug
mg/dscm	Concentration, mg/dscm:	41.532x 10-3
gr/dscm	Concentration, gr/dscm:	0.018x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	2.848x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	1.292x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: site9 Run No.: OUT-CR-3C Date: 6/2/90
Sampling Location: outlet Operator: b.d.
Net Run Time: 135 min Run Start Time: 7:35
Num Sampling Points: 9 Run Stop Time: 9:50

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.600

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	47.8
Vw(std)	Volume of Water Vapor, SCF:	2.250
%H2O	Moisture Content, % by Vol.:	2.58
%CO2	Percent CO2 by Volume, Dry:	4.30
%O2	Percent O2 by Volume, Dry:	14.70
Mfd	Dry Mole Fraction:	0.974
Fo	Orsat Validation Value:	1.44
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.69

ISOKINETIC DATA

	Nozzle Number:	0
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.250
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	38.1
Qsd	Volumetric Air Flow Rate, Dry SCFM:	18308.2
Qaw	Volumetric Air Flow Rate, Wet ACFM:	20966.5
%I	Isokinetic Sampling Rate, %:	92.5
Vm(Dry)	Volume Gas Metered, Dry:	92.008
Vm(Std)	Volume Gas Metered, Std:	85.030

FIELD DATA

Meter Box Number: n-16 Meter Box dHa: 1.762
Dry Gas Meter Cal. Y: 0.996 Assumed Moisture: 7.00
Leak Test Rate, CFM: 0.001 Leak Test Vac, in Hg: 15.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	7:35	127.830	0.420	1.200	83.0	123.0
2	7:50	137.862	0.370	1.200	84.0	125.0
3	8:05	147.355	0.430	1.300	97.0	121.0
4	8:20	157.185	0.450	1.400	104.0	121.0
5	8:35	167.500	0.430	1.400	110.0	123.0
6	8:50	177.978	0.430	1.400	111.0	124.0
7	9:05	188.350	0.430	1.400	117.0	125.0
8	9:20	198.453	0.430	1.400	117.0	124.0
9	9:35	208.995	0.440	1.400	117.0	119.0
10	135/OFF	219.838				
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
15	--	--	--	--	--	--
16	--	--	--	--	--	--
17	--	--	--	--	--	--
18	--	--	--	--	--	--
19	--	--	--	--	--	--
20	--	--	--	--	--	--
21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	135	92.008	0.425	1.344	104.4	122.8

EMISSIONS RESULTS

ug	chrome	100.000ug
mg/dscm	Concentration, mg/dscm:	41.532x 10-3
gr/dscf	Concentration, gr/dscf:	0.018x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	2.848x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	1.292x 10-3
ug	nickel	100.000ug
mg/dscm	Concentration, mg/dscm:	41.532x 10-3
gr/dscf	Concentration, gr/dscf:	0.018x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	2.848x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	1.292x 10-3
ug	metal	100.000ug
mg/dscm	Concentration, mg/dscm:	41.532x 10-3
gr/dscm	Concentration, gr/dscm:	0.018x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	2.848x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	1.292x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: site9 Run No.: OUT-CR-3D Date: 6/2/90
Sampling Location: outlet Operator: b.d.
Net Run Time: 135 min Run Start Time: 7:36
Num Sampling Points: 8 Run Stop Time: 9:51

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.600

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	20.6
Vw(std)	Volume of Water Vapor, SCF:	0.970
%H20	Moisture Content, % by Vol.:	1.18
%C02	Percent C02 by Volume, Dry:	4.30
%02	Percent 02 by Volume, Dry:	14.70
Mfd	Dry Mole Fraction:	0.988
Fo	Orsat Validation Value:	1.44
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.86

FIELD DATA

Meter Box Number:	nu-7	Meter Box dHa:	1.887
Dry Gas Meter Cal. Y:	0.969	Assumed Moisture:	7.00
Leak Test Rate, CFM:	0.001	Leak Test Vac, in Hg:	15.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H20)	Delta H (in H20)	Gas Meter Temp (oF)	Stack Temp (oF)
1	7.36	859.420	0.430	1.200	86.0	123.0
2	7:51	869.304	0.370	1.200	87.0	126.0
3	8:06	878.643	0.400	1.200	97.0	123.0
4	8:21	889.312	0.440	1.400	104.0	121.0
5	8.36	899.937	0.450	1.400	108.0	123.0
6	8:51	908.683	0.440	1.400	112.0	125.0
7	9:06	918.743	0.430	1.400	114.0	126.0
8	9:21	928.613	0.450	1.400	115.0	122.0
9	135/OFF	949.808				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
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21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	135	90.388	0.426	1.325	102.9	123.6

ISOKINETIC DATA

	Nozzle Number:	0
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.250
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	38.1
Qsd	Volumetric Air Flow Rate, Dry SCFM:	18518.1
Qaw	Volumetric Air Flow Rate, Wet ACFM:	20936.3
%I	Isokinetic Sampling Rate, %:	87.7
Vm(Dry)	Volume Gas Metered, Dry:	90.388
Vm(Std)	Volume Gas Metered, Std:	81.549

EMISSIONS RESULTS

ug	chrome	100.000ug
mg/dscm	Concentration, mg/dscm:	43.305x 10-3
gr/dscf	Concentration, gr/dscf:	0.019x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	3.003x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	1.362x 10-3
ug	nickel	100.000ug
mg/dscm	Concentration, mg/dscm:	43.305x 10-3
gr/dscf	Concentration, gr/dscf:	0.019x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	3.003x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	1.362x 10-3
ug	metal	100.000ug
mg/dscm	Concentration, mg/dscm:	43.305x 10-3
gr/dscm	Concentration, gr/dscm:	0.019x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	3.003x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	1.362x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site9** Run No.: **OUT-CR-3A** Date: 6/2/90
Sampling Location: Outlet Operator: BD
Net Run Time: 135 min Run Start Time: 1933
Num Sampling Points: 9 Run Stop Time: 2148

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.600

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	27.7
Vw(std)	Volume of Water Vapor, SCF:	1.304
%H2O	Moisture Content, % by Vol.:	1.55
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.984
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.81

FIELD DATA

Meter Box Number:	EN-2	Meter Box dHa:	1.985
Dry Gas Meter Cal. Y:	1.015	Assumed Moisture:	7.00
Leak Test Rate, CFM:	0.001	Leak Test Vac, in Hg:	15.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	618.307	0.420	1.500	81.0	123.0
2	15	628.002	0.360	1.200	84.0	128.0
3	30	637.000	0.400	1.200	90.0	125.0
4	45	646.002	0.430	1.400	97.0	120.0
5	60	655.835	0.430	1.400	100.0	123.0
6	75	665.668	0.440	1.400	103.0	125.0
7	90	675.468	0.430	1.400	104.0	123.0
8	105	685.000	0.440	1.400	104.0	124.0
9	120	694.697	0.440	1.400	104.0	120.0
10	135/OFF	704.913				
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
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24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	135	86.606	0.421	1.367	96.3	123.4

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.250
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	37.9
Qsd	Volumetric Air Flow Rate, Dry SCFM:	18353.5
Qaw	Volumetric Air Flow Rate, Wet ACFM:	20822.8
%I	Isokinetic Sampling Rate, %:	89.8
Vm(Dry)	Volume Gas Metered, Dry:	86.606
Vm(Std)	Volume Gas Metered, Std:	82.807

EMISSIONS RESULTS

ug	Cr+6	1.938 ug
mg/dscm	Concentration, mg/dscm:	0.826x 10-3
gr/dscf	Concentration, gr/dscf:	0.000x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.057x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.026x 10-3

ug	Cr	6.002 ug
mg/dscm	Concentration, mg/dscm:	2.560x 10-3
gr/dscf	Concentration, gr/dscf:	0.001x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.176x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.080x 10-3

ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **netco site9** Run No.: **OUT-CR-3B** Date: 6/2/90
Sampling Location: outlet Operator: b.d.
Net Run Time: 135 min Run Start Time: 7:34
Num Sampling Points: 9 Run Stop Time: 9:49

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.600

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	23.1
Vw(std)	Volume of Water Vapor, SCF:	1.087
%H2O	Moisture Content, % by Vol.:	1.33
%CO2	Percent CO2 by Volume, Dry:	4.30
%O2	Percent O2 by Volume, Dry:	14.70
Mfd	Dry Mole Fraction:	0.987
Fc	Orsat Validation Value:	1.44
Mc	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.84

FIELD DATA

Meter Box Number: en-1 Meter Box dHa: 1.934
Dry Gas Meter Cal. Y: 0.932 Assumed Moisture: 7.00
Leak Test Rate, CFM: 0.001 Leak Test Vac, in Hg: 15.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	7:34	863.655	0.440	1.200	84.0	123.0
2	7:49	873.792	0.370	1.200	85.0	126.0
3	8:04	883.585	0.420	1.300	94.0	121.0
4	8:19	893.328	0.450	1.400	99.0	121.0
5	8:34	903.135	0.430	1.400	103.0	123.0
6	8:49	914.185	0.430	1.400	105.0	124.0
7	9:04	924.668	0.430	1.400	107.0	124.0
8	9:19	934.052	0.450	1.400	107.0	124.0
9	9:34	945.400	0.440	1.400	108.0	120.0
10	135/OFF	956.300				
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13	--	--	--	--	--	--
14	--	--	--	--	--	--
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24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	135	92.645	0.429	1.344	99.1	122.9

ISOKINETIC DATA

	Nozzle Number:	0
Cp	Pitot Tube Coef.:	C.840
Dia	Nozzle Diameter, in:	0.250
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	38.2
Qsd	Volumetric Air Flow Rate, Dry SCFM:	18566.4
Qsw	Volumetric Air Flow Rate, Wet ACFM:	20996.4
%I	Isokinetic Sampling Rate, %:	86.8
Vm(Dry)	Volume Gas Metered, Dry:	92.645
Vm(Std)	Volume Gas Metered, Std:	80.949

EMISSIONS RESULTS

ug	Cr+6	1.722 ug
mg/dscm	Concentration, mg/dscm:	0.751x 10-3
gr/dscf	Concentration, gr/dscf:	0.000x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.052x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.024x 10-3
ug	Cr	9.140 ug
mg/dscm	Concentration, mg/dscm:	3.987x 10-3
gr/dscf	Concentration, gr/dscf:	0.002x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.277x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.126x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: site9 Run No.: OUT-CR-3C Date: 6/2/90
Sampling Location: outlet Operator: b.d.
Net Run Time: 135 min Run Start Time: 7:35
Num Sampling Points: 9 Run Stop Time: 9:50

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.600

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	47.8
Vw(std)	Volume of Water Vapor, SCF:	2.250
%H2O	Moisture Content, % by Vol.:	2.58
%CO2	Percent CO2 by Volume, Dry:	4.30
%O2	Percent O2 by Volume, Dry:	14.70
Mfd	Dry Mole Fraction:	0.974
Fo	Orsat Validation Value:	1.44
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.69

FIELD DATA

Meter Box Number: n-16 Meter Box dHa: 1.762
Dry Gas Meter Cal. Y: 0.996 Assumed Moisture: 7.00
Leak Test Rate, CFM: 0.001 Leak Test Vac, in Hg: 15.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	7:35	127.830	0.420	1.200	83.0	123.0
2	7:50	137.862	0.370	1.200	84.0	125.0
3	8:05	147.355	0.430	1.300	97.0	121.0
4	8:20	157.185	0.450	1.400	104.0	121.0
5	8:35	167.500	0.430	1.400	110.0	123.0
6	8:50	177.978	0.430	1.400	111.0	124.0
7	9:05	188.350	0.430	1.400	117.0	125.0
8	9:20	198.453	0.430	1.400	117.0	124.0
9	9:35	208.995	0.440	1.400	117.0	119.0
10	135/OFF	219.838				
11	--	--	--	--	--	--
12	--	--	--	--	--	--
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23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	135	92.008	0.425	1.344	104.4	122.8

ISOKINETIC DATA

	Nozzle Number:	0
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.250
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	38.1
Qsd	Volumetric Air Flow Rate, Dry SCFM:	18308.2
Qaw	Volumetric Air Flow Rate, Wet ACFM:	20966.5
%I	Isokinetic Sampling Rate, %:	92.5
Vm(Dry)	Volume Gas Metered, Dry:	92.008
Vm(Std)	Volume Gas Metered, Std:	85.030

EMISSIONS RESULTS

ug	Cr+6	1.577 ug
mg/dscm	Concentration, mg/dscm:	0.655x 10-3
gr/dscf	Concentration, gr/dscf:	0.000x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.045x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.020x 10-3
ug	Cr	7.622 ug
mg/dscm	Concentration, mg/dscm:	3.166x 10-3
gr/dscf	Concentration, gr/dscf:	0.001x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.217x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.098x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site9** Run No.: **MID-CR-5A** Date: 6-3-90
Sampling Location: Midpoint Operator: GV
Net Run Time: 120 min Run Start Time: 1447
Num Sampling Points: 8 Run Stop Time: 1647

Pressures:

Pbar	Barometric Pressure, in Hg:	29.490
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.284

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	46.3
Vw(std)	Volume of Water Vapor, SCF:	2.179
%H2O	Moisture Content, % by Vol.:	4.35
%CO2	Percent CO2 by Volume, Dry:	4.70
%O2	Percent O2 by Volume, Dry:	13.71
Mfd	Dry Mole Fraction:	0.956
Fo	Orsat Validation Value:	1.53
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.48

FIELD DATA

Meter Box Number: A1 Meter Box dHa: 2.270
Dry Gas Meter Cal. Y: 0.986 Assumed Moisture: 8.00
Leak Test Rate, CFM: 0.001 Leak Test Vac, in Hg: 10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	984.432	0.360	1.200	100.0	75.0
2	15	992.728	0.360	1.150	100.0	75.0
3	30	1000.374	0.320	0.900	100.0	82.0
4	45	107.009	0.360	0.600	100.0	89.0
5	60	10012.930	0.320	0.600	100.0	78.0
6	75	1018.588	0.360	0.600	100.0	81.0
7	90	1023.743	0.360	0.500	100.0	84.0
8	105	1028.372	0.260	0.400	100.0	84.0
9	120/OFF	1036.612				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
15	--	--	--	--	--	--
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23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	52.180	0.337	0.744	100.0	81.0

ISOKINETIC DATA

	Nozzle Number:	t-28
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	34.2
Qsd	Volumetric Air Flow Rate, Dry SCFM:	15991.9
Qaw	Volumetric Air Flow Rate, Wet ACFM:	18786.1
%I	Isokinetic Sampling Rate, %:	69.9
Vm(Dry)	Volume Gas Metered, Dry:	52.180
Vm(Std)	Volume Gas Metered, Std:	47.906

EMISSIONS RESULTS

ug	Cr+6	3.330 ug
mg/dscm	Concentration, mg/dscm:	2.455x 10-3
gr/dscf	Concentration, gr/dscf:	0.001x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.147x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.067x 10-3
ug	Cr	23.343 ug
mg/dscm	Concentration, mg/dscm:	17.208x 10-3
gr/dscf	Concentration, gr/dscf:	0.008x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	1.031x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.467x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-CR-5B** Date: 6-3-90
Sampling Location: Midpoint Operator: GB
Net Run Time: 122 min Run Start Time: 1449
Num Sampling Points: 8 Run Stop Time: 1649

Pressures:

Pbar	Barometric Pressure, in Hg:	29.490
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.284

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	70.9
Vw(std)	Volume of Water Vapor, SCF:	3.337
%H2O	Moisture Content, % by Vol.:	4.66
%CO2	Percent CO2 by Volume, Dry:	4.70
%O2	Percent O2 by Volume, Dry:	15.00
Mfd	Dry Mole Fraction:	0.953
Fo	Orsat Validation Value:	1.26
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.44

FIELD DATA

Meter Box Number: A2 Meter Box dHa: 2.047
Dry Gas Meter Cal. Y: 1.024 Assumed Moisture: 8.00
Leak Test Rate, CFM: 0.002 Leak Test Vac, in Hg: 10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	773.526	0.360	1.500	100.0	76.0
2	15	783.382	0.360	1.500	100.0	75.0
3	30	792.912	0.250	1.000	100.0	83.0
4	45	800.791	0.360	1.400	100.0	84.0
5	60	809.892	0.320	1.300	100.0	79.0
6	75	818.881	0.360	1.500	100.0	81.0
7	90	827.861	0.360	1.300	100.0	81.0
8	105	836.722	0.270	1.100	100.0	86.0
9	122/OFF	845.039				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
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22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	122	71.513	0.329	1.325	100.0	80.6

ISOKINETIC DATA

	Nozzle Number:	t-27
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	33.8
Qsd	Volumetric Air Flow Rate, Dry SCFM:	15763.3
Qaw	Volumetric Air Flow Rate, Wet ACFM:	18564.8
%I	Isokinetic Sampling Rate, %:	99.4
Vm(Dry)	Volume Gas Metered, Dry:	71.513
Vm(Std)	Volume Gas Metered, Std:	68.270

EMISSIONS RESULTS

ug	Cr+6	1.082 ug
mg/dscm	Concentration, mg/dscm:	0.560x 10-3
gr/dscf	Concentration, gr/dscf:	0.000x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.033x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.015x 10-3
ug	Cr	29.380 ug
mg/dscm	Concentration, mg/dscm:	15.198x 10-3
gr/dscf	Concentration, gr/dscf:	0.007x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.897x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.407x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-CR-5C** Date: 6-3-90
Sampling Location: Midpoint Operator: GB
Net Run Time: 120 min Run Start Time: 1451
Num Sampling Points: 8 Run Stop Time: 1651

Pressures:

Pbar	Barometric Pressure, in Hg:	29.490
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.284

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	88.6
Vw(std)	Volume of Water Vapor, SCF:	4.170
%H2O	Moisture Content, % by Vol.:	5.56
%CO2	Percent CO2 by Volume, Dry:	4.50
%O2	Percent O2 by Volume, Dry:	15.00
Mfd	Dry Mole Fraction:	0.944
Fo	Orsat Validation Value:	1.31
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.33

FIELD DATA

Meter Box Number:	B1	Meter Box dHa:	2.004
Dry Gas Meter Cal. Y:	1.034	Assumed Moisture:	8.00
Leak Test Rate, CFM:	0.001	Leak Test Vac, in Hg:	10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	190.972	0.360	1.500	100.0	76.0
2	15	200.957	0.360	1.500	100.0	75.0
3	30	210.424	0.250	1.000	100.0	83.0
4	45	218.502	0.360	1.500	100.0	81.0
5	60	228.502	0.320	1.300	100.0	81.0
6	75	232.082	0.350	1.500	100.0	82.0
7	90	246.691	0.360	1.500	100.0	84.0
8	105	256.352	0.270	1.100	100.0	87.0
9	120/OFF	264.418				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
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22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	73.446	0.327	1.362	100.0	81.1

ISOKINETIC DATA

	Nozzle Number:	t-30
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	33.8
Qsd	Volumetric Air Flow Rate, Dry SCFM:	15606.9
Qaw	Volumetric Air Flow Rate, Wet ACFM:	18573.6
%I	Isokinetic Sampling Rate, %:	105.8
Vm(Dry)	Volume Gas Metered, Dry:	73.446
Vm(Std)	Volume Gas Metered, Std:	70.779

EMISSIONS RESULTS

ug	Cr+6	2.816 ug
mg/dscm	Concentration, mg/dscm:	1.405x 10-3
gr/dscf	Concentration, gr/dscf:	0.001x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.082x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.037x 10-3
ug	Cr	30.677 ug
mg/dscm	Concentration, mg/dscm:	15.306x 10-3
gr/dscf	Concentration, gr/dscf:	0.007x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.895x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.406x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **OUT-CR-5A** Date: 6-3-90
Sampling Location: Outlet Operator: RM
Net Run Time: 120 min Run Start Time: 1455
Num Sampling Points: 8 Run Stop Time: 1655

Pressures:

Pbar	Barometric Pressure, in Hg:	29.490
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.490

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	65.3
Vw(std)	Volume of Water Vapor, SCF:	3.074
%H2O	Moisture Content, % by Vol.:	4.30
%CO2	Percent CO2 by Volume, Dry:	4.50
%O2	Percent O2 by Volume, Dry:	15.00
Mfd	Dry Mole Fraction:	0.957
Fo	Orsat Validation Value:	1.31
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.48

FIELD DATA

Meter Box Number:	En2	Meter Box dHa:	1.985
Dry Gas Meter Cal. Y:	0.985	Assumed Moisture:	3.00
Leak Test Rate, CFM:	0.000	Leak Test Vac, in Hg:	15.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	711.785	0.450	1.400	77.0	127.0
2	15	721.292	0.400	1.400	82.0	129.0
3	30	729.292	0.330	1.000	88.0	137.0
4	45	738.384	0.380	1.200	92.0	135.0
5	60	746.235	0.370	1.200	94.0	136.0
6	75	756.212	0.360	1.300	95.0	131.0
7	90	765.620	0.400	1.400	96.0	131.0
8	105	775.242	0.350	1.200	95.0	146.0
9	120/OFF	785.015				
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FINAL/AVG	120	73.230	0.379	1.262	89.9	134.0

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.250
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	36.6
Qsd	Volumetric Air Flow Rate, Dry SCFM:	16849.7
Qaw	Volumetric Air Flow Rate, Wet ACFM:	20095.6
%I	Isokinetic Sampling Rate, %:	91.0
Vm(Dry)	Volume Gas Metered, Dry:	73.230
Vm(Std)	Volume Gas Metered, Std:	68.468

EMISSIONS RESULTS

ug	Cr+6	1.886 ug
mg/dscm	Concentration, mg/dscm:	0.973x 10-3
gr/dscf	Concentration, gr/dscf:	0.000x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.061x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.028x 10-3
ug	Cr	65.636 ug
mg/dscm	Concentration, mg/dscm:	33.854x 10-3
gr/dscf	Concentration, gr/dscf:	0.015x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	2.136x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.969x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **OUT-CR-5B** Date: 6-3-90
Sampling Location: Outlet Operator: RM
Net Run Time: 120 min Run Start Time: 1450
Num Sampling Points: 8 Run Stop Time: 1650

Pressures:

Pbar	Barometric Pressure, in Hg:	29.490
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.490

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	78.7
Vw(std)	Volume of Water Vapor, SCF:	3.704
%H2O	Moisture Content, % by Vol.:	5.09
%CO2	Percent CO2 by Volume, Dry:	4.50
%O2	Percent O2 by Volume, Dry:	15.00
Mfd	Dry Mole Fraction:	0.949
Fo	Orsat Validation Value:	1.31
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.39

FIELD DATA

Meter Box Number:	EN1	Meter Box dHa:	1.934
Dry Gas Meter Cal. Y:	0.932	Assumed Moisture:	3.00
Leak Test Rate, CFM:	0.000	Leak Test Vac, in Hg:	15.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu.ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	968.468	0.400	1.400	78.0	128.0
2	15	978.328	0.370	1.400	83.0	133.0
3	30	987.442	0.340	1.000	86.0	138.0
4	45	996.555	0.380	1.200	90.0	134.0
5	60	1005.834	0.000	1.200	93.0	137.0
6	75	1015.615	0.360	1.300	93.0	132.0
7	90	1025.702	0.400	1.400	95.0	137.0
8	105	1036.137	0.350	1.200	95.0	147.0
9	120/OFF	1046.389				
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FINAL/AVG	120	77.921	0.284	1.262	89.1	135.7

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.250
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	31.7
Qsd	Volumetric Air Flow Rate, Dry SCFM:	14465.8
Qaw	Volumetric Air Flow Rate, Wet ACFM:	17448.4
%I	Isokinetic Sampling Rate, %:	106.9
Vm(Dry)	Volume Gas Metered, Dry:	77.921
Vm(Std)	Volume Gas Metered, Std:	69.051

EMISSIONS RESULTS

ug	Cr+6	3.179 ug
mg/dscm	Concentration, mg/dscm:	1.626x 10-3
gr/dscf	Concentration, gr/dscf:	0.001x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.088x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.040x 10-3
ug	Cr	6.946 ug
mg/dscm	Concentration, mg/dscm:	3.552x 10-3
gr/dscf	Concentration, gr/dscf:	0.002x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.192x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.087x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **OUT-CR-5C** Date: 6-3-90
Sampling Location: Outlet Operator: BD
Net Run Time: 120 min Run Start Time: 1457
Num Sampling Points: 8 Run Stop Time: 1657

Pressures:

Pbar	Barometric Pressure, in Hg:	29.490
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.490

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	53.8
Vw(std)	Volume of Water Vapor, SCF:	2.532
%H2O	Moisture Content, % by Vol.:	3.34
%CO2	Percent CO2 by Volume, Dry:	4.50
%O2	Percent O2 by Volume, Dry:	15.00
Mfd	Dry Mole Fraction:	0.967
Fo	Orsat Validation Value:	1.31
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.60

FIELD DATA

Meter Box Number: N16 Meter Box dHa: 1.762
Dry Gas Meter Cal. Y: 0.996 Assumed Moisture: 3.00
Leak Test Rate, CFM: 0.000 Leak Test Vac, in Hg: 10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	227.516	0.450	1.400	78.0	128.0
2	15	237.600	0.420	1.400	83.0	133.0
3	30	246.632	0.300	1.000	85.0	140.0
4	45	255.715	0.350	1.200	96.0	135.0
5	60	265.715	0.360	1.200	99.0	139.0
6	75	274.092	0.400	1.300	100.0	132.0
7	90	285.023	0.390	1.400	101.0	138.0
8	105	295.248	0.340	1.200	100.0	147.0
9	120/OFF	305.448				
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FINAL/AVG	120	77.932	0.375	1.262	92.7	136.5

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.250
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	36.3
Qsd	Volumetric Air Flow Rate, Dry SCFM:	16852.0
Qaw	Volumetric Air Flow Rate, Wet ACFM:	19983.7
%I	Isokinetic Sampling Rate, %:	97.4
Vm(Dry)	Volume Gas Metered, Dry:	77.932
Vm(Std)	Volume Gas Metered, Std:	73.258

EMISSIONS RESULTS

ug	Cr+6	3.092 ug
mg/dscm	Concentration, mg/dscm:	1.491x 10-3
gr/dscf	Concentration, gr/dscf:	0.001x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.094x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.043x 10-3
ug	Cr	8.033 ug
mg/dscm	Concentration, mg/dscm:	3.872x 10-3
gr/dscf	Concentration, gr/dscf:	0.002x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.244x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.111x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-RCCR-8A** Date: 6/5/90
Sampling Location: Midpoint Operator: GCB
Net Run Time: 120 min Run Start Time: 1221
Num Sampling Points: 8 Run Stop Time: 1421

Pressures:

Pbar	Barometric Pressure, in Hg:	29.500
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.294

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	90.7
Vw(std)	Volume of Water Vapor, SCF:	4.269
%H2O	Moisture Content, % by Vol.:	6.31
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.937
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.24

FIELD DATA

Meter Box Number:	A-1	Meter Box dHa:	2.270
Dry Gas Meter Cal. Y:	0.986	Assumed Moisture:	7.00
Leak Test Rate, CFM:	0.001	Leak Test Vac, in Hg:	7.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	163.800	0.360	1.400	86.0	88.0
2	15	173.192	0.340	1.400	86.0	88.0
3	30	182.262	0.320	1.300	86.0	88.0
4	45	191.024	0.320	1.300	86.0	84.0
5	60	199.864	0.250	1.000	86.0	83.0
6	75	207.558	0.250	1.000	86.0	82.0
7	90	215.232	0.250	1.000	90.0	82.0
8	105	222.875	0.280	1.150	90.0	82.0
9	120/OFF	231.114				
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FINAL/AVG	120	67.314	0.295	1.194	87.0	84.6

ISOKINETIC DATA

	Nozzle Number:	T27
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	32.2
Qsd	Volumetric Air Flow Rate, Dry SCFM:	14671.9
Qaw	Volumetric Air Flow Rate, Wet ACFM:	17707.7
%I	Isokinetic Sampling Rate, %:	100.7
Vm(Dry)	Volume Gas Metered, Dry:	67.314
Vm(Std)	Volume Gas Metered, Std:	63.362

EMISSIONS RESULTS

ug	Cr+6	1.847 ug
mg/dscm	Concentration, mg/dscm:	1.029x 10-3
gr/dscf	Concentration, gr/dscf:	0.000x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.057x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.026x 10-3
ug	Cr	31.310 ug
mg/dscm	Concentration, mg/dscm:	17.451x 10-3
gr/dscf	Concentration, gr/dscf:	0.008x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.959x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.435x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-RCCR-8B** Date: 6/5/90
Sampling Location: Midpoint Operator: GCB
Net Run Time: 120 min Run Start Time: 1223
Num Sampling Points: 8 Run Stop Time: 1423

Pressures:

Pbar	Barometric Pressure, in Hg:	29.500
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.294

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	147.5
Vw(std)	Volume of Water Vapor, SCF:	6.943
%H2O	Moisture Content, % by Vol.:	9.37
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.906
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	28.88

ISOKINETIC DATA

	Nozzle Number:	T 28
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	31.8
Qsd	Volumetric Air Flow Rate, Dry SCFM:	14009.1
Qaw	Volumetric Air Flow Rate, Wet ACFM:	17465.7
%:	Isokinetic Sampling Rate, %:	111.8
Vm(Dry)	Volume Gas Metered, Dry:	68.763
Vm(Std)	Volume Gas Metered, Std:	67.169

FIELD DATA

Meter Box Number: A-2 Meter Box dHa: 2.047
Dry Gas Meter Cal. Y: 1.024 Assumed Moisture: 7.00
Leak Test Rate, CFM: 0.002 Leak Test Vac, in Hg: 7.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	2	976.138	0.360	1.450	86.0	88.0
2	17	985.682	0.330	1.300	86.0	88.0
3	32	994.843	0.320	1.300	86.0	86.0
4	47	1003.936	0.260	1.100	86.0	84.0
5	62	1012.312	0.250	1.000	86.0	82.0
6	77	1020.428	0.250	1.000	88.0	82.0
7	92	1028.438	0.230	0.950	90.0	82.0
8	107	1036.720	0.280	1.150	90.0	82.0
9	120/OFF	1044.901				
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25	--	--	--	--	--	--
FINAL/AVG	120	68.763	0.283	1.156	87.2	84.2

EMISSIONS RESULTS

ug	Cr+6	2.498 ug
mg/dscm	Concentration, mg/dscm:	0.971x 10-3
gr/dscf	Concentration, gr/dscf:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.051x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.023x 10-3
ug	Cr	34.770 ug
mg/dscm	Concentration, mg/dscm:	18.281x 10-3
gr/dscf	Concentration, gr/dscf:	0.008x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.959x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.435x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-RCCR-BC** Date: 6/5/90
Sampling Location: Midpoint Operator: GCB
Net Run Time: 120 min Run Start Time: 1225
Num Sampling Points: 8 Run Stop Time: 1425

Pressures:

Pbar	Barometric Pressure, in Hg:	29.500
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.294

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	89.5
Vw(std)	Volume of Water Vapor, SCF:	4.213
%H2O	Moisture Content, % by Vol.:	6.17
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.938
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.26

FIELD DATA

Meter Box Number:	B-1	Meter Box dHa:	2.043
Dry Gas Meter Cal. Y:	1.000	Assumed Moisture:	7.00
Leak Test Rate, CFM:	0.001	Leak Test Vac, in Hg:	7.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	4	307.505	0.310	1.250	86.0	88.0
2	19	316.257	0.330	1.300	86.0	88.0
3	34	325.218	0.320	1.300	86.0	85.0
4	49	334.213	0.240	1.000	86.0	83.0
5	64	342.262	0.240	1.000	86.0	83.0
6	79	350.212	0.240	1.000	88.0	82.0
7	94	358.323	0.240	1.000	90.0	82.0
8	109	366.264	0.280	1.150	90.0	82.0
9	120/OFF	374.698				
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FINAL/AVG	120	67.193	0.274	1.125	87.2	84.1

ISOKINETIC DATA

	Nozzle Number:	T 30
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	31.0
Qsd	Volumetric Air Flow Rate, Dry SCFM:	14162.3
Qaw	Volumetric Air Flow Rate, Wet ACFM:	17050.9
%I	Isokinetic Sampling Rate, %:	105.5
Vm(Dry)	Volume Gas Metered, Dry:	67.193
Vm(Std)	Volume Gas Metered, Std:	64.073

EMISSIONS RESULTS

ug	Cr+6	2.498 ug
mg/dscm	Concentration, mg/dscm:	1.377x 10-3
gr/dscf	Concentration, gr/dscf:	0.001x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.073x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.033x 10-3
ug	Cr	7.620 ug
mg/dscm	Concentration, mg/dscm:	4.200x 10-3
gr/dscf	Concentration, gr/dscf:	0.002x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.223x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.101x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **OUT-CR+6-8A** Date: 6/5/90
Sampling Location: Outlet Operator: MLH
Net Run Time: 120 min Run Start Time: 1215
Num Sampling Points: 8 Run Stop Time: 1415

Pressures:

Pbar	Barometric Pressure, in Hg:	29.500
Pg	Flue Gas Static Press. in H2O:	-0.250
Ps	Absolute Flue Gas Press. in Hg:	29.482

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	22.0
Vw(std)	Volume of Water Vapor, SCF:	1.036
%H2O	Moisture Content, % by Vol.:	1.44
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.986
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.83

FIELD DATA

Meter Box Number:	BN-2	Meter Box dHa:	1.969
Dry Gas Meter Cal. Y:	0.985	Assumed Moisture:	6.00
Leak Test Rate, CFM:	0.004	Leak Test Vac, in Hg:	8.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	839.738	0.460	1.600	71.0	149.0
2	15	848.740	0.440	1.530	77.0	150.0
3	30	858.710	0.450	1.570	80.0	151.0
4	45	868.970	0.420	1.400	81.0	153.0
5	60	878.610	0.380	1.270	84.0	160.0
6	75	887.830	0.400	1.340	86.0	164.0
7	90	897.350	0.320	1.070	86.0	166.0
8	105	905.640	0.320	1.070	82.0	167.0
9	120/OFF	914.051				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
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21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	74.313	0.397	1.356	80.9	157.5

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.240
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	37.9
Qsd	Volumetric Air Flow Rate, Dry SCFM:	17310.3
Qaw	Volumetric Air Flow Rate, Wet ACFM:	20846.6
%I	Isokinetic Sampling Rate, %:	99.2
Vm(Dry)	Volume Gas Metered, Dry:	74.313
Vm(Std)	Volume Gas Metered, Std:	70.677

EMISSIONS RESULTS

ug	Cr+6	0.807 ug
mg/dscm	Concentration, mg/dscm:	0.403x 10-3
gr/dscf	Concentration, gr/dscf:	0.000x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.026x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.012x 10-3
ug	Cr	3.246 ug
mg/dscm	Concentration, mg/dscm:	1.622x 10-3
gr/dscf	Concentration, gr/dscf:	0.001x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.105x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.048x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: Site 9 Run No.: OUT-CR+6-8B Date: 6/5/90
Sampling Location: OUtlet Operator: MLH
Net Run Time: 120 min Run Start Time: 1216
Num Sampling Points: 8 Run Stop Time: 1416

Pressures:

Pbar	Barometric Pressure, in Hg:	29.500
Pg	Flue Gas Static Press. in H2O:	-0.250
Ps	Absolute Flue Gas Press. in Hg:	29.482

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	27.0
Vw(std)	Volume of Water Vapor, SCF:	1.271
%H2O	Moisture Content, % by Vol.:	1.75
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.983
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.79

FIELD DATA

Meter Box Number: EN-1 Meter Box dHa: 1.969
Dry Gas Meter Cal. Y: 0.932 Assumed Moisture: 6.00
Leak Test Rate, CFM: 0.008 Leak Test Vac, in Hg: 9.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	99.206	0.460	1.600	75.0	149.0
2	15	108.990	0.440	1.530	80.0	150.0
3	30	119.680	0.450	1.570	84.0	151.0
4	45	130.600	0.420	1.400	87.0	153.0
5	60	141.050	0.380	1.270	84.0	160.0
6	75	150.950	0.400	1.340	88.0	164.0
7	90	161.150	0.320	1.070	90.0	166.0
8	105	170.150	0.320	1.070	89.0	167.0
9	120/OFF	179.183				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
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21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	79.977	0.397	1.356	84.6	157.5

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.240
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	37.9
Qsd	Volumetric Air Flow Rate, Dry SCFM:	17267.7
Qaw	Volumetric Air Flow Rate, Wet ACFM:	20859.3
%I	Isokinetic Sampling Rate, %:	100.6
Vm(Dry)	Volume Gas Metered, Dry:	79.977
Vm(Std)	Volume Gas Metered, Std:	71.499.

EMISSIONS RESULTS

ug	Cr+6	1.203 ug
mg/dscm	Concentration, mg/dscm:	0.594x 10-3
gr/dscf	Concentration, gr/dscf:	0.000x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.038x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.017x 10-3
ug	Cr	3.672 ug
mg/dscm	Concentration, mg/dscm:	1.814x 10-3
gr/dscf	Concentration, gr/dscf:	0.001x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.117x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.053x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **OUT-CR+6-8C** Date: 6/5/90
Sampling Location: OUtlet Operator: RLM
Net Run Time: 120 min Run Start Time: 1216
Num Sampling Points: 8 Run Stop Time: 1416

Pressures:

Pbar	Barometric Pressure, in Hg:	29.500
Pg	Flue Gas Static Press. in H2O:	-0.250
Ps	Absolute Flue Gas Press. in Hg:	29.482

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	22.5
Vw(std)	Volume of Water Vapor, SCF:	1.059
%H2O	Moisture Content, % by Vol.:	1.44
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.986
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.83

FIELD DATA

Meter Box Number:	N-16	Meter Box dHa:	1.820
Dry Gas Meter Cal. Y:	0.996	Assumed Moisture:	6.00
Leak Test Rate, CFM:	0.012	Leak Test Vac, in Hg:	8.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	476.715	0.460	1.480	80.0	149.0
2	15	487.152	0.440	1.420	88.0	150.0
3	30	497.575	0.450	1.450	96.0	151.0
4	45	507.982	0.420	1.290	104.0	153.0
5	60	517.869	0.380	1.170	110.0	160.0
6	75	527.738	0.400	1.230	112.0	164.0
7	90	537.118	0.320	0.980	114.0	166.0
8	105	546.062	0.320	0.980	112.0	167.0
9	120/OFF	554.870				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
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21	--	--	--	--	--	--
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23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	78.155	0.397	1.250	102.0	157.5

ISOKINETIC DATA

	Nozzle Number:	T-7
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.242
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	37.9
Qsd	Volumetric Air Flow Rate, Dry SCFM:	17310.3
Qaw	Volumetric Air Flow Rate, Wet ACFM:	20846.6
%I	Isokinetic Sampling Rate, %:	99.8
Vm(Dry)	Volume Gas Metered, Dry:	78.155
Vm(Std)	Volume Gas Metered, Std:	72.280

EMISSIONS RESULTS

ug	Cr+6	3.007 ug
mg/dscm	Concentration, mg/dscm:	1.469x 10-3
gr/dscf	Concentration, gr/dscf:	0.001x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.095x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.043x 10-3
ug	Cr	4.446 ug
mg/dscm	Concentration, mg/dscm:	2.172x 10-3
gr/dscf	Concentration, gr/dscf:	0.001x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.141x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.064x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-CR-10A** Date: 6-6-90
Sampling Location: Midpoint Operator: GB
Net Run Time: 108 min Run Start Time: 1135
Num Sampling Points: 8 Run Stop Time: 1319

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.394

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	78.8
Vw(std)	Volume of Water Vapor, SCF:	3.709
%H2O	Moisture Content, % by Vol.:	6.11
%CO2	Percent CO2 by Volume, Dry:	5.65
%O2	Percent O2 by Volume, Dry:	14.80
Mfd	Dry Mole Fraction:	0.939
Fo	Orsat Validation Value:	1.08
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.27

FIELD DATA

Meter Box Number: A1 Meter Box dHa: 2.270
Dry Gas Meter Cal. Y: 0.986 Assumed Moisture: 178.80
Leak Test Rate, CFM: 0.005 Leak Test Vac, in Hg: 10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	367.285	0.300	1.100	92.0	92.0
2	15	375.591	0.300	1.200	92.0	92.0
3	30	384.042	0.300	1.200	92.0	92.0
4	45	392.042	0.300	1.200	92.0	92.0
5	60	400.801	0.300	1.200	94.0	92.0
6	75	409.256	0.320	1.300	94.0	92.0
7	90	418.088	0.320	1.300	94.0	92.0
8	105	427.095	0.320	1.300	96.0	92.0
9	108/OFF	428.300				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
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21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	108	61.015	0.307	1.225	93.2	92.0

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	33.0
Qsd	Volumetric Air Flow Rate, Dry SCFM:	14935.5
Qaw	Volumetric Air Flow Rate, Wet ACFM:	18164.2
%I	Isokinetic Sampling Rate, %:	98.9
Vm(Dry)	Volume Gas Metered, Dry:	61.015
Vm(Std)	Volume Gas Metered, Std:	56.980

EMISSIONS RESULTS

ug	Cr+6	1.889 ug
mg/dscm	Concentration, mg/dscm:	1.171x 10-3
gr/dscf	Concentration, gr/dscf:	0.001x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.065x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.030x 10-3
ug	Cr	23.460 ug
mg/dscm	Concentration, mg/dscm:	14.540x 10-3
gr/dscf	Concentration, gr/dscf:	0.006x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.813x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.369x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-CR-10B** Date: 6-6-90
Sampling Location: Midpoint Operator: GB
Net Run Time: 108 min Run Start Time: 1137
Num Sampling Points: 8 Run Stop Time: 1319

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.394

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	87.7
Vw(std)	Volume of Water Vapor, SCF:	4.128
%H2O	Moisture Content, % by Vol.:	6.39
%CO2	Percent CO2 by Volume, Dry:	5.65
%O2	Percent O2 by Volume, Dry:	14.80
Mfd	Dry Mole Fraction:	0.936
Fo	Orsat Validation Value:	1.08
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.23

FIELD DATA

Meter Box Number:	A2	Meter Box dHa:	2.047
Dry Gas Meter Cal. Y:	1.024	Assumed Moisture:	8.00
Leak Test Rate, CFM:	0.005	Leak Test Vac, in Hg:	10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	188.736	0.300	1.200	92.0	92.0
2	15	197.313	0.300	1.200	92.0	92.0
3	30	205.987	0.300	1.200	92.0	92.0
4	45	214.654	0.300	1.200	93.0	92.0
5	60	223.475	0.350	1.400	94.0	92.0
6	75	232.743	0.320	1.300	94.0	92.0
7	90	250.900	0.310	1.300	96.0	92.0
8	105	250.900	0.310	1.300	94.0	92.0
9	108/OFF	251.100				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
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23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	108	62.364	0.311	1.262	93.4	92.0

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	33.3
Qsd	Volumetric Air Flow Rate, Dry SCFM:	14987.1
Qaw	Volumetric Air Flow Rate, Wet ACFM:	18281.4
%I	Isokinetic Sampling Rate, %:	104.6
Vm(Dry)	Volume Gas Metered, Dry:	62.364
Vm(Std)	Volume Gas Metered, Std:	60.463

EMISSIONS RESULTS

ug	Cr+6	3.017 ug
mg/dscm	Concentration, mg/dscm:	1.762x 10-3
gr/dscf	Concentration, gr/dscf:	0.001x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.099x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.045x 10-3
ug	Cr	26.160 ug
mg/dscm	Concentration, mg/dscm:	15.279x 10-3
gr/dscf	Concentration, gr/dscf:	0.007x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.858x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.389x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-CR-10C** Date: 6-6-90
Sampling Location: Midpoint Operator: GB
Net Run Time: 108 min Run Start Time: 1139
Num Sampling Points: 8 Run Stop Time: 1319

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.394

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	70.5
Vw(std)	Volume of Water Vapor, SCF:	3.318
%H2O	Moisture Content, % by Vol.:	5.21
%CO2	Percent CO2 by Volume, Dry:	5.65
%O2	Percent O2 by Volume, Dry:	14.80
Mfd	Dry Mole Fraction:	0.948
Fo	Orsat Validation Value:	1.08
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.37

FIELD DATA

Meter Box Number:	2.043	Meter Box dHa:	2.043
Dry Gas Meter Cal. Y:	1.034	Assumed Moisture:	8.00
Leak Test Rate, CFM:	0.001	Leak Test Vac, in Hg:	10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	442.486	0.300	1.200	92.0	92.0
2	15	451.482	0.300	1.200	92.0	92.0
3	30	460.161	0.300	1.200	92.0	92.0
4	45	469.979	0.300	1.200	93.0	92.0
5	60	477.815	0.350	1.400	94.0	92.0
6	75	486.964	0.320	1.400	94.0	92.0
7	90	495.996	0.320	1.400	94.0	92.0
8	105	504.100	0.320	1.300	94.0	92.0
9	108/OFF	504.100				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
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25	--	--	--	--	--	--
FINAL/AVG	108	61.614	0.314	1.287	93.1	92.0

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	33.3
Qsd	Volumetric Air Flow Rate, Dry SCFM:	15199.5
Qaw	Volumetric Air Flow Rate, Wet ACFM:	18310.3
%I	Isokinetic Sampling Rate, %:	102.9
Vm(Dry)	Volume Gas Metered, Dry:	61.614
Vm(Std)	Volume Gas Metered, Std:	60.327

EMISSIONS RESULTS

ug	Cr+6	2.469 ug
mg/dscm	Concentration, mg/dscm:	1.445x 10-3
gr/dscf	Concentration, gr/dscf:	0.001x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.082x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.037x 10-3
ug	Cr	24.870 ug
mg/dscm	Concentration, mg/dscm:	14.559x 10-3
gr/dscf	Concentration, gr/dscf:	0.006x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.829x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.376x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **OUT-CR-10A** Date: 6-6-90
Sampling Location: Outlet Operator: MH
Net Run Time: 95 min Run Start Time: 1130
Num Sampling Points: 7 Run Stop Time: 1320

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.600

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	40.0
Vw(std)	Volume of Water Vapor, SCF:	1.883
%H2O	Moisture Content, % by Vol.:	3.18
%CO2	Percent CO2 by Volume, Dry:	4.50
%O2	Percent O2 by Volume, Dry:	15.00
Mfd	Dry Mole Fraction:	0.968
Fo	Orsat Validation Value:	1.31
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.62

FIELD DATA

Meter Box Number: EN2 Meter Box dHa: 2.004
Dry Gas Meter Cal. Y: 0.985 Assumed Moisture: 3.00
Leak Test Rate, CFM: 0.008 Leak Test Vac, in Hg: 15.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	987.874	0.400	1.400	78.0	158.0
2	15	996.827	0.420	1.400	83.0	156.0
3	30	1006.430	0.430	1.500	88.0	163.0
4	45	1016.370	0.390	1.300	92.0	166.0
5	60	1025.980	0.440	1.500	95.0	165.0
6	75	1035.930	0.420	1.400	98.0	166.0
7	90	1095.790	0.430	1.500	99.0	170.0
8	95/OFF	1049.072				
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25	--	--	--	--	--	--
FINAL/AVG	95	61.198	0.418	1.429	90.4	163.4

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.240
A	Stack/Duct Area, in2:	13'9.5
Vs	Flue Gas Velocity, Ft/sec:	39.2
Qsd	Volumetric Air Flow Rate, Dry SCFM:	17470.9
Qaw	Volumetric Air Flow Rate, Wet ACFM:	21535.6
%I	Isokinetic Sampling Rate, %:	100.9
Vm(Dry)	Volume Gas Metered, Dry:	61.198
Vm(Std)	Volume Gas Metered, Std:	57.397

EMISSIONS RESULTS

ug	Cr+6	1.249	ug
mg/dscm	Concentration, mg/dscm:	0.768x	10-3
gr/dscf	Concentration, gr/dscf:	0.000x	10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.050x	10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.023x	10-3
ug	Cr	3.709	ug
mg/dscm	Concentration, mg/dscm:	2.282x	10-3
gr/dscf	Concentration, gr/dscf:	0.001x	10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.149x	10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.068x	10-3
ug		0.000	ug
mg/dscm	Concentration, mg/dscm:	0.000x	10-3
gr/dscm	Concentration, gr/dscm:	0.000x	10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x	10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x	10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **OUT-CR-10B** Date: 6-6-90
Sampling Location: Outlet Operator: MH
Net Run Time: 94 min Run Start Time: 1131
Num Sampling Points: 7 Run Stop Time: 1320

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.600

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	40.0
Vw(std)	Volume of Water Vapor, SCF:	1.883
%H2O	Moisture Content, % by Vol.:	3.18
%CO2	Percent CO2 by Volume, Dry:	4.50
%O2	Percent O2 by Volume, Dry:	15.00
Mfd	Dry Mole Fraction:	0.968
Fo	Orsat Validation Value:	1.31
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.62

FIELD DATA

Meter Box Number: EN18 Meter Box dHa: 1.934
Dry Gas Meter Cal. Y: 0.932 Assumed Moisture: 8.00
Leak Test Rate, CFM: 0.009 Leak Test Vac, in Hg: 15.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	257.591	0.400	1.400	78.0	158.0
2	15	267.250	0.420	1.400	83.0	156.0
3	30	277.610	0.430	1.500	88.0	163.0
4	45	288.200	0.390	1.300	92.0	166.0
5	60	298.190	0.440	1.500	94.0	165.0
6	75	308.750	0.420	1.400	97.0	170.0
7	90	319.240	0.430	1.500	98.0	166.0
8	94/OFF	322.055				
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23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	94	64.464	0.418	1.429	90.0	163.4

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.240
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	39.2
Qsd	Volumetric Air Flow Rate, Dry SCFM:	17470.0
Qaw	Volumetric Air Flow Rate, Wet ACFM:	21535.9
%I	Isokinetic Sampling Rate, %:	101.7
Vm(Dry)	Volume Gas Metered, Dry:	64.464
Vm(Std)	Volume Gas Metered, Std:	57.271

EMISSIONS RESULTS

ug	Cr+6	1.237 ug
mg/dscm	Concentration, mg/dscm:	0.763x 10-3
gr/dscf	Concentration, gr/dscf:	0.000x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.050x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.023x 10-3
ug	Cr	3.407 ug
mg/dscm	Concentration, mg/dscm:	2.101x 10-3
gr/dscf	Concentration, gr/dscf:	0.001x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.137x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.062x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **OUT-CR+6-10D** Date: 6/6/90
Sampling Location: Outlet Operator: RLM
Net Run Time: 95 min Run Start Time: 1131
Num Sampling Points: 7 Run Stop Time: 1320

Pressures:

Pbar	Barometric Pressure, in Hg:	29.800
Pg	Flue Gas Static Press, in H2O:	-0.350
Ps	Absolute Flue Gas Press. in Hg:	29.774

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	39.0
Vw(std)	Volume of Water Vapor, SCF:	1.836
%H2O	Moisture Content, % by Vol.:	3.35
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.966
fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.60

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.240
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	39.1
Qsd	Volumetric Air Flow Rate, Dry SCFM:	17492.4
Qaw	Volumetric Air Flow Rate, Wet ACFM:	21485.1
%I	Isokinetic Sampling Rate, %:	92.8
Vm(Dry)	Volume Gas Metered, Dry:	58.476
Vm(Std)	Volume Gas Metered, Std:	52.892

FIELD DATA

Meter Box Number: NU-2 Meter Box dHa: 1.820
Dry Gas Meter Cal. Y: 0.969 Assumed Moisture: 6.00
Leak Test Rate, CFM: 0.012 Leak Test Vac, in Hg: 15.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	233.653	0.400	1.230	94.0	158.0
2	15	241.350	0.420	1.290	95.0	158.0
3	30	251.331	0.430	1.320	102.0	163.0
4	45	260.502	0.390	1.160	107.0	166.0
5	60	269.732	0.440	1.300	110.0	165.0
6	75	279.505	0.420	1.250	114.0	170.0
7	90	288.999	0.430	1.280	114.0	166.0
8	95/OFF	292.129				
9	--	--	--	--	--	--
10	--	--	--	--	--	--
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23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	95	58.476	0.418	1.261	105.1	163.7

EMISSIONS RESULTS

ug	Cr+6	1.189 ug
mg/dscm	Concentration, mg/dscm:	0.794x 10-3
gr/dscf	Concentration, gr/dscf:	0.000x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.052x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.024x 10-3
ug	Cr	2.905 ug
mg/dscm	Concentration, mg/dscm:	1.939x 10-3
gr/dscf	Concentration, gr/dscf:	0.001x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.127x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.058x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **IN-RCCR+6-5A** Date: 6/3/90
Sampling Location: Inlet Operator: MAC
Net Run Time: 75 min Run Start Time: 1500
Num Sampling Points: 5 Run Stop Time: 1615

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	-0.010
Ps	Absolute Flue Gas Press. in Hg:	29.599

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	83.6
Vw(std)	Volume of Water Vapor, SCF:	3.935
%H2O	Moisture Content, % by Vol.:	12.99
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.870
Fc	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	28.44

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	14400.0
Vs	Flue Gas Velocity, Ft/sec:	24.3
Qsd	Volumetric Air Flow Rate, Dry SCFM:	52111.3
Qaw	Volumetric Air Flow Rate, Wet ACFM:	146014.4
%I	Isokinetic Sampling Rate, %:	87.9
Vm(Dry)	Volume Gas Metered, Dry:	28.793
Vm(Std)	Volume Gas Metered, Std:	26.348

FIELD DATA

Meter Box Number: RAC-1 Meter Box dHa: 1.851
Dry Gas Meter Cal. Y: 1.000 Assumed Moisture: 30.00
Leak Test Rate, CFM: 0.002 Leak Test Vac, in Hg: 12.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	271.100	0.080	0.450	100.0	800.0
2	15	276.061	0.080	0.500	110.0	670.0
3	30	282.965	0.080	0.450	115.0	834.0
4	45	288.941	0.070	0.350	118.0	900.0
5	60	294.474	0.070	0.370	113.0	863.0
6	75/OFF	299.893				
7	--	--	--	--	--	--
8	--	--	--	--	--	--
9	--	--	--	--	--	--
10	--	--	--	--	--	--
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24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	75	28.793	0.076	0.424	111.2	813.4

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	134.032
gr/dscf	Concentration, gr/dscf:	0.059
Lb/hr	Emission Rate,lb/hr PMRc:	26.158
Kg/hr	Emission Rate,Kg/hr PMRc:	11.865

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	134.032
gr/dscf	Concentration, gr/dscf:	0.059
Lb/hr	Emission Rate,Lb/hr PMRc:	26.158
Kg/hr	Emission Rate,Kg/hr PMRc:	11.865

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	134.032
gr/dscm	Concentration, gr/dscm:	0.059

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: Site 9 Run No.: IN-RCCR+6-5B Date: 6/3/90
Sampling Location: Inlet Operator: MAC
Net Run Time: 76 min Run Start Time: 1501
Num Sampling Points: 6 Run Stop Time: 1616

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	-0.010
Ps	Absolute Flue Gas Press. in Hg:	29.599

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	99.1
Vw(std)	Volume of Water Vapor, SCF:	4.665
%H2O	Moisture Content, % by Vol.:	14.49
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.855
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	28.26

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	14400.0
Vs	Flue Gas Velocity, Ft/sec:	24.4
Qsd	Volumetric Air Flow Rate, Dry SCFM:	50748.7
Qaw	Volumetric Air Flow Rate, Wet ACFM:	146329.5
%I	Isokinetic Sampling Rate, %:	93.0
Vm(Dry)	Volume Gas Metered, Dry:	28.379
Vm(Std)	Volume Gas Metered, Std:	27.520

FIELD DATA

Meter Box Number: RAC 5 Meter Box dHa: 1.869
Dry Gas Meter Cal. Y: 1.061 Assumed Moisture: 30.00
Leak Test Rate, CFM: 0.002 Leak Test Vac, in Hg: 12.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	1	384.500	0.080	0.450	100.0	800.0
2	16	392.891	0.080	0.500	110.0	670.0
3	31	399.252	0.080	0.450	115.0	834.0
4	46	403.523	0.070	0.150	115.0	900.0
5	50	404.473	0.070	0.360	115.0	900.0
6	61	407.267	0.070	0.370	115.0	863.0
7	76/OFF	412.879				
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24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	76	28.379	0.075	0.380	111.7	827.8

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	128.324
gr/dscf	Concentration, gr/dscf:	0.056
Lb/hr	Emission Rate,Lb/hr PMRc:	24.389
Kg/hr	Emission Rate,Kg/hr PMRc:	11.063

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	128.324
gr/dscf	Concentration, gr/dscf:	0.056
Lb/hr	Emission Rate,Lb/hr PMRc:	24.389
Kg/hr	Emission Rate,Kg/hr PMRc:	11.063

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	128.324
gr/dscm	Concentration, gr/dscm:	0.056
Lb/hr	Emission Rate,Lb/hr PMRc:	24.389

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **IN-RCCR+6-5C** Date: 6/3/90
Sampling Location: INlet Operator: MAC
Net Run Time: 77 min Run Start Time: 1502
Num Sampling Points: 5 Run Stop Time: 1617

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	-0.010
Ps	Absolute Flue Gas Press. in Hg:	29.599

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	146.9
Vw(std)	Volume of Water Vapor, SCF:	6.915
%H2O	Moisture Content, % by Vol.:	19.91
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole fraction:	0.801
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	27.61

FIELD DATA

Meter Box Number:	RAC 2	Meter Box dHa:	1.858
Dry Gas Meter Cal. Y:	1.056	Assumed Moisture:	30.00
Leak Test Rate, CFM:	0.008	Leak Test Vac, in Hg:	12.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	2	208.000	0.080	0.450	100.0	800.0
2	17	213.899	0.080	0.500	110.0	670.0
3	32	220.195	0.080	0.450	115.0	834.0
4	47	226.164	0.070	0.360	115.0	900.0
5	62	231.755	0.070	0.370	115.0	863.0
6	77/OFF	236.777				
7	--	--	--	--	--	--
8	--	--	--	--	--	--
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25	--	--	--	--	--	--
FINAL/AVG	77	28.777	0.076	0.426	111.0	813.4

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	14400.0
Vs	Flue Gas Velocity, Ft/sec:	24.7
Qsd	Volumetric Air Flow Rate, Dry SCFM:	48685.7
Qaw	Volumetric Air Flow Rate, Wet ACFM:	148191.9
%I	Isokinetic Sampling Rate, %:	96.7
Vm(Dry)	Volume Gas Metered, Dry:	28.777
Vm(Std)	Volume Gas Metered, Std:	27.818

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	126.950
gr/dscf	Concentration, gr/dscf:	0.055
Lb/hr	Emission Rate,lb/hr PMRc:	23.147
Kg/hr	Emission Rate,Kg/hr PMRc:	10.499

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	126.950
gr/dscf	Concentration, gr/dscf:	0.055
Lb/hr	Emission Rate,Lb/hr PMRc:	23.147
Kg/hr	Emission Rate,Kg/hr PMRc:	10.499

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	126.950
gr/dscm	Concentration, gr/dscm:	0.055

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site9** Run No.: **MID-CR-5A** Date: 6-3-90
Sampling Location: Midpoint Operator: GV
Net Run Time: 120 min Run Start Time: 1447
Num Sampling Points: 8 Run Stop Time: 1647

Pressures:

Pbar	Barometric Pressure, in Hg:	29.490
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.284

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	46.3
Vw(std)	Volume of Water Vapor, SCF:	2.179
%H2O	Moisture Content, % by Vol.:	4.35
%CO2	Percent CO2 by Volume, Dry:	4.50
%O2	Percent O2 by Volume, Dry:	15.00
Mfd	Dry Mole Fraction:	0.956
Fo	Orsat Validation Value:	1.31
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.48

FIELD DATA

Meter Box Number:	A1	Meter Box dHa:	2.270
Dry Gas Meter Cal. Y:	0.986	Assumed Moisture:	8.00
Leak Test Rate, CFM:	0.001	Leak Test Vac, in Hg:	10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	984.432	0.360	1.200	100.0	75.0
2	15	992.728	0.360	1.150	100.0	75.0
3	30	1000.374	0.320	0.900	100.0	82.0
4	45	107.009	0.360	0.600	100.0	89.0
5	60	10012.930	0.320	0.600	100.0	78.0
6	75	1018.588	0.360	0.600	100.0	81.0
7	90	1023.743	0.360	0.500	100.0	84.0
8	105	1028.372	0.260	0.400	100.0	84.0
9	120/OFF	1036.612				
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25	--	--	--	--	--	--
FINAL/AVG	120	52.180	0.337	0.744	100.0	81.0

ISOKINETIC DATA

	Nozzle Number:	t-28
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	34.2
Qsd	Volumetric Air Flow Rate, Dry SCFM:	15991.9
Qaw	Volumetric Air Flow Rate, Wet ACFM:	18786.1
%I	Isokinetic Sampling Rate, %:	69.9
Vm(Dry)	Volume Gas Metered, Dry:	52.180
Vm(Std)	Volume Gas Metered, Std:	47.906

EMISSIONS RESULTS

ug	Cr+6	3.330 ug
mg/dscm	Concentration, mg/dscm:	2.455x 10-3
gr/dscf	Concentration, gr/dscf:	0.001x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.147x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.067x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscf	Concentration, gr/dscf:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-CR-5B** Date: 6-3-90
Sampling Location: Midpoint Operator: GB
Net Run Time: 122 min Run Start Time: 1449
Num Sampling Points: 8 Run Stop Time: 1649

Pressures:

Pbar	Barometric Pressure, in Hg:	29.490
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.284

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	70.9
Vw(std)	Volume of Water Vapor, SCF:	3.337
%H2O	Moisture Content, % by Vol.:	4.66
%CO2	Percent CO2 by Volume, Dry:	4.50
%O2	Percent O2 by Volume, Dry:	15.00
Mfd	Dry Mole Fraction:	0.953
Fo	Orsat Validation Value:	1.31
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.44

FIELD DATA

Meter Box Number:	A2	Meter Box dHa:	2.047
Dry Gas Meter Cal. Y:	1.024	Assumed Moisture:	8.00
Leak Test Rate, CFM:	0.002	Leak Test Vac, in Hg:	10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	773.526	0.360	1.500	100.0	76.0
2	15	783.382	0.360	1.500	100.0	75.0
3	30	792.912	0.250	1.000	100.0	83.0
4	45	800.791	0.360	1.400	100.0	84.0
5	60	809.892	0.320	1.300	100.0	79.0
6	75	818.881	0.360	1.500	100.0	81.0
7	90	827.861	0.360	1.300	100.0	81.0
8	105	836.722	0.270	1.100	100.0	86.0
9	122/OFF	845.039				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
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24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	122	71.513	0.329	1.325	100.0	80.6

ISOKINETIC DATA

	Nozzle Number:	t-27
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	33.8
Qsd	Volumetric Air Flow Rate, Dry SCFM:	15763.3
Qaw	Volumetric Air Flow Rate, Wet ACFM:	18564.8
%I	Isokinetic Sampling Rate, %:	99.4
Vm(Dry)	Volume Gas Metered, Dry:	71.513
Vm(Std)	Volume Gas Metered, Std:	68.270

EMISSIONS RESULTS

ug	Cr+6	1.082 ug
mg/dscm	Concentration, mg/dscm:	0.560x 10-3
gr/dscf	Concentration, gr/dscf:	0.000x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.033x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.015x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscf	Concentration, gr/dscf:	0.000x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-CR-5C** Date: 6-3-90
Sampling Location: Midpoint Operator: GB
Net Run Time: 120 min Run Start Time: 1451
Num Sampling Points: 8 Run Stop Time: 1651

Pressures:

Pbar	Barometric Pressure, in Hg:	29.490
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.284

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	88.6
Vw(std)	Volume of Water Vapor, SCF:	4.170
%H2O	Moisture Content, % by Vol.:	5.56
%CO2	Percent CO2 by Volume, Dry:	4.50
%O2	Percent O2 by Volume, Dry:	15.00
Mfd	Dry Mole Fraction:	0.944
Fo	Orsat Validation Value:	1.31
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.33

FIELD DATA

Meter Box Number: B1 Meter Box dHa: 2.004
Dry Gas Meter Cal. Y: 1.034 Assumed Moisture: 8.00
Leak Test Rate, CFM: 0.001 Leak Test Vac, in Hg: 10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	190.972	0.360	1.500	100.0	76.0
2	15	200.957	0.360	1.500	100.0	75.0
3	30	210.424	0.250	1.000	100.0	83.0
4	45	218.502	0.360	1.500	100.0	81.0
5	60	228.502	0.320	1.300	100.0	81.0
6	75	232.082	0.350	1.500	100.0	82.0
7	90	246.691	0.360	1.500	100.0	84.0
8	105	256.352	0.270	1.100	100.0	87.0
9	120/OFF	264.418				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
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25	--	--	--	--	--	--
FINAL/AVG	120	73.446	0.327	1.362	100.0	81.1

ISOKINETIC DATA

	Nozzle Number:	t-30
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	33.8
Qsd	Volumetric Air Flow Rate, Dry SCFM:	15606.9
Qaw	Volumetric Air Flow Rate, Wet ACFM:	18573.6
%I	Isokinetic Sampling Rate, %:	105.8
Vm(Dry)	Volume Gas Metered, Dry:	73.446
Vm(Std)	Volume Gas Metered, Std:	70.779

EMISSIONS RESULTS

ug	Cr+6	2.816 ug
mg/dscm	Concentration, mg/dscm:	1.405x 10-3
gr/dscf	Concentration, gr/dscf:	0.001x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.082x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.037x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscf	Concentration, gr/dscf:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-CR-5D** Date: 6/3/90
Sampling Location: Midpoint Operator: GCB
Net Run Time: 120 min Run Start Time: 1453
Num Sampling Points: 8 Run Stop Time: 1653

Pressures:

Pbar	Barometric Pressure, in Hg:	29.490
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.284

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	70.4
Vw(std)	Volume of Water Vapor, SCF:	3.314
%H20	Moisture Content, % by Vol.:	5.19
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.948
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.38

FIELD DATA

Meter Box Number:	B-2	Meter Box dHa:	2.215
Dry Gas Meter Cal. Y:	1.000	Assumed Moisture:	7.00
Leak Test Rate, CFM:	0.003	Leak Test Vac, in Hg:	10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H20)	Delta H (in H20)	Gas Meter Temp (oF)	Stack Temp (oF)
1	6	569.337	0.360	1.500	100.0	76.0
2	21	578.201	0.300	1.200	100.0	75.0
3	36	585.887	0.250	1.000	100.0	83.0
4	51	593.192	0.360	1.500	100.0	81.0
5	66	601.815	0.320	1.300	100.0	82.0
6	81	609.978	0.320	1.300	100.0	84.0
7	96	618.191	0.360	1.500	100.0	84.0
8	111	626.704	0.270	1.100	100.0	89.0
9	120/OFF	634.332				
10	--	--	--	--	--	--
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25	--	--	--	--	--	--
FINAL/AVG	120	64.995	0.316	1.300	100.0	81.7

ISOKINETIC DATA

	Nozzle Number:	T-31
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	33.2
Qsd	Volumetric Air Flow Rate, Dry SCFM:	15380.8
Qaw	Volumetric Air Flow Rate, Wet ACFM:	18252.7
%I	Isokinetic Sampling Rate, %:	91.9
Vm(Dry)	Volume Gas Metered, Dry:	64.995
Vm(Std)	Volume Gas Metered, Std:	60.572

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	58.302
gr/dscf	Concentration, gr/dscf:	0.025
Lb/hr	Emission Rate,Lb/hr PMRc:	3.358
Kg/hr	Emission Rate,Kg/hr PMRc:	1.523

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	58.302
gr/dscf	Concentration, gr/dscf:	0.025
Lb/hr	Emission Rate,Lb/hr PMRc:	3.358
Kg/hr	Emission Rate,Kg/hr PMRc:	1.523

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	58.302
gr/dscm	Concentration, gr/dscm:	0.025
Lb/hr	Emission Rate,Lb/hr PMRc:	3.358
Kg/hr	Emission Rate,Kg/hr PMRc:	1.523

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **OUT-CR-5A** Date: 6-3-90
Sampling Location: Outlet Operator: RM
Net Run Time: 120 min Run Start Time: 1455
Num Sampling Points: 8 Run Stop Time: 1655

Pressures:

Pbar	Barometric Pressure, in Hg:	29.490
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.490

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	65.3
Vw(std)	Volume of Water Vapor, SCF:	3.074
%H2O	Moisture Content, % by Vol.:	4.30
%CO2	Percent CO2 by Volume, Dry:	4.50
%O2	Percent O2 by Volume, Dry:	15.00
Mfd	Dry Mole Fraction:	0.957
Fo	Orsat Validation Value:	1.31
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.48

FIELD DATA

Meter Box Number: En2 Meter Box dHa: 1.985
Dry Gas Meter Cal. Y: 0.985 Assumed Moisture: 3.00
Leak Test Rate, CFM: 0.000 Leak Test Vac, in Hg: 15.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	711.785	0.450	1.400	77.0	127.0
2	15	721.292	0.400	1.400	82.0	129.0
3	30	729.292	0.330	1.000	88.0	137.0
4	45	738.384	0.380	1.200	92.0	135.0
5	60	746.235	0.370	1.200	94.0	136.0
6	75	756.212	0.360	1.300	95.0	131.0
7	90	765.620	0.400	1.400	96.0	131.0
8	105	775.242	0.350	1.200	95.0	146.0
9	120/OFF	785.015				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
15	--	--	--	--	--	--
16	--	--	--	--	--	--
17	--	--	--	--	--	--
18	--	--	--	--	--	--
19	--	--	--	--	--	--
20	--	--	--	--	--	--
21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	73.230	0.379	1.262	89.9	134.0

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.250
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	36.6
Qsd	Volumetric Air Flow Rate, Dry SCFM:	16849.7
Qaw	Volumetric Air Flow Rate, Wet ACFM:	20095.6
%I	Isokinetic Sampling Rate, %:	91.0
Vm(Dry)	Volume Gas Metered, Dry:	73.230
Vm(Std)	Volume Gas Metered, Std:	68.468

EMISSIONS RESULTS

ug	Cr+6	1.886 ug
mg/dscm	Concentration, mg/dscm:	0.973x 10-3
gr/dscf	Concentration, gr/dscf:	0.000x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.061x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.028x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscf	Concentration, gr/dscf:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **OUT-CR-5B** Date: 6-3-90
Sampling Location: Outlet Operator: RH
Net Run Time: 120 min Run Start Time: 1450
Num Sampling Points: 8 Run Stop Time: 1650

Pressures:

Pbar	Barometric Pressure, in Hg:	29.490
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.490

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	78.7
Vw(std)	Volume of Water Vapor, SCF:	3.704
%H2O	Moisture Content, % by Vol.:	5.09
%CO2	Percent CO2 by Volume, Dry:	4.50
%O2	Percent O2 by Volume, Dry:	15.00
Mfd	Dry Mole Fraction:	0.949
Fo	Orsat Validation Value:	1.31
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.39

FIELD DATA

Meter Box Number:	EN1	Meter Box dHa:	1.934
Dry Gas Meter Cal. Y:	0.932	Assumed Moisture:	3.00
Leak Test Rate, CFM:	0.000	Leak Test Vac, in Hg:	15.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	968.468	0.400	1.400	78.0	128.0
2	15	978.328	0.370	1.400	83.0	133.0
3	30	987.442	0.340	1.000	86.0	138.0
4	45	996.555	0.380	1.200	90.0	134.0
5	60	1005.834	0.000	1.200	93.0	137.0
6	75	1015.615	0.360	1.300	93.0	132.0
7	90	1025.702	0.400	1.400	95.0	137.0
8	105	1036.137	0.350	1.200	95.0	147.0
9	120/OFF	1046.389				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
15	--	--	--	--	--	--
16	--	--	--	--	--	--
17	--	--	--	--	--	--
18	--	--	--	--	--	--
19	--	--	--	--	--	--
20	--	--	--	--	--	--
21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	77.921	0.284	1.262	89.1	135.7

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.250
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	31.7
Qsd	Volumetric Air Flow Rate, Dry SCFM:	14465.8
Qaw	Volumetric Air Flow Rate, Wet ACFM:	17448.4
%I	Isokinetic Sampling Rate, %:	106.9
Vm(Dry)	Volume Gas Metered, Dry:	77.921
Vm(Std)	Volume Gas Metered, Std:	69.051

EMISSIONS RESULTS

ug	Cr+6	3.179 ug
mg/dscm	Concentration, mg/dscm:	1.626x 10-3
gr/dscf	Concentration, gr/dscf:	0.001x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.088x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.040x 10-3

ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscf	Concentration, gr/dscf:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **OUT-CR-5C** Date: 6-3-90
Sampling Location: Outlet Operator: BD
Net Run Time: 120 min Run Start Time: 1457
Num Sampling Points: 8 Run Stop Time: 1657

Pressures:

Pbar	Barometric Pressure, in Hg:	29.490
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.490

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	53.8
Vw(std)	Volume of Water Vapor, SCF:	2.532
%H2O	Moisture Content, % by Vol.:	3.34
%CO2	Percent CO2 by Volume, Dry:	4.50
%O2	Percent O2 by Volume, Dry:	15.00
Mfd	Dry Mole Fraction:	0.967
Fo	Orsat Validation Value:	1.31
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.60

FIELD DATA

Meter Box Number: N16 Meter Box dHa: 1.762
Dry Gas Meter Cal. Y: 0.996 Assumed Moisture: 3.00
Leak Test Rate, CFM: 0.000 Leak Test Vac, in Hg: 10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	227.516	0.450	1.400	78.0	128.0
2	15	237.600	0.420	1.400	83.0	133.0
3	30	246.632	0.300	1.000	85.0	140.0
4	45	255.715	0.350	1.200	96.0	135.0
5	60	265.715	0.360	1.200	99.0	139.0
6	75	274.092	0.400	1.300	100.0	132.0
7	90	285.023	0.390	1.400	101.0	138.0
8	105	295.248	0.340	1.200	100.0	147.0
9	120/OFF	305.448				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
15	--	--	--	--	--	--
16	--	--	--	--	--	--
17	--	--	--	--	--	--
18	--	--	--	--	--	--
19	--	--	--	--	--	--
20	--	--	--	--	--	--
21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	77.932	0.375	1.262	92.7	136.5

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.250
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	36.3
Qsd	Volumetric Air Flow Rate, Dry SCFM:	16852.0
QaW	Volumetric Air Flow Rate, Wet ACFM:	19983.7
%I	Isokinetic Sampling Rate, %:	97.4
Vm(Dry)	Volume Gas Metered, Dry:	77.932
Vm(Std)	Volume Gas Metered, Std:	73.258

EMISSIONS RESULTS

ug	Cr+6	3.092 ug
mg/dscm	Concentration, mg/dscm:	1.491x 10-3
gr/dscf	Concentration, gr/dscf:	0.001x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.094x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.043x 10-3

ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscf	Concentration, gr/dscf:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **OUT-RCCR+6-5D** Date: 6/3/90
Sampling Location: OUtlet Operator: BD
Net Run Time: 120 min Run Start Time: 1458
Num Sampling Points: 8 Run Stop Time: 1658

Pressures:

Pbar	Barometric Pressure, in Hg:	29.490
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.490

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	31.6
Vw(std)	Volume of Water Vapor, SCF:	1.487
%H2O	Moisture Content, % by Vol.:	2.07
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.979
Fo	Orsat Validation Value:	1.38
Mc	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.75

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.250
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	36.0
Qsd	Volumetric Air Flow Rate, Dry SCFM:	16910.1
Qaw	Volumetric Air Flow Rate, Wet ACFM:	19770.7
%I	Isokinetic Sampling Rate, %:	93.4
Vm(Dry)	Volume Gas Metered, Dry:	76.820
Vm(Std)	Volume Gas Metered, Std:	70.494

FIELD DATA

Meter Box Number: NU 7 Meter Box dHa: 1.887
Dry Gas Meter Cal. Y: 0.969 Assumed Moisture: 7.00
Leak Test Rate, CFM: 0.000 Leak Test Vac, in Hg: 15.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	957.668	0.430	1.400	76.0	127.0
2	15	967.455	0.400	1.400	81.0	133.0
3	30	976.284	0.320	1.000	87.0	140.0
4	45	985.252	0.350	1.200	94.0	134.0
5	60	994.459	0.340	1.200	95.0	136.0
6	75	1003.932	0.380	1.200	97.0	135.0
7	90	1013.755	0.390	1.400	100.0	139.0
8	105	1023.853	0.350	1.200	100.0	143.0
9	120/OFF	1034.488				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
15	--	--	--	--	--	--
16	--	--	--	--	--	--
17	--	--	--	--	--	--
18	--	--	--	--	--	--
19	--	--	--	--	--	--
20	--	--	--	--	--	--
21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	76.820	0.369	1.250	91.2	135.9

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	50.096
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,lb/hr PMRc:	3.173
Kg/hr	Emission Rate,Kg/hr PMRc:	1.439

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	50.096
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	3.173
Kg/hr	Emission Rate,Kg/hr PMRc:	1.439

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	50.096
gr/dscm	Concentration, gr/dscm:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	3.173
Kg/hr	Emission Rate,Kg/hr PMRc:	1.439

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-MM5-7A** Date: 6/4/90
Sampling Location: Midpoint Operator: GCB
Net Run Time: 120 min Run Start Time: 1718
Num Sampling Points: 24 Run Stop Time: 1918

Pressures:

Pbar	Barometric Pressure, in Hg:	29.200
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	26.994

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	72.0
Vw(std)	Volume of Water Vapor, SCF:	3.389
%H20	Moisture Content, % by Vol.:	4.58
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.954
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.45

FIELD DATA

Meter Box Number:	A-2	Meter Box dHa:	2.047
Dry Gas Meter Cal. Y:	1.024	Assumed Moisture:	7.00
Leak Test Rate, CFM:	0.015	Leak Test Vac, in Hg:	10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H20)	Delta H (in H20)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	889.542	0.360	1.500	98.0	86.0
2	5	892.249	0.360	1.500	98.0	86.0
3	10	895.398	0.360	1.500	98.0	86.0
4	15	898.552	0.360	1.400	98.0	90.0
5	20	901.663	0.360	1.400	98.0	92.0
6	25	904.765	0.360	1.400	98.0	92.0
7	30	907.873	0.360	1.400	98.0	92.0
8	35	910.978	0.360	1.400	98.0	92.0
9	40	914.092	0.360	1.400	98.0	92.0
10	45	917.212	0.360	1.400	98.0	91.0
11	50	920.321	0.360	1.400	98.0	91.0
12	55	923.431	0.360	1.400	98.0	90.0
13	60	926.564	0.360	1.400	98.0	90.0
14	65	929.692	0.360	1.400	98.0	90.0
15	70	932.811	0.360	1.400	98.0	90.0
16	75	935.931	0.360	1.400	98.0	92.0
17	80	939.028	0.360	1.400	98.0	92.0
18	85	942.128	0.360	1.400	98.0	92.0
19	90	945.248	0.360	1.400	98.0	92.0
20	95	948.362	0.360	1.400	98.0	92.0
21	100	951.502	0.360	1.400	98.0	91.0
22	105	954.642	0.360	1.400	98.0	88.0
23	110	957.790	0.360	1.400	98.0	88.0
24	115	960.918	0.360	1.400	98.0	87.0
25	120/OFF	964.018				
FINAL/AVG	120	74.476	0.360	1.412	98.0	90.2

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	35.8
Qsd	Volumetric Air Flow Rate, Dry SCFM:	16282.1
Qaw	Volumetric Air Flow Rate, Wet ACFM:	19706.4
%I	Isokinetic Sampling Rate, %:	101.2
Vm(Dry)	Volume Gas Metered, Dry:	74.476
Vm(Std)	Volume Gas Metered, Std:	70.670

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	49.972
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,lb/hr PMRc:	3.047
Kg/hr	Emission Rate,Kg/hr PMRc:	1.382

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	49.972
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	3.047
Kg/hr	Emission Rate,Kg/hr PMRc:	1.382

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	49.972
gr/dscm	Concentration, gr/dscm:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	3.047
Kg/hr	Emission Rate,Kg/hr PMRc:	1.382

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site9** Run No.: **OUT-MM5-7C** Date: 6/6/90
Sampling Location: OUTLET Operator: RLM
Net Run Time: 100 min Run Start Time: 0830
Num Sampling Points: 21 Run Stop Time: 1015

Pressures:

Pbar	Barometric Pressure, in Hg:	29.800
Pg	Flue Gas Static Press. in H2O:	-0.380
Ps	Absolute Flue Gas Press. in Hg:	29.772

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	63.4
Vw(std)	Volume of Water Vapor, SCF:	2.984
%H2O	Moisture Content, % by Vol.:	4.16
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.958
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.50

FIELD DATA

Meter Box Number:	M-16	Meter Box dHa:	1.762
Dry Gas Meter Cal. Y:	0.996	Assumed Moisture:	6.00
Leak Test Rate, CFM:	0.002	Leak Test Vac, in Hg:	8.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	629.852	0.440	1.350	62.0	137.0
2	5	633.115	0.420	1.290	66.0	138.0
3	10	636.198	0.450	1.380	70.0	138.0
4	15	639.511	0.440	1.350	75.0	139.0
5	20	642.815	0.430	1.340	80.0	139.0
6	25	646.141	0.460	1.430	82.0	140.0
7	30	649.535	0.440	1.350	84.0	140.0
8	35	652.946	0.420	1.290	87.0	140.0
9	40	656.173	0.450	1.400	88.0	135.0
10	45	659.509	0.430	1.380	90.0	129.0
11	50	662.844	0.420	1.360	92.0	137.0
12	55	666.215	0.450	1.450	94.0	139.0
13	60	669.675	0.470	1.520	95.0	139.0
14	65	673.312	0.480	1.550	97.0	139.0
15	70	676.819	0.480	1.550	98.0	141.0
16	75	680.414	0.460	1.480	99.0	128.0
17	80	683.920	0.470	1.520	100.0	123.0
18	85	687.595	0.460	1.540	102.0	118.0
19	90	691.259	0.440	1.420	102.0	135.0
20	95	694.548	0.470	1.520	103.0	141.0
21	100	698.079	0.480	1.550	104.0	144.0
22	100/OFF	701.792				
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	100	71.940	0.450	1.430	89.0	136.1

ISOKINETIC DATA

	Nozzle Number:	T-8
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.243
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	39.7
Qsd	Volumetric Air Flow Rate, Dry SCFM:	18436.2
Qaw	Volumetric Air Flow Rate, Wet ACFM:	21826.1
%I	Isokinetic Sampling Rate, %:	106.2
Vm(Dry)	Volume Gas Metered, Dry:	71.940
Vm(Std)	Volume Gas Metered, Std:	68.823

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	51.312
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	3.543
Kg/hr	Emission Rate,Kg/hr PMRc:	1.607

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	51.312
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	3.543
Kg/hr	Emission Rate,Kg/hr PMRc:	1.607

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	51.312
gr/dscm	Concentration, gr/dscm:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	3.543
Kg/hr	Emission Rate,Kg/hr PMRc:	1.607

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **OUT-MM5-7A** Date: 6/4/90
Sampling Location: Outlet Operator: RLM
Net Run Time: 120 min Run Start Time: 1715
Num Sampling Points: 8 Run Stop Time: 1915

Pressures:

Pbar	Barometric Pressure, in Hg:	29.300
Pg	Flue Gas Static Press. in H2O:	-0.250
Ps	Absolute Flue Gas Press. in Hg:	29.282

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	81.5
Vw(std)	Volume of Water Vapor, SCF:	3.836
%H2O	Moisture Content, % by Vol.:	3.62
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.964
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.57

FIELD DATA

Meter Box Number: N-16 Meter Box dHa: 1.762
Dry Gas Meter Cal. Y: 0.996 Assumed Moisture: 6.00
Leak Test Rate, CFM: 0.006 Leak Test Vac, in Hg: 8.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	354.800	0.750	2.340	80.0	135.0
2	15	368.021	0.770	2.400	85.0	142.0
3	30	382.111	0.800	2.500	94.0	145.0
4	45	395.129	0.850	2.650	100.0	141.0
5	60	409.278	0.820	2.560	104.0	141.0
6	75	423.223	0.780	2.430	105.0	142.0
7	90	436.929	0.800	2.500	106.0	145.0
8	105	450.717	0.830	2.590	106.0	143.0
9	120/OFF	464.722				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
15	--	--	--	--	--	--
16	--	--	--	--	--	--
17	--	--	--	--	--	--
18	--	--	--	--	--	--
19	--	--	--	--	--	--
20	--	--	--	--	--	--
21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	109.922	0.800	2.496	97.5	141.7

ISOKINETIC DATA

	Nozzle Number:	T-5
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.242
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	53.5
Qsd	Volumetric Air Flow Rate, Dry SCFM:	24361.8
Qaw	Volumetric Air Flow Rate, Wet ACFM:	29435.8
%I	Isokinetic Sampling Rate, %:	100.2
Vm(Dry)	Volume Gas Metered, Dry:	109.922
Vm(Std)	Volume Gas Metered, Std:	102.105

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	34.587
gr/dscf	Concentration, gr/dscf:	0.015
Lb/hr	Emission Rate,Lb/hr PMRc:	3.156
Kg/hr	Emission Rate,Kg/hr PMRc:	1.431

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	34.587
gr/dscf	Concentration, gr/dscf:	0.015
Lb/hr	Emission Rate,Lb/hr PMRc:	3.156
Kg/hr	Emission Rate,Kg/hr PMRc:	1.431

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	34.587
gr/dscm	Concentration, gr/dscm:	0.015
Lb/hr	Emission Rate,Lb/hr PMRc:	3.156
Kg/hr	Emission Rate,Kg/hr PMRc:	1.431

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-MM5-7A** Date: 6/4/90
Sampling Location: Midpoint Operator: GCB
Net Run Time: 120 min Run Start Time: 1718
Num Sampling Points: 24 Run Stop Time: 1918

Pressures:

Pbar	Barometric Pressure, in Hg:	29.200
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	26.994

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	72.0
Vw(std)	Volume of Water Vapor, SCF:	3.389
%H2O	Moisture Content, % by Vol.:	4.58
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.954
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.45

FIELD DATA

Meter Box Number: A-2 Meter Box dHa: 2.047
Dry Gas Meter Cal. Y: 1.024 Assumed Moisture: 7.00
Leak Test Rate, CFM: 0.015 Leak Test Vac, in Hg: 10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	889.542	0.360	1.500	98.0	86.0
2	5	892.249	0.360	1.500	98.0	86.0
3	10	895.398	0.360	1.500	98.0	86.0
4	15	898.552	0.360	1.400	98.0	90.0
5	20	901.663	0.360	1.400	98.0	92.0
6	25	904.765	0.360	1.400	98.0	92.0
7	30	907.873	0.360	1.400	98.0	92.0
8	35	910.978	0.360	1.400	98.0	92.0
9	40	914.092	0.360	1.400	98.0	92.0
10	45	917.212	0.360	1.400	98.0	91.0
11	50	920.321	0.360	1.400	98.0	91.0
12	55	923.431	0.360	1.400	98.0	90.0
13	60	926.564	0.360	1.400	98.0	90.0
14	65	929.692	0.360	1.400	98.0	90.0
15	70	932.811	0.360	1.400	98.0	90.0
16	75	935.931	0.360	1.400	98.0	92.0
17	80	939.028	0.360	1.400	98.0	92.0
18	85	942.128	0.360	1.400	98.0	92.0
19	90	945.248	0.360	1.400	98.0	92.0
20	95	948.362	0.360	1.400	98.0	92.0
21	100	951.502	0.360	1.400	98.0	91.0
22	105	954.642	0.360	1.400	98.0	88.0
23	110	957.790	0.360	1.400	98.0	88.0
24	115	960.918	0.360	1.400	98.0	87.0
25	120/OFF	964.018				
FINAL/AVG	120	74.476	0.360	1.412	98.0	90.2

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	35.8
Qsd	Volumetric Air Flow Rate, Dry SCFM:	16282.1
Qaw	Volumetric Air Flow Rate, Wet ACFM:	19706.4
%I	Isokinetic Sampling Rate, %:	101.2
Vm(Dry)	Volume Gas Metered, Dry:	74.476
Vm(Std)	Volume Gas Metered, Std:	70.670

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	49.972
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,lb/hr PMRc:	3.047
Kg/hr	Emission Rate,Kg/hr PMRc:	1.382

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	49.972
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	3.047
Kg/hr	Emission Rate,Kg/hr PMRc:	1.382

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	49.972
gr/dscm	Concentration, gr/dscm:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	3.047
Kg/hr	Emission Rate,Kg/hr PMRc:	1.382

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-MM5-7C** Date: 6/6/90
Sampling Location: Midpoint Operator: GCB
Net Run Time: 120 min Run Start Time: 0817
Num Sampling Points: 24 Run Stop Time: 1017

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.394

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	91.0
Vw(std)	Volume of Water Vapor, SCF:	4.283
%H2O	Moisture Content, % by Vol.:	5.80
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.942
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.30

FIELD DATA

Meter Box Number: A-2 Meter Box dHa: 2.047
Dry Gas Meter Cal. Y: 1.024 Assumed Moisture: 7.00
Leak Test Rate, CFM: 0.001 Leak Test Vac, in Hg: 10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	115.625	0.280	1.100	88.0	86.0
2	5	118.282	0.280	1.100	88.0	91.0
3	10	120.938	0.300	1.200	88.0	90.0
4	15	123.751	0.350	1.350	88.0	89.0
5	20	126.696	0.330	1.300	88.0	86.0
6	25	129.642	0.330	1.300	88.0	88.0
7	30	132.583	0.330	1.300	88.0	88.0
8	35	135.521	0.330	1.300	88.0	88.0
9	40	138.487	0.330	1.300	88.0	88.0
10	45	141.489	0.330	1.300	90.0	88.0
11	50	144.372	0.330	1.300	90.0	89.0
12	55	147.323	0.330	1.300	90.0	89.0
13	60	150.301	0.330	1.300	90.0	88.0
14	65	163.258	0.330	1.300	90.0	89.0
15	70	156.202	0.360	1.400	90.0	89.0
16	75	159.257	0.360	1.400	90.0	89.0
17	80	162.342	0.360	1.400	90.0	89.0
18	85	165.421	0.360	1.400	90.0	88.0
19	90	168.482	0.360	1.400	90.0	90.0
20	95	171.558	0.360	1.400	90.0	89.0
21	100	174.705	0.360	1.400	90.0	89.0
22	105	177.782	0.360	1.400	90.0	89.0
23	110	180.792	0.360	1.400	90.0	89.0
24	115	183.832	0.360	1.400	90.0	88.0
25	120/OFF	186.886				
FINAL/AVG	120	71.261	0.337	1.323	89.2	88.6

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	34.5
Qsd	Volumetric Air Flow Rate, Dry SCFM:	15739.6
Qaw	Volumetric Air Flow Rate, Wet ACFM:	18960.0
%I	Isokinetic Sampling Rate, %:	103.2
Vm(Dry)	Volume Gas Metered, Dry:	71.261
Vm(Std)	Volume Gas Metered, Std:	69.618

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	50.726
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	2.990
Kg/hr	Emission Rate,Kg/hr PMRc:	1.356
mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	50.726
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	2.990
Kg/hr	Emission Rate,Kg/hr PMRc:	1.356
mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	50.726
gr/dscm	Concentration, gr/dscm:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	2.990
Kg/hr	Emission Rate,Kg/hr PMRc:	1.356

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **OUT-MM5-7A** Date: 6/4/90
Sampling Location: Outlet Operator: RLM
Net Run Time: 120 min Run Start Time: 1715
Num Sampling Points: 8 Run Stop Time: 1915

Pressures:

Pbar	Barometric Pressure, in Hg:	29.300
Pg	Flue Gas Static Press. in H2O:	-0.250
Ps	Absolute Flue Gas Press. in Hg:	29.282

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	81.5
Vw(std)	Volume of Water Vapor, SCF:	3.836
%H2O	Moisture Content, % by Vol.:	3.62
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.964
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.57

FIELD DATA

Meter Box Number:	M-16	Meter Box dHa:	1.762
Dry Gas Meter Cal. Y:	0.996	Assumed Moisture:	6.00
Leak Test Rate, CFM:	0.006	Leak Test Vac, in Hg:	8.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	354.800	0.750	2.340	80.0	135.0
2	15	368.021	0.770	2.400	85.0	142.0
3	30	382.111	0.800	2.500	94.0	145.0
4	45	395.129	0.850	2.650	100.0	141.0
5	60	409.278	0.820	2.560	104.0	141.0
6	75	423.223	0.780	2.430	105.0	142.0
7	90	436.929	0.800	2.500	106.0	145.0
8	105	450.717	0.830	2.590	106.0	143.0
9	120/OFF	464.722				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
15	--	--	--	--	--	--
16	--	--	--	--	--	--
17	--	--	--	--	--	--
18	--	--	--	--	--	--
19	--	--	--	--	--	--
20	--	--	--	--	--	--
21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	109.922	0.800	2.496	97.5	141.7

ISOKINETIC DATA

	Nozzle Number:	T-5
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.242
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, ft/sec:	53.5
Qsd	Volumetric Air Flow Rate, Dry SCFM:	24361.8
Qaw	Volumetric Air Flow Rate, Wet ACFM:	29435.8
%I	Isokinetic Sampling Rate, %:	100.2
Vm(Dry)	Volume Gas Metered, Dry:	109.922
Vm(Std)	Volume Gas Metered, Std:	102.105

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	34.587
gr/dscf	Concentration, gr/dscf:	0.015
Lb/hr	Emission Rate,Lb/hr PMRc:	3.156
Kg/hr	Emission Rate,Kg/hr PMRc:	1.431

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	34.587
gr/dscf	Concentration, gr/dscf:	0.015
Lb/hr	Emission Rate,Lb/hr PMRc:	3.156
Kg/hr	Emission Rate,Kg/hr PMRc:	1.431

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	34.587
gr/dscm	Concentration, gr/dscm:	0.015
Lb/hr	Emission Rate,Lb/hr PMRc:	3.156
Kg/hr	Emission Rate,Kg/hr PMRc:	1.431

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: Site9 Run No.: OUT-MM5-7C Date: 6/6/90
Sampling Location: OUTLET Operator: RLM
Net Run Time: 100 min Run Start Time: 0830
Num Sampling Points: 21 Run Stop Time: 1015

Pressures:

Pbar	Barometric Pressure, in Hg:	29.800
Pg	Flue Gas Static Press. in H2O:	-0.380
Ps	Absolute Flue Gas Press. in Hg:	29.772

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	63.4
Vw(std)	Volume of Water Vapor, SCF:	2.984
%H2O	Moisture Content, % by Vol.:	4.16
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.958
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.50

FIELD DATA

Meter Box Number:	M-16	Meter Box dHa:	1.762
Dry Gas Meter Cal. Y:	0.996	Assumed Moisture:	6.00
Leak Test Rate, CFM:	0.002	Leak Test Vac, in Hg:	8.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	629.852	0.440	1.350	62.0	137.0
2	5	633.115	0.420	1.290	66.0	138.0
3	10	636.198	0.450	1.380	70.0	138.0
4	15	639.511	0.440	1.350	75.0	139.0
5	20	642.815	0.430	1.340	80.0	139.0
6	25	646.141	0.460	1.430	82.0	140.0
7	30	649.535	0.440	1.350	84.0	140.0
8	35	652.946	0.420	1.290	87.0	140.0
9	40	656.173	0.450	1.400	88.0	135.0
10	45	659.509	0.430	1.380	90.0	129.0
11	50	662.844	0.420	1.360	92.0	137.0
12	55	666.215	0.450	1.450	94.0	139.0
13	60	669.675	0.470	1.520	95.0	139.0
14	65	673.312	0.480	1.550	97.0	139.0
15	70	676.819	0.480	1.550	98.0	141.0
16	75	680.414	0.460	1.480	99.0	128.0
17	80	683.920	0.470	1.520	100.0	123.0
18	85	687.595	0.460	1.540	102.0	118.0
19	90	691.259	0.440	1.420	102.0	135.0
20	95	694.548	0.470	1.520	103.0	141.0
21	100	698.079	0.480	1.550	104.0	144.0
22	100/OFF	701.792				
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	100	71.940	0.450	1.430	89.0	136.1

ISOKINETIC DATA

	Nozzle Number:	T-8
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.243
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	39.7
Qsd	Volumetric Air Flow Rate, Dry SCFM:	18436.7
Qaw	Volumetric Air Flow Rate, Wet ACFM:	21826.1
%I	Isokinetic Sampling Rate, %:	106.2
Vm(Dry)	Volume Gas Metered, Dry:	71.940
Vm(Std)	Volume Gas Metered, Std:	68.823

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	51.312
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,lb/hr PMRc:	3.543
Kg/hr	Emission Rate,Kg/hr PMRc:	1.607

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	51.312
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	3.543
Kg/hr	Emission Rate,Kg/hr PMRc:	1.607

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	51.312
gr/dscm	Concentration, gr/dscm:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	3.543
Kg/hr	Emission Rate,Kg/hr PMRc:	1.607

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **IN-CR-8A** Date: 6/5/90
Sampling Location: Inlet Operator: LT
Net Run Time: 120 min Run Start Time: 1215
Num Sampling Points: 8 Run Stop Time: 1415

Pressures:

Pbar	Barometric Pressure, in Hg:	29.500
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.500

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	390.7
Vw(std)	Volume of Water Vapor, SCF:	18.390
%H2O	Moisture Content, % by Vol.:	25.12
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.749
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	26.99

FIELD DATA

Meter Box Number:	RAC 1	Meter Box dHa:	1.851
Dry Gas Meter Cal. Y:	1.034	Assumed Moisture:	30.00
Leak Test Rate, CFM:	0.013	Leak Test Vac, in Hg:	3.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	341.500	0.050	0.700	84.0	1262.0
2	15	348.500	0.050	0.700	90.0	1212.0
3	30	355.520	0.040	0.700	94.0	1171.0
4	45	362.800	0.070	0.700	97.0	1235.0
5	60	369.900	0.070	0.700	100.0	1234.0
6	75	376.910	0.060	0.700	102.0	1270.0
7	90	384.320	0.050	0.700	108.0	1208.0
8	105	391.200	0.060	0.700	109.0	1209.0
9	120/OFF	398.250				
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FINAL/AVG	120	56.750	0.056	0.700	98.0	1225.1

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	14400.0
Vs	Flue Gas Velocity, Ft/sec:	24.7
Qsd	Volumetric Air Flow Rate, Dry SCFM:	34257.3
Qaw	Volumetric Air Flow Rate, Wet ACFM:	148090.3
%I	Isokinetic Sampling Rate, %:	173.9
Vm(Dry)	Volume Gas Metered, Dry:	56.750
Vm(Std)	Volume Gas Metered, Std:	54.819

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	64.421
gr/dscf	Concentration, gr/dscf:	0.028
Lb/hr	Emission Rate,Lb/hr PMRc:	8.265
Kg/hr	Emission Rate,Kg/hr PMRc:	3.749

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	64.421
gr/dscf	Concentration, gr/dscf:	0.028
Lb/hr	Emission Rate,Lb/hr PMRc:	8.265
Kg/hr	Emission Rate,Kg/hr PMRc:	3.749

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	64.421
gr/dscm	Concentration, gr/dscm:	0.028
Lb/hr	Emission Rate,Lb/hr PMRc:	8.265
Kg/hr	Emission Rate,Kg/hr PMRc:	3.749

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **IN-CR-8B** Date: 6/5/90
Sampling Location: Inlet Operator: LT
Net Run Time: 120 min Run Start Time: 1216
Num Sampling Points: 8 Run Stop Time: 1416

Pressures:

Pbar	Barometric Pressure, in Hg:	29.500
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.500

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	400.6
Vw(std)	Volume of Water Vapor, SCF:	18.856
%H2O	Moisture Content, % by Vol.:	24.76
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.752
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	27.03

FIELD DATA

Meter Box Number: RN 5 Meter Box dHa: 1.869
Dry Gas Meter Cal. Y: 1.061 Assumed Moisture: 30.00
Leak Test Rate, CFM: 0.014 Leak Test Vac, in Hg: 3.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	491.976	0.050	0.700	84.0	1233.0
2	15	498.760	0.040	0.700	90.0	1214.0
3	30	506.000	0.030	0.700	94.0	1192.0
4	45	513.720	0.040	0.700	96.0	1233.0
5	60	520.120	0.050	0.700	100.0	1203.0
6	75	526.900	0.050	0.700	106.0	1263.0
7	90	534.200	0.070	0.700	108.0	1273.0
8	105	541.600	0.001	0.700	109.0	1283.0
9	120/OFF	549.854				
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FINAL/AVG	120	57.878	0.037	0.700	98.4	1236.7

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	1440C.0
Vs	Flue Gas Velocity, Ft/sec:	20.1
Qsd	Volumetric Air Flow Rate, Dry SCFM:	27807.1
Qaw	Volumetric Air Flow Rate, Wet ACFM:	120449.6
%I	Isokinetic Sampling Rate, %:	223.9
Vm(Dry)	Volume Gas Metered, Dry:	57.878
Vm(Std)	Volume Gas Metered, Std:	57.314

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	61.617
gr/dscf	Concentration, gr/dscf:	0.027
Lb/hr	Emission Rate,Lb/hr PMRc:	6.417
Kg/hr	Emission Rate,Kg/hr PMRc:	2.911

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	61.617
gr/dscf	Concentration, gr/dscf:	0.027
Lb/hr	Emission Rate,Lb/hr PMRc:	6.417
Kg/hr	Emission Rate,Kg/hr PMRc:	2.911

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	61.617
gr/dscm	Concentration, gr/dscm:	0.027
Lb/hr	Emission Rate,Lb/hr PMRc:	6.417
Kg/hr	Emission Rate,Kg/hr PMRc:	2.911

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: Site 9 Run No.: IN-CR-8C Date: 6/5/90
Sampling Location: Inlet Operator: LT
Net Run Time: 120 min Run Start Time: 1217
Num Sampling Points: 8 Run Stop Time: 1417

Pressures:

Pbar	Barometric Pressure, in Hg:	29.500
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.500

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	402.5
Vw(std)	Volume of Water Vapor, SCF:	18.946
%H2O	Moisture Content, % by Vol.:	25.76
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.742
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	26.91

FIELD DATA

Meter Box Number: RAC 2 Meter Box dHa: 1.858
Dry Gas Meter Cal. Y: 1.006 Assumed Moisture: 30.00
Leak Test Rate, CFM: 0.011 Leak Test Vac, in Hg: 4.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (of)	Stack Temp (of)
1	0	286.296	0.060	0.700	85.0	1226.0
2	15	293.410	0.040	0.700	89.0	1214.0
3	30	300.500	0.050	0.700	92.0	1198.0
4	45	307.960	0.060	0.700	94.0	1216.0
5	60	314.921	0.070	0.700	96.0	1241.0
6	75	322.000	0.070	0.700	104.0	1263.0
7	90	329.120	0.060	0.700	105.0	1271.0
8	105	344.275	0.080	0.700	108.0	1281.0
9	120/OFF	344.275				
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FINAL/AVG	120	57.979	0.061	0.700	96.6	1238.7

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	14400.0
Vs	Flue Gas Velocity, Ft/sec:	25.9
Qsd	Volumetric Air Flow Rate, Dry SCFM:	35320.9
Qaw	Volumetric Air Flow Rate, Wet ACFM:	155248.3
%I	Isokinetic Sampling Rate, %:	168.0
Vm(Dry)	Volume Gas Metered, Dry:	57.979
Vm(Std)	Volume Gas Metered, Std:	54.602

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	64.676
gr/dscf	Concentration, gr/dscf:	0.028
Lb/hr	Emission Rate,lb/hr PMRc:	8.555
Kg/hr	Emission Rate,Kg/hr PMRc:	3.881
mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	64.676
gr/dscf	Concentration, gr/dscf:	0.028
Lb/hr	Emission Rate,Lb/hr PMRc:	8.555
Kg/hr	Emission Rate,Kg/hr PMRc:	3.881
mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	64.676
gr/dscm	Concentration, gr/dscm:	0.028
Lb/hr	Emission Rate,Lb/hr PMRc:	8.555
Kg/hr	Emission Rate,Kg/hr PMRc:	3.881

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **IN-CR-8D** Date: 6/5/90
Sampling Location: Inlet Operator: LT
Net Run Time: 64 min Run Start Time: 1218
Num Sampling Points: 5 Run Stop Time: 1322

Pressures:

Pbar	Barometric Pressure, in Hg:	29.500
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.500

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	146.0
Vw(std)	Volume of Water Vapor, SCF:	6.872
%H2O	Moisture Content, % by Vol.:	20.93
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.791
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	27.49

FIELD DATA

Meter Box Number: RAC 3 Meter Box dHa: 1.849
Dry Gas Meter Cal. Y: 1.000 Assumed Moisture: 30.00
Leak Test Rate, CFM: 0.016 Leak Test Vac, in Hg: 5.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	31.863	0.060	0.700	82.0	1220.0
2	15	38.230	0.050	0.700	88.0	1213.0
3	30	45.125	0.070	0.700	94.0	1196.0
4	45	52.000	0.040	0.700	98.0	1234.0
5	60	55.700	0.050	0.700	98.0	1209.0
6	64/OFF	59.354				
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FINAL/AVG	64	27.491	0.054	0.700	92.0	1214.4

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	14400.0
Vs	Flue Gas Velocity, Ft/sec:	23.9
Qsd	Volumetric Air Flow Rate, Dry SCFM:	35212.7
Qaw	Volumetric Air Flow Rate, Wet ACFM:	143236.9
%I	Isokinetic Sampling Rate, %:	150.2
Vm(Dry)	Volume Gas Metered, Dry:	27.491
Vm(Std)	Volume Gas Metered, Std:	25.961

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	136.027
gr/dscf	Concentration, gr/dscf:	0.059
Lb/hr	Emission Rate, lb/hr PMRc:	17.939
Kg/hr	Emission Rate, Kg/hr PMRc:	8.137
mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	136.027
gr/dscf	Concentration, gr/dscf:	0.059
Lb/hr	Emission Rate, Lb/hr PMRc:	17.939
Kg/hr	Emission Rate, Kg/hr PMRc:	8.137
mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	136.027
gr/dscm	Concentration, gr/dscm:	0.059

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-RCCR-8A** Date: 6/5/90
Sampling Location: MIdpoint Operator: GCB
Net Run Time: 120 min Run Start Time: 1221
Num Sampling Points: 8 Run Stop Time: 1421

Pressures:

Pbar	Barometric Pressure, in Hg:	29.500
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.294

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	90.7
Vw(std)	Volume of Water Vapor, SCF:	4.269
%H2O	Moisture Content, % by Vol.:	6.31
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.937
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.24

FIELD DATA

Meter Box Number:	A-1	Meter Box dHa:	2.270
Dry Gas Meter Cal. Y:	0.986	Assumed Moisture:	7.00
Leak Test Rate, CFM:	0.001	Leak Test Vac, in Hg:	7.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	163.800	0.360	1.400	86.0	88.0
2	15	173.192	0.340	1.400	86.0	88.0
3	30	182.262	0.320	1.300	86.0	88.0
4	45	191.024	0.320	1.300	86.0	84.0
5	60	199.864	0.250	1.000	86.0	83.0
6	75	207.558	0.250	1.000	86.0	82.0
7	90	215.232	0.250	1.000	90.0	82.0
8	105	222.875	0.280	1.150	90.0	82.0
9	120/OFF	231.114				
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FINAL/AVG	120	67.314	0.295	1.194	87.0	84.6

ISOKINETIC DATA

	Nozzle Number:	127
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	32.2
Qsd	Volumetric Air Flow Rate, Dry SCFM:	14671.9
Qaw	Volumetric Air Flow Rate, Wet ACFM:	17707.7
%I	Isokinetic Sampling Rate, %:	100.7
Vm(Dry)	Volume Gas Metered, Dry:	67.314
Vm(Std)	Volume Gas Metered, Std:	63.362

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	55.735
gr/dscf	Concentration, gr/dscf:	0.024
Lb/hr	Emission Rate,lb/hr PMRc:	3.063
Kg/hr	Emission Rate,Kg/hr PMRc:	1.389

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	55.735
gr/dscf	Concentration, gr/dscf:	0.024
Lb/hr	Emission Rate,Lb/hr PMRc:	3.063
Kg/hr	Emission Rate,Kg/hr PMRc:	1.389

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	55.735
gr/dscm	Concentration, gr/dscm:	0.024
Lb/hr	Emission Rate,Lb/hr PMRc:	3.063
Kg/hr	Emission Rate,Kg/hr PMRc:	1.389

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-RCCR-8B** Date: 6/5/90
Sampling Location: Midpoint Operator: GCB
Net Run Time: 120 min Run Start Time: 1223
Num Sampling Points: 8 Run Stop Time: 1423

Pressures:

Pbar	Barometric Pressure, in Hg:	29.500
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.294

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	147.5
Vw(std)	Volume of Water Vapor, SCF:	6.943
%H2O	Moisture Content, % by Vol.:	9.37
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.906
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	28.88

ISOKINETIC DATA

	Nozzle Number:	T 28
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	31.8
Qsd	Volumetric Air Flow Rate, Dry SCFM:	14009.1
Qaw	Volumetric Air Flow Rate, Wet ACFM:	17465.7
%I	Isokinetic Sampling Rate, %:	111.8
Vm(Dry)	Volume Gas Metered, Dry:	68.763
Vm(Std)	Volume Gas Metered, Std:	67.169

FIELD DATA

Meter Box Number: A-2 Meter Box dHa: 2.047
Dry Gas Meter Cal. Y: 1.024 Assumed Moisture: 7.00
Leak Test Rate, CFM: 0.002 Leak Test Vac, in Hg: 7.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	2	976.138	0.360	1.450	86.0	88.0
2	17	985.682	0.330	1.300	86.0	88.0
3	32	994.843	0.320	1.300	86.0	86.0
4	47	1003.936	0.260	1.100	86.0	84.0
5	62	1012.312	0.250	1.000	86.0	82.0
6	77	1020.428	0.250	1.000	88.0	82.0
7	92	1028.438	0.230	0.950	90.0	82.0
8	107	1036.720	0.280	1.150	90.0	82.0
9	120/OFF	1044.901				
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25	--	--	--	--	--	--
FINAL/AVG	120	68.763	0.283	1.156	87.2	84.2

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	52.576
gr/dscf	Concentration, gr/dscf:	0.023
Lb/hr	Emission Rate,lb/hr PMRc:	2.758
Kg/hr	Emission Rate,Kg/hr PMRc:	1.251

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	52.576
gr/dscf	Concentration, gr/dscf:	0.023
Lb/hr	Emission Rate,Lb/hr PMRc:	2.758
Kg/hr	Emission Rate,Kg/hr PMRc:	1.251

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	52.576
gr/dscm	Concentration, gr/dscm:	0.023
Lb/hr	Emission Rate,Lb/hr PMRc:	2.758
Kg/hr	Emission Rate,Kg/hr PMRc:	1.251

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-RCCR-8C** Date: 6/5/90
Sampling Location: Midpoint Operator: GCB
Net Run Time: 120 min Run Start Time: 1225
Num Sampling Points: 8 Run Stop Time: 1425

Pressures:

Pbar	Barometric Pressure, in Hg:	29.500
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.294

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	89.5
Vw(std)	Volume of Water Vapor, SCF:	4.213
%H2O	Moisture Content, % by Vol.:	6.17
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.938
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.26

FIELD DATA

Meter Box Number:	B-1	Meter Box dHa:	2.043
Dry Gas Meter Cal. Y:	1.000	Assumed Moisture:	7.00
Leak Test Rate, CFM:	0.001	Leak Test Vac, in Hg:	7.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	4	307.505	0.310	1.250	86.0	88.0
2	19	316.257	0.330	1.300	86.0	88.0
3	34	325.218	0.320	1.300	86.0	85.0
4	49	334.213	0.240	1.000	86.0	83.0
5	64	342.262	0.240	1.000	86.0	83.0
6	79	350.212	0.240	1.000	88.0	82.0
7	94	358.323	0.240	1.000	90.0	82.0
8	109	366.264	0.280	1.150	90.0	82.0
9	120/OFF	374.698				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
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23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	67.193	0.274	1.125	87.2	84.1

ISOKINETIC DATA

	Nozzle Number:	T 30
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	31.0
Qsd	Volumetric Air Flow Rate, Dry SCFM:	14162.3
Qaw	Volumetric Air Flow Rate, Wet ACFM:	17050.9
%I	Isokinetic Sampling Rate, %:	105.5
Vm(Dry)	Volume Gas Metered, Dry:	67.193
Vm(Std)	Volume Gas Metered, Std:	64.073

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	55.116
gr/dscf	Concentration, gr/dscf:	0.024
Lb/hr	Emission Rate,lb/hr PMRc:	2.923
Kg/hr	Emission Rate,Kg/hr PMRc:	1.326

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	55.116
gr/dscf	Concentration, gr/dscf:	0.024
Lb/hr	Emission Rate,Lb/hr PMRc:	2.923
Kg/hr	Emission Rate,Kg/hr PMRc:	1.326

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	55.116
gr/dscm	Concentration, gr/dscm:	0.024
Lb/hr	Emission Rate,Lb/hr PMRc:	2.923
Kg/hr	Emission Rate,Kg/hr PMRc:	1.326

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-RCCR-8D** Date: 6/5/90
Sampling Location: Midpoint Operator: GCB
Net Run Time: 120 min Run Start Time: 1227
Num Sampling Points: 8 Run Stop Time: 1427

Pressures:

Pbar	Barometric Pressure, in Hg:	29.500
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.294

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	138.4
Vw(std)	Volume of Water Vapor, SCF:	6.514
%H2O	Moisture Content, % by Vol.:	10.22
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.898
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	28.77

FIELD DATA

Meter Box Number:	B-2	Meter Box dHa:	2.125
Dry Gas Meter Cal. Y:	1.000	Assumed Moisture:	7.00
Leak Test Rate, CFM:	0.001	Leak Test Vac, in Hg:	7.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	6	672.102	0.300	1.200	86.0	88.0
2	21	680.383	0.340	1.400	86.0	88.0
3	36	688.632	0.320	1.300	86.0	84.0
4	51	696.625	0.240	1.000	86.0	83.0
5	66	703.701	0.240	1.000	86.0	83.0
6	81	710.724	0.230	0.950	88.0	82.0
7	96	717.632	0.230	0.995	90.0	82.0
8	111	724.595	0.280	1.150	90.0	83.0
9	120/OFF	732.149				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
15	--	--	--	--	--	--
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22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	60.047	0.271	1.124	87.2	84.1

ISOKINETIC DATA

	Nozzle Number:	T 31
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.243
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	31.1
Qsd	Volumetric Air Flow Rate, Dry SCFM:	13596.8
Qaw	Volumetric Air Flow Rate, Wet ACFM:	17107.7
%I	Isokinetic Sampling Rate, %:	99.8
Vm(Dry)	Volume Gas Metered, Dry:	60.047
Vm(Std)	Volume Gas Metered, Std:	57.259

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	61.676
gr/dscf	Concentration, gr/dscf:	0.027
Lb/hr	Emission Rate,lb/hr PMRc:	3.141
Kg/hr	Emission Rate,Kg/hr PMRc:	1.425

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	61.676
gr/dscf	Concentration, gr/dscf:	0.027
Lb/hr	Emission Rate,Lb/hr PMRc:	3.141
Kg/hr	Emission Rate,Kg/hr PMRc:	1.425

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	61.676
gr/dscm	Concentration, gr/dscm:	0.027
Lb/hr	Emission Rate,Lb/hr PMRc:	3.141
Kg/hr	Emission Rate,Kg/hr PMRc:	1.425

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **OUT-CR+6-8A** Date: 6/5/90
Sampling Location: Outlet Operator: MLM
Net Run Time: 120 min Run Start Time: 1215
Num Sampling Points: 8 Run Stop Time: 1415

Pressures:

Pbar	Barometric Pressure, in Hg:	29.500
Pg	Flue Gas Static Press. in H20:	-0.250
Ps	Absolute Flue Gas Press. in Hg:	29.482

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	22.0
Vw(std)	Volume of Water Vapor, SCF:	1.036
%H20	Moisture Content, % by Vol.:	1.44
%C02	Percent C02 by Volume, Dry:	5.00
%02	Percent 02 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.986
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.83

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.240
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	37.9
Qsc	Volumetric Air Flow Rate, Dry SCFM:	17310.3
Qaw	Volumetric Air Flow Rate, Wet ACFM:	20846.6
%I	Isokinetic Sampling Rate, %:	99.2
Vm(Dry)	Volume Gas Metered, Dry:	74.313
Vm(Std)	Volume Gas Metered, Std:	70.677

FIELD DATA

Meter Box Number:	BN-2	Meter Box dHa:	1.969
Dry Gas Meter Cal. Y:	0.985	Assumed Moisture:	6.00
Leak Test Rate, CFM:	0.004	Leak Test Vac, in Hg:	8.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H20)	Delta H (in H20)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	839.738	0.460	1.600	71.0	149.0
2	15	848.740	0.440	1.530	77.0	150.0
3	30	858.710	0.450	1.570	80.0	151.0
4	45	868.970	0.420	1.400	81.0	153.0
5	60	878.610	0.380	1.270	84.0	160.0
6	75	887.830	0.400	1.340	86.0	164.0
7	90	897.350	0.320	1.070	86.0	166.0
8	105	905.640	0.320	1.070	82.0	167.0
9	120/OFF	914.051				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
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21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	74.313	0.397	1.356	80.9	157.5

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	49.966
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	3.239
Kg/hr	Emission Rate,Kg/hr PMRc:	1.469

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	49.966
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	3.239
Kg/hr	Emission Rate,Kg/hr PMRc:	1.469

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	49.966
gr/dscm	Concentration, gr/dscm:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	3.239
Kg/hr	Emission Rate,Kg/hr PMRc:	1.469

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **OUT-CR+6-8B** Date: 6/5/90
Sampling Location: OUtlet Operator: MLH
Net Run Time: 120 min Run Start Time: 1216
Num Sampling Points: 8 Run Stop Time: 1416

Pressures:

Pbar	Barometric Pressure, in Hg:	29.500
Pg	Flue Gas Static Press. in H2O:	-0.250
Ps	Absolute Flue Gas Press. in Hg:	29.482

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	27.0
Vw(std)	Volume of Water Vapor, SCF:	1.271
%H2O	Moisture Content, % by Vol.:	1.75
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.983
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.79

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.240
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	37.9
Qsd	Volumetric Air Flow Rate, Dry SCFM:	17267.7
Qaw	Volumetric Air Flow Rate, Wet ACFM:	20859.3
%I	Isokinetic Sampling Rate, %:	100.6
Vm(Dry)	Volume Gas Metered, Dry:	79.977
Vm(Std)	Volume Gas Metered, Std:	71.499

FIELD DATA

Meter Box Number: EN-1 Meter Box dHa: 1.969
Dry Gas Meter Cal. Y: 0.932 Assumed Moisture: 6.00
Leak Test Rate, CFM: 0.008 Leak Test Vac, in Hg: 9.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	99.206	0.460	1.600	75.0	149.0
2	15	108.990	0.440	1.530	80.0	150.0
3	30	119.680	0.450	1.570	84.0	151.0
4	45	130.600	0.420	1.400	87.0	153.0
5	60	141.050	0.380	1.270	84.0	160.0
6	75	150.950	0.400	1.340	88.0	164.0
7	90	161.150	0.320	1.070	90.0	166.0
8	105	170.150	0.320	1.070	89.0	167.0
9	120/OFF	179.183				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
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18	--	--	--	--	--	--
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22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	79.977	0.397	1.356	84.6	157.5

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	49.392
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,lb/hr PMRc:	3.194
Kg/hr	Emission Rate,Kg/hr PMRc:	1.449

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	49.392
gr/dscf	Concentration, gr/dscf:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	3.194
Kg/hr	Emission Rate,Kg/hr PMRc:	1.449

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	49.392
gr/dscm	Concentration, gr/dscm:	0.022
Lb/hr	Emission Rate,Lb/hr PMRc:	3.194
Kg/hr	Emission Rate,Kg/hr PMRc:	1.449

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: Site 9 Run No.: OUT-CR+6-8C Date: 6/5/90
Sampling Location: OUtlet Operator: RLM
Net Run Time: 120 min Run Start Time: 1216
Num Sampling Points: 8 Run Stop Time: 1416

Pressures:

Pbar	Barometric Pressure, in Hg:	29.500
Pg	Flue Gas Static Press. in H2O:	-0.250
Ps	Absolute Flue Gas Press. in Hg:	29.482

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	22.5
Vw(std)	Volume of Water Vapor, SCF:	1.059
%H2O	Moisture Content, % by Vol.:	1.44
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
M'd	Dry Mole Fraction:	0.986
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.83

FIELD DATA

Meter Box Number:	N-16	Meter Box dHa:	1.820
Dry Gas Meter Cal. Y:	0.996	Assumed Moisture:	6.00
Leak Test Rate, CFM:	0.012	Leak Test Vac, in Hg:	8.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	476.715	0.460	1.480	80.0	149.0
2	15	487.152	0.440	1.420	88.0	150.0
3	30	497.575	0.450	1.450	96.0	151.0
4	45	507.982	0.420	1.290	104.0	153.0
5	60	517.869	0.380	1.170	110.0	160.0
6	75	527.738	0.400	1.230	112.0	164.0
7	90	537.118	0.320	0.980	114.0	166.0
8	105	546.062	0.320	0.980	112.0	167.0
9	120/OFF	554.870				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
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18	--	--	--	--	--	--
19	--	--	--	--	--	--
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21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	120	78.155	0.397	1.250	102.0	157.5

ISOKINETIC DATA

	Nozzle Number:	T-7
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.242
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	37.9
Qsd	Volumetric Air Flow Rate, Dry SCFM:	17310.3
Qaw	Volumetric Air Flow Rate, Wet ACFM:	20846.6
%I	Isokinetic Sampling Rate, %:	99.8
Vm(Dry)	Volume Gas Metered, Dry:	78.155
Vm(Std)	Volume Gas Metered, Std:	72.280

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	48.858
gr/dscf	Concentration, gr/dscf:	0.021
Lb/hr	Emission Rate,lb/hr PMRc:	3.167
Kg/hr	Emission Rate,Kg/hr PMRc:	1.437

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	48.858
gr/dscf	Concentration, gr/dscf:	0.021
Lb/hr	Emission Rate,Lb/hr PMRc:	3.167
Kg/hr	Emission Rate,Kg/hr PMRc:	1.437

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	48.858
gr/dscm	Concentration, gr/dscm:	0.021
Lb/hr	Emission Rate,Lb/hr PMRc:	3.167
Kg/hr	Emission Rate,Kg/hr PMRc:	1.437

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **OUT-CR+6-8D** Date: 6/5/90
Sampling Location: Outlet Operator: RLM
Net Run Time: 120 min Run Start Time: 1217
Num Sampling Points: 8 Run Stop Time: 1417

Pressures:

Pbar	Barometric Pressure, in Hg:	29.500
Pg	Flue Gas Static Press. in H2O:	-0.320
Ps	Absolute Flue Gas Press. in Hg:	29.476

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	46.5
Vw(std)	Volume of Water Vapor, SCF:	2.189
%H2O	Moisture Content, % by Vol.:	3.11
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.969
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.63

FIELD DATA

Meter Box Number:	MU-7	Meter Box dHa:	1.820
Dry Gas Meter Cal. Y:	0.969	Assumed Moisture:	6.00
Leak Test Rate, CFM:	0.006	Leak Test Vac, in Hg:	8.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	86.120	0.460	1.480	80.0	149.0
2	15	96.131	0.440	1.420	86.0	150.0
3	30	105.995	0.450	1.450	92.0	151.0
4	45	116.139	0.420	1.290	98.0	153.0
5	60	125.753	0.380	1.170	104.0	160.0
6	75	134.954	0.400	1.230	107.0	164.0
7	90	144.460	0.320	0.980	109.0	166.0
8	105	152.804	0.320	0.980	110.0	167.0
9	120/CFF	161.324				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
15	--	--	--	--	--	--
16	--	--	--	--	--	--
17	--	--	--	--	--	--
18	--	--	--	--	--	--
19	--	--	--	--	--	--
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FINAL/AVG	120	75.204	0.397	1.250	98.2	157.5

ISOKINETIC DATA

	Nozzle Number:	7
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.242
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	38.0
Qsd	Volumetric Air Flow Rate, Dry SCFM:	17073.4
Qaw	Volumetric Air Flow Rate, Wet ACFM:	20918.7
%I	Isokinetic Sampling Rate, %:	95.4
Vm(Dry)	Volume Gas Metered, Dry:	75.204
Vm(Std)	Volume Gas Metered, Std:	68.169

EMISSIONS RESULTS

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	51.805
gr/dscf	Concentration, gr/dscf:	0.023
Lb/hr	Emission Rate,lb/hr PMRc:	3.312
Kg/hr	Emission Rate,Kg/hr PMRc:	1.503

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	51.805
gr/dscf	Concentration, gr/dscf:	0.023
Lb/hr	Emission Rate,Lb/hr PMRc:	3.312
Kg/hr	Emission Rate,Kg/hr PMRc:	1.503

mg	100.0	100.000mg
mg/dscm	Concentration, mg/dscm:	51.805
gr/dscm	Concentration, gr/dscm:	0.023
Lb/hr	Emission Rate,Lb/hr PMRc:	3.312
Kg/hr	Emission Rate,Kg/hr PMRc:	1.503

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **IN-CR-10A** Date: 6/690
Sampling Location: Inlet Operator: LT
Net Run Time: 60 min Run Start Time: 1230
Num Sampling Points: 4 Run Stop Time: 1330

Pressures:

Pbar	Barometric Pressure, in Hg:	29.700
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.700

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	150.0
Vw(std)	Volume of Water Vapor, SCF:	7.060
%H2O	Moisture Content, % by Vol.:	20.85
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.791
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	27.50

FIELD DATA

Meter Box Number: RAC1 Meter Box dHa: 1.851
Dry Gas Meter Cal. Y: 1.000 Assumed Moisture: 30.00
Leak Test Rate, CFM: 0.007 Leak Test Vac, in Hg: 12.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	456.357	0.050	0.700	90.0	1190.0
2	15	563.300	0.050	0.700	94.0	1210.0
3	30	470.610	0.050	0.700	98.0	1261.0
4	45	477.800	0.040	0.700	106.0	1285.0
5	60/OFF	484.800				
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7	--	--	--	--	--	--
8	--	--	--	--	--	--
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24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	60	28.443	0.047	0.700	97.0	1236.5

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	14400.0
Vs	Flue Gas Velocity, Ft/sec:	22.5
Qsd	Volumetric Air Flow Rate, Dry SCFM:	33058.2
Qaw	Volumetric Air Flow Rate, Wet ACFM:	135196.2
%I	Isokinetic Sampling Rate, %:	176.2
Vm(Dry)	Volume Gas Metered, Dry:	28.443
Vm(Std)	Volume Gas Metered, Std:	26.800

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	131.774
gr/dscf	Concentration, gr/dscf:	0.058
Lb/hr	Emission Rate,lb/hr PMRc:	16.314
Kg/hr	Emission Rate,Kg/hr PMRc:	7.400

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	131.774
gr/dscf	Concentration, gr/dscf:	0.058
Lb/hr	Emission Rate,Lb/hr PMRc:	16.314
Kg/hr	Emission Rate,Kg/hr PMRc:	7.400

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	131.774

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **IN-CR-10B** Date: 6/6/90
Sampling Location: Inlet Operator: LT
Net Run Time: 60 min Run Start Time: 1230
Num Sampling Points: 4 Run Stop Time: 1330

Pressures:

Pbar	Barometric Pressure, in Hg:	29.700
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.700

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	150.0
Vw(std)	Volume of Water Vapor, SCF:	7.060
%H2O	Moisture Content, % by Vol.:	19.28
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.807
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	27.69

FIELD DATA

Meter Box Number:	RAC 5	Meter Box dHa:	1.869
Dry Gas Meter Cal. Y:	1.000	Assumed Moisture:	30.00
Leak Test Rate, CFM:	0.016	Leak Test Vac, in Hg:	10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	606.401	0.050	0.700	90.0	1190.0
2	15	616.290	0.060	0.700	95.0	1192.0
3	30	623.680	0.050	0.700	100.0	1230.0
4	45	637.840	0.040	0.700	108.0	1260.0
5	60/OFF	637.840				
6	--	--	--	--	--	--
7	--	--	--	--	--	--
8	--	--	--	--	--	--
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23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	60	31.439	0.050	0.700	98.2	1218.0

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	14400.0
Vs	Flue Gas Velocity, Ft/sec:	22.9
Qsd	Volumetric Air Flow Rate, Dry SCFM:	34611.7
Qaw	Volumetric Air Flow Rate, Wet ACFM:	137282.9
%I	Isokinetic Sampling Rate, %:	185.6
Vm(Dry)	Volume Gas Metered, Dry:	31.439
Vm(Std)	Volume Gas Metered, Std:	29.556

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	119.484
gr/dscf	Concentration, gr/dscf:	0.052
Lb/hr	Emission Rate,lb/hr PMRc:	15.488
Kg/hr	Emission Rate,Kg/hr PMRc:	7.025

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	119.484
gr/dscf	Concentration, gr/dscf:	0.052
Lb/hr	Emission Rate,Lb/hr PMRc:	15.488
Kg/hr	Emission Rate,Kg/hr PMRc:	7.025

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	119.484

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **IN-CR-10C** Date: 6/6/90
Sampling Location: INlet Operator: LT
Net Run Time: 60 min Run Start Time: 1231
Num Sampling Points: 4 Run Stop Time: 1331

Pressures:

Pbar	Barometric Pressure, in Hg:	29.700
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.700

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	150.0
Vw(std)	Volume of Water Vapor, SCF:	7.060
%H2O	Moisture Content, % by Vol.:	20.39
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.796
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	27.55

FIELD DATA

Meter Box Number:	RAC 2	Meter Box dHa:	1.858
Dry Gas Meter Cal. Y:	1.000	Assumed Moisture:	30.00
Leak Test Rate, CFM:	0.018	Leak Test Vac, in Hg:	10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	402.520	0.050	0.700	91.0	1190.0
2	15	409.210	0.060	0.700	98.0	1230.0
3	30	416.330	0.050	0.700	101.0	1270.0
4	45	424.310	0.050	0.700	108.0	1280.0
5	60/OFF	431.915				
6	--	--	--	--	--	--
7	--	--	--	--	--	--
8	--	--	--	--	--	--
9	--	--	--	--	--	--
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
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18	--	--	--	--	--	--
19	--	--	--	--	--	--
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21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	60	29.395	0.052	0.700	99.5	1242.5

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	14400.0
Vs	Flue Gas Velocity, Ft/sec:	23.7
Qsd	Volumetric Air Flow Rate, Dry SCFM:	34872.0
Qaw	Volumetric Air Flow Rate, Wet ACFM:	142281.3
%I	Isokinetic Sampling Rate, %:	171.8
Vm(Dry)	Volume Gas Metered, Dry:	29.395
Vm(Std)	Volume Gas Metered, Std:	27.573

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	128.078
gr/dscf	Concentration, gr/dscf:	0.056
Lb/hr	Emission Rate,lb/hr PMRc:	16.727
Kg/hr	Emission Rate,Kg/hr PMRc:	7.587

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	128.078
gr/dscf	Concentration, gr/dscf:	0.056
Lb/hr	Emission Rate,Lb/hr PMRc:	16.727
Kg/hr	Emission Rate,Kg/hr PMRc:	7.587

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	128.078

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **IN-CR-10D** Date: 6/6/90
Sampling Location: Inlet Operator: LT
Net Run Time: 60 min Run Start Time: 1231
Num Sampling Points: 4 Run Stop Time: 1331

Pressures:

Pbar	Barometric Pressure, in Hg:	29.700
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.700

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	150.0
Vw(std)	Volume of Water Vapor, SCF:	7.060
%H2O	Moisture Content, % by Vol.:	21.90
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.781
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	27.37

FIELD DATA

Meter Box Number:	RAC 3	Meter Box dHa:	1.849
Dry Gas Meter Cal. Y:	1.000	Assumed Moisture:	30.00
Leak Test Rate, CFM:	0.009	Leak Test Vac, in Hg:	13.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	108.447	0.050	0.700	91.0	1180.0
2	15	115.000	0.060	0.700	92.0	1190.0
3	30	121.810	0.050	0.700	98.0	1215.0
4	45	128.420	0.050	0.700	108.0	1282.0
5	60/OFF	135.182				
6	--	--	--	--	--	--
7	--	--	--	--	--	--
8	--	--	--	--	--	--
9	--	--	--	--	--	--
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21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	60	26.735	0.052	0.700	97.2	1216.7

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.375
A	Stack/Duct Area, in2:	14400.0
Vs	Flue Gas Velocity, Ft/sec:	23.6
Qsd	Volumetric Air Flow Rate, Dry SCFM:	34584.8
Qaw	Volumetric Air Flow Rate, Wet ACFM:	141669.0
%I	Isokinetic Sampling Rate, %:	158.2
Vm(Dry)	Volume Gas Metered, Dry:	26.735
Vm(Std)	Volume Gas Metered, Std:	25.179

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	140.255
gr/dscf	Concentration, gr/dscf:	0.061
Lb/hr	Emission Rate,lb/hr PMRc:	18.166
Kg/hr	Emission Rate,Kg/hr PMRc:	8.240
mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	140.255
gr/dscf	Concentration, gr/dscf:	0.061
Lb/hr	Emission Rate,Lb/hr PMRc:	18.166
Kg/hr	Emission Rate,Kg/hr PMRc:	8.240
mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	140.255

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-CR-10A** Date: 6-6-90
Sampling Location: Midpoint Operator: GB
Net Run Time: 108 min Run Start Time: 1135
Num Sampling Points: 8 Run Stop Time: 1319

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.394

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	78.8
Vw(std)	Volume of Water Vapor, SCF:	3.709
%H2O	Moisture Content, % by Vol.:	6.11
%CO2	Percent CO2 by Volume, Dry:	4.50
%O2	Percent O2 by Volume, Dry:	15.00
Mfd	Dry Mole Fraction:	0.939
Fo	Orsat Validation Value:	1.31
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.27

FIELD DATA

Meter Box Number: A1 Meter Box dHa: 2.270
Dry Gas Meter Cal. Y: 0.986 Assumed Moisture: 178.80
Leak Test Rate, CFM: 0.005 Leak Test Vac, in Hg: 10.00

Point Num	Samp.e Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	367.285	0.300	1.100	92.0	92.0
2	15	375.591	0.300	1.200	92.0	92.0
3	30	384.042	0.300	1.200	92.0	92.0
4	45	392.042	0.300	1.200	92.0	92.0
5	60	400.801	0.300	1.200	94.0	92.0
6	75	409.256	0.320	1.300	94.0	92.0
7	90	418.088	0.320	1.300	94.0	92.0
8	105	427.095	0.320	1.300	96.0	92.0
9	108/OFF	428.300				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
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23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	108	61.015	0.307	1.225	93.2	92.0

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	33.0
Qsd	Volumetric Air Flow Rate, Dry SCFM:	14935.5
Qaw	Volumetric Air Flow Rate, Wet ACFM:	18164.2
%I	Isokinetic Sampling Rate, %:	98.9
Vm(Dry)	Volume Gas Metered, Dry:	61.015
Vm(Std)	Volume Gas Metered, Std:	56.980

EMISSIONS RESULTS

ug	Cr+6	1.889 ug
mg/dscm	Concentration, mg/dscm:	1.171x 10-3
gr/dscf	Concentration, gr/dscf:	0.001x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.065x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.030x 10-3

ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscf	Concentration, gr/dscf:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-CR-10B** Date: 6-6-90
Sampling Location: Midpoint Operator: GB
Net Run Time: 108 min Run Start Time: 1137
Num Sampling Points: 8 Run Stop Time: 1319

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.394

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	87.7
Vw(std)	Volume of Water Vapor, SCF:	4.128
%H2O	Moisture Content, % by Vol.:	6.39
%CO2	Percent CO2 by Volume, Dry:	4.50
%O2	Percent O2 by Volume, Dry:	15.00
Mfd	Dry Mole Fraction:	0.936
Fo	Orsat Validation Value:	1.31
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.23

FIELD DATA

Meter Box Number: A2 Meter Box dHa: 2.047
Dry Gas Meter Cal. Y: 1.024 Assumed Moisture: 8.00
Leak Test Rate, CFM: 0.005 Leak Test Vac, in Hg: 10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	188.736	0.300	1.200	92.0	92.0
2	15	197.313	0.300	1.200	92.0	92.0
3	30	205.987	0.300	1.200	92.0	92.0
4	45	214.654	0.300	1.200	93.0	92.0
5	60	223.475	0.350	1.400	94.0	92.0
6	75	232.743	0.320	1.300	94.0	92.0
7	90	250.900	0.310	1.300	96.0	92.0
8	105	250.900	0.310	1.300	94.0	92.0
9	108/OFF	251.100				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
15	--	--	--	--	--	--
16	--	--	--	--	--	--
17	--	--	--	--	--	--
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25	--	--	--	--	--	--
FINAL/AVG	108	62.364	0.311	1.262	93.4	92.0

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	33.3
Qsd	Volumetric Air Flow Rate, Dry SCFM:	14987.1
Qaw	Volumetric Air Flow Rate, Wet ACFM:	18281.4
%I	Isokinetic Sampling Rate, %:	104.6
Vm(Dry)	Volume Gas Metered, Dry:	62.364
Vm(Std)	Volume Gas Metered, Std:	60.463

EMISSIONS RESULTS

ug	Cr+6	3.017 ug
mg/dscm	Concentration, mg/dscm:	1.762x 10-3
gr/dscf	Concentration, gr/dscf:	0.001x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.099x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.045x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscf	Concentration, gr/dscf:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-CR-10C** Date: 6-6-90
Sampling Location: Midpoint Operator: GB
Net Run Time: 108 min Run Start Time: 1139
Num Sampling Points: 8 Run Stop Time: 1319

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.394

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	70.5
Vw(std)	Volume of Water Vapor, SCF:	3.318
%H2O	Moisture Content, % by Vol.:	5.21
%CO2	Percent CO2 by Volume, Dry:	4.50
%O2	Percent O2 by Volume, Dry:	15.00
Mfd	Dry Mole Fraction:	0.948
Fo	Orsat Validation Value:	1.31
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.37

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	33.3
Qsd	Volumetric Air Flow Rate, Dry SCFM:	15199.5
Qaw	Volumetric Air Flow Rate, Wet ACFM:	18310.3
%I	Isokinetic Sampling Rate, %:	102.9
Vm(Dry)	Volume Gas Metered, Dry:	61.614
Vm(Std)	Volume Gas Metered, Std:	60.327

FIELD DATA

Meter Box Number:	2.043	Meter Box dHa:	2.043
Dry Gas Meter Cal. Y:	1.034	Assumed Moisture:	8.00
Leak Test Rate, CFM:	0.001	Leak Test Vac, in Hg:	10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	442.486	0.300	1.200	92.0	92.0
2	15	451.482	0.300	1.200	92.0	92.0
3	30	460.161	0.300	1.200	92.0	92.0
4	45	469.979	0.300	1.200	93.0	92.0
5	60	477.815	0.350	1.400	94.0	92.0
6	75	486.964	0.320	1.400	94.0	92.0
7	90	495.996	0.320	1.400	94.0	92.0
8	105	504.100	0.320	1.300	94.0	92.0
9	108/OFF	504.100				
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
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25	--	--	--	--	--	--
FINAL/AVG	108	61.614	0.314	1.287	93.1	92.0

EMISSIONS RESULTS

ug	Cr+6	2.469 ug
mg/dscm	Concentration, mg/dscm:	1.445x 10-3
gr/dscf	Concentration, gr/dscf:	0.001x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.082x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.037x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscf	Concentration, gr/dscf:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **MID-RCCR-10D** Date: 6/6/90
Sampling Location: Midpoint Operator: GCB
Net Run Time: 102 min Run Start Time: 1141
Num Sampling Points: 7 Run Stop Time: 1319

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	-30.000
Ps	Absolute Flue Gas Press. in Hg:	27.394

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	141.8
Vw(std)	Volume of Water Vapor, SCF:	6.675
%H2O	Moisture Content, % by Vol.:	11.72
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.883
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	28.59

FIELD DATA

Meter Box Number: B-2 Meter Box dHa: 2.125
Dry Gas Meter Cal. Y: 1.000 Assumed Moisture: 7.00
Leak Test Rate, CFM: 0.001 Leak Test Vac, in Hg: 10.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	6	792.216	0.300	1.200	92.0	92.0
2	21	799.917	0.300	1.200	92.0	92.0
3	36	807.697	0.300	1.200	92.0	92.0
4	51	815.493	0.300	1.200	93.0	92.0
5	66	823.267	0.350	1.400	94.0	90.0
6	81	831.318	0.300	1.200	94.0	94.0
7	96	839.172	0.320	1.300	94.0	92.0
8	102/OFF	845.300				
9	--	--	--	--	--	--
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
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21	--	--	--	--	--	--
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23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	102	53.084	0.310	1.243	93.0	92.0

ISOKINETIC DATA

	Nozzle Number:	T31
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.245
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	33.6
Qsd	Volumetric Air Flow Rate, Dry SCFM:	14261.5
Qaw	Volumetric Air Flow Rate, Wet ACFM:	18446.3
%I	Isokinetic Sampling Rate, %:	96.7
Vm(Dry)	Volume Gas Metered, Dry:	53.084
Vm(Std)	Volume Gas Metered, Std:	50.277

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	70.241
gr/dscf	Concentration, gr/dscf:	0.031
Lb/hr	Emission Rate,lb/hr PMRc:	3.752
Kg/hr	Emission Rate,Kg/hr PMRc:	1.702

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	70.241
gr/dscf	Concentration, gr/dscf:	0.031
Lb/hr	Emission Rate,Lb/hr PMRc:	3.752
Kg/hr	Emission Rate,Kg/hr PMRc:	1.702

mg	1001	100.000mg
mg/dscm	Concentration, mg/dscm:	70.241
gr/dscm	Concentration, gr/dscm:	0.031
Lb/hr	Emission Rate,Lb/hr PMRc:	3.752
Kg/hr	Emission Rate,Kg/hr PMRc:	1.702

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **OUT-CR-10A** Date: 6-6-90
Sampling Location: Outlet Operator: MH
Net Run Time: 95 min Run Start Time: 1130
Num Sampling Points: 7 Run Stop Time: 1320

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.600

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	40.0
Vw(std)	Volume of Water Vapor, SCF:	1.883
%H2O	Moisture Content, % by Vol.:	3.18
%CO2	Percent CO2 by Volume, Dry:	4.50
%O2	Percent O2 by Volume, Dry:	15.00
Mfd	Dry Mole Fraction:	0.968
Fo	Orsat Validation Value:	1.31
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.62

FIELD DATA

Meter Box Number: EM2 Meter Box dHa: 2.004
Dry Gas Meter Cal. Y: 0.985 Assumed Moisture: 3.00
Leak Test Rate, CFM: 0.008 Leak Test Vac, in Hg: 15.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	987.874	0.400	1.400	78.0	158.0
2	15	996.827	0.420	1.400	83.0	156.0
3	30	1006.430	0.430	1.500	88.0	163.0
4	45	1016.370	0.390	1.300	92.0	166.0
5	60	1025.980	0.440	1.500	95.0	165.0
6	75	1035.930	0.420	1.400	98.0	166.0
7	90	1095.790	0.430	1.500	99.0	170.0
8	95/OFF	1049.072				
9	--	--	--	--	--	--
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
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22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	95	61.198	0.418	1.429	90.4	163.4

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.240
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	39.2
Qsd	Volumetric Air Flow Rate, Dry SCFM:	17470.9
Qaw	Volumetric Air Flow Rate, Wet ACFM:	21535.6
%I	Isokinetic Sampling Rate, %:	100.9
Vm(Dry)	Volume Gas Metered, Dry:	61.198
Vm(Std)	Volume Gas Metered, Std:	57.397

EMISSIONS RESULTS

ug	Cr+6	1.249 ug
mg/dscm	Concentration, mg/dscm:	0.768x 10-3
gr/dscf	Concentration, gr/dscf:	0.000x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.050x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.023x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscf	Concentration, gr/dscf:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **OUT-CR-10B** Date: 6-6-90
Sampling Location: Outlet Operator: MH
Net Run Time: 94 min Run Start Time: 1131
Num Sampling Points: 7 Run Stop Time: 1320

Pressures:

Fbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.600

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	40.0
Vw(std)	Volume of Water Vapor, SCF:	1.883
%H2O	Moisture Content, % by Vol.:	3.18
%CO2	Percent CO2 by Volume, Dry:	4.50
%O2	Percent O2 by Volume, Dry:	15.00
Mfd	Dry Mole Fraction:	0.968
Fo	Orsat Validation Value:	1.31
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.62

FIELD DATA

Meter Box Number: EN18 Meter Box dHa: 1.934
Dry Gas Meter Cal. Y: 0.932 Assumed Moisture: 8.00
Leak Test Rate, CFM: 0.009 Leak Test Vac, in Hg: 15.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	257.591	0.400	1.400	78.0	158.0
2	15	267.250	0.420	1.400	83.0	156.0
3	30	277.610	0.430	1.500	88.0	163.0
4	45	288.200	0.390	1.300	92.0	166.0
5	60	298.190	0.440	1.500	94.0	165.0
6	75	308.750	0.420	1.400	97.0	170.0
7	90	319.240	0.430	1.500	98.0	166.0
8	94/OFF	322.055				
9	--	--	--	--	--	--
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
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21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	94	64.464	0.418	1.429	90.0	163.4

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.240
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	39.2
Qsd	Volumetric Air Flow Rate, Dry SCFM:	17470.0
Qaw	Volumetric Air Flow Rate, Wet ACFM:	21535.9
%I	Isokinetic Sampling Rate, %:	101.7
Vm(Dry)	Volume Gas Metered, Dry:	64.464
Vm(Std)	Volume Gas Metered, Std:	57.271

EMISSIONS RESULTS

ug	Cr+6	1.237 ug
mg/dscm	Concentration, mg/dscm:	0.763x 10-3
gr/dscf	Concentration, gr/dscf:	0.000x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.050x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.023x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscf	Concentration, gr/dscf:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site9** Run No.: **OUT-CR-10C** Date: 6-6-90
Sampling Location: Outlet Operator: RM
Net Run Time: 95 min Run Start Time: 1130
Num Sampling Points: 7 Run Stop Time: 1320

Pressures:

Pbar	Barometric Pressure, in Hg:	29.600
Pg	Flue Gas Static Press. in H2O:	0.000
Ps	Absolute Flue Gas Press. in Hg:	29.600

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	40.0
Vw(std)	Volume of Water Vapor, SCF:	1.883
%H2O	Moisture Content, % by Vol.:	3.37
%CO2	Percent CO2 by Volume, Dry:	4.50
%O2	Percent O2 by Volume, Dry:	15.00
Mfd	Dry Mole Fraction:	0.966
Fo	Orsat Validation Value:	1.31
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.60

FIELD DATA

Meter Box Number:	N16	Meter Box dHa:	1.820
Dry Gas Meter Cal. Y:	0.996	Assumed Moisture:	3.00
Leak Test Rate, CFM:	0.009	Leak Test Vac, in Hg:	15.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	233.653	0.400	1.200	94.0	158.0
2	15	241.350	0.420	1.300	95.0	158.0
3	30	251.331	0.430	1.300	102.0	163.0
4	45	260.502	0.390	1.200	107.0	166.0
5	60	269.732	0.440	1.300	110.0	165.0
6	75	279.505	0.420	1.300	114.0	170.0
7	90	288.999	0.430	1.300	114.0	166.0
8	95/OFF	292.129				
9	--	--	--	--	--	--
10	--	--	--	--	--	--
11	--	--	--	--	--	--
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23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	95	58.476	0.418	1.271	105.1	163.7

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.240
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	39.2
Qsd	Volumetric Air Flow Rate, Dry SCFM:	17438.6
Qaw	Volumetric Air Flow Rate, Wet ACFM:	21549.0
%I	Isokinetic Sampling Rate, %:	95.0
Vm(Dry)	Volume Gas Metered, Dry:	58.476
Vm(Std)	Volume Gas Metered, Std:	53.964

EMISSIONS RESULTS

ug	Cr+6	1.189 ug
mg/dscm	Concentration, mg/dscm:	0.778x 10-3
gr/dscf	Concentration, gr/dscf:	0.000x 10-3
Lb/hr	Emission Rate,lb/hr PMRc:	0.051x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.023x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscf	Concentration, gr/dscf:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3
ug		0.000 ug
mg/dscm	Concentration, mg/dscm:	0.000x 10-3
gr/dscm	Concentration, gr/dscm:	0.000x 10-3
Lb/hr	Emission Rate,Lb/hr PMRc:	0.000x 10-3
Kg/hr	Emission Rate,Kg/hr PMRc:	0.000x 10-3

ISOKINETIC SAMPLING TRAIN FIELD DATA AND RESULTS TABULATION

Plant: **Site 9** Run No.: **OUT-CR+6-10D** Date: 6/6/90
Sampling Location: Outlet Operator: RLM
Net Run Time: 95 min Run Start Time: 1131
Num Sampling Points: 7 Run Stop Time: 1320

Pressures:

Pbar	Barometric Pressure, in Hg:	29.800
Pg	Flue Gas Static Press. in H2O:	-0.350
Ps	Absolute Flue Gas Press. in Hg:	29.774

Moisture Data:

Vlc	Vol. Liquid Collected, ml:	39.0
Vw(std)	Volume of Water Vapor, SCF:	1.836
%H2O	Moisture Content, % by Vol.:	3.35
%CO2	Percent CO2 by Volume, Dry:	5.00
%O2	Percent O2 by Volume, Dry:	14.00
Mfd	Dry Mole Fraction:	0.966
Fo	Orsat Validation Value:	1.38
Md	Estimated Dry Mol. Wt, Lb/Lb-Mole:	30.00
Ms	Wet Mol. Wt, Lb/Lb-Mole:	29.60

ISOKINETIC DATA

	Nozzle Number:	
Cp	Pitot Tube Coef.:	0.840
Dia	Nozzle Diameter, in:	0.240
A	Stack/Duct Area, in2:	1319.5
Vs	Flue Gas Velocity, Ft/sec:	39.1
Qsd	Volumetric Air Flow Rate, Dry SCFM:	17492.4
Qaw	Volumetric Air Flow Rate, Wet ACFM:	21485.1
%I	Isokinetic Sampling Rate, %:	92.8
Vm(Dry)	Volume Gas Metered, Dry:	58.476
Vm(Std)	Volume Gas Metered, Std:	52.892

FIELD DATA

Meter Box Number: NU-2 Meter Box dHa: 1.820
Dry Gas Meter Cal. Y: 0.969 Assumed Moisture: 6.00
Leak Test Rate, CFM: 0.012 Leak Test Vac, in Hg: 15.00

Point Num	Sample Time (min)	Dry Gas Meter Reading (cu ft)	Delta P (in H2O)	Delta H (in H2O)	Gas Meter Temp (oF)	Stack Temp (oF)
1	0	233.653	0.400	1.230	94.0	158.0
2	15	241.350	0.420	1.290	95.0	158.0
3	30	251.331	0.430	1.320	102.0	163.0
4	45	260.502	0.390	1.160	107.0	166.0
5	60	269.732	0.440	1.300	110.0	165.0
6	75	279.505	0.420	1.250	114.0	170.0
7	90	288.999	0.430	1.280	114.0	166.0
8	95/OFF	292.129				
9	--	--	--	--	--	--
10	--	--	--	--	--	--
11	--	--	--	--	--	--
12	--	--	--	--	--	--
13	--	--	--	--	--	--
14	--	--	--	--	--	--
15	--	--	--	--	--	--
16	--	--	--	--	--	--
17	--	--	--	--	--	--
18	--	--	--	--	--	--
19	--	--	--	--	--	--
20	--	--	--	--	--	--
21	--	--	--	--	--	--
22	--	--	--	--	--	--
23	--	--	--	--	--	--
24	--	--	--	--	--	--
25	--	--	--	--	--	--
FINAL/AVG	95	58.476	0.418	1.261	105.1	163.7

EMISSIONS RESULTS

mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	66.768
gr/dscf	Concentration, gr/dscf:	0.029
Lb/hr	Emission Rate,lb/hr PMRc:	4.374
Kg/hr	Emission Rate,Kg/hr PMRc:	1.984
mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	66.768
gr/dscf	Concentration, gr/dscf:	0.029
Lb/hr	Emission Rate,Lb/hr PMRc:	4.374
Kg/hr	Emission Rate,Kg/hr PMRc:	1.984
mg	100	100.000mg
mg/dscm	Concentration, mg/dscm:	66.768
gr/dscm	Concentration, gr/dscm:	0.029
Lb/hr	Emission Rate,Lb/hr PMRc:	4.374
Kg/hr	Emission Rate,Kg/hr PMRc:	1.984

Appendix D

Analytical Data and Reports

PARTICULATE SAMPLING LABORATORY RESULTS

Plant Name: SSI SITE #9 EEI Ref# 3808

Sampling Location:

Date Received: 6/12 Date Analyzed: 6/27 Reagent Box(es):

Run Number Run Date	4A-OUT	4B-OUT
Sample ID/Container #	F / 9-18	F / 9-20
		6.8047
	6.8959	6.8052
	6.8963	6.8065
Tare Weight., g.	6.2266	6.2690
SAMPLE WT., g.	0.6693	0.5357
Sample ID/Container #	R / 9-19	R / 9-24
	6.3422	6.1275
	6.3426	6.1276
	6.3435	6.1284
Tare Wt., g.	6.3388	6.1247
SAMPLE WT., g.	0.0034	0.0028
Sum of Particulate, mg.	672.7	538.5
Total Filter Tare, mg.	643.0	511.2
Blank Residue, mg. (175 ml)	0.4 (175 ml)	0.4
TOTAL PARTICULATE CATCH, mg.	29.3	26.9

Blank Beaker # 2003
Final wt., mg. 99546.3
Tare wt., mg. 99545.9
Residue, mg. 0.4
Volume, ml. 200

Concentration, mg/ml 0.002

---Legend---
= Final Weight
L = Loose Particulate
F = Filter D = Dish
R = Rinse P = Pan

Notes and Comments

PARTICULATE SAMPLING LABORATORY RESULTS

Plant Name: SSI SITE #9 EEI Ref# 3808

Sampling Location:

Date Received: 6/12 Date Analyzed: 6/27 Reagent Box(es):

Run Number Run Date	9A-OUT	9B-OUT
Sample ID/Container #	F / 9-44	F / 9-46
	6.9093	6.6198
	6.9094	6.6199
	6.9112	6.6210
Tare Weight., g.	6.3908	6.1010
SAMPLE WT., g.	0.5185	0.5188
Sample ID/Container #	R / 9-45	R / 9-47
	6.1045	6.2178
	6.1045	6.2177
	6.1051	6.2186
Tare Wt., g.	6.1007	6.2142
SAMPLE WT., g.	0.0038	0.0035
Sum of Particulate, mg.	522.3	522.3
Total Filter Tare, mg.	515.9	515.6
Blank Residue, mg. (100 ml)	0.2 (100 ml)	0.2
TOTAL PARTICULATE CATCH, mg.	6.2	6.5

Blank Beaker # 2003
Final wt., mg. 99546.3
Tare wt., mg. 99545.9
Residue, mg. 0.4
Volume, ml. 200

Concentration, mg/ml 0.002

---Legend---
= Final Weight
L = Loose Particulate
F = Filter D = Dish
R = Rinse P = Pan

Notes and Comments

PARTICULATE SAMPLING LABORATORY RESULTS

Plant Name: SSI SITE #9 EEI Ref# 3808

Sampling Location:

Date Received: 6/12 Date Analyzed: 6/27 Reagent Box(es):

Run Number Run Date	11A-OUT	11B-OUT
Sample ID/Container #	F / 9-5	F / 9-8
	6.9254	
	6.9256	
	6.9272	6.5867
	6.9283	6.5869
Tare Weight., g.	6.4102	6.0726
SAMPLE WT., g.	0.5152	0.5141
Sample ID/Container #	R / 9-7	R / 9-10
	6.2457	6.2715
	6.2456	6.2714
	6.2464	6.2730
Tare Wt., g.	6.2430	6.2677
SAMPLE WT., g.	0.0026	0.0037
Sum of Particulate, mg.	517.8	517.8
Total Filter Tare, mg.	513.6	511.3
Blank Residue, mg. (125 ml)	0.3 (75 ml)	0.2
TOTAL PARTICULATE CATCH, mg.	3.9	6.3

Blank Beaker # 2003
Final wt., mg. 99546.3
Tare wt., mg. 99545.9
Residue, mg. 0.4
Volume, ml. 200

Concentration, mg/ml 0.002

---Legend---
= Final Weight
L = Loose Particulate
F = Filter D = Dish
R = Rinse P = Pan

Notes and Comments

PARTICULATE SAMPLING LABORATORY RESULTS

Plant Name: SSI SITE #9 EEI Ref# 3808

Sampling Location:

Date Received: 6/12 Date Analyzed: 6/27 Reagent Box(es):

Run Number Run Date	12A-OUT	12B-OUT
Sample ID/Container #	F / 9-30	F / 9-35
	6.6573	6.7194
	6.6571	6.7199
Tare Weight., g.	6.1459	6.2078
SAMPLE WT., g.	0.5112	0.5116
Sample ID/Container #	R / 9-32	R / 9-36
	6.1572	6.2913
	6.1575	6.2914
	6.1587	6.2920
Tare Wt., g.	6.1550	6.2886
SAMPLE WT., g.	0.0022	0.0027
Sum of Particulate, mg.	513.4	514.3
Total Filter Tare, mg.	508.5	507.2
Blank Residue, mg. (100 ml)	0.2 (100 ml)	0.2
TOTAL PARTICULATE CATCH, mg.	4.7	6.9

Blank Beaker # 2003
Final wt., mg. 99546.3
Tare wt., mg. 99545.9
Residue, mg. 0.4
Volume, ml. 200

Concentration, mg/ml 0.002

---Legend---
= Final Weight
L = Loose Particulate
F = Filter D = Dish
R = Rinse P = Pan

Notes and Comments

PARTICULATE SAMPLING LABORATORY RESULTS

Plant Name: SSI SITE #9 EEI Ref# 3808

Sampling Location:

Date Received: 6/12 Date Analyzed: 6/27 Reagent Box(es):

Run Number Run Date	13A-OUT	13B-OUT
Sample ID/Container #	F / 9-63	F / 9-66
	6.8972	6.8737
	6.8971	6.8741
Tare Weight., g.	6.3134	6.3539
SAMPLE WT., g.	0.5837	0.5198
Sample ID/Container #	R / 9-65	R / 9-67
	6.0879	6.2566
	6.0880	6.2566
	6.0893	6.2579
Tare Wt., g.	6.0796	6.2527
SAMPLE WT., g.	0.0083	0.0039
Sum of Particulate, mg.	592.0	523.7
Total Filter Tare, mg.	579.3	516.2
Blank Residue, mg. (175 ml)	0.4 (100 ml)	0.2
TOTAL PARTICULATE CATCH, mg.	12.3	7.3

Blank Beaker # 2003
Final wt., mg. 99546.3
Tare wt., mg. 99545.9
Residue, mg. 0.4
Volume, ml. 200

Concentration, mg/ml 0.002

---Legend---
= Final Weight
L = Loose Particulate
F = Filter D = Dish
R = Rinse P = Pan

Notes and Comments

PARTICULATE SAMPLING LABORATORY RESULTS

Plant Name: SSI SITE #9 EEI Ref# 3808

Sampling Location.

Date Received: 6/12 Date Analyzed: 6/27 Reagent Box(es):

Run Number Run Date	2A-OUT-MMTL	2B-OUT-MMTL
Sample ID/Container #	F / 9-2	F / 9-9
		6.8443
		6.8444
	7.0309	6.8462
	7.0310	6.8472
	7.0319	6.8488
Tare Weight., g.	6.3135	6.1909
SAMPLE WT., g.	0.7174	0.6534
Sample ID/Container #	R / 9-6	R / 9-11
	6.2798	6.1677
	6.2795	6.1676
	6.2806	6.1686
Tare Wt., g.	6.2770	6.1652
SAMPLE WT., g.	0.0025	0.0024
Sum of Particulate, mg.	719.9	655.8
Total Filter Tare, mg.	642.8	572.5
Blank Residue, mg. (75 ml)	0.2 (100 ml)	0.2
TOTAL PARTICULATE CATCH, mg.	76.9	83.1

Blank Beaker #	2003	---Legend---
Final wt., mg.	99546.3	= Final Weight
Tare wt., mg.	99545.9	L = Loose Particulate
Residue, mg.	0.4	F = Filter D = Dish
Volume, ml.	200	R = Rinse P = Pan

Concentration, mg/ml 0.002

Notes and Comments

PARTICULATE SAMPLING LABORATORY RESULTS

Plant Name: SSI SITE #9 EEI Ref# 3808

Sampling Location:

Date Received: 6/12 Date Analyzed: 6/27 Reagent Box(es):

Run Number Run Date	2A-INLET-MMTL	2B-INLET-MMTL
Sample ID/Container #	F / 9-13	F / 9-16
	7.1258	
	7.1278	
	7.1292	7.1039
	7.1307	7.1037
Tare Weight., g.	6.3076	6.2683
SAMPLE WT., g.	0.8182	0.8354
Sample ID/Container #	R / 9-14	R / 9-17
	7.1505	6.9641
	7.1508	6.9645
	7.1518	6.9697
	7.1555	6.9736
Tare Wt., g.	6.1692	6.1856
SAMPLE WT., g.	0.9813	0.7785
Sum of Particulate, mg.	1799.5	1613.9
Total Filter Tare, mg.	515.4	567.4
Blank Residue, mg. (ml)	0.0 (200 ml)	0.4
TOTAL PARTICULATE CATCH, mg.	1284.1	1046.1

Blank Beaker # 2003
Final wt., mg. 99546.3
Tare wt., mg. 99545.9
Residue, mg. 0.4
Volume, ml. 200

Concentration, mg/ml 0.002

---Legend---
= Final Weight
L = Loose Particulate
F = Filter D = Dish
R = Rinse P = Pan

Notes and Comments

PARTICULATE SAMPLING LABORATORY RESULTS

Plant Name: SSI SITE #9 EEI Ref# 3808

Sampling Location:

Date Received: 6/12 Date Analyzed: 6/27 Reagent Box(es):

Run Number Run Date	4A-MID	4B-MID
Sample ID/Container #	F / 9-27	F / 9-34
	6.9575	
	6.9579	
	6.9589	6.9804
	6.9597	6.9805
	6.9616	6.9820
Tare Weight., g.	6.2755	6.2832
SAMPLE WT., g.	0.6820	0.6972

Sample ID/Container #	R / 28	R / 37
		6.5157
	6.5547	6.5157
	6.5550	6.5170
	6.5576	6.5207
Tare Wt., g.	6.3275	6.1944
SAMPLE WT., g.	0.2272	0.3213

Sum of Particulate, mg.		909.2		1018.5
Total Filter Tare, mg.		637.5		643.3
Blank Residue, mg.	(250 ml)	0.5	(225 ml)	0.5
TOTAL PARTICULATE CATCH, mg.		271.2		374.7

Blank Beaker #	2003	---Legend---
Final wt., mg.	99546.3	= Final Weight
Tare wt., mg.	99545.9	L = Loose Particulate
Residue, mg.	0.4	F = Filter D = Dish
Volume, ml.	200	R = Rinse P = Pan
Concentration, mg/ml	0.002	

Notes and Comments

PARTICULATE SAMPLING LABORATORY RESULTS

Plant Name: SSI SITE #9 EEI Ref# 3808

Sampling Location:

Date Received: 6/12 Date Analyzed: 6/27 Reagent Box(es):

Run Number Run Date	4A-INLET	4B-INLET
Sample ID/Container #	F / 38	F / 42
	7.0687	6.6724
	7.0688	6.6725
	7.0705	6.6750
	7.0719	6.6758
	7.0725	6.6787
Tare Weight., g.	6.2593	5.8362
SAMPLE WT., g.	0.8094	0.8362
Sample ID/Container #	R / 40	R / 43
	6.2713	
	6.2717	6.4516
	6.2723	6.4520
	6.2770	6.4550
Tare Wt., g.	6.1318	6.1734
SAMPLE WT., g.	0.1395	0.2782
Sum of Particulate, mg.	948.9	1114.4
Total Filter Tare, mg.	638.4	638.5
Blank Residue, mg. (150 ml)	0.3 (250 ml)	0.5
TOTAL PARTICULATE CATCH, mg.	310.2	475.4

Blank Beaker #	2003	---Legend---
Final wt., mg.	99546.3	= Final Weight
Tare wt., mg.	99545.9	L = Loose Particulate
Residue, mg.	0.4	F = Filter D = Dish
Volume, ml.	200	R = Rinse P = Pan

Concentration, mg/ml 0.002

Notes and Comments

PARTICULATE SAMPLING LABORATORY RESULTS

Plant Name: SSI SITE #9 EEI Ref# 3808

Sampling Location:

Date Received: 6/12 Date Analyzed: 6/27 Reagent Box(es):

Run Number Run Date	9A-MID	9B-MID
Sample ID/Container #	F / 9-48	F / 9-49
	6.9110	6.8847
	6.9107	6.8849
	6.9134	6.8880
	6.9158	6.8904
	6.9195	6.8942
Tare Weight., g.	6.2594	6.1649
SAMPLE WT., g.	0.6513	0.7198
Sample ID/Container #	R /	R /
Tare Wt., g.	0.0000	0.0000
SAMPLE WT., g.	0.0000	0.0000
Sum of Particulate, mg.	651.3	719.8
Total Filter Tare, mg.	571.8	634.4
Blank Residue, mg. (ml)	0.0 (ml)	0.0
TOTAL PARTICULATE CATCH, mg.	79.5	85.4

Blank Beaker # 2003
Final wt., mg. 99546.3
Tare wt., mg. 99545.9
Residue, mg. 0.4
Volume, ml. 200

Concentration, mg/ml 0.002

---Legend---
= Final Weight
L = Loose Particulate
F = Filter D = Dish
R = Rinse P = Pan

Notes and Comments

PARTICULATE SAMPLING LABORATORY RESULTS

Plant Name: SSI SITE #9 EEI Ref# 3808

Sampling Location:

Date Received: 6/12 Date Analyzed: 6/27 Reagent Box(es):

Run Number Run Date	9A-INLET	9B-INLET
Sample ID/Container #	F / 9-50	F / 9-3
	7.0577	
	7.0584	
	7.0616	
	7.0641	7.0202
	7.0657	7.0203
Tare Weight., g.	6.2603	6.2737
SAMPLE WT., g.	0.7974	0.7465
Sample ID/Container #	R / 9-1	R / 9-4
	7.9634	7.7652
	7.9634	7.7659
	7.9660	7.7688
	7.9675	7.7712
	7.9691	7.7759
Tare Wt., g.	6.3060	6.1703
SAMPLE WT., g.	1.6574	1.5949
Sum of Particulate, mg.	2454.8	2341.4
Total Filter Tare, mg.	504.7	514.1
Blank Residue, mg. (425 ml)	0.9 (400 ml)	0.8
TOTAL PARTICULATE CATCH, mg.	1949.2	1826.5

Blank Beaker #	2003	---Legend---
Final wt., mg.	99546.3	= Final Weight
Tare wt., mg.	99545.9	L = Loose Particulate
Residue, mg.	0.4	F = Filter D = Dish
Volume, ml.	200	R = Rinse P = Pan

Concentration, mg/ml 0.002

Notes and Comments

PARTICULATE SAMPLING LABORATORY RESULTS

Plant Name: SSI SITE #9 EEI Ref# 3808

Sampling Location:

Date Received: 6/12 Date Analyzed: 6/27 Reagent Box(es):

Run Number Run Date	11A-MID	11B-MID
Sample ID/Container #	F / 9-12	F / 9-21
		6.5968
	7.0389	6.5966
	7.0395	6.5987
	7.0419	6.5995
	7.0493	6.6076
	7.0532	6.6068
Tare Weight., g.	6.3190	5.9413
SAMPLE WT., g.	0.7199	0.6553
Sample ID/Container #	R / 9-15	R / 9-22
	6.1481	6.2185
	6.1479	6.2185
	6.1489	6.2199
Tare Wt., g.	6.1440	6.2120
SAMPLE WT., g.	0.0039	0.0065
Sum of Particulate, mg.	723.8	661.8
Total Filter Tare, mg.	638.8	569.4
Blank Residue, mg. (75 ml)	0.2 (75 ml)	0.2
TOTAL PARTICULATE CATCH, mg.	84.8	92.2

Blank Beaker # 2003
Final wt., mg. 99546.3
Tare wt., mg. 99545.9
Residue, mg. 0.4
Volume, ml. 200

Concentration, mg/ml 0.002

---Legend---
= Final Weight
L = Loose Particulate
F = Filter D = Dish
R = Rinse P = Pan

Notes and Comments

PARTICULATE SAMPLING LABORATORY RESULTS

Plant Name: SSI SITE #9 EEI Ref# 3808

Sampling Location:

Date Received: 6/12 Date Analyzed: 6/27 Reagent Box(es):

Run Number Run Date	11A-INLET	11B-INLET
Sample ID/Container #	F / 9-23	F / 9-26
	6.9515	6.9338
	6.9513	6.9333
	6.9528	6.9362
	6.9571	6.9386
	6.9542	6.9399
Tare Weight., g.	6.0668	6.1644
SAMPLE WT., g.	0.8845	0.7689
Sample ID/Container #	R / 9-25	R / 9-29
	8.9233	8.6845
	8.9235	8.6841
	8.9260	8.6862
	8.9277	8.6892
	8.9288	8.6886
Tare Wt., g.	6.3220	6.2932
SAMPLE WT., g.	2.6013	2.3909
Sum of Particulate, mg.	3485.8	3159.8
Total Filter Tare, mg.	515.0	569.8
Blank Residue, mg. (250 ml)	0.5 (250 ml)	0.5
TOTAL PARTICULATE CATCH, mg.	2970.3	2589.5

Blank Beaker # 2003
Final wt., mg. 99546.3
Tare wt., mg. 99545.9
Residue, mg. 0.4
Volume, ml. 200

Concentration, mg/ml 0.002

---Legend---
= Final Weight
L = Loose Particulate
F = Filter D = Dish
R = Rinse P = Pan

Notes and Comments

PARTICULATE SAMPLING LABORATORY RESULTS

Plant Name: SSI SITE #9 EEI Ref# 3808

Sampling Location:

Date Received: 6/12 Date Analyzed: 6/27 Reagent Box(es):

Run Number Run Date	12A-MID	12B-MID
Sample ID/Container #	F / 9-39	F / 9-56
	6.9955	
	6.9952	
	6.9986	
	7.0013	6.8458
	7.0077	6.8459
Tare Weight., g.	6.3294	6.1662
SAMPLE WT., g.	0.6658	0.6796
Sample ID/Container #	R / 9-41	R / 9-57
	6.2781	6.2867
	6.2781	6.2868
	6.2791	6.2874
Tare Wt., g.	6.2707	6.2740
SAMPLE WT., g.	0.0074	0.0127
Sum of Particulate, mg.	673.2	692.3
Total Filter Tare, mg.	580.1	577.0
Blank Residue, mg. (125 ml)	0.3 (125 ml)	0.3
TOTAL PARTICULATE CATCH, mg.	92.8	115.0

Blank Beaker # 2003
Final wt., mg. 99546.3
Tare wt., mg. 99545.9
Residue, mg. 0.4
Volume, ml. 200

Concentration, mg/ml 0.002

---Legend---
= Final Weight
L = Loose Particulate
F = Filter D = Dish
R = Rinse P = Pan

Notes and Comments

PARTICULATE SAMPLING LABORATORY RESULTS

Plant Name: SSI SITE #9 EEI Ref# 3808

Sampling Location:

Date Received: 6/12 Date Analyzed: 6/27 Reagent Box(es):

Run Number Run Date	12A-INLET	12B-INLET
Sample ID/Container #	F / 9-58	F / 9-60
	7.0928	
	7.0931	
	7.0943	7.2265
	7.0967	7.2269
Tare Weight., g.	6.2582	6.4196
SAMPLE WT., g.	0.8346	0.8069
Sample ID/Container #	R / 9-59	R / 9-61
	7.7949	8.0133
	7.7953	8.0141
	7.7987	8.0173
	7.8023	8.0211
Tare Wt., g.	6.1732	6.3199
SAMPLE WT., g.	1.6217	1.6934
Sum of Particulate, mg.	2456.3	2500.3
Total Filter Tare, mg.	568.2	569.1
Blank Residue, mg. (125 ml)	0.3 (150 ml)	0.3
TOTAL PARTICULATE CATCH, mg.	1887.8	1930.9

Blank Beaker #	2003	---Legend---
Final wt., mg.	99546.3	= Final Weight
Tare wt., mg.	99545.9	L = Loose Particulate
Residue, mg.	0.4	F = Filter D = Dish
Volume, ml.	200	R = Rinse P = Pan

Concentration, mg/ml 0.002

Notes and Comments

PARTICULATE SAMPLING LABORATORY RESULTS

Plant Name: SSI SITE #9 EEI Ref# 3808

Sampling Location:

Date Received: 6/12 Date Analyzed: 6/27 Reagent Box(es):

Run Number	13A-MID	13B-MID
Run Date		
Sample ID/Container #	F / 9-80	F / 9-76
	6.8293	6.8442
	6.8293	6.8445
	6.8329	6.8466
	6.8367	6.8495
	6.8472	6.8612
Tare Weight., g.	6.1684	6.1701
SAMPLE WT., g.	0.6609	0.6741
Sample ID/Container #		R / 9-77
		6.0358
		6.0359
		6.0369
Tare Wt., g.		6.0303
SAMPLE WT., g.		0.0055
Sum of Particulate, mg.	660.9	679.6
Total Filter Tare, mg.	568.5	572.3
Blank Residue, mg. (ml)	0.2 (100 ml)	0.0
TOTAL PARTICULATE CATCH, mg.	92.2	107.3

Blank Beaker # 2003
Final wt., mg. 99546.3
Tare wt., mg. 99545.9
Residue, mg. 0.4
Volume, ml. 200

Concentration, mg/ml 0.002

---Legend---
= Final Weight
L = Loose Particulate
F = Filter D = Dish
R = Rinse P = Pan

Notes and Comments

PARTICULATE SAMPLING LABORATORY RESULTS

Plant Name: SSI SITE #9 EEI Ref# 3808

Sampling Location:

Date Received: 6/12 Date Analyzed: 6/12 Reagent Box(es):

Run Number Run Date	13A-INLET	13B-INLET
Sample ID/Container #	F / 9-68	F / 9-74
	7.1303	7.1687
	7.1305	7.1692
	7.1336	7.1713
	7.1342	7.1768
	7.1396	7.1827
Tare Weight., g.	6.4107	6.5044
SAMPLE WT., g.	0.7196	0.6643
Sample ID/Container #	R / 9-70	R / 9-75
	7.1308	7.1686
	7.1309	7.1687
	7.1324	7.1695
	7.1333	7.1705
	7.1374	7.1741
Tare Wt., g.	6.2074	6.2518
SAMPLE WT., g.	0.9234	0.9168
Sum of Particulate, mg.	1643.0	1581.1
Total Filter Tare, mg.	571.4	507.0
Blank Residue, mg. (250 ml)	0.5 (250 ml)	0.5
TOTAL PARTICULATE CATCH, mg.	1071.1	1073.6

Blank Beaker # 2003 ---Legend--- Notes and Comments

Center for Environmental Measurements

August 29, 1990

Ms. Robin Segall
Senior Project Manager
Research & Analysis Division
Entropy Environmentalists Inc.
P. O. Box 12291
Research Triangle Park
North Carolina 27709-2291

Dear Robin,

Enclosed are the ICAP, GFAA, and mercury results for the sludge, ash, water, multiple metals trains samples and chromium samples from the sewage sludge incinerator received on 6-20-1990 through 7-10-1990, for EPA Contract No. 68-02-4462, Work Assignment No. 90-108, RTI Project No. 3893-108.

If you have any questions, please call me at 541-6569 or Peter Grohse at 541-6897.

Sincerely,

Kate Luk

Kate K. Luk, Ph.D.

Ref: 3893-108
cc: W. Gutknecht
P. Grohse
J. Merricks

Post Office Box 12194 Research Triangle Park, North Carolina 27709-2194 Telephone 919 541-6000
FAX: 919 541-5929

RTI Project No.: 3893-108
Company : Entropy
Sample : Sludge and Ash
Analysis Method : ICAP
Sample received : 6-20-90
Report Date : 8-24-90

Table 1. Original Sample, ug/g

Sample	Total Vol.mL	Sample Wt.(g)	As	Be	Cd	Cr	Pb	Ni
Run 3 Sludge	100.00	0.500	ND	ND	2.25	20.1	49.6	33.8
Run 4 Sludge	100.00	0.500	47.8	0.226	3.36	23.3	57.7	35.4
Run 4 Slud(Dup)	100.00	0.501	50.7	ND	2.55	24.9	61.4	37.1
Run 5 Sludge	100.00	0.502	ND	ND	2.12	23.7	58.6	37.9
Run 8 Sludge	100.00	0.501	ND	ND	2.62	27.2	92.3	42.0
Run 9 Sludge	100.00	0.500	ND	ND	2.44	25.6	56.5	37.1
Run 10 Sludge	100.00	0.500	46.0	0.246	3.25	26.7	69.3	47.2
Run 11 Sludge	100.00	0.500	35.2	ND	2.42	24.3	66.3	46.7
Run 12 Sludge	100.00	0.501	37.2	ND	2.39	25.1	63.2	49.9
Run 13 Sludge	100.00	0.500	ND	0.893	2.37	22.3	62.2	43.1
Sludge Audit	100.00	0.500	64.8	0.824	4.12	22.8	65.1	43.3
Run 3 Ash	100.00	0.500	42.6	2.03	6.85	326	746	594
Run 4 Ash	100.00	0.509	36.0	2.05	12.3	399	1051	723
Run 4 Ash (Dup)	100.00	0.509	33.5	2.06	10.8	390	1106	739
Run 5 Ash	100.00	0.507	47.4	2.01	10.4	344	848	654
Run 8 ash	100.00	0.508	ND	1.95	25.3	374	813	642
Run 9 Ash	100.00	0.501	73.7	2.20	6.93	372	806	687
Run 10 Ash	100.00	0.509	40.5	2.09	5.71	366	936	826
Run 11 Ash	100.00	0.508	33.8	2.09	6.42	365	936	805
Run 12 Ash	100.00	0.502	52.0	2.17	9.50	371	995	912
Run 13 Ash	100.00	0.510	45.7	2.04	9.28	347	856	785
Ash Audit	100.00	0.522	237	12.7	5.45	165	112	122
Detection Limit			32	0.20	0.90	1.2	17	2.4

Note : Detection Limit (ug/g) = Detection Limit (ug/mL)* Total Vol.(mL) /Sample Wt.(0.5g)
Dup = from separate digest
ND = Non-detectable, less than detection limit

RTI Project No.: 3893-108
Company : Entropy
Sample : QC for Sludge and Ash Samples
Analysis Method : ICAP
Sample received : 6-20-90
Report Date : 8-24-90

Table 2. Concentration, ug/mL

Sample	As	Be	Cd	Cr	Pb	Ni
QC	18.8	1.82	1.82	1.95	9.27	9.14
QC	19.0	2.21	2.19	1.98	10.9	11.3
QC	18.3	1.98	2.03	1.97	10.5	10.1
QC	18.5	1.94	1.94	2.05	9.79	9.93
QC	18.6	2.01	2.04	1.97	10.3	10.0
QC (Expected)	20.0	2.00	2.00	2.00	10.2	10.0
Sludge Blk	ND	ND	ND	ND	ND	ND
Ash Blk	ND	0.00600	0.00600	0.00600	ND	0.0345
Detection Limit	0.16	0.0010	0.0045	0.0060	0.084	0.012

Measurement Spike Concentration, ug/mL

Sample	As	Be	Cd	Cr	Pb	Ni
Run 13 Sludge Spk*	100	10.0	10.0	10.0	50.9	50.0
Run 13 Ash Spk*	--	10.0	10.0	10.0	50.9	50.0
Run 8 Ash Spk*	10.0					

Percent Recovery for Measurement Spike, %

Sample	As	Be	Cd	Cr	Pb	Ni
Run 13 Sludge Spk*	102	98.7	87.6	85.6	89.4	86.6
Run 13 Ash Spk*	--	93.3	92.3	90.4	94.6	90.2
Run 8 Ash Spk*	89.0					

Note : * Post digestion spike
ND = Non-detectable; less than detection limit

RTI Project No.: 3893-108
Company : Entropy
Sample : Water
Analysis Method : ICAP
Sample received : 7-9-90
Report Date : 8-24-90

Table 3. Original Sample, ug/mL

Sample	Total Vol.mL	As	Be	Cd	Cr	Pb	Ni
Run #2 V H20	100.00	ND	0.00100	0.139	0.231	1.82	0.605
Run #3 V H20	100.00	ND	ND	0.110	0.0800	0.651	0.101
Run #3 V H20 (Dup)		ND	ND	0.109	0.0770	0.654	0.103
Run #3 D H20	100.00	ND	ND	0.0400	0.0310	0.188	0.0330
Run #3 Inlet H20	100.00	ND	0.00100	0.00900	0.0260	ND	0.0230
Run #4 V H20	100.00	ND	0.00200	0.265	0.298	2.33	0.855
Run #4 D H20	100.00	ND	ND	0.209	0.226	1.64	0.348
Run #4 Inlet H20	100.00	ND	ND	0.00700	0.0190	ND	0.0660
Run #5 V H20	100.00	0.238	0.00400	0.680	0.698	3.75	1.42
Run #5 D H20	100.00	ND	ND	0.0570	0.0800	0.475	0.195
Run #5 Inlet H20	100.00	ND	ND	ND	ND	ND	ND
Run #8 V H20	100.00	0.413	0.00600	1.53	0.551	5.50	2.36
Run #8 D H20	100.00	ND	ND	0.144	0.176	2.02	0.442
Run #8 Inlet H20	100.00	ND	ND	0.0150	0.0450	ND	0.119
Run #9 V H20	100.00	0.169	0.00200	0.209	0.232	2.29	0.606
Run #9 D H20	100.00	ND	ND	0.0580	0.0800	0.611	0.124
Run #9 Inlet H20	100.00	ND	ND	0.0190	0.0940	0.106	0.0960
Run #10 V H20	100.00	0.260	0.0100	0.442	0.570	6.25	2.18
Run #10 D H20	100.00	ND	0.00100	0.159	0.187	1.86	0.507
Run #10 Inlet H20	100.00	ND	ND	0.0110	0.0440	ND	0.0980
Run #11 V H20	100.00	0.285	0.0110	0.507	0.683	6.15	2.83
Run #11 D H20	100.00	ND	ND	0.183	0.420	2.12	0.581
Run #11 Inlet H20	100.00	ND	ND	0.0120	0.304	ND	0.101
Run #12 V H20	100.00	0.280	0.00500	0.663	2.95	5.81	7.08
Run #12 D H20	100.00	ND	0.00100	0.190	0.362	1.71	0.621
Run #12 Inlet H20	100.00	ND	ND	0.0130	0.153	ND	0.121
Run #13 V H20	100.00	0.209	0.00400	0.319	0.671	2.83	1.67
Run #13 D H20	100.00	ND	ND	0.197	0.432	1.67	0.452
Run #13 Inlet H20	100.00	ND	ND	0.0220	0.362	0.0860	0.142
Detection Limit		0.16	0.0010	0.0045	0.0060	0.084	0.012

Note : ND = Non-detectable; less than detection limit

RTI Project No.: 3893-108
Company : Entropy
Sample : QC for Water Sample
Analysis Method : ICAP
Sample received : 7-9-90
Report Date : 8-24-90

Table 4. Concentration, ug/mL

Sample	As	Be	Cd	Cr	Pb	Ni
QC	19.3	2.01	2.17	2.02	11.1	10.3
QC	20.8	2.00	2.14	1.98	11.2	10.2
QC	20.5	1.88	1.70	1.84	8.50	9.19
QC	17.7	2.12	2.29	2.15	11.9	10.9
QC	22.6	1.96	1.93	1.98	9.75	9.91
QC (Expected)	20.0	2.00	2.00	2.00	10.2	10.0
Detection Limit	0.16	0.0010	0.0045	0.0060	0.084	0.012

Measurement Spike Concentration, ug/mL

Sample	As	Be	Cd	Cr	Pb	Ni
Run #3 D Spike*	10.0	10.0	10.0	10.0	50.9	50.0

Percent Recovery for Measurement Spike, %

Sample	As	Be	Cd	Cr	Pb	Ni
Run #3 D Spike*	90.0	93.3	92.3	90.4	94.6	90.2

Note : * Post digestion spike

RTI Project No.: 3893-108
Company : Entropy
Sample : Sludge, Ash, and Water
Analysis Method : CVAA
Sample received : 6-20-90 (Sludge and Ash); 7-9-90 (Water)
Report Date : 8-24-90

Table 5. Hg Results

Sample	Total Vol.mL	Sample Wt.(g)	Hg ug/mL	Hg ug/g	Spike Conc. (ug/mL)	Spike % Recovery
Run 3 Sludge	100.00	0.500	0.00562	1.12		
Run 4 Sludge	100.00	0.500	0.00412	0.824		
Run 5 Sludge	100.00	0.502	0.0119	2.37		
Run 5 Sludge (Dup)	100.00	0.502	0.0104	2.07		
Run 8 Sludge	100.00	0.502	0.00719	1.43		
Run 9 Sludge	100.00	0.500	0.00621	1.24		
Run 10 Sludge	100.00	0.500	0.0112	2.24		
Run 11 Sludge	100.00	0.500	0.00811	1.62		
Run 12 Sludge	100.00	0.501	0.00928	1.85		
Run 12 Sludge(Spk)					0.100	104
Run 13 Sludge	100.00	0.500	0.00941	1.88		
Sludge Audit	100.00	0.500	0.00499	0.998		
Sludge Blk	100.00		ND	ND		
Run 3 Ash	100.00	0.500	ND	ND		
Run 3 Ash (Dup)	100.00	0.500	ND	ND		
Run 4 Ash	100.00	0.509	ND	ND		
Run 5 Ash	100.00	0.507	ND	ND		
Run 8 ash	100.00	0.508	ND	ND		
Run 9 Ash	100.00	0.501	ND	ND		
Run 10 Ash	100.00	0.509	ND	ND		
Run 10 Ash (Spk)					0.100	92.9
Run 11 Ash	100.00	0.508	ND	ND		
Run 12 Ash	100.00	0.502	ND	ND		
Run 13 Ash	100.00	0.510	ND	ND		
Ash Audit	100.00	0.522	ND	ND		
Ash Blk	100.00		ND	ND		
Run #2 V H20			0.00151			
Run #2 V H20 (Dup)			0.00175			
Run #3 D H20			0.00210			
Run #3 V H20			0.00555			
Run #4 D H20			0.00131			
Run #4 V H20			0.00146			
Run #5 SWI H20			ND			
Run #9 D H20			0.00164			
Run #9 D H20 (Spk)					0.100	102
Run #9 V H20			ND			
Run #9 SWI H20			ND			
Run #10 D H20			ND			
Run #10 V H20			ND			
Run #10 SWI H20			ND			
Hg Al			0.111			
Detection Limit			0.0002			

Note : (Dup) was duplicate analysis from same digest
ND = Non-detectable; less than detection limit

RTI Project No.: 3893-108
Company : Entropy
Sample : QC for Sludge, Ash, and Water
Analysis Method : CVAA
Sample received : 6-20-90 (Sludge and Ash); 7-9-90 (Water)
Report Date : 8-24-90

Table 6. Calibration Check Sample, ug/mL

Sample	Measured ug/mL	Expected ug/mL
QC	0.0924	0.100
QC	0.212	0.200
QC	0.183	0.200
QC	0.218	0.200
QC	0.222	0.200
QC	0.203	0.200
QC	0.187	0.200
QC	0.285	0.300

RTI Project No.: 3893-108
Company : Entropy
Sample : Front Half Samples of Multiple Metals Trains from Sewage Sludge Incinerator
Analysis Method : ICAP
Sample received : 7-10-90
Report Date : 8-24-90

Table 7

Sample	Total Vol.mL	60% Total Vol.mL
2-A-OUT-FH	100	60.0
2-B-OUT-FH	100	60.0
2-A-IN-FH	200	120.0
2-B-IN-FH	200	120.0
4-A-OUT-FH	100	60.0
4-B-OUT-FH	200	120.0
4-A-MID-FH	200	120.0
4-B-MID-FH	200	120.0
4-A-IN-FH	250	150.0
4-B-IN-FH	200	120.0
9A-OUT-FH	100	60.0
9B-OUT-FH	100	60.0
9A-MID-F	100	60.0
9B-MID-F	100	60.0
9A-IN-FH	200	120.0
9B-IN-FH	200	120.0
11A-OUT-FH	100	60.0
11B-OUT-FH	200	120.0
11-A-MID-FH	100	60.0
11-B-MID-FH	100	60.0
11A-IN-FH	200	120.0
11B-IN-FH	200	120.0
12A-OUT-FH	200	120.0
12B-OUT-FH	200	120.0
12-A-MID-FH	200	120.0
12-B-MID-FH	200	120.0
12A-IN-FH	200	120.0
12B-IN-FH	200	120.0
13A-OUT-FH	200	120.0
13B-OUT-FH	100	60.0
13B-MID-FH	200	120.0
13A-IN-FH	200	120.0
13B-IN-FH	200	120.0
13A-MID-F	100	60.0
Reagent Blk 1	100	
Reagent Blk 2	100	
AF1	100	
AF2	100	

RTI Project No.: 3893-108
Company : Entropy
Sample : Back Half Samples of Multiple Metals Trains from Sewage Sludge Incinerator
Analysis Method : ICAP
Sample received : 7-10-90
Report Date : 8-24-90

Table 8

Sample	Total Vol.mL	60% Total Vol.mL
2-A-OUT-BH	100.00	60.0
2-B-OUT-BH	100.00	60.0
2-A-IN-BH	100.00	60.0
2-B-IN-BH	100.00	60.0
4-A-OUT-BH	100.00	60.0
4-B-OUT-BH	100.00	60.0
4-A-MID-BH	100.00	60.0
4-B-MID-BH	100.00	60.0
4-A-IN-BH	100.00	60.0
4-B-IN-BH	100.00	60.0
9A-OUT-BH	100.00	60.0
9B-OUT-BH	100.00	60.0
9A-MID-BH	100.00	60.0
9B-MID-BH	100.00	60.0
9A-IN-BH	100.00	60.0
9B-IN-BH	100.00	60.0
11A-OUT-BH	100.00	60.0
11B-OUT-BH	100.00	60.0
11-A-MID-BH	100.00	60.0
11-B-MID-BH	100.00	60.0
11A-IN-BH	100.00	60.0
11B-IN-BH	100.00	60.0
12A-OUT-BH	100.00	60.0
12B-OUT-BH	100.00	60.0
12-A-MID-BH	100.00	60.0
12-B-MID-BH	100.00	60.0
12A-IN-BH	100.00	60.0
12B-IN-BH	100.00	60.0
13A-OUT-BH	100.00	60.0
13B-OUT-BH	100.00	60.0
13B-MID-BH	100.00	60.0
13A-IN-BH	100.00	60.0
13B-IN-BH	100.00	60.0
Reagent Blk 1	100	
Reagent Blk 2	100	
AF1	100	
AF2	100	

RTI Project No.: 3893-108
Company : Entropy
Sample : Combined Front and Back Half Samples of Multiple Metals Trains from Sewage Sludge Incinerator
Analysis Method : ICAP
Sample received : 7-10-90
Report Date : 8-24-90

Table 9. Combined Digested Sample, ug/mL

Combined Sample	Combined Total Vol.mL	As	Be	Cd	Cr	Pb	Ni
2-A-OUT-FH+BH	120.0	0.281	ND	1.11	2.07	7.67	0.160
2-B-OUT-FH+BH	120.0	0.283	ND	1.12	0.212	7.76	0.155
2-A-IN-FH+BH	180.0	0.421	0.00800	2.02	1.24	14.8	2.52
2-B-IN-FH+BH	180.0	0.286	0.00700	1.43	1.21	10.4	2.22
4-A-OUT-FH+BH	120.0	ND	ND	0.130	0.0430	0.595	0.0370
4-B-OUT-FH+BH	180.0	ND	ND	0.0920	0.0220	0.442	0.0220
4-A-MID-FH+BH	180.0	ND	ND	0.188	0.270	1.56	0.470
4-B-MID-FH+BH	180.0	ND	0.00100	0.284	0.475	3.24	1.00
4-A-IN-FH+BH	210.0	ND	ND	0.447	0.335	2.60	0.564
4-B-IN-FH+BH	180.0	0.173	0.00100	0.627	0.474	3.51	0.893
9A-OUT-FH+BH	120.0	ND	ND	0.0340	0.0180	0.348	0.0130
9B-OUT-FH+BH	120.0	ND	ND	0.0230	0.0240	0.230	0.0240
9A-MID-F+BH	120.0	0.647	ND	1.47	0.333	12.6	0.195
9B-MID-F+BH	120.0	0.667	ND	1.59	0.362	13.4	0.214
9A-IN-FH+BH	180.0	0.347	0.0130	2.70	2.52	25.0	4.91
9B-IN-FH+BH	180.0	0.351	0.0120	2.45	2.25	24.7	4.17
11A-OUT-FH+BH	120.0	ND	ND	0.0390	0.0200	0.312	0.0190
11B-OUT-FH+BH	180.0	ND	ND	0.0220	0.0130	0.210	ND
11-A-MID-FH+BH	120.0	0.588	ND	1.45	0.349	10.3	0.234
11-B-MID-FH+BH	120.0	0.591	ND	1.52	0.376	10.9	0.246
11A-IN-FH+BH	180.0	ND	0.0220	2.11	2.50	20.7	6.62
11B-IN-FH+BH	180.0	ND	0.0200	1.98	2.60	18.7	6.06
12A-OUT-FH+BH	180.0	ND	ND	0.00800	0.0100	0.0890	0.0140
12B-OUT-FH+BH	180.0	ND	ND	0.00500	0.00900	0.0910	ND
12-A-MID-FH+BH	180.0	0.458	ND	1.23	0.212	7.63	0.207
12-B-MID-FH+BH	180.0	0.471	ND	1.39	0.236	8.44	0.241
12A-IN-FH+BH	180.0	0.450	0.0130	2.61	2.35	19.3	6.03
12B-IN-FH+BH	180.0	0.481	0.0120	2.42	2.34	18.1	5.38
13A-OUT-FH+BH	180.0	ND	ND	0.0190	0.0200	0.177	0.0170
13B-OUT-FH+BH	120.0	ND	ND	0.0130	0.0270	0.200	0.0180
13B-MID-FH+BH	180.0	0.448	ND	1.37	0.158	10.2	0.201
13A-IN-FH+BH	180.0	0.509	0.00700	2.10	1.32	18.0	3.15
13B-IN-FH+BH	180.0	0.561	0.00800	2.52	1.52	19.6	3.44
13A-MID-F	100.0	1.34	ND	3.55	0.431	27.3	0.521
13A-MID-F Dup	100.0	1.37	ND	3.76	0.437	27.2	0.51
Reagent Blk 1	100.0	ND	ND	ND	ND	ND	ND
Reagent Blk 2	100.0	ND	ND	ND	ND	ND	ND
AF1	100.0	ND	0.0540	0.116	0.130	0.586	0.290
AF2	100.0	ND	0.0470	0.0980	0.118	0.483	0.243
Detection Limit		0.164	0.0010	0.0020	0.0070	0.061	0.013

Combined Sample = 60% of Front Half + 60% of Back Half

RTI Project No.: 3893-108
Company : Entropy
Sample : Combined Front and Back Half Samples of Multiple Metals Trains from Sewage Sludge Incinerator
Analysis Method : ICAP
Sample received : 7-10-90
Report Date : 8-24-90

Table 10. Combined Digested Sample, ug

Combined Sample	Combined Total Vol.mL	As	Be	Cd	Cr	Pb	Ni
2-A-OUT-FH+BH	120.0	33.7	ND	133	248	920	19.2
2-B-OUT-FH+BH	120.0	34.0	ND	134	25.4	931	18.6
2-A-IN-FH+BH	180.0	75.8	1.44	364	223	2664	454
2-B-IN-FH+BH	180.0	51.5	1.26	257	218	1872	400
4-A-OUT-FH+BH	120.0	ND	ND	15.6	5.16	71.4	4.44
4-B-OUT-FH+BH	180.0	ND	ND	16.6	3.96	79.6	3.96
4-A-MID-FH+BH	180.0	ND	ND	33.8	48.6	281	84.6
4-B-MID-FH+BH	180.0	ND	0.180	51.1	85.5	583	180
4-A-IN-FH+BH	210.0	ND	ND	93.9	70.4	546	118
4-B-IN-FH+BH	180.0	31.1	0.180	113	85.3	632	161
9A-OUT-FH+BH	120.0	ND	ND	4.08	2.16	41.8	1.56
9B-OUT-FH+BH	120.0	ND	ND	2.76	2.88	27.6	2.88
9A-MID-F+BH	120.0	77.6	ND	176	40.0	1512	23.4
9B-MID-F+BH	120.0	80.0	ND	191	43.4	1608	25.7
9A-IN-FH+BH	180.0	62.5	2.34	486	453.6	4500	884
9B-IN-FH+BH	180.0	63.2	2.16	441	405	4445	751
11A-OUT-FH+BH	120.0	ND	ND	4.68	2.40	37.4	2.28
11B-OUT-FH+BH	180.0	ND	ND	3.96	2.34	37.8	ND
11-A-MID-FH+BH	120.0	70.6	ND	174	41.9	1236	28.1
11-B-MID-FH+BH	120.0	70.9	ND	182	45.1	1308	29.5
11A-IN-FH+BH	180.0	ND	3.96	380	450	3726	1192
11B-IN-FH+BH	180.0	ND	3.60	356	468	3366	1091
12A-OUT-FH+BH	180.0	ND	ND	1.44	1.8	16.0	2.52
12B-OUT-FH+BH	180.0	ND	ND	0.9	1.62	16.4	ND
12-A-MID-FH+BH	180.0	82.4	ND	221	38.2	1373	37.3
12-B-MID-FH+BH	180.0	84.8	ND	250	42.5	1519	43.4
12A-IN-FH+BH	180.0	81.0	2.34	470	423	3474	1085
12B-IN-FH+BH	180.0	86.6	2.16	436	421	3258	968
13A-OUT-FH+BH	180.0	ND	ND	3.42	3.60	31.9	3.06
13B-OUT-FH+BH	120.0	ND	ND	1.56	3.24	24.0	2.16
13B-MID-FH+BH	180.0	80.6	ND	247	28.4	1836	36.2
13A-IN-FH+BH	180.0	91.6	1.26	378	238	3240	567
13B-IN-FH+BH	180.0	101	1.44	454	274	3528	619
13A-MID-F	100.0	134	ND	355	43.1	2730	52.1
13A-MID-F Dup	100.0	137	ND	376	43.7	2720	51
Reagent Blk 1	100.0	ND	ND	ND	ND	ND	ND
Reagent Blk 2	100.0	ND	ND	ND	ND	ND	ND
AF1	100.0	ND	5.40	11.6	13.0	58.6	29.0
AF2	100.0	ND	4.70	9.80	11.8	48.3	24.3

Combined Sample = 60% of Front Half + 60% of Back Half

RTI Project No.: 3893-108
Company : Entropy
Sample : Combined Front and Back Half Samples of Multiple Metals Trains from Sewage Sludge Incinerator
Analysis Method : ICAP
Sample received : 7-10-90
Report Date : 8-24-90

Table 11. Original Sample, ug

Combined Sample	Total Vol.mL	As	Be	Cd	Cr	Pb	Ni
2-A-OUT-FH+BH	200	56.2	ND	222	414	1534	32.0
2-B-OUT-FH+BH	200	56.6	ND	224	42.4	1552	31.0
2-A-IN-FH+BH	300	126	2.40	606	372	4440	756
2-B-IN-FH+BH	300	85.8	2.10	429	363	3120	656
4-A-OUT-FH+BH	200	ND	ND	26.0	8.60	119	7.40
4-B-OUT-FH+BH	300	ND	ND	27.6	6.60	133	6.60
4-A-MID-FH+BH	300	ND	ND	56.4	81.0	468	141
4-B-MID-FH+BH	300	ND	0.300	85.2	143	972	300
4-A-IN-FH+BH	350	ND	ND	156	117	910	197
4-B-IN-FH+BH	300	51.9	0.300	188	142	1053	268
9A-OUT-FH+BH	200	ND	ND	6.80	3.60	69.6	2.60
9B-OUT-FH+BH	200	ND	ND	4.60	4.80	46.0	4.80
9A-MID-F+BH	200	129	ND	294	66.6	2520	39.0
9B-MID-F+BH	200	133	ND	318	72.4	2680	42.8
9A-IN-FH+BH	300	104	3.90	810	756	7500	1473
9B-IN-FH+BH	300	105	3.60	735	675	7410	1251
11A-OUT-FH+BH	200	ND	ND	7.80	4.00	62.4	3.80
11B-OUT-FH+BH	300	ND	ND	6.60	3.90	63.0	ND
11-A-MID-FH+BH	200	118	ND	290	69.8	2060	46.8
11-B-MID-FH+BH	200	118	ND	304	75.2	2180	49.2
11A-IN-FH+BH	300	ND	6.60	633	750	6210	1986
11B-IN-FH+BH	300	ND	6.00	594	780	5610	1818
12A-OUT-FH+BH	300	ND	ND	2.40	3.00	26.7	4.20
12B-OUT-FH+BH	300	ND	ND	1.50	2.70	27.3	ND
12-A-MID-FH+BH	300	137	ND	369	63.6	2289	62.1
12-B-MID-FH+BH	300	141	ND	417	70.8	2532	72.3
12A-IN-FH+BH	300	135	3.90	783	705	5790	1809
12B-IN-FH+BH	300	144	3.60	726	702	5430	1614
13A-OUT-FH+BH	300	ND	ND	5.70	6.00	53.1	5.10
13B-OUT-FH+BH	200	ND	ND	2.60	5.40	40.0	3.60
13B-MID-FH+BH	300	134	ND	411	47.4	3060	60.3
13A-IN-FH+BH	300	153	2.10	630	396	5400	945
13B-IN-FH+BH	300	168	2.40	756	456	5880	1032
13A-MID-F	100	134	ND	355	43.1	2730	52
13A-MID-F Dup	100	137	ND	376	43.7	2720	51
Reagent Blk 1	100	ND	ND	ND	ND	ND	ND
Reagent Blk 2	100	ND	ND	ND	ND	ND	ND
AF1	100	ND	5.40	11.6	13.0	58.6	29.0
AF2	100	ND	4.70	9.80	11.8	48.3	24.3

Note : Non-detectable; less than detection limit

RTI Project No.: 3893-108
Company : Entropy
Sample : QC for Combined Front and Back Half Samples of Multiple Metals Trains from Sewage Sludge Incinerator
Analysis Method : ICAP
Sample received : 7-10-90
Report Date : 8-24-90

Table 12. Calibration Check Sample, ug/mL

Sample	As	Be	Cd	Cr	Pb	Ni
QC	20.1	1.81	1.92	1.85	9.95	9.55
QC	19.9	1.92	2.07	2.06	10.5	10.5
QC	18.9	1.97	2.02	1.99	10.4	10.1
QC	20.2	1.94	2.06	2.07	10.6	10.5
QC	19.9	1.95	2.03	1.94	10.3	9.82
QC	20.0	2.15	2.03	2.16	10.3	10.8
QC	19.5	1.99	2.00	2.01	10.2	10.1
QC Expected	20.0	2.00	2.00	2.00	10.2	10.0
Detection Limit	0.164	0.0010	0.0020	0.0070	0.061	0.013

Measurement Spike Concentration, ug/mL

Sample	As	Be	Cd	Cr	Pb	Ni
13A-OUT-FH+BH Spk*	10.0	--	--	--	--	--
13A-MID-F Spk*	--	10.0	10.0	10.0	50.0	50.0

Percent Recovery for Measurement Spike, %

Sample	As	Be	Cd	Cr	Pb	Ni
13A-OUT-FH+BH Spk*	96.0	--	--	--	--	--
13A-MID-F Spk*		109	108	107	107	106

* : Post digestion Spike

RTI Project No.: 3893-108
Company : Entropy
Sample : Combined Front and Back Half Samples of Multiple Metals Trains from Sewage Sludge Incinerator
Analysis Method : GFAA
Sample received : 7-10-90
Report Date : 8-24-90

Table 13. Combined Digested Sample, ug/mL

Combined Sample	Combined Total Vol.mL	As	Be	Cd	Cr	Pb	Ni
2-A-OUT-FH+BH	120.0	0.280	0.000420	ICAP	ICAP	ICAP	ICAP
2-B-OUT-FH+BH	120.0	0.314	0.000500	ICAP	ICAP	ICAP	ICAP
2-A-IN-FH+BH	180.0	0.485	0.00826	ICAP	ICAP	ICAP	ICAP
2-B-IN-FH+BH	180.0	0.368	0.00636	ICAP	ICAP	ICAP	ICAP
4-A-OUT-FH+BH	120.0	0.0205	ND	ICAP	ICAP	ICAP	0.0314
4-B-OUT-FH+BH	180.0	0.0122	0.00890	ICAP	0.0285	ICAP	0.0184
4-A-MID-FH+BH	180.0	0.0416	0.000900	ICAP	ICAP	ICAP	ICAP
4-B-MID-FH+BH	180.0	0.0684	0.00161	ICAP	ICAP	ICAP	ICAP
4-A-IN-FH+BH	210.0	0.119	0.00101	ICAP	ICAP	ICAP	ICAP
4-B-IN-FH+BH	180.0	0.154	0.00176	ICAP	ICAP	ICAP	ICAP
9A-OUT-FH+BH	120.0	0.0130	0.000280	ICAP	0.0194	0.303	0.0235
9B-OUT-FH+BH	120.0	0.00850	ND	ICAP	0.0204	0.230	0.0236
9A-MID-F+BH	120.0	0.478	0.000910	ICAP	ICAP	ICAP	ICAP
9B-MID-F+BH	120.0	0.512	0.000630	ICAP	ICAP	ICAP	ICAP
9A-IN-FH+BH	180.0	0.677	0.0148	ICAP	ICAP	ICAP	ICAP
9B-IN-FH+BH	180.0	0.638	0.0136	ICAP	ICAP	ICAP	ICAP
11A-OUT-FH+BH	120.0	0.0145	ND	ICAP	0.0224	0.307	0.0162
11B-OUT-FH+BH	180.0	0.00890	ND	ICAP	0.0132	0.213	0.00860
11-A-MID-FH+BH	120.0	0.419	0.000770	ICAP	ICAP	ICAP	ICAP
11-B-MID-FH+BH	120.0	0.442	0.000610	ICAP	ICAP	ICAP	ICAP
11A-IN-FH+BH	180.0	0.529	0.0211	ICAP	ICAP	ICAP	ICAP
11B-IN-FH+BH	180.0	0.534	0.0191	ICAP	ICAP	ICAP	ICAP
12A-OUT-FH+BH	180.0	0.00410	ND	0.0130	0.0109	0.0850	0.00880
12B-OUT-FH+BH	180.0	0.00320	ND	0.0136	0.0102	0.0892	0.00610
12-A-MID-FH+BH	180.0	0.320	0.000490	ICAP	ICAP	ICAP	ICAP
12-B-MID-FH+BH	180.0	0.349	0.000690	ICAP	ICAP	ICAP	ICAP
12A-IN-FH+BH	180.0	0.646	0.0143	ICAP	ICAP	ICAP	ICAP
12B-IN-FH+BH	180.0	0.631	0.0145	ICAP	ICAP	ICAP	ICAP
13A-OUT-FH+BH	180.0	0.00620	ND	ICAP	0.0164	0.140	0.0161
13B-OUT-FH+BH	120.0	0.00680	ND	ICAP	0.0286	0.208	0.0249
13B-MID-FH+BH	180.0	0.424	0.000530	ICAP	ICAP	ICAP	ICAP
13A-IN-FH+BH	180.0	0.542	0.00726	ICAP	ICAP	ICAP	ICAP
13B-IN-FH+BH	180.0	0.613	0.00860	ICAP	ICAP	ICAP	ICAP
13A-MID-F	100.0	1.191	0.000950	ICAP	ICAP	ICAP	ICAP
Reagent Blk 1	100.0	ND	ND	ND	0.00050	ND	ND
Reagent Blk 2	100.0	ND	ND	ND	0.00050	0.00320	ND
AF1	100.0	0.0916	0.0475	ICAP	ICAP	ICAP	ICAP
AF2	100.0	0.0933	0.0443	ICAP	ICAP	ICAP	ICAP
Detection Limit		0.0027	0.00036	0.00015	0.00024	0.0012	0.0033

ND : Non-detectable; less than detection limit

RTI Project No.: 3893-108
Company : Entropy
Sample : Combined Front and Back Half Samples of Multiple Metals Trains from Sewage Sludge Incinerator
Analysis Method : GFAA
Sample received : 7-10-90
Report Date : 8-24-90

Table 14. Combined Digested Sample, ug

Combined Sample	Combined Total Vol.mL	As	Be	Cd	Cr	Pb	Ni
2-A-OUT-FH+BH	120.0	33.6	0.0504	ICAP	ICAP	ICAP	ICAP
2-B-OUT-FH+BH	120.0	37.7	0.0600	ICAP	ICAP	ICAP	ICAP
2-A-IN-FH+BH	180.0	87.3	1.49	ICAP	ICAP	ICAP	ICAP
2-B-IN-FH+BH	180.0	66.2	1.14	ICAP	ICAP	ICAP	ICAP
4-A-OUT-FH+BH	120.0	2.46	ND	ICAP	ICAP	ICAP	3.77
4-B-OUT-FH+BH	180.0	2.20	1.60	ICAP	5.13	ICAP	3.31
4-A-MID-FH+BH	180.0	7.49	0.162	ICAP	ICAP	ICAP	ICAP
4-B-MID-FH+BH	180.0	12.3	0.290	ICAP	ICAP	ICAP	ICAP
4-A-IN-FH+BH	210.0	25.0	0.212	ICAP	ICAP	ICAP	ICAP
4-B-IN-FH+BH	180.0	27.7	0.317	ICAP	ICAP	ICAP	ICAP
9A-OUT-FH+BH	120.0	1.56	0.0336	ICAP	2.33	36.4	2.82
9B-OUT-FH+BH	120.0	1.02	ND	ICAP	2.45	27.6	2.83
9A-MID-F+BH	120.0	57.4	0.109	ICAP	ICAP	ICAP	ICAP
9B-MID-F+BH	120.0	61.4	0.0756	ICAP	ICAP	ICAP	ICAP
9A-IN-FH+BH	180.0	122	2.66	ICAP	ICAP	ICAP	ICAP
9B-IN-FH+BH	180.0	115	2.45	ICAP	ICAP	ICAP	ICAP
11A-OUT-FH+BH	120.0	1.74	ND	ICAP	2.69	36.8	1.94
11B-OUT-FH+BH	180.0	1.60	ND	ICAP	2.38	38.3	1.55
11-A-MID-FH+BH	120.0	50.3	0.0924	ICAP	ICAP	ICAP	ICAP
11-B-MID-FH+BH	120.0	53.0	0.0732	ICAP	ICAP	ICAP	ICAP
11A-IN-FH+BH	180.0	95.2	3.80	ICAP	ICAP	ICAP	ICAP
11B-IN-FH+BH	180.0	96.1	3.44	ICAP	ICAP	ICAP	ICAP
12A-OUT-FH+BH	180.0	0.738	ND	2.34	1.96	15.3	1.58
12B-OUT-FH+BH	180.0	0.576	ND	2.45	1.84	16.1	1.10
12-A-MID-FH+BH	180.0	57.6	0.0882	ICAP	ICAP	ICAP	ICAP
12-B-MID-FH+BH	180.0	62.8	0.124	ICAP	ICAP	ICAP	ICAP
12A-IN-FH+BH	180.0	116	2.57	ICAP	ICAP	ICAP	ICAP
12B-IN-FH+BH	180.0	114	2.61	ICAP	ICAP	ICAP	ICAP
13A-OUT-FH+BH	180.0	1.12	ND	ICAP	2.95	25.2	2.90
13B-OUT-FH+BH	120.0	0.816	ND	ICAP	3.43	25.0	2.99
13B-MID-FH+BH	180.0	76.3	0.0954	ICAP	ICAP	ICAP	ICAP
13A-IN-FH+BH	180.0	97.6	1.31	ICAP	ICAP	ICAP	ICAP
13B-IN-FH+BH	180.0	110	1.55	ICAP	ICAP	ICAP	ICAP
13A-MID-F	100.0	119	0.0950	ICAP	ICAP	ICAP	ICAP
Reagent Blk 1	100.0	ND	ND	ND	0.05	ND	ND
Reagent Blk 2	100.0	ND	ND	ND	0.05	0.320	ND
AF1	100.0	9.16	4.75	ICAP	ICAP	ICAP	ICAP
AF2	100.0	9.33	4.43	ICAP	ICAP	ICAP	ICAP

ND : Non-detectable; less than detection limit

RTI Project No.: 3893-108
Company : Entropy
Sample : Combined Front and Back Half Samples of Multiple Metals Trains from Sewage Sludge Incinerator
Analysis Method : GFAA
Sample received : 7-10-90
Report Date : 8-24-90

Table 15. Original Sample, ug

Combined Sample	Total Vol.mL	As	Be	Cd	Cr	Pb	Ni
2-A-OUT-FH+BH	200	56.0	0.0840	ICAP	ICAP	ICAP	ICAP
2-B-OUT-FH+BH	200	62.8	0.100	ICAP	ICAP	ICAP	ICAP
2-A-IN-FH+BH	300	146	2.48	ICAP	ICAP	ICAP	ICAP
2-B-IN-FH+BH	300	110	1.91	ICAP	ICAP	ICAP	ICAP
4-A-OUT-FH+BH	200	4.10	ND	ICAP	ICAP	ICAP	6.28
4-B-OUT-FH+BH	300	3.66	2.67	ICAP	8.55	ICAP	5.52
4-A-MID-FH+BH	300	12.5	0.270	ICAP	ICAP	ICAP	ICAP
4-B-MID-FH+BH	300	20.5	0.483	ICAP	ICAP	ICAP	ICAP
4-A-IN-FH+BH	350	41.7	0.354	ICAP	ICAP	ICAP	ICAP
4-B-IN-FH+BH	300	46.2	0.528	ICAP	ICAP	ICAP	ICAP
9A-OUT-FH+BH	200	2.60	0.0560	ICAP	3.88	60.6	4.70
9B-OUT-FH+BH	200	1.70	ND	ICAP	4.08	46.0	4.72
9A-MID-F+BH	200	95.6	0.182	ICAP	ICAP	ICAP	ICAP
9B-MID-F+BH	200	102	0.126	ICAP	ICAP	ICAP	ICAP
9A-IN-FH+BH	300	203	4.44	ICAP	ICAP	ICAP	ICAP
9B-IN-FH+BH	300	191	4.08	ICAP	ICAP	ICAP	ICAP
11A-OUT-FH+BH	200	2.90	ND	ICAP	4.48	61.4	3.24
11B-OUT-FH+BH	300	2.67	ND	ICAP	3.96	63.9	2.58
11-A-MID-FH+BH	200	83.8	0.154	ICAP	ICAP	ICAP	ICAP
11-B-MID-FH+BH	200	88.4	0.122	ICAP	ICAP	ICAP	ICAP
11A-IN-FH+BH	300	159	6.33	ICAP	ICAP	ICAP	ICAP
11B-IN-FH+BH	300	160	5.73	ICAP	ICAP	ICAP	ICAP
12A-OUT-FH+BH	300	1.23	ND	3.90	3.27	25.5	2.64
12B-OUT-FH+BH	300	0.960	ND	4.08	3.06	26.8	1.83
12-A-MID-FH+BH	300	96.0	0.147	ICAP	ICAP	ICAP	ICAP
12-B-MID-FH+BH	300	105	0.207	ICAP	ICAP	ICAP	ICAP
12A-IN-FH+BH	300	194	4.29	ICAP	ICAP	ICAP	ICAP
12B-IN-FH+BH	300	189	4.35	ICAP	ICAP	ICAP	ICAP
13A-OUT-FH+BH	300	1.86	ND	ICAP	4.92	42.0	4.83
13B-OUT-FH+BH	200	1.36	ND	ICAP	5.72	41.6	4.98
13B-MID-FH+BH	300	127	0.159	ICAP	ICAP	ICAP	ICAP
13A-IN-FH+BH	300	163	2.178	ICAP	ICAP	ICAP	ICAP
13B-IN-FH+BH	300	184	2.58	ICAP	ICAP	ICAP	ICAP
13A-MID-F	100	119	0.0950	ICAP	ICAP	ICAP	ICAP
Reagent Blk 1	100	ND	ND	ND	0.0500	ICAP	ND
Reagent Blk 2	100	ND	ND	ND	0.0500	0.533	ND
AF1	100	9.16	4.75	ICAP	ICAP	ICAP	ICAP
AF2	100	9.33	4.43	ICAP	ICAP	ICAP	ICAP

ND : Non-detectable; less than detection limit

RTI Project No.: 3893-108
Company : Entropy
Sample : Combined Front and Back Half Samples of Multiple Metals Trains from Sewa Sludge Incinerator
Analysis Method : GFAA
Sample received : 7-10-90
Report Date : 8-24-90

Table 16. Calibration Check Sample, ug/mL

Sample	As	Be	Cd	Cr	Pb	Ni
QC	0.0497	0.0193	0.0202	0.0195	0.0244	0.0854
QC	0.0491	0.0200	0.0205	0.0189	0.0249	0.0799
QC	0.0489	0.0207				
QC	0.0506	0.0193				
QC	0.0489	0.0206				
QC	0.0521	0.0186				
QC	0.0524					
QC Expected	0.0500	0.0190	0.0200	0.0186	0.0237	0.0840

RTI Project No.: 3893-108
Company : Entropy
Sample : KMnO4 Samples
Analysis Method : CVAA
Sample received : 6-14-90
Report Date : 8-29-90

Table 17

Sample	Total Vol.mL	15% Total Vol.mL
2A-OUT-MMTL-K	176.2	26.4
2B-OUT-MMTL-K	197.1	29.6
2A-IN-MMTL-K	136.1	20.4
2B-IN-MMTL-K	192.2	28.8
4A-OUT-MMTL-K	213.8	32.1
4B-OUT-MMTL-K	111.8	16.8
4A-MID-MMTL-K	202.5	30.4
4B-MID-MMTL-K	174.7	26.2
4A-IN-MMTL-K	163.4	24.5
4B-IN-MMTL-K	171.9	25.8
9A-OUT-MMTL-K	181.2	27.2
9B-OUT-MMTL-K	123.9	18.6
9A-MID-MMTL-K	176.6	26.5
9B-MID-MMTL-K	174.2	26.1
9A-IN-MMTL-K	376.4	56.5
9B-IN-MMTL-K	234.9	35.2
11A-OUT-MMTL-K	108.6	16.3
11B-OUT-MMTL-K	142.4	21.4
11A-MID-MMTL-K	211.7	31.8
11B-MID-MMTL-K	240.7	36.1
11A-IN-MMTL-K	226.6	34.0
11B-IN-MMTL-K	223.1	33.5
12A-OUT-MMTL-K	172.1	25.8
12B-OUT-MMTL-K	182.5	27.4
12A-MID-MMTL-K	203.0	30.5
12B-MID-MMTL-K	248.4	37.3
12A-IN-MMTL-K	192.7	28.9
12B-IN-MMTL-K	165.0	24.7
13A-OUT-MMTL-K	176.5	26.5
13B-OUT-MMTL-K	126.6	19.0
13B-MID-MMTL-K	213.4	32.0
13A-IN-MMTL-K	240.7	36.1
13B-IN-MMTL-K	283.7	42.5
13A-MID-F	100	
KMnO4 Blk	65.9	

RTI Project No.: 3893-108
Company : Entropy
Sample : Combined Front Half and Back Half Samples from Multiple Metals Trains
Analysis Method : CVAA
Sample received : 6-14-90
Report Date : 8-29-90

Table 18

Combined Sample	Total Combined Vol.mL	15% Total Vol.mL
2A-OUT-MMTL-FH+BH	120.0	18.0
2B-OUT-MMTL-FH+BH	120.0	18.0
2A-IN-MMTL-FH+BH	180.0	27.0
2B-IN-MMTL-FH+BH	180.0	27.0
4A-OUT-MMTL-FH+BH	120.0	18.0
4B-OUT-MMTL-FH+BH	180.0	27.0
4A-MID-MMTL-FH+BH	180.0	27.0
4B-MID-MMTL-FH+BH	180.0	27.0
4A-IN-MMTL-FH+BH	210.0	31.5
4B-IN-MMTL-FH+BH	180.0	27.0
9A-OUT-MMTL-FH+BH	120.0	18.0
9B-OUT-MMTL-FH+BH	120.0	18.0
9A-MID-MMTL-FH+BH	120.0	18.0
9B-MID-MMTL-FH+BH	120.0	18.0
9A-IN-MMTL-FH+BH	180.0	27.0
9B-IN-MMTL-FH+BH	180.0	27.0
11A-OUT-MMTL-FH+BH	120.0	18.0
11B-OUT-MMTL-FH+BH	180.0	27.0
11A-MID-MMTL-FH+BH	120.0	18.0
11B-MID-MMTL-FH+BH	120.0	18.0
11A-IN-MMTL-FH+BH	180.0	27.0
11B-IN-MMTL-FH+BH	180.0	27.0
12A-OUT-MMTL-FH+BH	180.0	27.0
12B-OUT-MMTL-FH+BH	180.0	27.0
12A-MID-MMTL-FH+BH	180.0	27.0
12B-MID-MMTL-FH+BH	180.0	27.0
12A-IN-MMTL-FH+BH	180.0	27.0
12B-IN-MMTL-FH+BH	180.0	27.0
13A-OUT-MMTL-FH+BH	180.0	27.0
13B-OUT-MMTL-FH+BH	120.0	18.0
13B-MID-MMTL-FH+BH	180.0	27.0
13A-IN-MMTL-FH+BH	180.0	27.0
13B-IN-MMTL-FH+BH	180.0	27.0
13A-MID-F	100.0	
KMnO4 Blk	65.9	
Reagent Blk	100.0	
Hg Al	24.6	

Combined Sample = 60% Front Half + 60% Back Half

RTI Project No.: 3893-108
Company : Entropy
Sample : Combined KMnO4 and Front Half and Back Half Samples
Analysis Method : CVAA
Sample received : 6-14-90
Report Date : 8-29-90

Table 19. Hg Results for Combined Sample

Combined* Sample	Total Combined* Vol.mL	Hg ug/mL	Total Hg, ug	Spike Conc. ug/mL	Spike Rec.%
2A-OUT-K-FH+BH	44.4	2.25	100		
2B-OUT-K-FH+BH	47.6	2.29	109		
2A-IN-K-FH+BH	47.4	0.881	41.8		
2B-IN-K-FH+BH	55.8	0.488	27.2		
2B-IN-K-FH+BH Spk				0.100	107
4A-OUT-K-FH+BH	50.1	0.529	26.5		
4B-OUT-K-FH+BH	43.8	0.538	23.5		
4A-MID-K-FH+BH	57.4	0.312	17.9		
4B-MID-K-FH+BH	53.2	0.305	16.2		
4A-IN-K-FH+BH	56.0	0.259	14.5		
4B-IN-K-FH+BH	52.8	0.297	15.7		
9A-OUT-K-FH+BH	45.2	1.73	78.2		
9B-OUT-K-FH+BH	36.6	2.73	99.9		
9A-MID-K-FH+BH	44.5	2.55	113		
9B-MID-K-FH+BH	44.1	2.73	120		
9A-IN-K-FH+BH	83.5	0.804	67.1		
9B-IN-K-FH+BH	62.2	1.36	84.6		
11A-OUT-K-FH+BH	34.3	2.75	94.3		
11B-OUT-K-FH+BH	48.4	2.29	111		
11A-MID-K-FH+BH	49.8	1.44	71.7		
11B-MID-K-FH+BH	54.1	1.29	69.8		
11A-IN-K-FH+BH	61.0	0.860	52.4		
11B-IN-K-FH+BH	60.5	0.881	53.3		
11B-IN-K-FH+BH Dup	52.8	0.880	46.5		
12A-OUT-K-FH+BH	52.8	1.41	74.5		
12B-OUT-K-FH+BH	54.4	1.49	81.0		
12A-MID-K-FH+BH	57.5	1.46	83.9		
12B-MID-K-FH+BH	64.3	1.44	92.5		
12A-IN-K-FH+BH	55.9	1.09	60.9		
12B-IN-K-FH+BH	51.7	1.20	62.1		
13A-OUT-K-FH+BH	53.5	1.60	85.6		
13B-OUT-K-FH+BH	37.0	2.45	90.6		
13B-MID-K-FH+BH	59.0	1.11	65.5		
13A-IN-K-FH+BH	63.1	0.640	40.4		
13B-IN-K-FH+BH	69.5	0.710	49.4		
13A-MID-F	100.0	0.0126	1.260		
KMnO4 Blk	65.90	0.00582	0.3835		
Reagent Blank	100	0.00583	0.583		
Hg Al	24.6	0.115	2.83		

Combined* Sample = 15% of KMnO4 Sample + 15% of Combined Front and Back Half

RTI Project No.: 3893-108
Company : Entropy
Sample : Cr
Analyte : Cr
Analysis Method : GFAA & ICAP
Sample received : 7-10-90
Report Date : 8-24-90

Table 20

Sample	Total Vol.mL	Cr ug/mL		Total Cr ug
500 KOH	680	0.00760		5.17
501 HNO3	169	0.00760		1.28
502 Filter	100	0.0563	*	5.63
503 KOH	652	0.00500		3.26
504 HNO3	194	0.00120		0.233
505 Filter	100	0.360	*	36.0
506 KOH	742	0.00770		5.71
507 HNO3	205	0.00350		0.718
508 Filter	100	0.729	*	72.9
509 KOH	664	0.0130		8.63
510 HNO3	182	0.00220		0.400
511 Filter	100	0.446	*	44.6
512 KOH	798	0.00390		3.11
513 HNO3	279	0.00260		0.725
514 Filter	100	0.113	*	11.3
515 KOH	600	0.00400		2.40
516 HNO3	280	0.00240		0.672
517 Filter	100	0.122	*	12.2
518 KOH	653	0.00720		4.70
519 HNO3	162	0.00310		0.502
520 Filter	100	0.110	*	11.0
521 KOH	636	0.0148		9.41
522 HNO3	122	0.00230		0.281
523 Filter	100	0.127	*	12.7
524 KOH	830	0.00270		2.24
525 HNO3	119	0.00220		0.262
526 Filter	100	0.0350	*	3.50
527 KOH	650	0.00440		2.86
528 HNO3	150	0.00180		0.270
529 Filter	100	0.0601	*	6.01
530 KOH	729	0.00400		2.92
531 HNO3	340	0.00080		0.272
532 Filter	100	0.0443	*	4.43
533 KOH	680	0.0106		7.21
534 HNO3	320	0.00060		0.192
535 Filter	100	0.0355	*	3.55
536 KOH	720	0.00790		5.69
537 HNO3	248	0.00450		1.12
538 Filter	100	1.17	*	117
539 KOH	818	0.00720		5.89
540 HNO3	206	0.00080		0.165
541 Filter	100	0.984	*	98.4

Detection Limit 0.00024 (GFAA)
Detection Limit 0.00060 (ICAP)

* : Results were obtained by ICAP

RTI Project No.: 3893-108
Company : Entropy
Sample : Cr
Analyte : Cr
Analysis Method : GFAA & ICAP
Sample received : 7-10-90
Report Date : 8-24-90

Table 21

Sample	Total Vol.mL	Cr ug/mL		Total Cr ug
542 KOH	784	0.00710		5.57
543 HNO3	295	0.00420		1.24
544 Filter	100	1.23	*	123
548 KOH	672	0.00870		5.85
549 HNO3	305	0.00260		0.793
550 Filter	100	0.167	*	16.7
551 KOH	965	0.00560		5.40
552 HNO3	300	0.00260		0.780
553 Filter	100	0.232	*	23.2
554 KOH	951	0.00830		7.89
555 HNO3	255	0.00230		0.587
556 Filter	100	0.222	*	22.2
557 KOH	760	0.0139		10.6
558 HNO3	288	0.00090		0.259
559 Filter	100	0.197	*	19.7
560 KOH	839	0.00300		2.52
561 HNO3	276	0.00100		0.276
562 Filter	100	0.631	*	63.1
563 KOH	730	0.00310		2.26
564 HNO3	155	0.00120		0.186
565 Filter	100	0.0450	*	4.50
566 KOH	710	0.00470		3.34
567 HNO3	228	0.00130		0.296
568 Filter	100	0.04400	*	4.40
569 KOH	750	0.01000		7.50
570 HNO3	275	0.00050		0.138
571 Filter	100	0.0326	*	3.26
572 KOH	1057	0.0191		20.2
573 HNO3	283	0.0242		6.85
574 Filter	100	0.0457	*	4.57
575 KOH	858	0.0225		19.3
576 HNO3	246	0.0250		6.15
577 Filter	100	0.0450	*	4.50
578 KOH	1054	0.0124		13.1
579 HNO3	232	0.0814		18.9
580 Filter	100	0.0400	*	4.00

Detection Limit 0.00024 (GFAA)
Detection Limit 0.00060 (ICAP)

* : Results were obtained by ICAP

RTI Project No.: 3893-108
Company : Entropy
Sample : Cr
Analyte : Cr
Analysis Method : GFAA & ICAP
Sample received : 7-10-90
Report Date : 8-24-90

Table 22

Sample	Total Vol.mL	Cr ug/mL		Total Cr ug
581 KOH	787	0.0189		14.9
582 HNO3	248	0.0147		3.65
583 Filter	100	1.98	*	198
584 KOH	802	0.00290		2.33
585 HNO3	328	0.00450		1.48
586 Filter	100	0.275	*	27.5
587 KOH	953	0.00250		2.38
588 HNO3	338	0.00500		1.69
589 Filter	100	0.307	*	30.7
590 KOH	727	0.00200		1.45
591 HNO3	347	0.00430		1.49
592 Filter	100	0.0468	*	4.68
593 KOH	766	0.0177		13.6
594 HNO3	270	0.00080		0.216
595 Filter	100	0.225	*	22.5
596 KOH	627	0.00170		1.07
597 HNO3	280	0.00140		0.392
598 Filter	100	0.0178	*	1.78
599 KOH	691	0.00200		1.38
600 HNO3	304	0.00130		0.395
601 Filter	100	0.0190	*	1.90
602 KOH	643	0.00470		3.02
603 HNO3	272	0.00250		0.680
604 Filter	100	0.00746	*	0.746
605 KOH	656	0.0116		7.61
606 HNO3	270	0.00110		0.297
607 Filter	100	0.284	*	28.4
608 KOH	711	0.00820		5.83
609 HNO3	154	0.0239		3.68
610 Filter	100	1.96	*	196
611 KOH	751	0.00700		5.26
612 HNO3	128	0.0378		4.84
613 Filter	100	1.53	*	153
620 KOH	853	0.00260		2.22
621 HNO3	344	0.00360		1.24
622 Filter	100	0.200	*	20.0

Detection Limit 0.00024 (GFAA)
Detection Limit 0.00060 (ICAP)

* : Results were obtained by ICAP

RTI Project No.: 3893-108
Company : Entropy
Sample : Cr
Analyte : Cr
Analysis Method : GFAA & ICAP
Sample received : 7-10-90
Report Date : 8-24-90

Table 23

Sample	Total Vol.mL	Cr ug/mL		Total Cr ug
623 KOH	694	0.00410		2.85
624 HNO3	353	0.00400		1.41
625 Filter	100	0.219	*	21.9
626 KOH	827	0.00530		4.38
627 HNO3	354	0.00420		1.49
628 Filter	100	0.190	*	19.0
629 KOH	631	0.0188		11.9
630 HNO3	330	0.00090		0.297
631 Filter	100	0.157	*	15.7
632 KOH	713	0.00220		1.57
633 HNO3	232	0.00090		0.209
634 Filter	100	0.0193	*	1.93
635 KOH	570	0.00240		1.37
636 HNO3	257	0.00100		0.257
637 Filter	100	0.0178	*	1.78
638 KOH	629	0.00900		5.66
639 HNO3	291	0.00050		0.146
640 Filter	100	0.0233	*	2.33
641 KOH	800	0.00160		1.28
642 HNO3	282	0.00030		0.0846
643 Filter	100	0.0154	*	1.54
644 Blk		0.00180		
645 Blk		0.00080		
648 Audit		0.00100		
649 Audit		0.00630		

Detection Limit 0.00024 (GFAA)
Detection Limit 0.00060 (ICAP)

* : Results were obtained by ICAP

RTI Project No.: 3893-108
Company : Entropy
Sample : QC for Cr Samples
Analyte : Cr
Analysis Method : GFAA & ICAP
Sample received : 7-10-90
Report Date : 8-24-90

Table 24. Calibration Check Sample, ug/mL

Sample	GFAA Cr ug/mL measured	GFAA Cr ug/mL Expected	ICAP Cr ug/mL measured	ICAP Cr ug/mL Expected
QC	0.0197	0.0186	1.98	2.00
QC	0.0204	0.0186	1.99	2.00
QC	0.0203	0.0186	1.97	2.00
QC	0.0193	0.0186	2.04	2.00
QC	0.0191	0.0186	1.98	2.00
QC	0.0187	0.0186	2.01	2.00
QC	0.0193	0.0186	2.00	2.00
QC	0.0186	0.0186	1.98	2.00
QC	0.0202	0.0186	2.02	2.00
QC	0.0202	0.0186		
QC	0.0195	0.0186		
QC	0.0184	0.0186		
QC	0.0184	0.0186		
QC	0.0196	0.0186		
QC	0.0191	0.0186		
Detection Limit		0.00024		0.00060

3808

HEXAVALENT CHROMIUM ANALYTICAL DATA SHEET

Job Name: Cr+6 at SSI Site 9 EEI Job No: 3808
Analyst: P. Royals Date: June 18,1990

Chromium Standard Calibration Curve (with standards in approx. 0.08N KOH)

Conc. (ppb)	Peak Area Run 1	Run 2	Average	Percent Deviation	Regression Values
0.000					1650181
0.400	2620000	2530700	2575350	1.7%	2721265
1.000	4203800	4252900	4228350	0.6%	4327891
3.000	10151000	10285000	10218000	0.7%	9683312
5.000	14663000	14836000	14749500	0.6%	15038732

Regression Output:

Constant	1650181
Std Err of Y Est	447631
R Squared	0.99574
No. of Observations	4
Degrees of Freedom	2
X Coefficient(s)	2677710
Std Err of Coef.	123818

Sample ID	Peak Area Run 1	Run 2	Average	Percent Deviation	Chromium Conc. ppb	Sample Volume (ml)	Total Catch (ug)
3A MID	7379100	7814000	7596550	2.9%	2.22	798	1.772
3B MID	7932800	7903500	7918150	0.2%	2.34	810	1.896
3C MID	14088000	14320000	14204000	0.8%	4.69	653	3.061
3D MID	11788000	11288000	11538000	2.2%	3.69	636	2.349
5A MID	15102000	14733000	14917500	1.2%	4.95	672	3.330
5B MID	4744900	4562900	4653900	2.0%	1.12	965	1.082
Low Audit	3184600	3088000	3136300	1.5%	0.55	1	0.001
Blank	1097100	1097100	1097100	0.0%	-0.21	1	-0.000

HEXAVALENT CHROMIUM ANALYTICAL DATA SHEET

Job Name: Cr+6 at SSI Site 9 EEI Job No: 3808
Analyst: P. Royals Date: June 21, 1990

Chromium Standard Calibration Curve (with standards in approx. 0.08M KOH)

Conc. (ppb)	Peak Area Run 1	Run 2	Average	Percent Deviation	Regression Values
0.000					1647112
1.000	4815100	4396800	4605950	4.5%	4622125
3.000	10723000	10486000	10604500	1.1%	10572150
5.000	16419000	16593000	16506000	0.5%	16522175

Regression Output:

Constant	1647112
Std Err of Y Est	39620.5
R Squared	0.99998
No. of Observations	3
Degrees of Freedom	1
X Coefficient(s)	2975013
Std Err of Coef.	14008

Sample ID	Peak Area Run 1	Run 2	Average	Percent Deviation	Chromium Conc. ppb	Sample Volume (ml)	Total Catch (ug)
5C MID	10425000	10487000	10456000	0.3%	2.96	951	2.816
5D MID	0	0	0			760	
8A MID	8375400	8622700	8499050	1.5%	2.30	802	1.847
8B MID	9341900	9549000	9445450	1.1%	2.62	953	2.498
8C MID	7984400	7976100	7980250	0.1%	2.13	727	1.548
8D MID	0	0	0			766	
10A MID	7982400	8489400	8235900	3.1%	2.21	853	1.889
10B MID	14787000	14371000	14579000	1.4%	4.35	694	3.017
Low Audit	3184600	3088000	3136300	1.5%	0.50	1	0.001
Blank	1097100	1097100	1097100	0.0%	-0.18	1	-0.000

HEXAVALENT CHROMIUM ANALYTICAL DATA SHEET

Job Name: Cr+6 at SSI Site 9 EEI Job No: 3808
Analyst: P. Royals Date: June 22,1990

Chromium Standard Calibration Curve (with standards in approx. 0.08M KOH)

Conc. (ppb)	Peak Area Run 1	Run 2	Average	Percent Deviation	Regression Values
0.000					1470277
0.500	2692000	2921100	2806550	4.1%	2975248
1.000	4815100	4396800	4605950	4.5%	4480220
3.000	10723000	10486000	10604500	1.1%	10500106
5.000	16419000	16593000	16506000	0.5%	16519991
6.000	19815000	19150000	19482500	1.7%	19529934

Regression Output:	
Constant	1470277
Std Err of Y Est	138578
R Squared	0.99973
No. of Observations	5
Degrees of Freedom	3
X Coefficient(s)	3009943
Std Err of Coef.	28770.6

Sample ID	Peak Area Run 1	Run 2	Average	Percent Deviation	Chromium Conc. ppb	Sample Volume (ml)	Total Catch (ug)
10C MID	10425000	10487000	10456000	0.3%	2.99	827	2.469
10D MID	0	0	0			631	
3A OUT	8375400	8622700	8499050	1.5%	2.34	830	1.938
3B OUT	9341900	9549000	9445450	1.1%	2.65	650	1.722
3C OUT	7984400	7976100	7980250	0.1%	2.16	729	1.577
3D OUT	0	0	0			680	
5A OUT	7982400	8489400	8235900	3.1%	2.25	839	1.886
5B OUT	14787000	14371000	14579000	1.4%	4.36	730	3.179
5C OUT	14787000	14371000	14579000	1.4%	4.36	710	3.092
5D OUT	14787000	14371000	14579000	1.4%	4.36	750	3.266
Low Audit	3184600	3088000	3136300	1.5%	0.55	1	0.001
Blank	1097100	1097100	1097100	0.0%	-0.12	1	-0.000

HEXAVALENT CHROMIUM ANALYTICAL DATA SHEET

Job Name: Cr+6 at SSI Site 9 EEI Job No: 3808
Analyst: P. Royals Date: June 25,1990

Chromium Standard Calibration Curve (with standards in approx. 0.08M KOH)

Conc. (ppb)	Peak Area Run 1	Peak Area Run 2	Peak Area Average	Percent Deviation	Regression Values
0.000					1470277
0.500	2692000	2921100	2806550	4.1%	2975248
1.000	4815100	4396800	4605950	4.5%	4480220
3.000	10723000	10486000	10604500	1.1%	10500106
5.000	16419000	16593000	16506000	0.5%	16519991
6.000	19815000	19150000	19482500	1.7%	19529934

Regression Output:	
Constant	1470277
Std Err of Y Est	138578
R Squared	0.99973
No. of Observations	5
Degrees of Freedom	3
X Coefficient(s)	3009943
Std Err of Coef.	28770.6

Sample ID	Peak Area Run 1	Peak Area Run 2	Peak Area Average	Percent Deviation	Chromium Conc. ppb	Sample Volume (ml)	Total Catch (ug)
8A OUT	5291700	5401100	5346400	1.0%	1.29	627	0.807
8B OUT	6452300	6967300	6709800	3.8%	1.74	691	1.203
8C OUT	15098000	16007000	15548500	2.9%	4.68	643	3.007
8D OUT	0	0	0			656	
10A OUT	6677700	6806500	6742100	1.0%	1.75	713	1.249
10B OUT	7958600	8044600	8001600	0.5%	2.17	570	1.237
10C OUT	0	0	0			629	
10D OUT	6182000	5702400	5942200	4.0%	1.49	800	1.189
Low Audit	3184600	3088000	3136300	1.5%	0.55	1	0.001
Blank	1097100	1097100	1097100	0.0%	-0.12	1	-0.000

CHROMIUM RADIOACTIVE ANALYTICAL DATA SHEET

Job Name: SSI, Site 9 EEI Job No. 3808
Analyst: P. ROYALS Date: 6/28/90

SAMPLE ID	COUNTS 1	COUNTS 2	AVG COUNTS	COUNTS -BKG	MLS INJECTED	AC-BKG/ MLS INJ.	TOTAL VOL(MLS)	TOTAL COUNTS	PERCENT RECOVERY	PERCENT OF SAMPLE
BKG	53	55	54							
RAD STD	4000	3982	3991	3937	1	3937	300	1181100		
5AIN(F)	16170	16296	16233	16233	1	16233	1	16233		1.4%
5AIN(N)	56	65	61	61	1	61	248	15004		1.3%
5AIN-KOH	1656	1570	1613	1613	1	1613	720	1161360		97.4%
								1192597	101.0%	
5BIN(F)	4103	4232	4168	4168	1	4168	1	4168		0.3%
5BIN(N)	55	59	57	57	1	57	206	11742		0.9%
5BIN-KOH	1589	1635	1612	1612	1	1612	818	1318616		98.8%
								1334526	113.0%	
5CIN(F)	25686	25778	25732	25732	1	25732	1	25732		24.8%
5CIN(N)	74	67	71	71	1	71	295	20798		20.0%
5CIN-KOH	78	68	73	73	1	73	784	57232		55.2%
								103762	8.8%	

CHROMIUM RADIOACTIVE ANALYTICAL DATA SHEET

Job Name: SSI, Site 9 EEI Job No. 3808
Analyst: P. ROYALS Date: 6/28/90

SAMPLE ID	COUNTS 1	COUNTS 2	AVG COUNTS	COUNTS -BKG	MLS INJECTED	AC-BKG/ MLS INJ.	TOTAL VOL(MLS)	TOTAL COUNTS	PERCENT RECOVERY	PERCENT OF SAMPLE
BKG	53	55	54							
RAD STD	4000	3982	3991	3937	1	3937	300	1181100		
8AIN(F)	41016	41433	41225	41225	1	41225	1	41225		3.4%
8AIN(N)	172	138	155	155	1	155	283	43865		3.6%
8AIN-KOH	1092	1050	1071	1071	1	1071	1057	1132047		93.0%
								1217137	103.1%	
8BIN(F)	97183	96939	97061	97061	1	97061	1	97061		9.4%
8BIN(N)	121	99	110	110	1	110	246	27060		2.6%
8BIN-KOH	1066	1051	1059	1059	1	1059	858	908193		88.0%
								1032314	87.4%	
8CIN(F)	401483	401690	401587	401587	1	401587	1	401587		15.2%
8CIN(N)	920	939	930	930	1	930	232	215644		8.2%
8CIN-KOH	1929	1906	1918	1918	1	1918	1054	2021045		76.6%
								2638276	223.4%	
8DIN(F)	139	148	144	144	1	144	1	144		0.2%
8DIN(N)	42	44	43	43	1	43	248	10664		17.8%
8DIN-KOH	54	71	63	63	1	63	787	49188		82.0%
								59995	5.1%	

CHROMIUM RADIOACTIVE ANALYTICAL DATA SHEET

Job Name: SSI, Site 9 EEI Job No. 3808
Analyst: P. ROYALS Date: 6/28/90

SAMPLE ID	COUNTS 1	COUNTS 2	AVG COUNTS	COUNTS -BKG	MLS INJECTED	AC-BKG/ MLS INJ.	TOTAL VOL(MLS)	TOTAL COUNTS	PERCENT RECOVERY	PERCENT OF SAMPLE
BKG	53	55	54							
RAD STD	4000	3982	3991	3937	1	3937	300	1181100		
10AIN(F)	315078	315780	315429	315429	1	315429	1	315429		24.6%
10AIN(N)	67	60	64	64	1	64	154	9779		0.8%
10AIN-KOH	1289	1253	1271	1271	1	1271	751	954521		74.6%
								1279729	108.4%	
10BIN(F)	14915	15063	14989	14989	1	14989	1	14989		1.5%
10BIN(N)	84	96	90	90	1	90	128	11520		1.1%
10BIN-KOH	1412	1366	1389	1389	1	1389	711	987579		97.4%
								1014088	85.9%	

ZATKA
Chemical Consulting Company

July 25, 1990

Mr. William G. DeWees
Deeco Inc.
P.O.Box 4159
Cary, North Carolina 27519
U.S.A.

Re: Nickel speciation of incinerator dust samples (plant SSI, site 9)

Dear Mr. DeWees:

I have completed the analysis of 10 sludge incinerator dust samples as you requested. Five of the received samples (MIDPOINT) were loaded on 85 mm circles of quartz fiber filters and required analysis of the entire specimens. Five were bulk-type samples (INLET), consisting of excess dust deposited on quartz fiber filters. Portions of the dust from each filter were carefully scraped, homogenized by grinding, and used as bulk samples. Except for the sample 4C-IN, all filter deposits appeared reasonably homogeneous. The dust deposit on 4C-IN consisted of two distinct layers, top brown and bottom black; both layers were scraped and ground to obtain a homogeneous mixture. Also included in the received set of samples was one blank filter circle. The sample origin was plant SSI, site 9. The identification was as follows:

Sample No.	Date	Sample No.	Date
4C-MID-Ni-F	6/4/90	4C-IN-Ni-F	6/4/90
9C-MID-Ni-F	6/4/90	9C-IN-Ni-F	6/4/90
11C-MID-Ni-F	6/6/90	11C-IN-Ni-F	6/6/90
12C-MID-Ni-F		12C-IN-Ni-F	
13C-MID-Ni-F		13C-IN-Ni-F	

The samples were analyzed for nickel species by sequential selective leaching, soluble nickel for 90 min (pH 4), sulfidic nickel for 60 min (pH 4), and metallic nickel for 5 sec. Oxidic nickel was determined in the remaining leached sample residue.

NOTE: The unexpectedly high sulfidic nickel found in sample 4C-MID appears suspect. During analysis, it was noted that the deposited particulates of this particular sample contained a significant amount of organic material leacheable by methanol. Since this organic material was insoluble in water, and therefore not readily wettable, it probably made the leaching of the soluble nickel phase incomplete and produced so the sulfidic artefact. To avoid this kind of problem, all remaining samples were washed, not only wetted, with anhydrous methanol before the speciation analysis. The methanolic filtrates were combined with the leached soluble nickel fraction.

over ./.

483 Caesar Ave., Oakville, Ontario L6J 3Z1 Tel: (416) 845-8981

William G. DeWees (cont'd)

ANALYTICAL RESULTS:

Sample	Portion	Found Microgram Ni (% rel.) soluble	sulfidic	metallic	oxidic	total	Total %Ni
4C-MID	full circle	4.5 (51)	1.0 (11)	<0.2	3.3 (38)	8.8	N/A
9C-MID	full circle	40.0 (92)	<0.2	<0.2	3.4 (8)	43.4	N/A
11C-MID	full circle	45.6 (91)	<0.2	<0.2	4.3 (9)	49.9	N/A
12C-MID	full circle	57.9 (96)	<0.2	<0.2	2.7 (4)	60.6	N/A
13C-MID	full circle	53.1 (96)	<0.2	<0.2	2.5 (4)	55.6	N/A
Blank	full circle	<0.2	<0.2	<0.2	0.9	0.9	N/A
4C-IN	12.22 mg	1.7 (19)	<0.2	<0.2	7.3 (81)	9.0	0.074
9C-IN	22.83 mg	3.6 (20)	<0.2	<0.2	14.8 (80)	18.4	0.081
11C-IN	17.05 mg	3.4 (21)	<0.2	<0.2	12.8 (79)	16.2	0.095
12C-IN	12.95 mg	4.5 (31)	<0.2	<0.2	9.9 (69)	14.4	0.111
13C-IN	14.87 mg	6.8 (57)	0.2(1.5)	<0.2	5.0 (42)	12.0	0.081

Precision of the sums of nickel species found in the INLET bulk dusts was checked by direct analyses for total nickel content

4C-IN	13.21 mg	------- directly for total Ni -------	9.8	0.074
9C-IN	28.65 mg	------- directly for total Ni -------	23.6	0.082
11C-IN	19.47 mg	------- directly for total Ni -------	20.5	0.105
12C-IN	17.50 mg	------- directly for total Ni -------	19.7	0.113
13C-IN	12.63 mg	------- directly for total Ni -------	9.8	0.078

and expressed as relative standard deviation

Sample	% Total Nickel by speciation	by direct analysis	RDS, %
4C-IN	0.073_6	0.074_2	0.57
9C-IN	0.080_6	0.082_4	1.56
11C-IN	0.095_0	0.105_3	7.27
12C-IN	0.111_2	0.112_6	0.88
13C-IN	0.080_7	0.077_5	2.77

VJZ/

V. J. Zatka

ENTROPY ENVIRO. INC.
PO BOX 12291
RES TRIANGLE PK NC 27709 SAMPLE ID: RUN #3

OPERATING CO. :
SAMPLED BY: CUSTOMER PROVIDED
MINE:
LOCATION:

DATE SAMPLED: DATE RECEIVED: 6/25/90
WEATHER:
GROSS WEIGHT:

OTHER ID: PO 2712-90-RRS SLUDGE

CERTIFICATE OF ANALYSIS

	ASTM METHOD	AS RECEIVED	DRY BASIS
MOISTURE	D2961 D3302 D3173	80.29%	XXX
VOLATILE MATTER	D3175	11.78%	59.74%
FIXED CARBON	D3172	2.45%	12.47%
ASH	D3174	5.48%	27.79%
SULFUR	D3177 METHOD A	.25%	1.27%
CARBON	D3178	8.90%	45.16%
HYDROGEN	D3178	1.14%	5.78%
NITROGEN	D3179	.81%	4.10%
OXYGEN	D3176	3.13%	15.90%
BTU/LB	D2015	1720	8723
MAF BTU/LB			12081
LBS OF SO2 PER MILLION BTU			2.91

ENTROPY ENVIRO. INC.
PO BOX 12291
RES TRIANGLE PK NC 27709 SAMPLE ID: RUN #4

OPERATING CO.:
SAMPLED BY: CUSTOMER PROVIDED
MINE:
LOCATION:

DATE SAMPLED: DATE RECEIVED: 6/25/90
WEATHER:
GROSS WEIGHT:

OTHER ID: PO 2712-90-RRS SLUDGE

CERTIFICATE OF ANALYSIS

	ASTM METHOD	AS RECEIVED	DRY BASIS
MOISTURE	D2961 D3302 D3173	77.57%	XXX
VOLATILE MATTER	D3175	14.78%	65.92%
FIXED CARBON	D3172	1.82%	8.09%
ASH	D3174	5.83%	25.99%
SULFUR	D3177 METHOD A	.20%	.88%
CARBON	D3178	9.76%	43.53%
HYDROGEN	D3178	1.40%	6.24%
NITROGEN	D3179	1.04%	4.63%
OXYGEN	D3176	4.20%	18.74%
BTU/LB	D2015	1877	8369
MAF BTU/LB			11308
LBS OF SO2 PER MILLION BTU			2.10

ENTROPY ENVIRO. INC.
PO BOX 12291
RES TRIANGLE PK NC 27709 SAMPLE ID: RUN #5

OPERATING CO.:
SAMPLED BY: CUSTOMER PROVIDED
MINE:
LOCATION:

DATE SAMPLED: DATE RECEIVED: 6/25/90
WEATHER:
GROSS WEIGHT:

OTHER ID: PO 2712-90-RRS SLUDGE

CERTIFICATE OF ANALYSIS

	ASTM METHOD		AS RECEIVED	DRY BASIS
MOISTURE	D2961 D3302	D3173	79.59%	XXX
VOLATILE MATTER	D3175		12.86%	62.98%
FIXED CARBON	D3172		2.05%	10.09%
ASH	D3174		5.50%	26.93%
SULFUR	D3177	METHOD A	.17%	.85%
CARBON	D3178		8.71%	42.67%
HYDROGEN	D3178		1.33%	6.49%
NITROGEN	D3179		.95%	4.66%
OXYGEN	D3176		3.75%	18.40%
BTU/LB	D2015		1705	8351
MAF BTU/LB				11428
LBS OF SO2 PER MILLION BTU				2.03

ENTROPY ENVIRO. INC.
PO BOX 12291
RES TRIANGLE PK NC 27709 SAMPLE ID: RUN #8 & 9

OPERATING CO.:
SAMPLED BY: CUSTOMER PROVIDED
MINE:
LOCATION:

DATE SAMPLED: DATE RECEIVED: 6/25/90
WEATHER:
GROSS WEIGHT:

OTHER ID: PO 2712-90-RRS SLUDGE

CERTIFICATE OF ANALYSIS

	ASTM METHOD	AS RECEIVED	DRY BASIS
MOISTURE	D2961 D3302 D3173	76.95%	XXX
VOLATILE MATTER	D3175	15.22%	66.03%
FIXED CARBON	D3172	2.11%	9.16%
ASH	D3174	5.72%	24.81%
SULFUR	D3177 METHOD A	.20%	.85%
CARBON	D3178	10.41%	45.17%
HYDROGEN	D3178	1.47%	6.38%
NITROGEN	D3179	1.14%	4.95%
OXYGEN	D3176	4.11%	17.83%
BTU/LB	D2015	1924	8348
MAF BTU/LB			11102
LBS OF SO2 PER MILLION BTU			2.03

FILE NAME....:	S902084	CLIENT ID....:	ENTROPY	TLI NUMBER....:	33-30-1A-F
CONCAL.....:	S902083	SAMPLE ID....:	7A-OUT MM5		
ANALYST.....:	JA	ANALYSIS DATE:	06/30/90	PROJECT NUMBER:	15962
SAMPLE SIZE..:	1.00	SAMPLE MATRIX:	MM5	DATE RECEIVED.:	06/14/90
ICAL DATE....:	06/27/90	SAMPLE ORIGIN:	n/a	DATE COLLECTED:	/ /
SPIKE FILE...:	SPM23710			SHIPMENT NO...:	n/a

SURROGATE RECOVERY SUMMARY (TYPE A)

NAME	AMT (ng)	% REC.	RATIO	RT	FLAGS
37Cl-TCDD	11.8	118		31:18	___
13C12-PeCDF 234	11.1	111	1.56	36:12	___
13C12-HxCDF 478	11.4	114	0.50	40:20	___
13C12-HxCDD 478	10.7	107	1.19	41:28	___
13C12-HpCDF 789	13.3	133	0.41	47:09	___

ALTERNATE STANDARDS RECOVERY SUMMARY (TYPE A)

NAME	AMT (ng)	% REC.	RATIO	RT	FLAGS
13C12-HxCDF 789	6.5	65.1	0.48	42:26	___
13C12-HxCDF 234	7.1	70.6	0.49	41:16	___

INTERNAL STANDARDS RECOVERY SUMMARY

NAME	AMT (ng)	% REC.	RATIO	RT	FLAGS
13C12-2378-TCDF	7.7	76.7	0.75	30:29	___
13C12-2378-TCDD	8.6	85.6	0.78	31:16	___
13C12-PeCDF 123	9.1	90.8	1.56	35:15	___
13C12-PeCDD 123	11.2	112	1.54	36:42	___
13C12-HxCDF 678	6.4	63.5	0.48	40:29	___
13C12-HxCDD 678	7.3	73.5	1.22	41:36	___
13C12-HpCDF 678	6.7	66.6	0.42	44:56	___
13C12-HpCDD 678	8.4	84.5	0.99	46:28	___
13C12-OCDD	11.7	58.5	0.79	51:53	___

KV 7/11/90 M237_RPT rev:3.03

TRIANGLE LABORATORIES, INC.
CONFIRMATION ANALYSIS (DB-225)

07/11/90

FILE NAME...:	W105703	CLIENT ID....:	ENTROPY	TLI NUMBER....:	33-30-1A-F
CONCAL.....:	W901056	SAMPLE ID....:	7A-OUT MM5		
ANALYST.....:	DM	ANALYSIS DATE:	07/06/90	PROJECT NUMBER:	15962
SAMPLE SIZE..:	1.00	SAMPLE MATRIX:	MM5	DATE RECEIVED.:	06/14/90
ICAL DATE....:	05/15/90	SAMPLE ORIGIN:	n/a	DATE COLLECTED:	/ /
SPIKE FILE...:	SPC2NF10			SHIPMENT NO...:	n/a

NAME	AMT(ng)	NUMBER	DL	EMPC	RATIO	RT	FLAGS
2378-TCDD	ND		0.01				___
2378-TCDF	4.0				0.73	18:44	___
TOTAL TCDD	3.2	2			0.73		___
TOTAL TCDF	17.2	16		17.4	0.71		___

SURROGATE STD. RECOVERY SUMMARY (TYPE A)

NAME	AMT (ng)	% REC.	RATIO	RT	FLAGS
37Cl-TCDD	10.4	104		17:25	___

INTERNAL STANDARDS RECOVERY SUMMARY

NAME	AMT (ng)	% REC.	RATIO	RT	FLAGS
13C12-2378-TCDF	7.8	78.3	0.75	18:43	___
13C12-2378-TCDD	7.5	74.6	0.78	17:24	___

_____	7/11/90	C2NF_RPT rev:3.01

ENTROPY ENVIRO. INC.
PO BOX 12291
RES TRIANGLE PK NC 27709 SAMPLE ID: RUN #10 & 11

OPERATING CO. :
SAMPLED BY: CUSTOMER PROVIDED
MINE:
LOCATION:

DATE SAMPLED: DATE RECEIVED: 6/25/90
WEATHER:
GROSS WEIGHT:

OTHER ID: PO 2712-90-RRS SLUDGE

CERTIFICATE OF ANALYSIS

	ASTM METHOD	AS RECEIVED	DRY BASIS
MOISTURE	D2961 D3302 D3173	78.00%	XXX
VOLATILE MATTER	D3175	14.54%	66.10%
FIXED CARBON	D3172	1.95%	8.86%
ASH	D3174	5.51%	25.04%
SULFUR	D3177 METHOD A	.21%	.95%
CARBON	D3178	9.68%	44.02%
HYDROGEN	D3178	1.37%	6.23%
NITROGEN	D3179	1.15%	5.25%
OXYGEN	D3176	4.08%	18.51%
BTU/LB	D2015	1911	8688
MAF BTU/LB			11591
LBS OF SO2 PER MILLION BTU			2.18

ENTROPY ENVIRO. INC.
PO BOX 12291
RES TRIANGLE PK NC 27709 SAMPLE ID: RUN #12 & 13

OPERATING CO.:
SAMPLED BY: CUSTOMER PROVIDED
MINE:
LOCATION:

DATE SAMPLED: DATE RECEIVED: 6/25/90
WEATHER:
GROSS WEIGHT:

OTHER ID: PO 2712-90-RRS SLUDGE

CERTIFICATE OF ANALYSIS

	ASTM METHOD	AS RECEIVED	DRY BASIS
MOISTURE	D2961 D3302 D3173	79.15%	XXX
VOLATILE MATTER	D3175	13.95%	66.88%
FIXED CARBON	D3172	1.73%	8.34%
ASH	D3174	5.17%	24.78%
SULFUR	D3177 METHOD A	.19%	.89%
CARBON	D3178	9.31%	44.62%
HYDROGEN	D3178	1.32%	6.31%
NITROGEN	D3179	1.06%	5.08%
OXYGEN	D3176	3.80%	18.32%
BTU/LB	D2015	1829	8768
MAF BTU/LB			11656
LBS OF SO2 PER MILLION BTU			2.03

TRIANGLE LABORATORIES, INC.
801-10 CAPITOLA DRIVE
RESEARCH TRIANGLE PARK, NC 27713

Phone: (919) 544-5729
Fax: (919) 544-5491

DATE :	* 16 JULY 1990
CLIENT ID :	* ENTROPY ENVIRONMENTALISTS, INC.
P.O. NUMBER :	* 3808 T-7
TLI PROJECT No.:	* 15962

CASE NARRATIVE
MODEL 8290X

ANALYSIS OF SAMPLES FOR THE PRESENCE OF

POLYCHLORINATED DIBENZO-p-DIOXINS

AND

DIBENZOFURANS

BY

HIGH-RESOLUTION GAS CHROMATOGRAPHY / HIGH-RESOLUTION MASS SPECTROMETRY

Five MM5 samples were received from ENTROPY ENVIRONMENTALISTS, INC. in good condition June 12, 1990 and stored in a refrigerator at 4°C. The samples were extracted and analyzed according to procedures described in the Triangle Labs User Manual provided with this data package. Any particular difficulties encountered during the sample handling by Triangle Labs will be discussed in the QA/QC remark section below.

Quality Assurance/Quality Control Samples

A laboratory method blank -- identified as the TLI Blank -- is prepared along with the batch of samples.

QA/QC Remarks

The release of this particular set of ENTROPY ENVIRONMENTALISTS, INC. analytical data by Triangle Labs was authorized by the Quality Assurance Officer who has reviewed each sample data package individually following a series of inspections/reviews conducted at two other levels of the data production line. When applicable, general deviations from acceptable QA/QC requirements are identified below. Comments on the effect of these deviations upon the validity and reliability of the results can be obtained from the User Manual (Data Quality Objectives; Section 5). Specific QA/QC Problems Associated with this Particular Project are:

Sample Preparation Laboratory: None

Mass Spectrometry: None

Data Review:

Analytes, 1,2,3,4,6,7,8 - HpCDD an OCDD, were found in the TLI blank. The concentrations found are not greater than one-third the calculated method quantitation limit (TMQL) for the associated samples. Blank contamination levels of one-third TMQL or less are acceptable under TLI guidelines, as discussed in section 5.1.3.2 of the Data User's Manual.

A high percent recovery was found for the 1234789-13C12-HpCDF labeled surrogate standard for sample 7A-OUT MM5 (TLI # 33-30-1A-F).

No surrogate prespike was added for XAD Resin sample Audit # 2176 (TLI # 33-30-5).

Due to sensitivity differences between analyses of sample 7C-OUT-MM5 (TLI # 33-30-3A-D), more TCDD peaks were detected on the DB-5 column analysis. A reliable estimate for Total TCDD can be obtained from the DB-5 analysis for this sample.

Samples 7A-OUT MM5 (TLI # 33-30-1A-F) and 7A-MID MM5 (TLI # 33-30-2A-F) show saturated signals in the Total MCDF and DCDD mass channels. The values given for these congener groups are

minimum estimates of the total amount in the samples.

Addendum to Section 4.6 of the Data User's Manual

Effective December 15, 1989, Triangle Laboratories has adopted a new procedure for calculating the analyte specific detection limits. Under this new policy two representative noise height determinations are summed and multiplied by an empirically determined factor before the detection limit equation given in Section 4.6 of the Data User's Manual is applied. The effect of this procedure is to increase DB-225 analyses detection limits by a factor of 3.5, and DB-5 analyses detection limits by a factor of 5. This procedure will result in a more accurate estimate of detection limits.

The revised formula for DB-225 analyses is:

$$DL_{ai}^{DB-225} = \frac{2.5 * (3.5 * H_{ai}) * Q_{bj}}{A_{bj} * \overline{RRF} * W}$$

$$3.5 * H_{ai} = A_{noise}$$

The revised formula for DB-5 analyses is:

$$DL_{ai}^{DB-5} = \frac{2.5 * (5 * H_{ai}) * Q_{bj}}{A_{bj} * \overline{RRF} * W}$$

$$5 * H_{ai} = A_{noise}$$

The symbols are defined in Section 4.6 of the Data User's Manual.

As an example, consider a DB-225 confirmation analysis of a 10 g sample. The internal standard spike is 2000 pg, the 13C12-2,3,7,8-TCDF internal standard area is 12000 area units, the $\overline{RRF}$ is 1.215 and the noise height is 11 units. The 2,3,7,8-TCDF detection limit is:

$$DL_{TCDF}^{DB-225} = \frac{2.5 * (3.5 * 11) * 2000}{12000 * 1.215 * 10.0} = 1.3 \text{ ppt}$$

Should ENTROPY ENVIRONMENTALISTS, INC. have any questions or comments to formulate regarding this data package please feel free to contact us.

For Triangle Laboratories,

Glenn Graham — Analyst

Gary Penley — QA Project Officer

Mary C Collins for — Laboratory Manager

FILE NAME..: S902079 CLIENT ID....: ENTROPY TLI NUMBER....: n/a
CONCAL.....: S902071 SAMPLE ID....: TLI BLANK
ANALYST.....: AO ANALYSIS DATE: 06/29/90 PROJECT NUMBER: 15962
SAMPLE SIZE..: 1.00 SAMPLE MATRIX: n/a DATE RECEIVED.: / /
ICAL DATE....: 06/27/90 SAMPLE ORIGIN: n/a DATE COLLECTED: / /
SPIKE FILE...: SPM23710 SHIPMENT NO...: n/a

NAME	AMT(ng)	NUMBER	DL	EMPC	RATIO	RT	FLAGS
2378-TCDD	ND		0.01				
12378-PeCDD	ND		0.008				
123478-HxCDD	ND		0.01				
123678-HxCDD	ND		0.01				
123789-HxCDD	ND		0.02				
1234678-HpCDD	0.07				0.99	46:29	
OCDD	1.0				0.87	51:54	
2378-TCDF	ND		0.008				
12378-PeCDF	ND		0.008				
23478-PeCDF	ND		0.01				
123478-HxCDF	ND		0.01				
123678-HxCDF	ND		0.008				
234678-HxCDF	ND		0.01				
123789-HxCDF	ND		0.02				
1234678-HpCDF	ND		0.01				
1234789-HpCDF	ND		0.02				
OCDF	ND		0.03				
TOTAL MCDD	ND		0.003				
TOTAL DCDD	ND		0.005				
TOTAL TriCDD	ND		0.008				
TOTAL TCDD	ND		0.01				
TOTAL PeCDD	ND		0.008				
TOTAL HxCDD	ND		0.01				
TOTAL HpCDD	0.10	2			1.08		
TOTAL MCDF	ND		0.003				
TOTAL DCDF	ND		0.01				
TOTAL TriCDF	ND		0.005				
TOTAL TCDF	ND		0.008				
TOTAL PeCDF	ND		0.01				
TOTAL HxCDF	ND		0.01				
TOTAL HpCDF	ND		0.01				

7/11/90 M237_RPT rev:3.03

FILE NAME....:	S902079	CLIENT ID....:	ENTROPY	TLI NUMBER....:	n/a
CONCAL.....:	S902071	SAMPLE ID....:	TLI BLANK		
ANALYST.....:	AO	ANALYSIS DATE:	06/29/90	PROJECT NUMBER:	15962
SAMPLE SIZE..:	1.00	SAMPLE MATRIX:	n/a	DATE RECEIVED.:	/ /
ICAL DATE....:	06/27/90	SAMPLE ORIGIN:	n/a	DATE COLLECTED:	/ /
SPIKE FILE...:	SPM23710			SHIPMENT NO...:	n/a

SURROGATE RECOVERY SUMMARY (TYPE A)

NAME	AMT (ng)	% REC.	RATIO	RT	FLAGS
37Cl-TCDD	11.6	116		31:17	___
13C12-PeCDF 234	11.5	115	1.55	36:12	___
13C12-HxCDF 478	10.3	103	0.51	40:20	___
13C12-HxCDD 478	9.0	89.7	1.17	41:28	___
13C12-HpCDF 789	10.9	109	0.44	47:09	___

ALTERNATE STANDARDS RECOVERY SUMMARY (TYPE A)

NAME	AMT (ng)	% REC.	RATIO	RT	FLAGS
13C12-HxCDF 789	7.1	71.4	0.50	42:26	___
13C12-HxCDF 234	8.2	81.7	0.52	41:16	___

INTERNAL STANDARDS RECOVERY SUMMARY

NAME	AMT (ng)	% REC.	RATIO	RT	FLAGS
13C12-2378-TCDF	7.4	73.8	0.74	30:29	___
13C12-2378-TCDD	8.0	80.1	0.79	31:16	___
13C12-PeCDF 123	8.8	87.5	1.52	35:14	___
13C12-PeCDD 123	12.8	128	1.53	36:42	___
13C12-HxCDF 678	6.9	69.0	0.51	40:29	___
13C12-HxCDD 678	8.6	86.3	1.19	41:36	___
13C12-HpCDF 678	7.2	71.9	0.45	44:56	___
13C12-HpCDD 678	8.9	89.3	1.01	46:28	___
13C12-OCDD	10.7	53.6	0.87	51:53	___

: _____ 7/11/90 M237_RPT rev:3.03

FILE NAME....: S208504 CLIENT ID....: ENTROPY TLI NUMBER....: 33-30-5
CONCAL.....: S902083 SAMPLE ID....: AUDIT #2176
ANALYST.....: JA ANALYSIS DATE: 06/30/90 PROJECT NUMBER: 15962
SAMPLE SIZE..: 1.00 SAMPLE MATRIX: XAD RESIN DATE RECEIVED.: 06/14/90
ICAL DATE....: 06/27/90 SAMPLE ORIGIN: n/a DATE COLLECTED: / /
SPIKE FILE...: SPM23710 SHIPMENT NO...: n/a

NAME	AMT(ng)	NUMBER	DL	EMPC	RATIO	RT	FLAGS
2378-TCDD	1.2				0.81	31:16	
12378-PeCDD	2.7				1.77	36:42	
123478-HxCDD	6.9				1.25	41:30	
123678-HxCDD	6.0				1.17	41:37	
123789-HxCDD	14.6				1.20	42:05	PR
1234678-HpCDD	34.4				0.97	46:29	B
OCDD	71.1				0.84	51:53	B
2378-TCDF	10.0				0.72	30:32	
12378-PeCDF	3.2				1.42	35:16	
23478-PeCDF	5.8				1.61	36:13	
123478-HxCDF	17.4				1.11	40:20	
123678-HxCDF	7.9				1.14	40:30	
234678-HxCDF	8.1				1.13	41:17	
123789-HxCDF	ND		0.2				
1234678-HpCDF	28.1				0.91	44:56	
1234789-HpCDF	1.0				1.03	47:10	
OCDF	11.9				0.88	52:08	
TOTAL MCDD	ND		0.03				
TOTAL DCDD	0.51	1		1.0	1.64		
TOTAL TriCDD	8.3	7		8.5	1.04		
TOTAL TCDD	17.6	10		18.4	0.78		
TOTAL PeCDD	30.7	11			1.60		
TOTAL HxCDD	78.6	7			1.19		
TOTAL HpCDD	68.4	2			0.97		
TOTAL MCDF	ND		0.03				
TOTAL DCDF	3.7	3		6.2	6.21		
TOTAL TriCDF	35.9	11			1.08		
TOTAL TCDF	53.0	13		56.6	0.73		
TOTAL PeCDF	58.9	12		64.3	1.59		
TOTAL HxCDF	78.5	8		81.8	1.11		
TOTAL HpCDF	45.4	4			0.95		

KV 7/11/90 M237_RPT rev:3.03

FILE NAME....:	S208504	CLIENT ID....:	ENTROPY	TLI NUMBER....:	33-30-5
CONCAL.....:	S902083	SAMPLE ID....:	AUDIT #2176		
ANALYST.....:	JA	ANALYSIS DATE:	06/30/90	PROJECT NUMBER:	15962
SAMPLE SIZE..:	1.00	SAMPLE MATRIX:	XAD RESIN	DATE RECEIVED.:	06/14/90
ICAL DATE....:	06/27/90	SAMPLE ORIGIN:	n/a	DATE COLLECTED:	/ /
SPIKE FILE...:	SPM23710			SHIPMENT NO...:	n/a

ALTERNATE STANDARDS RECOVERY SUMMARY (TYPE A)

NAME	AMT (ng)	% REC.	RATIO	RT	FLAGS
13C12-HxCDF 789	7.6	76.1	0.45	42:26	___
13C12-HxCDF 234	9.7	97.2	0.47	41:16	___

INTERNAL STANDARDS RECOVERY SUMMARY

NAME	AMT (ng)	% REC.	RATIO	RT	FLAGS
13C12-2378-TCDF	7.0	70.5	0.74	30:29	___
13C12-2378-TCDD	8.0	79.7	0.81	31:16	___
13C12-PeCDF 123	6.3	63.2	1.57	35:15	___
13C12-PeCDD 123	7.4	73.9	1.40	36:42	___
13C12-HxCDF 678	7.7	77.2	0.48	40:29	___
13C12-HxCDD 678	7.6	76.0	1.20	41:36	___
13C12-HpCDF 678	8.5	84.7	0.39	44:55	___
13C12-HpCDD 678	9.2	92.1	1.04	46:28	___
13C12-OCDD	9.4	47.2	0.97	51:52	___

KV 7/11/90 M237_RPT rev:3.03

TRIANGLE LABORATORIES, INC.
CONFIRMATION ANALYSIS (DB-225)

07/11/90

FILE NAME....:	W105707	CLIENT ID....:	ENTROPY	TLI NUMBER....:	33-30-5
CONCAL.....:	W901056	SAMPLE ID....:	AUDIT #2176		
ANALYST.....:	DM	ANALYSIS DATE:	07/06/90	PROJECT NUMBER:	15962
SAMPLE SIZE..:	1.00	SAMPLE MATRIX:	MM5	DATE RECEIVED.:	06/14/90
ICAL DATE....:	05/15/90	SAMPLE ORIGIN:	n/a	DATE COLLECTED:	/ /
SPIKE FILE...:	SPC2NF10			SHIPMENT NO...:	n/a

NAME	AMT(ng)	NUMBER	DL	EMPC	RATIO	RT	FLAGS
2378-TCDD	2.3				0.78	17:25	PR
2378-TCDF	1.5				0.75	18:44	___
TOTAL TCDD	21.2	16			0.78		___
TOTAL TCDF	33.4	20			0.74		___

SURROGATE STD. RECOVERY SUMMARY (TYPE A)

NAME	AMT (ng)	% REC.	RATIO	RT	FLAGS
37Cl-TCDD	0.02	0.24		17:24	___

INTERNAL STANDARDS RECOVERY SUMMARY

NAME	AMT (ng)	% REC.	RATIO	RT	FLAGS
13C12-2378-TCDF	6.8	68.3	0.76	18:43	___
13C12-2378-TCDD	6.9	69.3	0.79	17:23	___

[signature] 7/11/90

C2NF_RPT rev:3.01

FILE NAME....: S902084 CLIENT ID....: ENTROPY TLI NUMBER....: 33-30-1A-F
CONCAL.....: S902083 SAMPLE ID....: 7A-OUT MM5
ANALYST.....: JA ANALYSIS DATE: 06/30/90 PROJECT NUMBER: 15962
SAMPLE SIZE..: 1.00 SAMPLE MATRIX: MM5 DATE RECEIVED.: 06/14/90
ICAL DATE....: 06/27/90 SAMPLE ORIGIN: n/a DATE COLLECTED: / /
SPIKE FILE...: SPM23710 SHIPMENT NO...: n/a

NAME	AMT(ng)	NUMBER	DL	EMPC	RATIO	RT	FLAGS
2378-TCDD	ND		0.01				—
12378-PeCDD	EMPC			0.02			—
123478-HxCDD	ND		0.02				—
123678-HxCDD	ND		0.02				—
123789-HxCDD	0.08				1.38	42:06	—
1234678-HpCDD	0.85				1.11	46:30	B
OCDD	3.9				0.87	51:53	B
2378-TCDF	7.0				0.72	30:30	—
12378-PeCDF	0.72				1.65	35:16	—
23478-PeCDF	3.4				1.62	36:13	—
123478-HxCDF	0.76				1.15	40:20	—
123678-HxCDF	0.27				1.10	40:30	—
234678-HxCDF	0.55				1.11	41:17	—
123789-HxCDF	ND		0.02				—
1234678-HpCDF	0.31				0.89	44:56	—
1234789-HpCDF	0.03				1.12	47:11	—
OCDF	0.17				0.86	52:08	—
TOTAL MCDD	11.8	2			2.97		
TOTAL DCDD	6.3	5		189	1.60		S
TOTAL TriCDD	13.4	5		13.5	1.02		—
TOTAL TCDD	3.3	2		3.4	0.78		—
TOTAL PeCDD	0.15	3		0.29	1.66		—
TOTAL HxCDD	0.46	3		0.56	1.31		—
TOTAL HpCDD	1.6	2			1.04		—
TOTAL MCDF	66.6	2		200	3.46		S
TOTAL DCDF	84.6	4		132	6.68		—
TOTAL TriCDF	33.2	9		33.3	1.03		—
TOTAL TCDF	24.5	12		24.5	0.72		—
TOTAL PeCDF	14.6	11		15.3	1.58		—
TOTAL HxCDF	3.0	8		3.2	1.12		—
TOTAL HpCDF	0.57	4			0.97		—

KU 7/11/90 M237_RPT rev:3.03

TRIANGLE LABORATORIES, INC.
PCDD/PCDF ANALYSIS (2378A)

07/13/90

FILE NAME....: S208501 CLIENT ID....: ENTROPY TLI NUMBER....: 33-30-2A-F
CONCAL.....: S902083 SAMPLE ID....: 7A-MID MM5
ANALYST.....: JA ANALYSIS DATE: 06/30/90 PROJECT NUMBER: 15962
SAMPLE SIZE..: 1.00 SAMPLE MATRIX: MM5 DATE RECEIVED.: 06/14/90
ICAL DATE....: 06/27/90 SAMPLE ORIGIN: n/a DATE COLLECTED: / /
SPIKE FILE...: SPM23710 SHIPMENT NO...: n/a

NAME	AMT(ng)	NUMBER	DL	EMPC	RATIO	RT	FLAGS
2378-TCDD	ND		0.03				—
12378-PeCDD	ND		0.04				—
123478-HxCDD	ND		0.08				—
123678-HxCDD	ND		0.06				—
123789-HxCDD	ND		0.08				—
1234678-HpCDD	3.5				1.05	46:28	B
OCDD	18.5				0.86	51:53	B
2378-TCDF	26.7				0.71	30:29	—
12378-PeCDF	3.4				1.55	35:15	—
23478-PeCDF	14.5				1.61	36:13	—
123478-HxCDF	3.6				1.10	40:19	—
123678-HxCDF	0.76				1.21	40:29	—
234678-HxCDF	2.3				1.07	41:16	—
123789-HxCDF	ND		0.09				—
1234678-HpCDF	EMPC			1.7			—
1234789-HpCDF	ND		0.1				—
OCDF	3.3				1.01	52:07	—
TOTAL MCDD	33.4	2		33.4	3.09		—
TOTAL DCDD	17.6	4		698	1.61		S
TOTAL TriCDD	53.3	8			1.03		—
TOTAL TCDD	14.1	3		14.3	0.76		—
TOTAL PeCDD	0.43	2			1.70		—
TOTAL HxCDD	0.96	2		1.2	1.28		—
TOTAL HpCDD	6.5	2			1.03		—
TOTAL MCDF	599	4		601	3.21		S
TOTAL DCDF	373	9		378	6.27		—
TOTAL TriCDF	112	8		123	1.08		—
TOTAL TCDF	89.8	12		93.7	0.72		—
TOTAL PeCDF	72.1	12		73.2	1.60		—
TOTAL HxCDF	12.9	6		14.1	1.16		—
TOTAL HpCDF	1.2	2		3.4	1.05		—

[signature] 7/13/90

M237_RPT rev:3.03

FILE NAME....: S208501 CLIENT ID....: ENTROPY TLI NUMBER....: 33-30-2A-F
CONCAL.....: S902083 SAMPLE ID....: 7A-MID MM5
ANALYST.....: JA ANALYSIS DATE: 06/30/90 PROJECT NUMBER: 15962
SAMPLE SIZE..: 1.00 SAMPLE MATRIX: MM5 DATE RECEIVED.: 06/14/90
ICAL DATE....: 06/27/90 SAMPLE ORIGIN: n/a DATE COLLECTED: / /
SPIKE FILE...: SPM23710 SHIPMENT NO...: n/a

SURROGATE RECOVERY SUMMARY (TYPE A)

NAME	AMT (ng)	% REC.	RATIO	RT	FLAGS
37Cl-TCDD	11.9	119		31:18	___
13C12-PeCDF 234	10.9	109	1.52	36:12	___
13C12-HxCDF 478	12.6	126	0.48	40:19	___
13C12-HxCDD 478	11.2	112	1.20	41:28	___
13C12-HpCDF 789	12.2	122	0.41	47:08	___

ALTERNATE STANDARDS RECOVERY SUMMARY (TYPE A)

NAME	AMT (ng)	% REC.	RATIO	RT	FLAGS
13C12-HxCDF 789	6.5	65.1	0.48	42:25	___
13C12-HxCDF 234	7.4	74.0	0.50	41:16	___

INTERNAL STANDARDS RECOVERY SUMMARY

NAME	AMT (ng)	% REC.	RATIO	RT	FLAGS
13C12-2378-TCDF	7.2	72.4	0.75	30:28	___
13C12-2378-TCDD	7.4	74.2	0.79	31:16	___
13C12-PeCDF 123	5.8	58.5	1.56	35:14	___
13C12-PeCDD 123	6.6	66.5	1.56	36:41	___
13C12-HxCDF 678	6.4	64.3	0.46	40:29	___
13C12-HxCDD 678	7.5	74.6	1.20	41:36	___
13C12-HpCDF 678	5.7	57.1	0.39	44:55	___
13C12-HpCDD 678	6.8	68.3	1.01	46:27	___
13C12-OCDD	8.6	43.1	0.91	51:52	___

[signature] 7/13/90 M237_RPT rev:3.03

TRIANGLE LABORATORIES, INC.
CONFIRMATION ANALYSIS (DB-225)

07/11/90

FILE NAME....: W105704 CLIENT ID....: ENTROPY TLI NUMBER....: 33-30-2A-F
CONCAL.....: W901056 SAMPLE ID....: 7A-MID MM5
ANALYST.....: DM ANALYSIS DATE: 07/06/90 PROJECT NUMBER: 15962
SAMPLE SIZE..: 1.00 SAMPLE MATRIX: MM5 DATE RECEIVED.: 06/14/90
ICAL DATE....: 05/15/90 SAMPLE ORIGIN: n/a DATE COLLECTED: / /
SPIKE FILE...: SPC2NF10 SHIPMENT NO...: n/a

NAME	AMT(ng)	NUMBER	DL	EMPC	RATIO	RT	FLAGS
2378-TCDD	ND		0.008				___
2378-TCDF	15.5				0.75	18:45	___
TOTAL TCDD	13.2	1			0.74		___
TOTAL TCDF	73.4	19			0.72		___

SURROGATE STD. RECOVERY SUMMARY (TYPE A)

NAME	AMT (ng)	% REC.	RATIO	RT	FLAGS
37Cl-TCDD	10.4	104		17:26	___

INTERNAL STANDARDS RECOVERY SUMMARY

NAME	AMT (ng)	% REC.	RATIO	RT	FLAGS
13C12-2378-TCDF	7.0	69.8	0.75	18:43	___
13C12-2378-TCDD	7.2	71.6	0.77	17:25	___

[signature] 7/11/90 C2NF_RPT rev:3.01

TRIANGLE LABORATORIES, INC.
PCDD/PCDF ANALYSIS (2378A)

07/11/90

FILE NAME....: S208502 CLIENT ID....: ENTROPY TLI NUMBER....: 33-30-3A-D
CONCAL.....: S902083 SAMPLE ID....: 7C-OUT MM5
ANALYST.....: JA ANALYSIS DATE: 06/30/90 PROJECT NUMBER: 15962
SAMPLE SIZE..: 1.00 SAMPLE MATRIX: MM5 DATE RECEIVED.: 06/14/90
ICAL DATE....: 06/27/90 SAMPLE ORIGIN: n/a DATE COLLECTED: / /
SPIKE FILE...: SPM23710 SHIPMENT NO...: n/a

NAME	AMT(ng)	NUMBER	DL	EMPC	RATIO	RT	FLAGS
2378-TCDD	ND		0.02				
12378-PeCDD	ND		0.02				
123478-HxCDD	ND		0.04				
123678-HxCDD	ND		0.03				
123789-HxCDD	ND		0.04				
1234678-HpCDD	EMPC			0.12			B
OCDD	0.93				0.81	51:53	B
2378-TCDF	1.1				0.71	30:29	
12378-PeCDF	0.06				1.45	35:15	
23478-PeCDF	0.23				1.63	36:13	
123478-HxCDF	0.05				1.30	40:20	
123678-HxCDF	ND		0.02				
234678-HxCDF	ND		0.03				
123789-HxCDF	ND		0.04				
1234678-HpCDF	0.05				1.04	44:56	
1234789-HpCDF	ND		0.04				
OCDF	ND		0.06				
TOTAL MCDD	ND		0.008				
TOTAL DCDD	51.4	3		51.4	1.54		
TOTAL TriCDD	1.7	4		1.7	1.03		
TOTAL TCDD	0.29	1			0.68		
TOTAL PeCDD	ND		0.02				
TOTAL HxCDD	ND		0.03				
TOTAL HpCDD	0.09	1		0.21	0.90		
TOTAL MCDF	EMPC			2.9			
TOTAL DCDF	6.9	5		11.1	6.25		
TOTAL TriCDF	7.3	8		7.4	1.07		
TOTAL TCDF	4.7	11		4.8	0.69		
TOTAL PeCDF	1.4	7		1.5	1.62		
TOTAL HxCDF	0.12	2			1.24		
TOTAL HpCDF	0.06	1			1.04		

7/11/90

M237_RPT rev:3.03

FILE NAME....:	S208502	CLIENT ID....:	ENTROPY	TLI NUMBER....:	33-30-3A-D
CONCAL.....:	S902083	SAMPLE ID....:	7C-OUT MM5		
ANALYST.....:	JA	ANALYSIS DATE:	06/30/90	PROJECT NUMBER:	15962
SAMPLE SIZE..:	1.00	SAMPLE MATRIX:	MM5	DATE RECEIVED.:	06/14/90
ICAL DATE....:	06/27/90	SAMPLE ORIGIN:	n/a	DATE COLLECTED:	/ /
SPIKE FILE...:	SPM23710			SHIPMENT NO...:	n/a

SURROGATE RECOVERY SUMMARY (TYPE A)

NAME	AMT (ng)	% REC.	RATIO	RT	FLAGS
37Cl-TCDD	11.2	112		31:18	___
13C12-PeCDF 234	11.5	115	1.51	36:12	___
13C12-HxCDF 478	11.2	112	0.49	40:20	___
13C12-HxCDD 478	10.2	102	1.12	41:28	___
13C12-HpCDF 789	12.9	129	0.41	47:08	___

ALTERNATE STANDARDS RECOVERY SUMMARY (TYPE A)

NAME	AMT (ng)	% REC.	RATIO	RT	FLAGS
13C12-HxCDF 789	7.5	75.0	0.46	42:25	___
13C12-HxCDF 234	8.2	82.0	0.48	41:16	___

INTERNAL STANDARDS RECOVERY SUMMARY

NAME	AMT (ng)	% REC.	RATIO	RT	FLAGS
13C12-2378-TCDF	7.3	72.5	0.76	30:28	___
13C12-2378-TCDD	8.3	82.8	0.79	31:16	___
13C12-PeCDF 123	8.0	80.2	1.54	35:14	___
13C12-PeCDD 123	10.9	109	1.57	36:41	___
13C12-HxCDF 678	7.5	74.5	0.51	40:29	___
13C12-HxCDD 678	8.6	86.3	1.20	41:36	___
13C12-HpCDF 678	8.1	81.3	0.42	44:55	___
13C12-HpCDD 678	10.3	103	1.03	46:28	___
13C12-OCDD	15.8	79.2	0.88	51:52	___

[signature] 7/11/90 M237_RPT rev:3.03

FILE NAME....: W105705 CLIENT ID....: ENTROPY TLI NUMBER....: 33-30-3A-D
CONCAL.....: W901056 SAMPLE ID....: 7C-OUT MM5
ANALYST.....: DM ANALYSIS DATE: 07/06/90 PROJECT NUMBER: 15962
SAMPLE SIZE..: 1.00 SAMPLE MATRIX: MM5 DATE RECEIVED.: 06/14/90
ICAL DATE....: 05/15/90 SAMPLE ORIGIN: n/a DATE COLLECTED: / /
SPIKE FILE...: SPC2NF10 SHIPMENT NO...: n/a

NAME	AMT(ng)	NUMBER	DL	EMPC	RATIO	RT	FLAGS
2378-TCDD	ND		0.01				___
2378-TCDF	0.55				0.69	18:43	___
TOTAL TCDD	0.16	1			0.78		___
TOTAL TCDF	2.5	9		2.8	0.71		___

SURROGATE STD. RECOVERY SUMMARY (TYPE A)

NAME	AMT (ng)	% REC.	RATIO	RT	FLAGS
37Cl-TCDD	10.2	102		17:24	___

INTERNAL STANDARDS RECOVERY SUMMARY

NAME	AMT (ng)	% REC.	RATIO	RT	FLAGS
13C12-2378-TCDF	7.4	73.7	0.75	18:42	___
13C12-2378-TCDD	7.4	74.1	0.78	17:24	___

[signature] 7/11/90 C2NF_RPT rev:3.01

FILE NAME....: S208503 CLIENT ID....: ENTROPY TLI NUMBER....: 33-30-4A-D
CONCAL.....: S902083 SAMPLE ID....: 7C-MID MM5
ANALYST.....: JA ANALYSIS DATE: 06/30/90 PROJECT NUMBER: 15962
SAMPLE SIZE..: 1.00 SAMPLE MATRIX: MM5 DATE RECEIVED.: 06/14/90
ICAL DATE....: 06/27/90 SAMPLE ORIGIN: n/a DATE COLLECTED: / /
SPIKE FILE...: SPM23710 SHIPMENT NO...: n/a

NAME	AMT(ng)	NUMBER	DL	EMPC	RATIO	RT	FLAGS
2378-TCDD	EMPC			0.45			—
12378-PeCDD	ND		0.03				—
123478-HxCDD	ND		0.05				—
123678-HxCDD	ND		0.04				—
123789-HxCDD	ND		0.06				—
1234678-HpCDD	EMPC			0.26			B
OCDD	2.9				0.85	51:53	B
2378-TCDF	3.5				0.72	30:29	—
12378-PeCDF	0.20				1.34	35:15	—
23478-PeCDF	0.86				1.57	36:13	—
123478-HxCDF	EMPC			0.23			—
123678-HxCDF	0.07				1.16	40:29	—
234678-HxCDF	0.11				1.10	41:18	—
123789-HxCDF	ND		0.06				—
1234678-HpCDF	0.12				0.90	44:55	—
1234789-HpCDF	ND		0.06				—
OCDF	EMPC			0.21			—
TOTAL MCDD	0.30	1		0.31	3.26		—
TOTAL DCDD	64.5	2		64.7	1.47		—
TOTAL TriCDD	1.9	3			1.06		—
TOTAL TCDD	0.28	2		0.78	0.80		—
TOTAL PeCDD	EMPC			0.03			—
TOTAL HxCDD	0.07	1		0.14	1.22		—
TOTAL HpCDD	EMPC			0.52			—
TOTAL MCDF	11.1	2		11.8	3.42		—
TOTAL DCDF	25.6	4		27.2	6.57		—
TOTAL TriCDF	8.6	8		9.8	1.09		—
TOTAL TCDF	10.3	11		10.7	0.74		—
TOTAL PeCDF	4.7	8		4.9	1.53		—
TOTAL HxCDF	0.52	3		0.86	1.11		—
TOTAL HpCDF	0.16	1			0.90		—

7/11/90

M237_RPT rev:3.03

FILE NAME....:	S208503	CLIENT ID....:	ENTROPY	TLI NUMBER....:	33-30-4A-D
CONCAL.....:	S902083	SAMPLE ID....:	7C-MID MM5		
ANALYST.....:	JA	ANALYSIS DATE:	06/30/90	PROJECT NUMBER:	15962
SAMPLE SIZE..:	1.00	SAMPLE MATRIX:	MM5	DATE RECEIVED.:	06/14/90
ICAL DATE....:	06/27/90	SAMPLE ORIGIN:	n/a	DATE COLLECTED:	/ /
SPIKE FILE...:	SPM23710			SHIPMENT NO...:	n/a

SURROGATE RECOVERY SUMMARY (TYPE A)

NAME	AMT (ng)	% REC.	RATIO	RT	FLAGS
37Cl-TCDD	11.8	118		31:18	___
13C12-PeCDF 234	11.2	112	1.51	36:12	___
13C12-HxCDF 478	11.2	112	0.49	40:19	___
13C12-HxCDD 478	10.4	104	1.18	41:28	___
13C12-HpCDF 789	11.3	113	0.39	47:08	___

ALTERNATE STANDARDS RECOVERY SUMMARY (TYPE A)

NAME	AMT (ng)	% REC.	RATIO	RT	FLAGS
13C12-HxCDF 789	8.0	79.7	0.46	42:25	___
13C12-HxCDF 234	9.3	93.3	0.48	41:16	___

INTERNAL STANDARDS RECOVERY SUMMARY

NAME	AMT (ng)	% REC.	RATIO	RT	FLAGS
13C12-2378-TCDF	8.4	83.8	0.75	30:28	___
13C12-2378-TCDD	9.0	90.0	0.81	31:16	___
13C12-PeCDF 123	8.1	80.7	1.55	35:14	___
13C12-PeCDD 123	10.4	104	1.52	36:41	___
13C12-HxCDF 678	8.4	83.5	0.49	40:29	___
13C12-HxCDD 678	9.2	91.6	1.17	41:36	___
13C12-HpCDF 678	8.7	86.8	0.41	44:55	___
13C12-HpCDD 678	10.0	100	1.00	46:27	___
13C12-OCDD	13.9	69.7	0.93	51:52	___

7/11/90 M237_RPT rev:3.03

FILE NAME....: W105706 CLIENT ID....: ENTROPY TLI NUMBER....: 33-30-4A-D
CONCAL.....: W901056 SAMPLE ID....: 7C-MID MM5
ANALYST.....: DM ANALYSIS DATE: 07/06/90 PROJECT NUMBER: 15962
SAMPLE SIZE..: 1.00 SAMPLE MATRIX: MM5 DATE RECEIVED.: 06/14/90
ICAL DATE....: 05/15/90 SAMPLE ORIGIN: n/a DATE COLLECTED: / /
SPIKE FILE...: SPC2NF10 SHIPMENT NO...: n/a

NAME	AMT(ng)	NUMBER	DL	EMPC	RATIO	RT	FLAGS
2378-TCDD	0.47				0.76	17:25	___
2378-TCDF	2.2				0.75	18:44	___
TOTAL TCDD	0.79	2		0.85	0.78		___
TOTAL TCDF	8.5	16		8.6	0.73		___

SURROGATE STD. RECOVERY SUMMARY (TYPE A)

NAME	AMT (ng)	% REC.	RATIO	RT	FLAGS
37Cl-TCDD	10.0	99.7		17:25	___

INTERNAL STANDARDS RECOVERY SUMMARY

NAME	AMT (ng)	% REC.	RATIO	RT	FLAGS
13C12-2378-TCDF	7.9	78.9	0.80	18:43	___
13C12-2378-TCDD	8.2	82.2	0.78	17:23	___

[signature] 7/11/90 C2NF_RPT rev:3.01

TRIANGLE LABORATORIES, INC. Date: 07/02/90
Initial Calibration Summary for SM00626

Analysis Date....: 06/27/90 Method....: M237
Machine...: S

Name	RF	SD	%RSD	RT	RT/LO	RT/HI	Ratio1	Ratio2	Peaks
Total MCDF	2.595	0.175	7%	11:45	8:10	19:10	3.321		3
Total MCDD	2.229	0.173	8%	12:53	8:58	19:58	2.835		3
Total DCDF	0.538	0.014	3%	16:55	15:10	20:10	5.827		3
Total DCDD	1.522	0.238	16%	17:55	15:58	20:58	1.611		3
Total TriCDF	0.766	0.029	4%	22:21	19:10	24:10	1.025		3
Total TriCDD	0.901	0.085	11%	22:28	20:58	24:58	1.015		3
2378-TCDF	0.874	0.066	8%	28:11	24:10	32:10	0.732		5
TOTAL TCDF	0.874	0.066	8%				0.732		5
2378-TCDD	0.954	0.075	8%	28:59	24:58	32:58	0.790		5
TOTAL TCDD	0.954	0.075	8%				0.790		5
12378-PeCDF	1.303	0.098	8%	32:54	28:53	36:53	1.582		5
23478-PeCDF	1.210	0.089	7%	33:32			1.601		5
TOTAL PeCDF	1.257	0.089	7%				1.591		5
12378-PeCDD	1.799	0.266	15%	34:21	30:20	38:20	1.544		5
TOTAL PeCDD	1.799	0.266	15%				1.544		5
123478-HxCDF	1.066	0.061	6%	37:57	34:05	42:05	1.100		5
123678-HxCDF	1.290	0.094	7%	38:06			1.079		5
234678-HxCDF	0.840	0.091	11%	38:54			1.096		5
123789-HxCDF	0.609	0.055	9%	40:02			1.098		5
TOTAL HxCDF	0.951	0.070	7%				1.091		5
123478-HxCDD	0.870	0.062	7%	39:07	35:14	43:14	1.213		5
123678-HxCDD	1.078	0.133	12%	39:15			1.143		5
123789-HxCDD	0.820	0.047	6%	39:42			1.180		5
TOTAL HxCDD	0.923	0.078	9%				1.175		5
1234678-HpCDF	1.925	0.135	7%	42:31	38:30	46:30	0.902		5
1234789-HpCDF	1.072	0.041	4%	44:38			0.913		5
TOTAL HpCDF	1.498	0.085	6%				0.906		5
1234678-HpCDD	1.051	0.088	8%	44:02	40:01	48:01	1.037		5
TOTAL HpCDD	1.051	0.088	8%				1.037		5
OCDF	1.053	0.243	23%	48:58	44:46	52:46	0.916		5
OCDD	1.028	0.235	23%	48:48	44:46	52:46	0.853		5

Name	RF	SD	%RSD	RT	RT/LO	RT/HI	Ratio1	Ratio2	Peaks
37Cl-TCDD	0.887	0.084	10%	28:59	26:58	30:58			5
13C12-PeCDF 234	1.094	0.084	8%	33:51	30:53	34:53	1.519		5
13C12-HxCDF 478	0.698	0.030	4%	37:56			0.509		5
13C12-HxCDF 234	0.731	0.079	11%	38:53			0.496		5
13C12-HxCDF 789	0.540	0.044	8%	40:01			0.509		5
13C12-HxCDD 478	0.636	0.018	3%	39:06			1.190		5
13C12-HpCDF 789	0.741	0.024	3%	44:37	40:30	46:30	0.432		5

Name	RF	SD	%RSD	RT	RT/LO	RT/HI	Ratio1	Ratio2	Peaks
13C12-2378-TCDF	1.608	0.204	13%	28:10	27:10	29:10	0.764		5
13C12-2378-TCDD	1.090	0.041	4%	28:58	26:58	30:58	0.807		5
13C12-PeCDF 123	0.875	0.105	12%	32:53	28:53	36:53	1.546		5
13C12-PeCDD 123	0.454	0.089	20%	34:20	30:20	38:20	1.529		5
13C12-HxCDF 678	1.623	0.168	10%	38:05	34:05	42:05	0.504		5
13C12-HxCDD 678	1.168	0.118	10%	39:14	35:14	43:14	1.218		5
13C12-HpCDF 678	0.805	0.068	9%	42:30	40:30	46:30	0.428		5
13C12-HpCDD 678	0.708	0.057	8%	44:01	43:01	45:01	1.007		5
13C12-OCDD	0.628	0.158	25%	48:46	46:46	50:46	0.874		5

CASE NARRATIVE

Triangle Laboratories, Inc
801-10 Capitola Dr.
Research Triangle Park, NC 27713
(919) 544-5729

DATE: July 14, 1990

CLIENT NO: 3808 T-7

TLI NO: 15968

OBJECTIVE: Analysis of MM5 train samples for semivolatile compounds.

METHOD

The samples were spiked with 50 ug of nitrobenzene-d_5, 2-fluorobiphenyl and terphenyl-d_{14} and 100 ug of 2-fluorophenol, 2,4,6-tribromophenol and phenol-d_5 prior to extraction. The samples were Soxhlett extracted for 16 hours with toluene. All extracts were combined and concentrated to one milliliter prior to analysis. The semivolatile analysis Method was 8270 from EPA SW-846.

The internal standards, 1,4-dichlorobenzene-d_4, naphthalene-d_8, acenaphthene-d_{10}, phenanthrene-d_{10}, chrysene-d_{12} and perylene-d_{12} were added in the amount of 40 ug immediately prior to analysis by GC/MS.

The GC/MS analysis conditions are listed below:

GC CONDITIONS:	
Column:	J&W DB-5, 30m x .32mm x 25micron film thickness
Program:	40C hold 3 min to 300C at 8C/min hold 4.5 min
MS CONDITIONS:	
Instrument:	TRIO-1, Lab Base data system
Scan:	35-510 amu at 1s/scan
Ion Source:	180C
Interface:	Capillary 275C

REPORT

Included with the case narrative are the chain of custody sheets, instrument log pages and tracking forms and wet laboratory information.

The data are reported as quantitation reports, chromatograms, interim reports, and spectra of detected compounds. The quantitation report header describes the sample and calibration injection ID, 'data file' and 'RF file' respectively. The sample

name, dilution factor, TLI project number, date of report, and analysis date are also listed in the quantitation report header. The raw areas and scan numbers found on the quantitation report are from the interim report. The RF is from the continuing calibration. All initial and continuing calibration data is located in the back of the data package. The ISID is the internal standard identifier. Those compounds matched to naphthalene-d_8, for example, are flagged with ISID number 14. The amounts for the target compounds are reported in ug. The sample calculations are listed below in the Sample Calculations section of the narrative. If the target compound is detected, a code of 'D' is reported. If the target compound is detected but the amount is below the quantitation limit, a code of 'E' or estimated is reported. If the target compound is not detected, a code of 'ND' is reported. Amounts reported for target compounds that are not detected are calculated using an area of 20 counts. Compounds flagged with the code 'IS' are internal standards.

RESULTS

The sample AUDIT #2176 was not analyzed for Method 8270 compounds, as per Rik Tebeau.

The MM5 extracts were run with a five and one-half minute solvent delay in order to avoid damage to the filament caused by the large solvent front of the samples. No data was therefore collected for the early eluting surrogate 2-fluorophenol. This surrogate is reported with a recovery of 0.0 percent.

As authorized by Entropy, all samples were run at diluted levels in order to have all analytes within the calibration range of the analysis. The samples 1-7A-OUT-MM5 and 2-7A-MID-MM5 were diluted 1:10 while samples 3-7C-OUT-MM5 and 4-7C-MID-MM5 were diluted 1:100. For all samples, the dilutions caused the surrogates to be lost so no recoveries are reported.

The surrogate recoveries in the laboratory blank SBLK 061490 were very good for MM5 train samples. The surrogate recoveries for 2-fluorobiphenyl, nitrobenzene-d_5, and terphenyl-d_{14} were good in all samples. The recovery of phenol-d_5 was good in sample 1-7A-OUT-MM5, but the recovery of 2,4,6-tribromophenol was very low. The recoveries of phenol-d_5 and 2,4,6-tribromophenol were normal in sample 2-7A-MID-MM5. The recoveries of these two acidic surrogates were very high (approximately 180% for phenol-d_5 and 470% for 2,4,6-tribromophenol) in samples 3-7C-OUT-MM5 and 4-7C-MID-MM5. Because the recoveries for these surrogates look normal in the laboratory blank and in most of the other samples

this is most likely due to a matrix effect.

There was no chrysene-d_{12} found in the 1:100 dilution of sample 3-7C-OUT-MM5. There were no target compounds matched to this internal standard found in the sample either. The quantitation report amounts for these compounds are flagged with the error message ERR. There was no perylene-d_{12} found in sample 4-7C-MID-MM5. There were no target compounds matched to this internal standard either. The quantitation report amounts for these compounds are also flagged with the error message ERR.

The following compounds were found as contaminants in the laboratory blank, SBLK 061490: benzyl alcohol, di-n-butylphthalate, and bis(2-ethylhexyl)phthalate. These contaminants should not be considered present in the associated samples unless they are found in the sample at a level five times higher than the level in the blank.

SAMPLE CALCULATIONS

Response Factor, RF:

$$RF = \frac{(\text{Area X} * \text{Amount Int Std})}{(\text{Area Int Std} * \text{Amount X})}$$

Amount in samples, ug:

$$\text{Amount, ug} = \frac{(\text{Area X} * \text{Amt Int Std})}{(\text{Area Int Std} * \text{RF X})}$$

where:

X = Analyte
Int Std = internal standard
Amt Int Std = amount of internal standard = 40 ug
RF X = response factor of X from the continuing calibration

Valerie Evans — Laboratory Manager
Penny Brock — QA/QC Officer
Nancy Bragg — Report Generation Manager

TRIANGLE LABORATORIES, INC.
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Telephone: (919) 544-5729

DATA FILE:FB81006 SAMPLE ID 1-7A-OUT-MM5
RF FILE: FB809 DILN FACTOR 2
DATE: 07/09/90
TLI Project Number: 15968
ANALYSIS DATE: 07/03/90

QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	1,4-Dichlorobenzene-d4	436		75	1		IS	
2	Phenol	0	1.5257	0	1	2.41	ND	20
3	bis(2-Chloroethyl)ether	0	1.2341	0	1	2.98	ND	20
4	2-Chlorophenol	0	1.2481	0	1	2.94	ND	20
5	1,3-Dichlorobenzene	0	1.4692	0	1	2.50	ND	20
6	1,4-Dichlorobenzene	742	1.5313	77	1	89.01	D	20
7	Benzyl alcohol	4490	.4837	118	1	1703.23	D	20
8	1,2-Dichlorobenzene	568	1.4079	98	1	74.16	D	20
9	2-Methylphenol	0	1.1661	0	1	3.15	ND	20
10	bis(2-Chloroisopropyl)ether	0	2.3815	0	1	1.54	ND	20
11	4-Methylphenol	0	1.0276	0	1	3.58	ND	20
12	N-Nitroso-di-n-propylamine	0	1.0912	0	1	3.37	ND	20
13	Hexachloroethane	0	.3238	0	1	11.35	ND	20
14	Naphthalene-d8	2698		287	14		IS	
15	Nitrobenzene	0	.5786	0	14	1.03	ND	20
16	Isophorone	0	.9021	0	14	.66	ND	20
17	2-Nitrophenol	1240	.1513	226	14	242.95	D	20
18	2,4-Dimethylphenol	0	.3610	0	14	1.64	ND	20
19	Benzoic acid	23611	.1552	377	14	4512.73	D	20
20	bis(2-Chloroethoxy)methane	0	.3741	0	14	1.59	ND	20
21	2,4-Dichlorophenol	0	.3538	0	14	1.68	ND	20
22	1,2,4-Trichlorobenzene	14130	.5944	282	14	704.98	D	20
23	Naphthalene	67901	1.1453	292	14	1758.23	D	20
24	4-Chloroaniline	0	.2409	0	14	2.46	ND	20
25	Hexachlorobutadiene	0	.2446	0	14	2.42	ND	20
26	4-Chloro-3-methylphenol	0	.3056	0	14	1.94	ND	20
27	2-Methylnaphthalene	3254	.7696	414	14	125.40	D	20
28	Acenaphthene-d10	1020		597	28		IS	
29	Hexachlorocyclopentadiene	0	.1472	0	28	10.66	ND	20
30	2,4,6-Trichlorophenol	0	.4649	0	28	3.23	ND	20
31	2,4,5-Trichlorophenol	0	.6083	0	28	2.58	ND	20
32	2-Chloronaphthalene	0	1.1721	0	28	1.34	ND	20
33	2-Nitroaniline	0	.5275	0	28	2.97	ND	20
34	Dimethylphthalate	0	1.3735	0	28	1.14	ND	20
35	Acenaphthylene	0	1.5087	0	28	1.04	ND	20
36	3-Nitroaniline	0	.1648	0	28	9.52	ND	20
37	Acenaphthene	0	1.1378	0	28	1.38	ND	20
38	2,4-Dinitrophenol	0	.0801	0	28	19.58	ND	20
39	4-Nitrophenol	0	.0855	0	28	18.34	ND	20
40	Dibenzofuran	3059	1.8332	636	28	130.87	D	20
41	2,4-Dinitrotoluene	0	.3271	0	28	4.80	ND	20
42	2,6-Dinitrotoluene	0	.2797	0	28	5.61	ND	20
43	Diethylphthalate	0	1.0448	0	28	1.50	ND	20

TRIANGLE LABORATORIES, INC.
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DATA FILE:FB81005 SAMPLE ID SBLK 061490
RF FILE: FB809 DILN FACTOR 2
DATE: 07/09/90
TLI Project Number: 15968
ANALYSIS DATE: 07/03/90

Q U A N T I T A T I O N R E P O R T

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	1,4-Dichlorobenzene-d4	420		73	1	IS		
2	Phenol	0	1.5257	0	1	2.49	ND	20
3	bis(2-Chloroethyl)ether	0	1.2341	0	1	3.08	ND	20
4	2-Chlorophenol	0	1.2481	0	1	3.05	ND	20
5	1,3-Dichlorobenzene	0	1.4692	0	1	2.59	ND	20
6	1,4-Dichlorobenzene	0	1.5313	0	1	2.49	ND	20
7	Benzyl alcohol	118	.4837	107	1	46.39	D	20
8	1,2-Dichlorobenzene	0	1.4079	0	1	2.70	ND	20
9	2-Methylphenol	0	1.1661	0	1	3.26	ND	20
10	bis(2-Chloroisopropyl)ether	0	2.3815	0	1	1.60	ND	20
11	4-Methylphenol	0	1.0276	0	1	3.70	ND	20
12	N-Nitroso-di-n-propylamine	0	1.0912	0	1	3.49	ND	20
13	Hexachloroethane	0	.3238	0	1	11.75	ND	20
14	Naphthalene-d8	1293		281	14	IS		
15	Nitrobenzene	0	.5786	0	14	2.14	ND	20
16	Isophorone	0	.9021	0	14	1.37	ND	20
17	2-Nitrophenol	0	.1513	0	14	8.17	ND	20
18	2,4-Dimethylphenol	0	.3610	0	14	3.43	ND	20
19	Benzoic acid	0	.1552	0	14	7.97	ND	20
20	bis(2-Chloroethoxy)methane	0	.3741	0	14	3.31	ND	20
21	2,4-Dichlorophenol	0	.3538	0	14	3.50	ND	20
22	1,2,4-Trichlorobenzene	0	.5944	0	14	2.08	ND	20
23	Naphthalene	0	1.1453	0	14	1.08	ND	20
24	4-Chloroaniline	0	.2409	0	14	5.13	ND	20
25	Hexachlorobutadiene	0	.2446	0	14	5.06	ND	20
26	4-Chloro-3-methylphenol	0	.3056	0	14	4.05	ND	20
27	2-Methylnaphthalene	0	.7696	0	14	1.61	ND	20
28	Acenaphthene-d10	856		593	28	IS		
29	Hexachlorocyclopentadiene	0	.1472	0	28	12.69	ND	20
30	2,4,6-Trichlorophenol	0	.4849	0	28	3.85	ND	20
31	2,4,5-Trichlorophenol	0	.6083	0	28	3.07	ND	20
32	2-Chloronaphthalene	0	1.1721	0	28	1.59	ND	20
33	2-Nitroaniline	0	.5275	0	28	3.54	ND	20
34	Dimethylphthalate	0	1.3735	0	28	1.36	ND	20
35	Acenaphthylene	0	1.5087	0	28	1.24	ND	20
36	3-Nitroaniline	0	.1648	0	28	11.34	ND	20
37	Acenaphthene	0	1.1378	0	28	1.64	ND	20
38	2,4-Dinitrophenol	0	.0801	0	28	23.32	ND	20
39	4-Nitrophenol	0	.0855	0	28	21.85	ND	20
40	Dibenzofuran	0	1.8332	0	28	1.02	ND	20
41	2,4-Dinitrotoluene	0	.3271	0	28	5.71	ND	20
42	2,6-Dinitrotoluene	0	.2797	0	28	6.68	ND	20
43	Diethylphthalate	154	1.0448	702	28	13.75	E	20

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DATA FILE:FB81005 SAMPLE ID SBLK 061490
RF FILE: FB809 DILN FACTOR 2
DATE: 07/09/90
TLI Project Number: 15968
ANALYSIS DATE: 07/03/90

Q U A N T I T A T I O N R E P O R T

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
44	4-Chlorophenyl-phenylether	0	1.0162	0	28	1.84	ND	20
45	Fluorene	0	1.4392	0	28	1.30	ND	20
46	4-Nitroaniline	0	.1498	0	28	12.47	ND	20
47	Phenanthrene-d10	1769		859	47		IS	
48	4,6-Dinitro-2-methylphenol	0	.0354	0	47	25.53	ND	20
49	N-Nitrosodiphenylamine(1)	0	.3807	0	47	2.38	ND	20
50	4-Bromophenyl-phenylether	0	.1553	0	47	5.82	ND	20
51	Hexachlorobenzene	0	.1394	0	47	6.49	ND	20
52	Pentachlorophenol	0	.0303	0	47	29.83	ND	20
53	Phenanthrene	0	1.1598	0	47	.78	ND	20
54	Anthracene	0	1.1101	0	47	.81	ND	20
55	Di-n-butylphthalate	392	.6613	1005	47	26.82	D	20
56	Fluoranthene	0	1.7081	0	47	.53	ND	20
57	Chrysene-d12	2770		1313	57		IS	
58	Pyrene	0	1.7571	0	57	.33	ND	20
59	Butylbenzylphthalate	0	.4937	0	57	1.17	ND	20
60	3,3'-Dichlorobenzidine	0	.1068	0	57	5.41	ND	20
61	Benzo(a)anthracene	0	1.3685	0	57	.42	ND	20
62	Chrysene	0	1.3009	0	57	.44	ND	20
63	bis(2-Ethylhexyl)phthalate	297	.7254	1357	57	11.81	E	20
64	Perylene-d12	2215		1513	64		IS	
65	Di-n-octylphthalate	0	3.1428	0	64	.23	ND	20
66	Benzo(b)fluoranthene	0	2.2061	0	64	.33	ND	20
67	Benzo(k)fluoranthene	0	2.5592	0	64	.28	ND	20
68	Benzo(a)pyrene	0	1.7546	0	64	.41	ND	20
69	Indeno(1,2,3-cd)pyrene	0	.8215	0	64	.88	ND	20
70	Dibenz(a,h)anthracene	0	1.0083	0	64	.72	ND	20
71	Benzo(g,h,i)perylene	0	1.1378	0	64	.63	ND	20

S U R R O G A T E S U M M A R Y		AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
72	Nitrobenzene-d5	159	.3562	164	14	27.55	D	55.1
73	2-Fluorobiphenyl	310	.7861	485	28	36.86	D	73.7
74	Terphenyl-d14	574	.6017	1160	57	27.58	D	55.2
75	Phenol-d5	347	.7144	39	1	92.43	D	92.4
76	2-Fluorophenol	0	.7165	0	1	.00	ND	.0
77	2,4,6-Tribromophenol	44	.0414	739	28	99.89	D	99.9

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DATA FILE:FB81006 SAMPLE ID 1-7A-OUT-MM5
RF FILE: FB809 DILN FACTOR 2
DATE: 07/09/90
TLI Project Number: 15968
ANALYSIS DATE: 07/03/90

Q U A N T I T A T I O N R E P O R T

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
44	4-Chlorophenyl-phenylether	0	1.0162	0	28	1.54	ND	20
45	Fluorene	0	1.4392	0	28	1.09	ND	20
46	4-Nitroaniline	0	.1498	0	28	10.47	ND	20
47	Phenanthrene-d10	2137		862	47		IS	
48	4,6-Dinitro-2-methylphenol	0	.0354	0	47	21.14	ND	20
49	N-Nitrosodiphenylamine(1)	0	.3807	0	47	1.97	ND	20
50	4-Bromophenyl-phenylether	0	.1553	0	47	4.82	ND	20
51	Hexachlorobenzene	0	.1394	0	47	5.37	ND	20
52	Pentachlorophenol	0	.0303	0	47	24.69	ND	20
53	Phenanthrene	4025	1.1598	866	47	129.94	D	20
54	Anthracene	0	1.1101	0	47	.67	ND	20
55	Di-n-butylphthalate	0	.6613	0	47	1.13	ND	20
56	Fluoranthene	652	1.7081	1079	47	14.29	E	20
57	Chrysene-d12	3954		1316	57		IS	
58	Pyrene	0	1.7571	0	57	.23	ND	20
59	Butylbenzylphthalate	0	.4937	0	57	.82	ND	20
60	3,3'-Dichlorobenzidine	0	.1068	0	57	3.79	ND	20
61	Benzo(a)anthracene	0	1.3685	0	57	.30	ND	20
62	Chrysene	0	1.3009	0	57	.31	ND	20
63	bis(2-Ethylhexyl)phthalate	3025	.7254	1359	57	84.37	D	20
64	Perylene-d12	1249		1515	64		IS	
65	Di-n-octylphthalate	241	3.1428	1452	64	4.91	E	20
66	Benzo(b)fluoranthene	0	2.2061	0	64	.58	ND	20
67	Benzo(k)fluoranthene	0	2.5592	0	64	.50	ND	20
68	Benzo(a)pyrene	0	1.7546	0	64	.73	ND	20
69	Indeno(1,2,3-cd)pyrene	0	.8215	0	64	1.56	ND	20
70	Dibenz(a,h)anthracene	0	1.0083	0	64	1.27	ND	20
71	Benzo(g,h,i)perylene	0	1.1378	0	64	1.13	ND	20

S U R R O G A T E S U M M A R Y		AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
72	Nitrobenzene-d5	770	.3562	168	14	64.07	D	128.1
73	2-Fluorobiphenyl	529	.7861	489	28	52.76	D	105.5
74	Terphenyl-d14	1093	.6017	1162	57	36.76	D	73.5
75	Phenol-d5	315	.7144	42	1	80.90	D	80.9
76	2-Fluorophenol	0	.7165	0	1	.00	ND	.0
77	2,4,6-Tribromophenol	2	.0414	742	28	3.58	D	3.6

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DATA FILE:FB816 SAMPLE ID 1-7A-OUT-MM5 (1:10 DILN)
RF FILE: FB81504 DILN FACTOR 20
DATE: 07/09/90
TLI Project Number: 15968
ANALYSIS DATE: 07/06/90

QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	1,4-Dichlorobenzene-d4	381		60	1		IS	
2	Phenol	0	1.1577	0	1	36.32	ND	200
3	bis(2-Chloroethyl)ether	0	1.1357	0	1	37.02	ND	200
4	2-Chlorophenol	0	1.1506	0	1	36.55	ND	200
5	1,3-Dichlorobenzene	0	1.2920	0	1	32.55	ND	200
6	1,4-Dichlorobenzene	96	1.4004	63	1	143.53	E	200
7	Benzyl alcohol	567	.5147	97	1	2315.05	D	200
8	1,2-Dichlorobenzene	69	1.2386	84	1	116.51	E	200
9	2-Methylphenol	0	.8767	0	1	47.96	ND	200
10	bis(2-Chloroisopropyl)ether	0	1.2827	0	1	32.78	ND	200
11	4-Methylphenol	0	.7723	0	1	54.44	ND	200
12	N-Nitroso-di-n-propylamine	0	.8844	0	1	47.54	ND	200
13	Hexachloroethane	0	.5105	0	1	82.37	ND	200
14	Naphthalene-d8	1332		272	14		IS	
15	Nitrobenzene	0	.4254	0	14	28.23	ND	200
16	Isophorone	0	.6024	0	14	19.94	ND	200
17	2-Nitrophenol	115	.1219	211	14	568.14	D	200
18	2,4-Dimethylphenol	0	.2622	0	14	45.82	ND	200
19	Benzoic acid	1783	.1284	307	14	8242.96	D	200
20	bis(2-Chloroethoxy)methane	0	.3515	0	14	34.18	ND	200
21	2,4-Dichlorophenol	0	.2108	0	14	56.97	ND	200
22	1,2,4-Trichlorobenzene	974	.2895	266	14	2021.01	D	200
23	Naphthalene	4419	.9398	275	14	2824.16	D	200
24	4-Chloroaniline	0	.3244	0	14	37.03	ND	200
25	Hexachlorobutadiene	0	.1521	0	14	78.99	ND	200
26	4-Chloro-3-methylphenol	0	.1796	0	14	66.86	ND	200
27	2-Methylnaphthalene	334	.6264	400	14	319.91	D	200
28	Acenaphthene-d10	735		583	28		IS	
29	Hexachlorocyclopentadiene	0	.0854	0	28	254.76	ND	200
30	2,4,6-Trichlorophenol	0	.2453	0	28	88.68	ND	200
31	2,4,5-Trichlorophenol	0	.3047	0	28	71.41	ND	200
32	2-Chloronaphthalene	0	.9935	0	28	21.90	ND	200
33	2-Nitroaniline	0	.3977	0	28	54.70	ND	200
34	Dimethylphthalate	0	.9350	0	28	23.27	ND	200
35	Acenaphthylene	0	1.4186	0	28	15.34	ND	200
36	3-Nitroaniline	0	.1964	0	28	110.78	ND	200
37	Acenaphthene	0	.9146	0	28	23.79	ND	200
38	2,4-Dinitrophenol	0	.1972	0	28	110.31	ND	200
39	4-Nitrophenol	0	.0821	0	28	264.99	ND	200
40	Dibenzofuran	318	1.3733	621	28	252.07	D	200
41	2,4-Dinitrotoluene	0	.2702	0	28	80.50	ND	200
42	2,6-Dinitrotoluene	0	.2125	0	28	102.40	ND	200
43	Diethylphthalate	0	.8088	0	28	26.90	ND	200

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DATA FILE:FB816 SAMPLE ID 1-7A-OUT-HH5 (1:10 DILN)
RF FILE: FB81504 DILN FACTOR 20
DATE: 07/09/90
TLI Project Number: 15968
ANALYSIS DATE: 07/06/90

QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
44	4-Chlorophenyl-phenylether	0	.4413	0	28	49.29	ND	200
45	Fluorene	0	1.0694	0	28	20.34	ND	200
46	4-Nitroaniline	0	.2353	0	28	92.46	ND	200
47	Phenanthrene-d10	620		847	47		IS	
48	4,6-Dinitro-2-methylphenol	0	.0266	0	47	970.06	ND	200
49	N-Nitrosodiphenylamine(1)	0	.5190	0	47	49.75	ND	200
50	4-Bromophenyl-phenylether	0	.1274	0	47	202.65	ND	200
51	Hexachlorobenzene	0	.1401	0	47	184.39	ND	200
52	Pentachlorophenol	0	.0284	0	47	910.66	ND	200
53	Phenanthrene	169	1.0486	851	47	208.57	D	200
54	Anthracene	0	.7875	0	47	32.38	ND	200
55	Di-n-butylphthalate	0	.7873	0	47	32.80	ND	200
56	Fluoranthene	0	.8510	0	47	30.35	ND	200
57	Chrysene-d12	503		1302	57		IS	
58	Pyrene	0	2.6306	0	57	12.09	ND	200
59	Butylbenzylphthalate	0	1.0210	0	57	31.14	ND	200
60	3,3'-Dichlorobenzidine	0	.1905	0	57	166.91	ND	200
61	Benzo(a)anthracene	0	.5917	0	57	53.74	ND	200
62	Chrysene	0	1.3525	0	57	23.51	ND	200
63	bis(2-Ethylhexyl)phthalate	0	.4956	0	57	64.16	ND	200
64	Perylene-d12	151		1501	64		IS	
65	Di-n-octylphthalate	0	.9707	0	64	109.45	ND	200
66	Benzo(b)fluoranthene	0	.8181	0	64	129.87	ND	200
67	Benzo(k)fluoranthene	0	1.6757	0	64	63.40	ND	200
68	Benzo(a)pyrene	0	1.4188	0	64	74.88	ND	200
69	Indeno(1,2,3-cd)pyrene	0	.5777	0	64	183.89	ND	200
70	Dibenz(a,h)anthracene	0	.6305	0	64	168.51	ND	200
71	Benzo(g,h,i)perylene	0	1.0703	0	64	99.26	ND	200

SURROGATE SUMMARY		AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
72	Nitrobenzene-d5	0	.2240	0	14	.00	ND	.0
73	2-Fluorobiphenyl	0	.5997	0	28	.00	ND	.0
74	Terphenyl-d14	0	.4672	0	57	.00	ND	.0
75	Phenol-d5	0	.8310	0	1	.00	ND	.0
76	2-Fluorophenol	0	.5721	0	1	.00	ND	.0
77	2,4,6-Tribromophenol	0	.0242	0	28	.00	ND	.0

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DATA FILE:FB81007 SAMPLE ID 2-7A-MID-MM5
RF FILE: FB809 DILN FACTOR 2
DATE: 07/09/90
TLI Project Number: 15968
ANALYSIS DATE: 07/03/90

QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	1,4-Dichlorobenzene-d4	450		75	1		IS	
2	Phenol	0	1.5257	0	1	2.33	ND	20
3	bis(2-Chloroethyl)ether	0	1.2341	0	1	2.88	ND	20
4	2-Chlorophenol	0	1.2481	0	1	2.85	ND	20
5	1,3-Dichlorobenzene	0	1.4682	0	1	2.42	ND	20
6	1,4-Dichlorobenzene	575	1.5313	78	1	66.73	D	20
7	Benzyl alcohol	5181	.4837	121	1	1902.46	D	20
8	1,2-Dichlorobenzene	424	1.4079	99	1	53.45	D	20
9	2-Methylphenol	0	1.1661	0	1	3.05	ND	20
10	bis(2-Chloroisopropyl)ether	0	2.3815	0	1	1.49	ND	20
11	4-Methylphenol	0	1.0276	0	1	3.46	ND	20
12	N-Nitroso-di-n-propylamine	0	1.0912	0	1	3.26	ND	20
13	Hexachloroethane	0	.3238	0	1	10.97	ND	20
14	Naphthalene-d8	2133		287	14		IS	
15	Nitrobenzene	0	.5786	0	14	1.30	ND	20
16	Isophorone	0	.9021	0	14	.83	ND	20
17	2-Nitrophenol	1191	.1513	226	14	295.12	D	20
18	2,4-Dimethylphenol	0	.3610	0	14	2.08	ND	20
19	Benzoic acid	16249	.1552	376	14	3926.96	D	20
20	bis(2-Chloroethoxy)methane	0	.3741	0	14	2.00	ND	20
21	2,4-Dichlorophenol	0	.3538	0	14	2.12	ND	20
22	1,2,4-Trichlorobenzene	11673	.5944	281	14	736.42	D	20
23	Naphthalene	41304	1.1453	292	14	1352.40	D	20
24	4-Chloroaniline	0	.2409	0	14	3.11	ND	20
25	Hexachlorobutadiene	0	.2446	0	14	3.07	ND	20
26	4-Chloro-3-methylphenol	0	.3056	0	14	2.45	ND	20
27	2-Methylnaphthalene	1868	.7696	414	14	91.03	D	20
28	Acenaphthene-d10	888		597	28		IS	
29	Hexachlorocyclopentadiene	0	.1472	0	28	12.24	ND	20
30	2,4,6-Trichlorophenol	0	.4849	0	28	3.71	ND	20
31	2,4,5-Trichlorophenol	0	.6083	0	28	2.96	ND	20
32	2-Chloronaphthalene	0	1.1721	0	28	1.54	ND	20
33	2-Nitroaniline	0	.5275	0	28	3.41	ND	20
34	Dimethylphthalate	0	1.3735	0	28	1.31	ND	20
35	Acenaphthylene	0	1.5087	0	28	1.19	ND	20
36	3-Nitroaniline	0	.1648	0	28	10.93	ND	20
37	Acenaphthene	0	1.1378	0	28	1.58	ND	20
38	2,4-Dinitrophenol	261	.0801	628	28	293.39	D	20
39	4-Nitrophenol	0	.0855	0	28	21.06	ND	20
40	Dibenzofuran	1821	1.8332	635	28	89.48	D	20
41	2,4-Dinitrotoluene	0	.3271	0	28	5.51	ND	20
42	2,6-Dinitrotoluene	0	.2797	0	28	6.44	ND	20
43	Diethylphthalate	0	1.0448	0	28	1.72	ND	20

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DATA FILE:FB81007 SAMPLE ID 2-7A-MID-MM5
RF FILE: FB809 DILN FACTOR 2
DATE: 07/09/90
TLI Project Number: 15968
ANALYSIS DATE: 07/03/90

Q U A N T I T A T I O N R E P O R T

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
44	4-Chlorophenyl-phenylether	0	1.0162	0	28	1.77	ND	20
45	Fluorene	0	1.4392	0	28	1.25	ND	20
46	4-Nitroaniline	0	.1498	0	28	12.02	ND	20
47	Phenanthrene-d10	2312		863	47		IS	
48	4,6-Dinitro-2-methylphenol	0	.0354	0	47	19.53	ND	20
49	N-Nitrosodiphenylamine(1)	0	.3807	0	47	1.82	ND	20
50	4-Bromophenyl-phenylether	0	.1553	0	47	4.45	ND	20
51	Hexachlorobenzene	0	.1394	0	47	4.96	ND	20
52	Pentachlorophenol	0	.0303	0	47	22.82	ND	20
53	Phenanthrene	2242	1.1598	866	47	66.87	D	20
54	Anthracene	0	1.1101	0	47	.62	ND	20
55	Di-n-butylphthalate	0	.8613	0	47	1.05	ND	20
56	Fluoranthene	1314	1.7081	1080	47	26.62	D	20
57	Chrysene-d12	2687		1318	57		IS	
58	Pyrene	829	1.7571	1116	57	14.05	E	20
59	Butylbenzylphthalate	0	.4937	0	57	1.21	ND	20
60	3,3'-Dichlorobenzidine	0	.1068	0	57	5.58	ND	20
61	Benzo(a)anthracene	203	1.3685	1320	57	4.41	E	20
62	Chrysene	0	1.3009	0	57	.46	ND	20
63	bis(2-Ethylhexyl)phthalate	1272	.7254	1360	57	52.21	D	20
64	Perylene-d12	561		1516	64		IS	
65	Di-n-octylphthalate	0	3.1428	0	64	.91	ND	20
66	Benzo(b)fluoranthene	0	2.2061	0	64	1.29	ND	20
67	Benzo(k)fluoranthene	0	2.5592	0	64	1.12	ND	20
68	Benzo(a)pyrene	0	1.7546	0	64	1.63	ND	20
69	Indeno(1,2,3-cd)pyrene	0	.8215	0	64	3.47	ND	20
70	Dibenz(a,h)anthracene	0	1.0083	0	64	2.83	ND	20
71	Benzo(g,h,i)perylene	0	1.1378	0	64	2.51	ND	20

S U R R O G A T E S U M M A R Y		AREA	RF	SCAN	ISID	AMOUNT,	CODE	% RECOVERY
72	Nitrobenzene-d5	551	.3562	168	14	58.01	D	116.0
73	2-Fluorobiphenyl	470	.7861	489	28	53.82	D	107.6
74	Terphenyl-d14	966	.6017	1163	57	47.79	D	95.6
75	Phenol-d5	212	.7144	42	1	52.78	D	52.8
76	2-Fluorophenol	0	.7165	0	1	.00	ND	.0
77	2,4,6-Tribromophenol	24	.0414	742	28	53.17	D	53.2

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DATA FILE:FB81601 SAMPLE ID 2-7A-MID-MM5 (1:10 DILN)
RF FILE: FB81504 DILN FACTOR 20
DATE: 07/09/90
TLI Project Number: 15968
ANALYSIS DATE: 07/06/90

Q U A N T I T A T I O N R E P O R T

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	1,4-Dichlorobenzene-d4	380		60	1		IS	
2	Phenol	0	1.1577	0	1	36.39	ND	200
3	bis(2-Chloroethyl)ether	0	1.1357	0	1	37.10	ND	200
4	2-Chlorophenol	0	1.1506	0	1	36.62	ND	200
5	1,3-Dichlorobenzene	0	1.2920	0	1	32.61	ND	200
6	1,4-Dichlorobenzene	68	1.4004	63	1	99.35	E	200
7	Benzyl alcohol	549	.5147	97	1	2248.08	D	200
8	1,2-Dichlorobenzene	53	1.2386	84	1	89.68	E	200
9	2-Methylphenol	0	.8767	0	1	48.05	ND	200
10	bis(2-Chloroisopropyl)ether	0	1.2827	0	1	32.84	ND	200
11	4-Methylphenol	0	.7723	0	1	54.55	ND	200
12	N-Nitroso-di-n-propylamine	0	.8844	0	1	47.64	ND	200
13	Hexachloroethane	0	.5105	0	1	82.54	ND	200
14	Naphthalene-d8	1210		271	14		IS	
15	Nitrobenzene	0	.4254	0	14	31.07	ND	200
16	Isophorone	0	.6024	0	14	21.95	ND	200
17	2-Nitrophenol	105	.1219	211	14	567.88	D	200
18	2,4-Dimethylphenol	0	.2622	0	14	50.43	ND	200
19	Benzoic acid	1251	.1284	301	14	6440.53	D	200
20	bis(2-Chloroethoxy)methane	0	.3515	0	14	37.61	ND	200
21	2,4-Dichlorophenol	0	.2108	0	14	62.71	ND	200
22	1,2,4-Trichlorobenzene	673	.2895	266	14	1536.08	D	200
23	Naphthalene	2458	.9398	275	14	1729.05	D	200
24	4-Chloroaniline	0	.3244	0	14	40.75	ND	200
25	Hexachlorobutadiene	0	.1521	0	14	86.94	ND	200
26	4-Chloro-3-methylphenol	0	.1796	0	14	73.59	ND	200
27	2-Methylnaphthalene	189	.6264	400	14	199.47	E	200
28	Acenaphthene-d10	803		583	28		IS	
29	Hexachlorocyclopentadiene	0	.0854	0	28	233.23	ND	200
30	2,4,6-Trichlorophenol	0	.2453	0	28	81.19	ND	200
31	2,4,5-Trichlorophenol	0	.3047	0	28	65.37	ND	200
32	2-Chloronaphthalene	0	.9935	0	28	20.05	ND	200
33	2-Nitroaniline	0	.3977	0	28	50.08	ND	200
34	Dimethylphthalate	0	.9350	0	28	21.30	ND	200
35	Acenaphthylene	0	1.4186	0	28	14.04	ND	200
36	3-Nitroaniline	0	.1964	0	28	101.42	ND	200
37	Acenaphthene	0	.9146	0	28	21.78	ND	200
38	2,4-Dinitrophenol	0	.1972	0	28	100.99	ND	200
39	4-Nitrophenol	0	.0821	0	28	242.60	ND	200
40	Dibenzofuran	195	1.3733	621	28	141.70	E	200
41	2,4-Dinitrotoluene	0	.2702	0	28	73.70	ND	200
42	2,6-Dinitrotoluene	0	.2125	0	28	93.74	ND	200
43	Diethylphthalate	0	.8088	0	28	24.63	ND	200

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DATA FILE:FB81601 SAMPLE ID 2-7A-MID-MM5 (1:10 DILN)
RF FILE: FB81504 DILN FACTOR 20
DATE: 07/09/90
TLI Project Number: 15968
ANALYSIS DATE: 07/06/90

QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
44	4-Chlorophenyl-phenylether	0	.4413	0	28	45.13	ND	200
45	Fluorene	0	1.0694	0	28	18.62	ND	200
46	4-Nitroaniline	0	.2353	0	28	84.65	ND	200
47	Phenanthrene-d10	762		847	47		IS	
48	4,6-Dinitro-2-methylphenol	0	.0266	0	47	789.10	ND	200
49	N-Nitrosodiphenylamine(1)	0	.5190	0	47	40.47	ND	200
50	4-Bromophenyl-phenylether	0	.1274	0	47	164.85	ND	200
51	Hexachlorobenzene	0	.1401	0	47	149.99	ND	200
52	Pentachlorophenol	0	.0284	0	47	740.78	ND	200
53	Phenanthrene	108	1.0486	851	47	108.62	E	200
54	Anthracene	0	.7975	0	47	26.34	ND	200
55	Di-n-butylphthalate	0	.7873	0	47	26.68	ND	200
56	Fluoranthene	0	.8510	0	47	24.69	ND	200
57	Chrysene-d12	385		1302	57		IS	
58	Pyrene	0	2.6306	0	57	15.79	ND	200
59	Butylbenzylphthalate	0	1.0210	0	57	40.68	ND	200
60	3,3'-Dichlorobenzidine	0	.1905	0	57	218.03	ND	200
61	Benzo(a)anthracene	0	.5917	0	57	70.20	ND	200
62	Chrysene	0	1.3525	0	57	30.71	ND	200
63	bis(2-Ethylhexyl)phthalate	0	.4956	0	57	83.81	ND	200
64	Perylene-d12	151		1501	64		IS	
65	Di-n-octylphthalate	0	.9707	0	64	108.96	ND	200
66	Benzo(b)fluoranthene	0	.8181	0	64	129.28	ND	200
67	Benzo(k)fluoranthene	0	1.6757	0	64	63.12	ND	200
68	Benzo(a)pyrene	0	1.4188	0	64	74.55	ND	200
69	Indeno(1,2,3-cd)pyrene	0	.5777	0	64	183.06	ND	200
70	Dibenz(a,h)anthracene	0	.6305	0	64	167.75	ND	200
71	Benzo(g,h,i)perylene	0	1.0703	0	64	98.82	ND	200

SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
72 Nitrobenzene-d5	0	.2240	0	14	.00	ND	.0
73 2-Fluorobiphenyl	0	.5997	0	28	.00	ND	.0
74 Terphenyl-d14	0	.4672	0	57	.00	ND	.0
75 Phenol-d5	0	.8310	0	1	.00	ND	.0
76 2-Fluorophenol	0	.5721	0	1	.00	ND	.0
77 2,4,6-Tribromophenol	0	.0242	0	28	.00	ND	.0

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DATA FILE:FB81008 SAMPLE ID 3-7C-OUT-MM5
RF FILE: FB809 DILN FACTOR 2
DATE: 07/09/90
TLI Project Number: 15968
ANALYSIS DATE: 07/03/90

QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	1,4-Dichlorobenzene-d4	311		75	1		IS	
2	Phenol	1357	1.5257	46	1	228.94	D	20
3	bis(2-Chloroethyl)ether	0	1.2341	0	1	4.17	ND	20
4	2-Chlorophenol	0	1.2481	0	1	4.12	ND	20
5	1,3-Dichlorobenzene	0	1.4692	0	1	3.50	ND	20
6	1,4-Dichlorobenzene	0	1.5313	0	1	3.36	ND	20
7	Benzyl alcohol	24504	.4837	125	1	13040.59	D	20
8	1,2-Dichlorobenzene	51	1.4079	98	1	9.37	E	20
9	2-Methylphenol	69	1.1661	143	1	15.20	E	20
10	bis(2-Chloroisopropyl)ether	0	2.3815	0	1	2.16	ND	20
11	4-Methylphenol	165	1.0276	172	1	41.24	D	20
12	N-Nitroso-di-n-propylamine	0	1.0912	0	1	4.72	ND	20
13	Hexachloroethane	0	.3238	0	1	15.90	ND	20
14	Naphthalene-d8	992		286	14		IS	
15	Nitrobenzene	0	.5786	0	14	2.79	ND	20
16	Isophorone	0	.9021	0	14	1.79	ND	20
17	2-Nitrophenol	158	.1513	224	14	84.07	D	20
18	2,4-Dimethylphenol	0	.3610	0	14	4.47	ND	20
19	Benzoic acid	16737	.1552	385	14	8698.58	D	20
20	bis(2-Chloroethoxy)methane	0	.3741	0	14	4.31	ND	20
21	2,4-Dichlorophenol	0	.3536	0	14	4.56	ND	20
22	1,2,4-Trichlorobenzene	0	.5944	0	14	2.71	ND	20
23	Naphthalene	0	1.1453	0	14	1.41	ND	20
24	4-Chloroaniline	0	.2409	0	14	6.69	ND	20
25	Hexachlorobutadiene	0	.2446	0	14	6.59	ND	20
26	4-Chloro-3-methylphenol	0	.3056	0	14	5.28	ND	20
27	2-Methylnaphthalene	0	.7696	0	14	2.10	ND	20
28	Acenaphthene-d10	685		594	28		IS	
29	Hexachlorocyclopentadiene	0	.1472	0	28	15.86	ND	20
30	2,4,6-Trichlorophenol	0	.4849	0	28	4.82	ND	20
31	2,4,5-Trichlorophenol	0	.6083	0	28	3.84	ND	20
32	2-Chloronaphthalene	0	1.1721	0	28	1.99	ND	20
33	2-Nitroaniline	0	.5275	0	28	4.43	ND	20
34	Dimethylphthalate	0	1.3735	0	28	1.70	ND	20
35	Acenaphthylene	0	1.5087	0	28	1.55	ND	20
36	3-Nitroaniline	0	.1648	0	28	14.17	ND	20
37	Acenaphthene	0	1.1378	0	28	2.05	ND	20
38	2,4-Dinitrophenol	0	.0801	0	28	29.15	ND	20
39	4-Nitrophenol	139	.0855	666	28	189.92	D	20
40	Dibenzofuran	140	1.8332	633	28	8.89	E	20
41	2,4-Dinitrotoluene	0	.3271	0	28	7.14	ND	20
42	2,6-Dinitrotoluene	0	.2797	0	28	8.35	ND	20
43	Diethylphthalate	0	1.0448	0	28	2.23	ND	20

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DATA FILE:FB81008 SAMPLE ID 3-7C-OUT-MM5
RF FILE: FB809 DILN FACTOR 2
DATE: 07/09/90
TLI Project Number: 15988
ANALYSIS DATE: 07/03/90

Q U A N T I T A T I O N R E P O R T

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
44	4-Chlorophenyl-phenylether	0	1.0162	0	28	2.30	ND	20
45	Fluorene	0	1.4392	0	28	1.62	ND	20
46	4-Nitroaniline	0	.1498	0	28	15.59	ND	20
47	Phenanthrene-d10	1978		860	47		IS	
48	4,6-Dinitro-2-methylphenol	0	.0354	0	47	22.83	ND	20
49	N-Nitrosodiphenylamine(1)	0	.3807	0	47	2.12	ND	20
50	4-Bromophenyl-phenylether	0	.1553	0	47	5.21	ND	20
51	Hexachlorobenzene	0	.1394	0	47	5.80	ND	20
52	Pentachlorophenol	0	.0303	0	47	26.67	ND	20
53	Phenanthrene	768	1.1598	863	47	26.77	D	20
54	Anthracene	0	1.1101	0	47	.73	ND	20
55	Di-n-butylphthalate	167	.6613	1005	47	10.20	E	20
56	Fluoranthene	184	1.7081	1077	47	4.35	E	20
57	Chrysene-d12	3227		1314	57		IS	
58	Pyrene	0	1.7571	0	57	.28	ND	20
59	Butylbenzylphthalate	0	.4937	0	57	1.00	ND	20
60	3,3'-Dichlorobenzidine	0	.1068	0	57	4.64	ND	20
61	Benzo(a)anthracene	0	1.3685	0	57	.36	ND	20
62	Chrysene	0	1.3009	0	57	.38	ND	20
63	bis(2-Ethylhexyl)phthalate	300	.7254	1357	57	10.26	E	20
64	Perylene-d12	1326		1514	64		IS	
65	Di-n-octylphthalate	0	3.1428	0	64	.38	ND	20
66	Benzo(b)fluoranthene	0	2.2061	0	64	.55	ND	20
67	Benzo(k)fluoranthene	0	2.5592	0	64	.47	ND	20
68	Benzo(a)pyrene	0	1.7545	0	64	.69	ND	20
69	Indeno(1,2,3-cd)pyrene	0	.8215	0	64	1.47	ND	20
70	Dibenz(a,h)anthracene	0	1.0083	0	64	1.20	ND	20
71	Benzo(g,h,i)perylene	0	1.1378	0	64	1.06	ND	20

S U R R O G A T E S U M M A R Y		AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
72	Nitrobenzene-d5	220	.3562	167	14	49.77	D	99.5
73	2-Fluorobiphenyl	352	.7861	486	28	52.21	D	104.4
74	Terphenyl-d14	638	.6017	1160	57	26.28	D	52.6
75	Phenol-d5	504	.7144	44	1	181.75	D	181.8
76	2-Fluorophenol	0	.7165	0	1	.00	ND	.0
77	2,4,6-Tribromophenol	167	.0414	739	28	471.05	D	471.0

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DATA FILE:FB81602 SAMPLE ID 3-7C-OUT-MM5 (1:100 DILN)
RF FILE: FB81504 DILN FACTOR 200
DATE: 07/09/90
TLI Project Number: 15968
ANALYSIS DATE: 07/06/90

QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	1,4-Dichlorobenzene-d4	403		60	1		IS	
2	Phenol	0	1.1577	0	1	342.87	ND	2000
3	bis(2-Chloroethyl)ether	0	1.1357	0	1	349.51	ND	2000
4	2-Chlorophenol	0	1.1506	0	1	345.01	ND	2000
5	1,3-Dichlorobenzene	0	1.2920	0	1	307.24	ND	2000
6	1,4-Dichlorobenzene	0	1.4004	0	1	283.45	ND	2000
7	Benzyl alcohol	207	.5147	97	1	7987.23	D	2000
8	1,2-Dichlorobenzene	0	1.2386	0	1	320.49	ND	2000
9	2-Methylphenol	0	.8767	0	1	452.76	ND	2000
10	bis(2-Chloroisopropyl)ether	0	1.2827	0	1	309.46	ND	2000
11	4-Methylphenol	0	.7723	0	1	513.98	ND	2000
12	N-Nitroso-di-n-propylamine	0	.8844	0	1	448.83	ND	2000
13	Hexachloroethane	0	.5105	0	1	777.64	ND	2000
14	Naphthalene-d8	1288		271	14		IS	
15	Nitrobenzene	0	.4254	0	14	292.04	ND	2000
16	Isophorone	0	.6024	0	14	206.25	ND	2000
17	2-Nitrophenol	0	.1219	0	14	1019.21	ND	2000
18	2,4-Dimethylphenol	0	.2622	0	14	473.92	ND	2000
19	Benzoic acid	205	.1284	280	14	9928.19	D	2000
20	bis(2-Chloroethoxy)methane	0	.3515	0	14	353.51	ND	2000
21	2,4-Dichlorophenol	0	.2108	0	14	589.34	ND	2000
22	1,2,4-Trichlorobenzene	0	.2895	0	14	429.19	ND	2000
23	Naphthalene	0	.9398	0	14	132.21	ND	2000
24	4-Chloroaniline	0	.3244	0	14	382.98	ND	2000
25	Hexachlorobutadiene	0	.1521	0	14	817.05	ND	2000
26	4-Chloro-3-methylphenol	0	.1796	0	14	691.63	ND	2000
27	2-Methylnaphthalene	0	.6264	0	14	198.36	ND	2000
28	Acenaphthene-d10	718		583	28		IS	
29	Hexachlorocyclopentadiene	0	.0854	0	28	2610.57	ND	2000
30	2,4,6-Trichlorophenol	0	.2453	0	28	908.75	ND	2000
31	2,4,5-Trichlorophenol	0	.3047	0	28	731.70	ND	2000
32	2-Chloronaphthalene	0	.9935	0	28	224.38	ND	2000
33	2-Nitroaniline	0	.3977	0	28	560.52	ND	2000
34	Dimethylphthalate	0	.9350	0	28	238.43	ND	2000
35	Acenaphthylene	0	1.4186	0	28	157.14	ND	2000
36	3-Nitroaniline	0	.1964	0	28	1135.19	ND	2000
37	Acenaphthene	0	.9146	0	28	243.75	ND	2000
38	2,4-Dinitrophenol	0	.1972	0	28	1130.37	ND	2000
39	4-Nitrophenol	0	.0821	0	28	2715.38	ND	2000
40	Dibenzofuran	0	1.3733	0	28	162.33	ND	2000
41	2,4-Dinitrotoluene	0	.2702	0	28	824.92	ND	2000
42	2,6-Dinitrotoluene	0	.2125	0	28	1049.28	ND	2000
43	Diethylphthalate	0	.8088	0	28	275.63	ND	2000

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DATA FILE:FB81602 SAMPLE ID 3-7C-OUT-MM5 (1:100 DILN)
RF FILE: FB81504 DILN FACTOR 200
DATE: 07/09/90
TLI Project Number: 15968
ANALYSIS DATE: 07/06/90

QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
44	4-Chlorophenyl-phenylether	0	.4413	0	28	505.12	ND	2000
45	Fluorene	0	1.0894	0	28	208.46	ND	2000
46	4-Nitroaniline	0	.2353	0	28	947.49	ND	2000
47	Phenanthrene-d10	1046		847	47		IS	
48	4,6-Dinitro-2-methylphenol	0	.0266	0	47	5744.78	ND	2000
49	N-Nitrosodiphenylamine(1)	0	.5190	0	47	294.65	ND	2000
50	4-Bromophenyl-phenylether	0	.1274	0	47	1200.11	ND	2000
51	Hexachlorobenzene	0	.1401	0	47	1091.98	ND	2000
52	Pentachlorophenol	0	.0284	0	47	5393.02	ND	2000
53	Phenanthrene	0	1.0488	0	47	145.85	ND	2000
54	Anthracene	0	.7975	0	47	191.78	ND	2000
55	Di-n-butylphthalate	0	.7873	0	47	194.27	ND	2000
56	Fluoranthene	0	.8510	0	47	179.72	ND	2000
57	Chrysene-d12	0		0	57		IS	
58	Pyrene	0	2.6306	0	57	ERR	ND	2000
59	Butylbenzylphthalate	0	1.0210	0	57	ERR	ND	2000
60	3,3'-Dichlorobenzidine	0	.1905	0	57	ERR	ND	2000
61	Benzo(a)anthracene	0	.5917	0	57	ERR	ND	2000
62	Chrysene	0	1.3525	0	57	ERR	ND	2000
63	bis(2-Ethylhexyl)phthalate	0	.4956	0	57	ERR	ND	2000
64	Perylene-d12	79		1501	64		IS	
65	Di-n-octylphthalate	0	.9707	0	64	2088.56	ND	2000
66	Benzo(b)fluoranthene	0	.8181	0	64	2478.23	ND	2000
67	Benzo(k)fluoranthene	0	1.6757	0	64	1209.85	ND	2000
68	Benzo(a)pyrene	0	1.4188	0	64	1428.97	ND	2000
69	Indeno(1,2,3-cd)pyrene	0	.5777	0	64	3509.11	ND	2000
70	Dibenz(a,h)anthracene	0	.6305	0	64	3215.61	ND	2000
71	Benzo(g,h,i)perylene	0	1.0703	0	64	1894.19	ND	2000

	SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
72	Nitrobenzene-d5	0	.2240	0	14	.00	ND	.0
73	2-Fluorobiphenyl	0	.5997	0	28	.00	ND	.0
74	Terphenyl-d14	0	.4672	0	57	ERR	ND	ERR
75	Phenol-d5	0	.8310	0	1	.00	ND	.0
76	2-Fluorophenol	0	.5721	0	1	.00	ND	.0
77	2,4,6-Tribromophenol	0	.0242	0	28	.00	ND	.0

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DATA FILE:FB81009 SAMPLE ID 4-7C-MID-MM5
RF FILE: FB809 DILN FACTOR 2
DATE: 07/09/90
TLI Project Number: 15968
ANALYSIS DATE: 07/03/90

Q U A N T I T A T I O N R E P O R T

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	1,4-Dichlorobenzene-d4	416		75	1		IS	
2	Phenol	2770	1.5257	50	1	349.00	D	20
3	bis(2-Chloroethyl)ether	0	1.2341	0	1	3.11	ND	20
4	2-Chlorophenol	0	1.2481	0	1	3.08	ND	20
5	1,3-Dichlorobenzene	0	1.4692	0	1	2.62	ND	20
6	1,4-Dichlorobenzene	0	1.5313	0	1	2.51	ND	20
7	Benzyl alcohol	53653	.4837	133	1	21321.69	D	20
8	1,2-Dichlorobenzene	71	1.4079	98	1	9.76	E	20
9	2-Methylphenol	0	1.1661	0	1	3.30	ND	20
10	bis(2-Chloroisopropyl)ether	0	2.3815	0	1	1.61	ND	20
11	4-Methylphenol	217	1.0276	176	1	40.55	D	20
12	N-Nitroso-di-n-propylamine	0	1.0912	0	1	3.52	ND	20
13	Hexachloroethane	0	.3238	0	1	11.87	ND	20
14	Naphthalene-d8	972		289	14		IS	
15	Nitrobenzene	0	.5786	0	14	2.84	ND	20
16	Isophorone	0	.9021	0	14	1.82	ND	20
17	2-Nitrophenol	277	.1513	226	14	150.74	D	20
18	2,4-Dimethylphenol	0	.3610	0	14	4.56	ND	20
19	Benzoic acid	33079	.1552	407	14	17539.71	D	20
20	bis(2-Chloroethoxy)methane	0	.3741	0	14	4.40	ND	20
21	2,4-Dichlorophenol	0	.3538	0	14	4.65	ND	20
22	1,2,4-Trichlorobenzene	0	.5944	0	14	2.77	ND	20
23	Naphthalene	0	1.1453	0	14	1.44	ND	20
24	4-Chloroaniline	0	.2409	0	14	6.83	ND	20
25	Hexachlorobutadiene	0	.2446	0	14	6.73	ND	20
26	4-Chloro-3-methylphenol	0	.3056	0	14	5.38	ND	20
27	2-Methylnaphthalene	0	.7696	0	14	2.14	ND	20
28	Acenaphthene-d10	787		595	28		IS	
29	Hexachlorocyclopentadiene	0	.1472	0	28	13.82	ND	20
30	2,4,6-Trichlorophenol	0	.4849	0	28	4.20	ND	20
31	2,4,5-Trichlorophenol	0	.6083	0	28	3.34	ND	20
32	2-Chloronaphthalene	0	1.1721	0	28	1.74	ND	20
33	2-Nitroaniline	0	.5275	0	28	3.86	ND	20
34	Dimethylphthalate	0	1.3735	0	28	1.48	ND	20
35	Acenaphthylene	0	1.5087	0	28	1.35	ND	20
36	3-Nitroaniline	0	.1648	0	28	12.34	ND	20
37	Acenaphthene	0	1.1378	0	28	1.79	ND	20
38	2,4-Dinitrophenol	0	.0801	0	28	25.39	ND	20
39	4-Nitrophenol	353	.0855	671	28	419.69	D	20
40	Dibenzofuran	0	1.8332	0	28	1.11	ND	20
41	2,4-Dinitrotoluene	0	.3271	0	28	6.22	ND	20
42	2,6-Dinitrotoluene	0	.2797	0	28	7.27	ND	20
43	Diethylphthalate	0	1.0448	0	28	1.95	ND	20

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DATA FILE:FB81009 SAMPLE ID 4-7C-MID-MM5
RF FILE: FB809 DILN FACTOR 2
DATE: 07/09/90
TLI Project Number: 15968
ANALYSIS DATE: 07/03/90

Q U A N T I T A T I O N R E P O R T

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
44	4-Chlorophenyl-phenylether	0	1.0162	0	28	2.00	ND	20
45	Fluorene	0	1.4392	0	28	1.41	ND	20
46	4-Nitroaniline	0	.1498	0	28	13.58	ND	20
47	Phenanthrene-d10	2771		860	47		IS	
48	4,6-Dinitro-2-methylphenol	0	.0354	0	47	16.31	ND	20
49	N-Nitrosodiphenylamine(1)	0	.3807	0	47	1.52	ND	20
50	4-Bromophenyl-phenylether	0	.1553	0	47	3.72	ND	20
51	Hexachlorobenzene	0	.1394	0	47	4.14	ND	20
52	Pentachlorophenol	0	.0303	0	47	19.04	ND	20
53	Phenanthrene	0	1.1598	0	47	.50	ND	20
54	Anthracene	0	1.1101	0	47	.52	ND	20
55	Di-n-butylphthalate	0	.6613	0	47	.87	ND	20
56	Fluoranthene	0	1.7081	0	47	.34	ND	20
57	Chrysene-d12	5744		1321	57		IS	
58	Pyrene	0	1.7571	0	57	.16	ND	20
59	Butylbenzylphthalate	0	.4937	0	57	.56	ND	20
60	3,3'-Dichlorobenzidine	0	.1068	0	57	2.61	ND	20
61	Benzo(a)anthracene	0	1.3685	0	57	.20	ND	20
62	Chrysene	0	1.3009	0	57	.21	ND	20
63	bis(2-Ethylhexyl)phthalate	7354	.7254	1364	57	141.18	D	20
64	Perylene-d12	0		0	64		IS	
65	Di-n-octylphthalate	0	3.1428	0	64	ERR	ND	20
66	Benzo(b)fluoranthene	0	2.2061	0	64	ERR	ND	20
67	Benzo(k)fluoranthene	0	2.5592	0	64	ERR	ND	20
68	Benzo(a)pyrene	0	1.7546	0	64	ERR	ND	20
69	Indeno(1,2,3-cd)pyrene	0	.8215	0	64	ERR	ND	20
70	Dibenz(a,h)anthracene	0	1.0083	0	64	ERR	ND	20
71	Benzo(g,h,i)perylene	0	1.1378	0	64	ERR	ND	20

S U R R O G A T E S U M M A R Y		AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
72	Nitrobenzene-d5	290	.3562	169	14	67.00	D	134.0
73	2-Fluorobiphenyl	380	.7861	488	28	49.18	D	98.4
74	Terphenyl-d14	1438	.6017	1162	57	33.29	D	66.6
75	Phenol-d5	682	.7144	48	1	183.49	D	183.5
76	2-Fluorophenol	0	.7165	0	1	.00	ND	.0
77	2,4,6-Tribromophenol	194	.0414	740	28	475.81	D	475.8

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DATA FILE:FB81603 SAMPLE ID 4-7C-MID-MH5 (1:100 DILN)
RF FILE: FB81504 DILN FACTOR 200
DATE: 07/09/90
TLI Project Number: 15968
ANALYSIS DATE: 07/06/90

QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	1,4-Dichlorobenzene-d4	432		60	1		IS	
2	Phenol	0	1.1577	0	1	320.09	ND	2000
3	bis(2-Chloroethyl)ether	0	1.1357	0	1	326.29	ND	2000
4	2-Chlorophenol	0	1.1506	0	1	322.09	ND	2000
5	1,3-Dichlorobenzene	0	1.2920	0	1	286.83	ND	2000
6	1,4-Dichlorobenzene	0	1.4004	0	1	264.62	ND	2000
7	Benzyl alcohol	215	.5147	96	1	7755.30	D	2000
8	1,2-Dichlorobenzene	0	1.2386	0	1	299.19	ND	2000
9	2-Methylphenol	0	.8767	0	1	422.68	ND	2000
10	bis(2-Chloroisopropyl)ether	0	1.2827	0	1	288.90	ND	2000
11	4-Methylphenol	0	.7723	0	1	479.82	ND	2000
12	N-Nitroso-di-n-propylamine	0	.8844	0	1	419.01	ND	2000
13	Hexachloroethane	0	.5105	0	1	725.97	ND	2000
14	Naphthalene-d8	1325		271	14		IS	
15	Nitrobenzene	0	.4254	0	14	283.73	ND	2000
16	Isophorone	0	.6024	0	14	200.39	ND	2000
17	2-Nitrophenol	0	.1219	0	14	990.22	ND	2000
18	2,4-Dimethylphenol	0	.2622	0	14	460.44	ND	2000
19	Benzoic acid	178	.1284	284	14	8364.71	D	2000
20	bis(2-Chloroethoxy)methane	0	.3515	0	14	343.45	ND	2000
21	2,4-Dichlorophenol	0	.2108	0	14	572.58	ND	2000
22	1,2,4-Trichlorobenzene	39	.2895	266	14	807.69	E	2000
23	Naphthalene	0	.9398	0	14	128.45	ND	2000
24	4-Chloroaniline	0	.3244	0	14	372.09	ND	2000
25	Hexachlorobutadiene	0	.1521	0	14	793.81	ND	2000
26	4-Chloro-3-methylphenol	0	.1796	0	14	671.96	ND	2000
27	2-Methylnaphthalene	0	.6264	0	14	192.71	ND	2000
28	Acenaphthene-d10	685		583	28		IS	
29	Hexachlorocyclopentadiene	0	.0854	0	28	2736.47	ND	2000
30	2,4,6-Trichlorophenol	0	.2453	0	28	952.57	ND	2000
31	2,4,5-Trichlorophenol	0	.3047	0	28	766.99	ND	2000
32	2-Chloronaphthalene	0	.9935	0	28	235.20	ND	2000
33	2-Nitroaniline	0	.3977	0	28	587.55	ND	2000
34	Dimethylphthalate	0	.9350	0	28	249.93	ND	2000
35	Acenaphthylene	0	1.4186	0	28	164.72	ND	2000
36	3-Nitroaniline	0	.1964	0	28	1189.94	ND	2000
37	Acenaphthene	0	.9146	0	28	255.51	ND	2000
38	2,4-Dinitrophenol	0	.1972	0	28	1184.88	ND	2000
39	4-Nitrophenol	0	.0821	0	28	2846.33	ND	2000
40	Dibenzofuran	0	1.3733	0	28	170.16	ND	2000
41	2,4-Dinitrotoluene	0	.2702	0	28	864.70	ND	2000
42	2,6-Dinitrotoluene	0	.2125	0	28	1099.88	ND	2000
43	Diethylphthalate	0	.8088	0	28	288.92	ND	2000

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DATA FILE:FB81503 . SAMPLE ID 4-7C-MID-MH5 (1:100 DILN)
RF FILE: FB81504 DILN FACTOR 200
DATE: 07/09/90
TLI Project Number: 15968
ANALYSIS DATE: 07/06/90

QUANTITATION REPORT

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
44	4-Chlorophenyl-phenylether	0	.4413	0	28	529.48	ND	2000
45	Fluorene	0	1.0694	0	28	218.52	ND	2000
46	4-Nitroaniline	0	.2353	0	28	993.18	ND	2000
47	Phenanthrene-d10	934		847	47		IS	
48	4,6-Dinitro-2-methylphenol	0	.0266	0	47	6433.12	ND	2000
49	N-Nitrosodiphenylamine(1)	0	.5190	0	47	329.96	ND	2000
50	4-Bromophenyl-phenylether	0	.1274	0	47	1343.90	ND	2000
51	Hexachlorobenzene	0	.1401	0	47	1222.82	ND	2000
52	Pentachlorophenol	0	.0284	0	47	6038.21	ND	2000
53	Phenanthrene	0	1.0486	0	47	163.32	ND	2000
54	Anthracene	0	.7975	0	47	214.74	ND	2000
55	Di-n-butylphthalate	0	.7873	0	47	217.54	ND	2000
56	Fluoranthene	0	.8510	0	47	201.26	ND	2000
57	Chrysene-d12	157		1302	57		IS	
58	Pyrene	0	2.6306	0	57	388.57	ND	2000
59	Butylbenzylphthalate	0	1.0210	0	57	1001.12	ND	2000
60	3,3'-Dichlorobenzidine	0	.1905	0	57	5365.40	ND	2000
61	Benzo(a)anthracene	0	.5817	0	57	1727.60	ND	2000
62	Chrysene	0	1.3525	0	57	755.75	ND	2000
63	bis(2-Ethylhexyl)phthalate	0	.4956	0	57	2062.40	ND	2000
64	Perylene-d12	118		502	64		IS	
65	Di-n-octylphthalate	0	.9707	0	64	1396.85	ND	2000
66	Benzo(b)fluoranthene	0	.8181	0	64	1657.48	ND	2000
67	Benzo(k)fluoranthene	0	1.6757	0	64	809.16	ND	2000
68	Benzo(a)pyrene	0	1.4188	0	64	955.72	ND	2000
69	Indeno(1,2,3-cd)pyrene	0	.5777	0	64	2346.94	ND	2000
70	Dibenz(a,h)anthracene	0	.6305	0	64	2150.64	ND	2000
71	Benzo(g,h,i)perylene	0	1.0703	0	64	1266.86	ND	2000

	SURROGATE SUMMARY	AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
72	Nitrobenzene-d5	0	.2240	0	14	.00	ND	.0
73	2-Fluorobiphenyl	0	.5997	0	28	.00	ND	.0
74	Terphenyl-d14	0	.4672	0	57	.00	ND	.0
75	Phenol-d5	0	.8310	0	1	.00	ND	.0
76	2-Fluorophenol	0	.5721	0	1	.00	ND	.0
77	2,4,6-Tribromophenol	0	.0242	0	28	.00	ND	.0

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SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name:Triangle Labs, Inc. Contract:68-01-7407

Lab Code: TRILAB Case No.: ***** SAS No.: ****** SDG No.: *****

Instrument ID: F Calibration Date:07/03/90 Time:1255

Lab File ID: FB809 Init. Calib. Date(s): 07/02/90 07/02/90

Min RRF50 for SPCC(#) = 0.050 Max %D for CCC(*) = 25.0%

	COMPOUND	RRF	RRF50	%D
	Phenol	1.432	1.526	-6.5*
	bis(2-Chloroethyl)ether	1.139	1.234	-8.3
	2-Chlorophenol	1.115	1.248	-12.0
	1,3-Dichlorobenzene	1.533	1.469	4.2
	1,4-Dichlorobenzene	1.577	1.531	2.9*
	Benzyl alcohol	0.409	0.484	-18.1
	1,2-Dichlorobenzene	1.455	1.408	3.2
	2-Methylphenol	0.852	1.166	-36.8
	bis(2-Chloroisopropyl)ether	2.005	2.382	-18.8
	4-Methylphenol	0.786	1.028	-30.8
#	N-Nitroso-di-n-propylamine	1.167	1.091	6.5#
	Hexachloroethane	0.398	0.324	18.7
	Nitrobenzene	0.570	0.579	-1.4
	Isophorone	0.802	0.902	-12.5
*	2-Nitrophenol	0.166	0.151	9.0*
	2,4-Dimethylphenol	0.293	0.361	-23.1
	Benzoic acid	0.144	0.155	-7.5
	bis(2-Chloroethoxy)methane	0.390	0.374	4.0
*	2,4-Dichlorophenol	0.447	0.354	20.8*
	1,2,4-Trichlorobenzene	0.601	0.594	1.1
	Naphthalene	1.130	1.145	-1.4
	4-Chloroaniline	0.353	0.241	31.8
*	Hexachlorobutadiene	0.303	0.245	19.3*
*	4-Chloro-3-methylphenol	0.253	0.306	-20.8*
	2-Methylnaphthalene	0.994	0.770	22.6
#	Hexachlorocyclopentadiene	0.128	0.147	-14.9#
*	2,4,6-Trichlorophenol	0.456	0.485	-6.3*
	2,4,5-Trichlorophenol	0.550	0.608	-10.5
	2-Chloronaphthalene	1.242	1.172	5.6
	2-Nitroaniline	0.380	0.527	-38.9
	Dimethylphthalate	1.218	1.373	-12.8
	Acenaphthylene	1.709	1.509	11.7
	2,6-Dinitrotoluene	0.306	0.280	8.7
	3-Nitroaniline	0.199	0.165	17.0
*	Acenaphthene	1.152	1.138	1.2*
#	2,4-Dinitrophenol	0.079	0.080	-1.3#
#	4-Nitrophenol	0.089	0.086	3.8#

7C

SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name:Triangle Labs, Inc. Contract:68-01-7407

Lab Code: TRILAB Case No.: ***** SAS No.: ****** SDG No.: *****

Instrument ID: F Calibration Date:07/03/90 Time:1255

Lab File ID: FB809 Init. Calib. Date(s): 07/02/90 07/02/90

Min RRF50 for SPCC(#) = 0.050 Max %D for CCC(*) = 25.0%

COMPOUND	RRF	RRF50	%D
Dibenzofuran	1.734	1.833	-5.7
2,4-Dinitrotoluene	0.378	0.327	13.5
Diethylphthalate	0.879	1.045	-18.8
4-Chlorophenyl-phenylether	0.793	1.016	-28.2
Fluorene	1.403	1.439	-2.6
4-Nitroaniline	0.203	0.150	26.4
4,6-Dinitro-2-methylphenol	0.036	0.035	0.5
N-Nitrosodiphenylamine((1)	* 0.430	0.381	11.6*
4-Bromophenyl-phenylether	0.141	0.155	-9.8
Hexachlorobenzene	0.114	0.139	-22.1
Pentachlorophenol	* 0.032	0.030	6.0*
Phenanthrene	1.138	1.160	-2.0
Anthracene	1.017	1.110	-9.2
Di-n-butylphthalate	0.767	0.661	13.8
Fluoranthene	* 1.423	1.708	-20.0*
Pyrene	2.488	1.757	29.4
Butylbenzylphthalate	0.581	0.494	15.0
3,3'-Dichlorobenzidine	0.166	0.107	35.6
Benzo(a)anthracene	1.426	1.369	4.0
Chrysene	1.491	1.301	12.8
bis(2-Ethylhexyl)phthalate	0.873	0.725	16.9
Di-n-octylphthalate	* 3.237	3.143	2.9*
Benzo(b)fluoranthene	2.377	2.206	7.2
Benzo(k)fluoranthene	3.127	2.559	18.1
Benzo(a)pyrene	* 2.059	1.755	14.8*
Indeno(1,2,3-cd)pyrene	1.276	0.822	35.6
Dibenz(a,h)anthracene	1.604	1.008	37.1
Benzo(g,h,i)perylene	1.731	1.138	34.3
2-Fluorophenol	0.614	0.717	-16.7
Phenol-d5	0.862	0.714	17.2
Nitrobenzene-d5	0.306	0.356	-16.5
2-Fluorobiphenyl	0.850	0.786	7.6
2,4,6-Tribromophenol	0.036	0.041	-14.1
Terphenyl-d14	0.710	0.602	15.3

(1) Cannot be separated from Diphenylamine

FORM VII SV-2

6B

SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name:Triangle Labs, Inc. Contract:68-01-7407

Lab Code: TRILAB Case No.: ***** SAS No.: ****** SDG No.: *****

Instrument ID: F Calibration Date(s):07/02/90 07/02/90

Min $\overline{RRF}$ for SPCC(#) = 0.050 Max %RSD for CCC(*) = 30.0%

LAB FILE ID: RRF20 =FB80503 RRF50 =FB80504
RRF80 =FB80502 RRF120=FB80501 RRF160=FB805

	COMPOUND	RRF20	RRF50	RRF80	RRF120	RRF160	$\overline{RRF}$	% RSD
	Phenol	1.013	1.219	1.530	1.479	1.920	1.432	23.0*
	bis(2-Chloroethyl)ether	0.879	1.100	1.110	1.103	1.506	1.139	19.0
	2-Chlorophenol	0.959	1.072	1.111	1.071	1.362	1.115	13.0
	1,3-Dichlorobenzene	1.497	1.497	1.534	1.483	1.653	1.533	4.0
	1,4-Dichlorobenzene	1.512	1.564	1.578	1.518	1.714	1.577	5.0*
	Benzyl alcohol	0.310	0.396	0.421	0.405	0.516	0.410	17.0
	1,2-Dichlorobenzene	1.429	1.420	1.478	1.397	1.550	1.455	4.0
	2-Methylphenol	0.688	0.884	0.820	0.811	1.057	0.852	15.0
	bis(2-Chloroisopropyl)ether	2.073	1.999	2.129	1.948	1.878	2.005	4.0
	4-Methylphenol	0.586	0.788	0.786	0.770	1.000	0.786	18.0
#	N-Nitroso-di-n-propylamine	1.047	1.223	1.233	1.119	1.216	1.168	6.0#
	Hexachloroethane	0.372	0.413	0.391	0.380	0.435	0.398	6.0
	Nitrobenzene	0.542	0.599	0.596	0.534	0.581	0.571	5.0
	Isophorone	0.656	0.861	0.830	0.742	0.919	0.802	12.0
*	2-Nitrophenol	0.148	0.158	0.196	0.181	0.148	0.166	12.0*
	2,4-Dimethylphenol	0.202	0.294	0.305	0.290	0.375	0.293	20.0
	Benzoic acid		0.144	0.167	0.139	0.128	0.144	11.0
	bis(2-Chloroethoxy)methane	0.293	0.395	0.401	0.369	0.492	0.390	18.0
*	2,4-Dichlorophenol	0.417	0.431	0.484	0.454	0.448	0.447	5.0*
	1,2,4-Trichlorobenzene	0.632	0.601	0.643	0.571	0.558	0.601	6.0
	Naphthalene	1.025	1.127	1.134	1.067	1.295	1.130	9.0
	4-Chloroaniline	0.276	0.355	0.383	0.356	0.397	0.353	13.0
*	Hexachlorobutadiene	0.324	0.323	0.326	0.272	0.271	0.303	9.0*
*	4-Chloro-3-methylphenol	0.198	0.248	0.265	0.246	0.308	0.253	15.0*
	2-Methylnaphthalene	0.917	0.965	1.060	0.975	1.055	0.995	6.0
#	Hexachlorocyclopentadiene	0.065	0.123	0.151	0.143	0.159	0.128	29.0#
*	2,4,6-Trichlorophenol	0.390	0.455	0.505	0.440	0.490	0.456	9.0*
	2,4,5-Trichlorophenol		0.583	0.585	0.511	0.523	0.550	7.0
	2-Chloronaphthalene	1.216	1.237	1.260	1.186	1.310	1.242	3.0
	2-Nitroaniline		0.429	0.374	0.333	0.382	0.380	10.0
	Dimethylphthalate	1.201	1.243	1.280	1.213	1.154	1.218	3.0
	Acenaphthylene	1.602	1.744	1.754	1.624	1.822	1.709	5.0
	2,6-Dinitrotoluene	0.290	0.299	0.309	0.294	0.339	0.306	6.0
	3-Nitroaniline		0.201	0.204	0.196	0.193	0.199	2.0
*	Acenaphthene	1.104	1.158	1.164	1.095	1.237	1.152	4.0*
#	2,4-Dinitrophenol		0.066	0.093	0.087	0.070	0.079	16.0#
#	4-Nitrophenol		0.084	0.098	0.087	0.087	0.089	6.0#

6C

SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name:Triangle Labs, Inc. Contract:68-01-7407

Lab Code: TRILAB Case No.: ***** SAS No.: ****** SDG No.: *****

Instrument ID: F Calibration Date(s):07/02/90 07/02/90

Min $\overline{RRF}$ for SPCC(#) = 0.050 Max %RSD for CCC(*) = 30.0%

LAB FILE ID: RRF20 =FB80503 RRF50 =FB80504
RRF80 =FB80502 RRF120=FB80501 RRF160=FB805

COMPOUND		RRF20	RRF50	RRF80	RRF120	RRF160	$\overline{RRF}$	% RSD
Dibenzofuran		1.675	1.722	1.794	1.690	1.787	1.734	3.0
2,4-Dinitrotoluene		0.319	0.363	0.422	0.399	0.389	0.378	10.0
Diethylphthalate		0.893	0.875	0.882	0.862	0.884	0.879	1.0
4-Chlorophenyl-phenylether		0.804	0.831	0.846	0.735	0.748	0.793	6.0
Fluorene		1.352	1.389	1.456	1.370	1.446	1.403	3.0
4-Nitroaniline			0.228	0.185	0.197	0.204	0.203	8.0
4,6-Dinitro-2-methylphenol			0.032	0.045	0.037	0.030	0.036	19.0
N-Nitrosodiphenylamine((1)	*	0.465	0.482	0.437	0.406	0.363	0.430	10.0*
4-Bromophenyl-phenylether		0.145	0.170	0.145	0.119	0.128	0.141	13.0
Hexachlorobenzene		0.101	0.137	0.114	0.100	0.120	0.114	13.0
Pentachlorophenol	*		0.025	0.036	0.033	0.036	0.032	16.0*
Phenanthrene		1.131	1.155	1.216	1.112	1.074	1.138	4.0
Anthracene		1.058	1.056	1.082	0.981	0.908	1.017	7.0
Di-n-butylphthalate		0.640	0.737	0.857	0.808	0.793	0.767	10.0
Fluoranthene	*	1.204	1.577	1.627	1.424	1.284	1.423	12.0*
Pyrene		2.530	2.314	2.708	2.765	2.122	2.488	10.0
Butylbenzylphthalate		0.400	0.511	0.665	0.723	0.607	0.581	22.0
3,3'-Dichlorobenzidine		0.112	0.129	0.159	0.171	0.258	0.166	34.0
Benzo(a)anthracene		1.163	1.397	1.555	1.501	1.512	1.426	11.0
Chrysene		1.528	1.440	1.447	1.507	1.536	1.491	3.0
bis(2-Ethylhexyl)phthalate		0.607	0.760	0.990	1.089	0.918	0.873	21.0
Di-n-octylphthalate	*	3.166	3.257	3.209	3.049	3.505	3.237	5.0*
Benzo(b)fluoranthene		1.427	2.115	2.832	2.474	3.035	2.377	26.0
Benzo(k)fluoranthene		2.433	3.069	3.655	3.283	3.193	3.127	14.0
Benzo(a)pyrene	*	1.218	1.853	2.318	2.152	2.755	2.059	27.0*
Indeno(1,2,3-cd)pyrene		1.174	1.194	1.129	1.183	1.699	1.276	18.0
Dibenz(a,h)anthracene		1.281	1.614	1.447	1.440	2.237	1.604	23.0
Benzo(g,h,i)perylene		1.634	1.332	1.673	1.752	2.264	1.731	19.0
2-Fluorophenol		0.431	0.556	0.619	0.615	0.849	0.614	24.0
Phenol-d5		0.628	0.804	0.864	0.873	1.143	0.862	21.0
Nitrobenzene-d5		0.256	0.326	0.320	0.289	0.338	0.306	10.0
2-Fluorobiphenyl		0.852	0.852	0.884	0.805	0.859	0.851	3.0
2,4,6-Tribromophenol		0.029	0.031	0.040	0.042	0.040	0.036	17.0
Terphenyl-d14		0.577	0.642	0.852	0.800	0.681	0.710	15.0

(1) Cannot be separated from Diphenylamine

FORM VI SV-2

78

SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name:Triangle Labs, Inc. Contract:68-01-7407

Lab Code: TRILAB Case No.: ***** SAS No.: ****** SDG No.: *****

Instrument ID: F Calibration Date:07/06/90 Time:1257

Lab File ID: FB81504 Init. Calib. Date(s): 07/06/90 07/06/90

Min RRF50 for SPCC(#) = 0.050 Max %D for CCC(*) = 25.0%

COMPOUND		RRF	RRF50	%D
Phenol	*	1.298	1.158	10.8*
bis(2-Chloroethyl)ether		1.161	1.136	2.2
2-Chlorophenol		1.161	1.151	0.9
1,3-Dichlorobenzene		1.343	1.292	3.8
1,4-Dichlorobenzene	*	1.398	1.400	-0.2*
Benzyl alcohol		0.512	0.515	-0.5
1,2-Dichlorobenzene		1.261	1.239	1.8
2-Methylphenol		0.928	0.877	5.5
bis(2-Chloroisopropyl)ether		1.454	1.283	11.8
4-Methylphenol		0.787	0.772	1.9
N-Nitroso-di-n-propylamine	#	0.949	0.884	6.8#
Hexachloroethane		0.513	0.510	0.5
Nitrobenzene		0.460	0.425	7.6
Isophorone		0.637	0.602	5.5
2-Nitrophenol	*	0.119	0.122	-2.7*
2,4-Dimethylphenol		0.278	0.262	5.9
Benzoic acid		0.109	0.128	-17.3
bis(2-Chloroethoxy)methane		0.373	0.351	5.7
2,4-Dichlorophenol	*	0.226	0.211	6.6*
1,2,4-Trichlorobenzene		0.298	0.289	2.7
Naphthalene		0.959	0.940	2.0
4-Chloroaniline		0.316	0.324	-2.6
Hexachlorobutadiene	*	0.159	0.152	4.6*
4-Chloro-3-methylphenol	*	0.184	0.180	2.6*
2-Methylnaphthalene		0.668	0.626	6.3
Hexachlorocyclopentadiene	#	0.103	0.085	17.1#
2,4,6-Trichlorophenol	*	0.254	0.245	3.2*
2,4,5-Trichlorophenol		0.324	0.305	5.9
2-Chloronaphthalene		0.973	0.994	-2.1
2-Nitroaniline		0.408	0.398	2.4
Dimethylphthalate		0.957	0.935	2.3
Acenaphthylene		1.435	1.419	1.1
2,6-Dinitrotoluene		0.221	0.212	3.8
3-Nitroaniline		0.187	0.196	-5.0
Acenaphthene	*	0.951	0.915	3.8*
2,4-Dinitrophenol	#	0.281	0.197	29.9#
4-Nitrophenol	#	0.103	0.082	20.3#

FORM VII SV-1

7C

SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name:Triangle Labs, Inc. Contract:68-01-7407

Lab Code: TRILAB Case No.: ***** SAS No.: ****** SDG No.: *****

Instrument ID: F Calibration Date:07/06/90 Time:1257

Lab File ID: FB81504 Init. Calib. Date(s): 07/06/90 07/06/90

Min RRF50 for SPCC(#) = 0.050 Max %D for CCC(*) = 25.0%

COMPOUND	RRF	RRF50	%D
Dibenzofuran	1.368	1.373	-0.4
2,4-Dinitrotoluene	0.271	0.270	0.1
Diethylphthalate	0.817	0.809	1.1
4-Chlorophenyl-phenylether	0.443	0.441	0.5
Fluorene	1.079	1.069	0.9
4-Nitroaniline	0.204	0.235	-15.1
4,6-Dinitro-2-methylphenol	0.039	0.027	32.3
N-Nitrosodiphenylamine((1)	* 0.507	0.519	-2.3*
4-Bromophenyl-phenylether	0.133	0.127	4.3
Hexachlorobenzene	0.149	0.140	6.3
Pentachlorophenol	* 0.032	0.028	12.5*
Phenanthrene	1.044	1.049	-0.5
Anthracene	0.750	0.798	-6.3
Di-n-butylphthalate	0.938	0.787	16.1
Fluoranthene	* 0.883	0.851	3.6*
Pyrene	3.052	2.631	13.8
Butylbenzylphthalate	1.236	1.021	17.4
3,3'-Dichlorobenzidine	0.242	0.191	21.3
Benzo(a)anthracene	0.777	0.592	23.8
Chrysene	1.344	1.353	-0.7
bis(2-Ethylhexyl)phthalate	0.872	0.496	43.2
Di-n-octylphthalate	* 0.897	0.971	-8.3*
Benzo(b)fluoranthene	0.796	0.818	-2.8
Benzo(k)fluoranthene	1.716	1.676	2.4
Benzo(a)pyrene	* 1.378	1.419	-3.0*
Indeno(1,2,3-cd)pyrene	0.446	0.578	-29.4
Dibenz(a,h)anthracene	0.564	0.630	-11.9
Benzo(g,h,i)perylene	0.937	1.070	-14.3
2-Fluorophenol	0.648	0.572	11.8
Phenol-d5	0.836	0.831	6.2
Nitrobenzene-d5	0.239	0.224	6.2
2-Fluorobiphenyl	0.587	0.600	-2.1
2,4,6-Tribromophenol	0.024	0.024	0.9
Terphenyl-d14	0.643	0.467	27.3

(1) Cannot be separated from Diphenylamine

FORM VII SV-2

6B

SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name:Triangle Labs, Inc. Contract:68-01-7407

Lab Code: TRILAB Case No.: ***** SAS No.: ****** SDG No.: *****

Instrument ID: F Calibration Date(s):07/06/90 07/06/90

Min $\overline{RRF}$ for SPCC(#) = 0.050 Max %RSD for CCC(*) = 30.0%

LAB FILE ID: RRF20 =FB81503 RRF50 =FB81504
RRFB0 =FB81502 RRF120=FB81501 RRF160=FB815

COMPOUND		RRF20	RRF50	RRFB0	RRF120	RRF160	$\overline{RRF}$	% RSD
Phenol	*	1.107	1.158	1.503	1.498	1.223	1.298	14.0*
bis(2-Chloroethyl)ether		1.109	1.136	1.224	1.257	1.079	1.161	6.0
2-Chlorophenol		1.040	1.151	1.278	1.304	1.034	1.161	10.0
1,3-Dichlorobenzene		1.369	1.292	1.450	1.444	1.161	1.343	8.0
1,4-Dichlorobenzene	*	1.411	1.400	1.481	1.510	1.188	1.398	9.0*
Benzyl alcohol		0.494	0.515	0.517	0.563	0.471	0.512	6.0
1,2-Dichlorobenzene		1.291	1.239	1.326	1.355	1.095	1.261	8.0
2-Methylphenol		0.839	0.877	1.032	1.019	0.872	0.928	9.0
bis(2-Chloroisopropyl)ether		1.495	1.283	1.783	1.653	1.056	1.454	19.0
4-Methylphenol		0.557	0.772	0.889	0.923	0.794	0.787	18.0
N-Nitroso-di-n-propylamine	#	0.985	0.884	1.064	1.038	0.775	0.949	12.0#
Hexachloroethane		0.500	0.511	0.556	0.553	0.445	0.513	8.0
Nitrobenzene		0.487	0.425	0.536	0.478	0.376	0.461	13.0
Isophorone		0.622	0.602	0.719	0.687	0.556	0.637	10.0
2-Nitrophenol	*	0.095	0.122	0.137	0.138	0.102	0.119	16.0*
2,4-Dimethylphenol		0.254	0.262	0.304	0.309	0.263	0.279	9.0
Benzoic acid			0.128	0.114	0.112	0.084	0.110	17.0
bis(2-Chloroethoxy)methane		0.347	0.352	0.416	0.405	0.344	0.373	9.0
2,4-Dichlorophenol	*	0.175	0.211	0.257	0.267	0.218	0.226	16.0*
1,2,4-Trichlorobenzene		0.314	0.290	0.328	0.319	0.238	0.298	12.0
Naphthalene		0.973	0.940	1.039	1.019	0.824	0.959	8.0
4-Chloroaniline		0.240	0.324	0.374	0.367	0.276	0.316	18.0
Hexachlorobutadiene	*	0.173	0.152	0.179	0.174	0.120	0.159	15.0*
4-Chloro-3-methylphenol	*	0.156	0.180	0.207	0.206	0.174	0.184	11.0*
2-Methylnaphthalene		0.631	0.626	0.745	0.737	0.601	0.668	10.0
Hexachlorocyclopentadiene	#	0.074	0.085	0.132	0.129	0.095	0.103	25.0#
2,4,6-Trichlorophenol	*	0.202	0.245	0.299	0.301	0.220	0.254	17.0*
2,4,5-Trichlorophenol			0.305	0.372	0.360	0.259	0.324	16.0
2-Chloronaphthalene		0.957	0.994	1.038	1.055	0.823	0.973	9.0
2-Nitroaniline			0.398	0.476	0.459	0.298	0.408	19.0
Dimethylphthalate		0.891	0.935	1.079	1.088	0.791	0.957	13.0
Acenaphthylene		1.306	1.419	1.601	1.633	1.216	1.435	12.0
2,6-Dinitrotoluene		0.184	0.213	0.258	0.272	0.179	0.221	19.0
3-Nitroaniline			0.196	0.225	0.203	0.123	0.187	23.0
Acenaphthene	*	0.948	0.915	1.053	1.062	0.778	0.951	12.0*
2,4-Dinitrophenol	#		0.197	0.334	0.358	0.236	0.282	27.0#
4-Nitrophenol	#		0.082	0.133	0.119	0.079	0.103	26.0#

FORM VI SV-1

6C

SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name:Triangle Labs, Inc. Contract:68-01-7407

Lab Code: TRILAB Case No.: ***** SAS No.: ****** SDG No.: *****

Instrument ID: F Calibration Date(s):07/06/90 07/06/90

Min $\overline{RRF}$ for SPCC(#) = 0.050 Max %RSD for CCC(*) = 30.0%

LAB FILE ID: 5 RRF20 =FB81503 RRF50 =FB81504

RRF80 =FB81502 RRF120=FB81501 RRF160=FB815

COMPOUND	RRF20	RRF50	RRF80	RRF120	RRF160	$\overline{RRF}$	% RSD
Dibenzofuran	1.322	1.373	1.487	1.510	1.149	1.368	10.0
2,4-Dinitrotoluene	0.207	0.270	0.335	0.324	0.217	0.271	21.0
Diethylphthalate	0.772	0.809	0.951	0.952	0.603	0.817	17.0
4-Chlorophenyl-phenylether	0.479	0.441	0.482	0.466	0.349	0.444	12.0
Fluorene	1.055	1.069	1.223	1.207	0.842	1.079	14.0
4-Nitroaniline		0.235	0.232	0.205	0.146	0.205	20.0
4,6-Dinitro-2-methylphenol		0.027	0.046	0.045	0.040	0.039	22.0
N-Nitrosodiphenylamine((1)	* 0.523	0.519	0.525	0.552	0.418	0.507	10.0*
4-Bromophenyl-phenylether	0.126	0.127	0.145	0.156	0.110	0.133	13.0
Hexachlorobenzene	0.129	0.140	0.159	0.176	0.142	0.149	12.0
Pentachlorophenol	*	0.028	0.034	0.038	0.029	0.032	13.0*
Phenanthrene	1.133	1.049	1.109	1.118	0.811	1.044	12.0
Anthracene	0.920	0.798	0.769	0.725	0.540	0.750	18.0
Di-n-butylphthalate	0.724	0.787	1.111	1.149	0.920	0.938	20.0
Fluoranthene	* 0.713	0.851	1.016	0.970	0.864	0.883	13.0*
Pyrene	3.612	2.631	3.983	3.086	1.946	3.052	26.0
Butylbenzylphthalate	0.879	1.021	1.756	1.536	0.989	1.236	31.0
3,3'-Dichlorobenzidine	0.156	0.191	0.291	0.325	0.248	0.242	28.0
Benzo(a)anthracene	0.599	0.592	0.893	0.959	0.841	0.777	22.0
Chrysene	1.545	1.353	1.438	1.331	1.052	1.344	13.0
bis(2-Ethylhexyl)phthalate	0.709	0.496	1.242	1.115	0.800	0.872	34.0
Di-n-octylphthalate	* 0.758	0.971	0.989	0.889	0.877	0.897	10.0*
Benzo(b)fluoranthene	0.319	0.818	0.949	0.996	0.896	0.796	34.0
Benzo(k)fluoranthene	1.137	1.676	2.402	2.044	1.324	1.716	30.0
Benzo(a)pyrene	* 1.372	1.419	1.836	1.368	0.893	1.378	24.0*
Indeno(1,2,3-cd)pyrene	0.491	0.578	0.332	0.341	0.490	0.447	23.0
Dibenz(a,h)anthracene	0.394	0.630	0.480	0.605	0.708	0.564	22.0
Benzo(g,h,i)perylene	0.848	1.070	0.883	0.945	0.937	0.937	9.0
2-Fluorophenol	0.484	0.572	0.768	0.772	0.646	0.649	19.0
Phenol-d5	0.786	0.831	0.998	0.975	0.841	0.886	10.0
Nitrobenzene-d5	0.231	0.224	0.277	0.269	0.193	0.239	14.0
2-Fluorobiphenyl	0.599	0.600	0.630	0.619	0.490	0.588	9.0
2,4,6-Tribromophenol	0.017	0.024	0.029	0.029	0.023	0.024	19.0
Terphenyl-d14	0.564	0.467	0.865	0.776	0.543	0.643	26.0

(1) Cannot be separated from Diphenylamine

FORM VI SV-2

CASE NARRATIVE
Triangle Laboratories, Inc.
801-10 Capitola Drive
Research Triangle Park, NC 27713
(919)-544-5729

DATE: June 29, 1990

CLIENT P.O. NO: 3808 T-7

TLI NO: 15916

OBJECTIVE: Analysis of VOST tubes for a specified list of volatile compounds.

METHOD:

The VOST tubes were analyzed according to Method 5040 from the EPA SOW-846. The internal standards bromochloromethane, 1,4-difluorobenzene and chlorobenzene-d_5 were added in the amount of 0.25 ug immediately prior to analysis by GC/MS. The surrogate standards, toluene-d_8 and benzene-d_6 were added in the amount of 0.15 ug immediately prior to analysis by GC/MS.

The GC/MS analysis conditions are listed below:

Purge and trap:	Tekmar LSC-2000
Purge:	11 min.
Desorb Temperature:	180 C
Desorb Time:	4 min.
GC:	
Column:	30 m x .52mm DB624
Program:	0 C hold 4 min to 105 C at 6 C/min
MS:	
Scan:	35-260 amu at 0.55 s/scan
Source Temperature:	180 C
Interface:	Jet Separator, 190 C

REPORT:

Enclosed with the case narrative are the chain of custody, sample log-in sheets and instrument work sheets and log pages.

The data are reported as quantitation reports, chromatograms, interim reports, and spectra of detected compounds. The quantitation report header gives the sample and calibration injection ID, as 'data file' and 'RF file' respectively. The sample name, dilution factor, TLI project number, date of report,

and analysis date are also listed in the quantitation report header. The raw areas and scan numbers found on the quantitation report are from the interim report. The response factors used are the average response factors from the initial calibration. All initial and continuing calibration data is located in the back of the data package. The ISID is the internal standard identifier. Those compounds matched to 1,4-difluorobenzene, for example, are flagged with the ISID number 14. The amounts for the target compounds are reported in ug. The sample calculations are listed below. If the target compound is detected, a code of 'D' is reported. If the target compound is detected but below the quantitation limit, a code of 'E' or estimated is reported. If the target compound is not detected, a code of 'ND' is or not detected is reported. Amounts reported for target compounds that are not detected are calculated using an area of 20 counts. Compounds flagged with the code 'IS' are internal standards.

RESULTS:

All VOST tubes were run in pairs as indicated on the Entropy REQUEST FOR ANALYSIS sheet.

The recoveries for all surrogates were normal in the two laboratory blanks and in the three FIELD BLANKs associated with these VOST samples. The surrogate recoveries varied greatly in the VOST samples, mainly due to the extremely high levels of target compounds. Several samples had no reported recovery of 1,2-dichloroethane-d_4. This surrogate was lost due to the large amount of methylene chloride in the samples. Elevated levels of the surrogates toluene-d_8 and benzene-d_6 are due to large amounts of the unlabeled compounds present in the samples.

In sample 7A/1 there no bromochloromethane found. This internal standard was most likely lost in the large methylene chloride peak that eluted in the same time window as the analyte. All detected analytes in the sample that are normally quantitated against bromochloromethane were instead quantitated against 1,4-difluorobenzene. The response factors for these analytes are listed on a chart enclosed in the case narrative packet which is on top of the complete data package.

Samples 7A/1, 7A/2, 7A/3, 7B/1, 7B/2, 7B/3, 7C/1, 7C/2, and 7C/3 contained benzene and toluene at levels which gave saturated spectra (i.e. a 10 V signal) for these compounds. A secondary ion of each was used for quantitation in order to better estimate the true amount of these compounds present in the sample. Benzene was quantitated on the m/z = 50 ion. Toluene was quantitat-

ed on the m/z = 65 ion. The calibration data for these secondary ions is included with the initial calibration data for the analysis. The ion used for quantitation is indicated on the quantitation report.

All samples, except for the FIELD BLANKs, contained one or more analytes at levels higher than the 0.1 to 1.0 microgram range of the analysis. All amounts listed on the quantitation reports that exceed 1.0 microgram should be considered estimated, not absolute, values.

SAMPLE CALCULATIONS

$$\text{response factor} = \frac{(\text{area analyte ccal}) * (\text{amt IS ccal})}{(\text{area IS ccal}) * (\text{amt analyte ccal})}$$

Amount in ug:

$$\text{amount of analyte} = \frac{(\text{area analyte in sample}) * (\text{amt IS})}{(\text{area IS in sample}) * (\text{RF})}$$

ccal = continuing calibration
IS = internal standard
amt IS ccal = amount of internal standard in the ccal = 0.25 ug
amt analyte ccal = amount of analyte in the ccal = 0.25 ug
amt IS = amount of internal standard added to the sample =0.25 ug
RF= the average response factor from the initial calibration

Valerie Evans	Penny Brock	Nancy Bragg
Laboratory Manager	QA/QC Officer	Report Generation Manager

Triangle Laboratories, Inc.
801-10 Capitola Drive
Research Triangle Park, NC 27713
Telephone: (919) 544-5729

FILE NAME:HB474 SAMPLE ID 7A/FB
RF FILE: VOST0611
DATE: 06/20/90
ANALYSIS DATE: 06/11/90
TLI Project Number:15916

QUANTITATION REPORT VOST METHOD 5040

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	1165		711	1		IS	
2	Acrylonitrile	0	.3190	0	1	.013	ND	.05
4	Vinyl Chloride	0	1.1440	0	1	.004	ND	.05
6	Methylene Chloride	3033	1.5770	370	1	.413	D	.05
12	Chloroform	0	3.4590	0	1	.001	ND	.05
13	1,2-Dichloroethane	0	2.1960	0	1	.002	ND	.05
14	1,4-Difluorobenzene	6342		934	14		IS	
16	1,1,1-Trichloroethane	269	.4890	755	14	.022	E	.05
17	Carbon Tetrachloride	0	.4650	0	14	.002	ND	.05
22	Trichloroethene	414	.3930	966	14	.042	E	.05
25	Benzene	3778	1.0780	827	14	.138	D	.05
28	Chlorobenzene-d5	5351		1483	28		IS	
31	Tetrachloroethene	0	.3440	0	28	.003	ND	.05
33	Toluene	3966	.6240	1215	28	.297	D	.05
34	Chlorobenzene	0	.7820	0	28	.001	ND	.05
35	Ethylbenzene	0	.4090	0	28	.002	ND	.05

S U R R O G A T E S U M M A R Y		AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
39	Toluene-d8	4265	1.0550	1203	28	.189	D	125.9
41	1,2-Dichloroethane-d4	1471	2.2600	829	1	.140	D	93.1
48	Benzene-d6	4921	1.1240	821	14	.173	D	115.1

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FILE NAME:HB475 SAMPLE ID 7/2/FB
RF FILE: VOST0611
DATE: 06/20/90
ANALYSIS DATE: 06/11/90
TLI Project Number:15916

QUANTITATION REPORT VOST METHOD 5040

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	1088		711	1		IS	
2	Acrylonitrile	0	.3190	0	1	.014	ND	.05
4	Vinyl Chloride	0	1.1440	0	1	.004	ND	.05
6	Methylene Chloride	1521	1.5770	370	1	.222	D	.05
12	Chloroform	0	3.4590	0	1	.001	ND	.05
13	1,2-Dichloroethane	0	2.1960	0	1	.002	ND	.05
14	1,4-Difluorobenzene	6482		934	14		IS	
16	1,1,1-Trichloroethane	0	.4890	0	14	.002	ND	.05
17	Carbon Tetrachloride	0	.4650	0	14	.002	ND	.05
22	Trichloroethene	327	.3830	965	14	.032	E	.05
25	Benzene	0	1.0780	0	14	.001	ND	.05
28	Chlorobenzene-d5	4799		1482	28		IS	
31	Tetrachloroethene	0	.3440	0	28	.003	ND	.05
33	Toluene	2433	.6240	1215	28	.203	D	.05
34	Chlorobenzene	0	.7820	0	28	.001	ND	.05
35	Ethylbenzene	0	.4090	0	28	.003	ND	.05

	S U R R O G A T E S U M M A R Y	AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
39	Toluene-d8	4389	1.0550	1203	28	.217	D	144.5
41	1,2-Dichloroethane-d4	1424	2.2600	829	1	.145	D	96.5
48	Benzene-d6	4640	1.1240	821	14	.159	D	106.1

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FILE NAME:HB476 SAMPLE ID 7/3/FB
RF FILE: VOST0611
DATE: 06/20/90
ANALYSIS DATE: 06/11/90
TLI Project Number:15916

QUANTITATION REPORT VOST METHOD 5040

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	862		712	1		IS	
2	Acrylonitrile	0	.3190	0	1	.018	ND	.05
4	Vinyl Chloride	0	1.1440	0	1	.005	ND	.05
6	Methylene Chloride	318	1.5770	371	1	.058	D	.05
12	Chloroform	0	3.4590	0	1	.002	ND	.05
13	1,2-Dichloroethane	0	2.1960	0	1	.003	ND	.05
14	1,4-Difluorobenzene	4948		935	14		IS	
16	1,1,1-Trichloroethane	0	.4890	0	14	.002	ND	.05
17	Carbon Tetrachloride	0	.4650	0	14	.002	ND	.05
22	Trichloroethene	0	.3930	0	14	.003	ND	.05
25	Benzene	0	1.0780	0	14	.001	ND	.05
28	Chlorobenzene-d5	4022		1484	28		IS	
31	Tetrachloroethene	0	.3440	0	28	.004	ND	.05
33	Toluene	309	.6240	1216	28	.031	E	.05
34	Chlorobenzene	0	.7820	0	28	.002	ND	.05
35	Ethylbenzene	0	.4090	0	28	.003	ND	.05

S U R R O G A T E S U M M A R Y		AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
39	Toluene-d8	3459	1.0550	1205	28	.204	D	135.9
41	1,2-Dichloroethane-d4	1122	2.2600	829	1	.144	D	96.0
48	Benzene-d6	3332	1.1240	821	14	.150	D	99.9

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FILE NAME:HB471 SAMPLE ID VOSTBLK 061190
RF FILE: VOST0611
DATE: 06/20/90
ANALYSIS DATE: 06/11/90
TLI Project Number:15916

QUANTITATION REPORT VOST METHOD 5040

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	1380		711	1		IS	
2	Acrylonitrile	0	.3190	0	1	.011	ND	.05
4	Vinyl Chloride	0	1.1440	0	1	.003	ND	.05
6	Methylene Chloride	0	1.5770	0	1	.002	ND	.05
12	Chloroform	0	3.4590	0	1	.001	ND	.05
13	1,2-Dichloroethane	0	2.1960	0	1	.002	ND	.05
14	1,4-Difluorobenzene	7070		934	14		IS	
16	1,1,1-Trichloroethane	0	.4890	0	14	.001	ND	.05
17	Carbon Tetrachloride	0	.4650	0	14	.002	ND	.05
22	Trichloroethene	0	.3930	0	14	.002	ND	.05
25	Benzene	0	1.0780	0	14	.001	ND	.05
28	Chlorobenzene-d5	6668		1481	28		IS	
31	Tetrachloroethene	0	.3440	0	28	.002	ND	.05
33	Toluene	154	.6240	1215	28	.009	E	.05
34	Chlorobenzene	0	.7820	0	28	.001	ND	.05
35	Ethylbenzene	74	.4090	1522	28	.007	E	.05

S U R R O G A T E S U M M A R Y		AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
39	Toluene-d8	5355	1.0550	1202	28	.190	D	126.9
41	1,2-Dichloroethane-d4	1538	2.2600	829	1	.123	D	82.2
48	Benzene-d6	5105	1.1240	820	14	.161	D	107.1

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FILE NAME:H8485 SAMPLE ID VOSTBLK 061290
RF FILE: VOST0611
DATE: 06/20/90
ANALYSIS DATE: 06/11/90
TLI Project Number:15916

QUANTITATION REPORT VOST METHOD 5040

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	1069		707	1		IS	
2	Acrylonitrile	0	.3190	0	1	.015	ND	.05
4	Vinyl Chloride	0	1.1440	0	1	.004	ND	.05
6	Methylene Chloride	0	1.5770	0	1	.003	ND	.05
12	Chloroform	0	3.4590	0	1	.001	ND	.05
13	1,2-Dichloroethane	0	2.1960	0	1	.002	ND	.05
14	1,4-Difluorobenzene	5318		930	14		IS	
16	1,1,1-Trichloroethane	0	.4890	0	14	.002	ND	.05
17	Carbon Tetrachloride	0	.4650	0	14	.002	ND	.05
22	Trichloroethene	0	.3930	0	14	.002	ND	.05
25	Benzene	0	1.0780	0	14	.001	ND	.05
28	Chlorobenzene-d5	5336		1478	28		IS	
31	Tetrachloroethene	0	.3440	0	28	.003	ND	.05
33	Toluene	0	.6240	0	28	.002	ND	.05
34	Chlorobenzene	0	.7820	0	28	.001	ND	.05
35	Ethylbenzene	0	.4090	0	28	.002	ND	.05

S U R R O G A T E S U M M A R Y		AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
39	Toluene-d8	4644	1.0550	1199	28	.206	D	137.5
41	1,2-Dichloroethane-d4	1320	2.2600	825	1	.137	D	91.1
48	Benzene-d6	3776	1.1240	816	14	.158	D	105.3

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FILE NAME:HB477 SAMPLE ID 7A/1
RF FILE: VOSTO611
DATE: 06/20/90
ANALYSIS DATE: 06/11/90
TLI Project Number:15916

QUANTITATION REPORT VOST METHOD 5040

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	906		719	1		IS	
2	Acrylonitrile	47572	.3180	459	1	41.166	D	.05
4	Vinyl Chloride	0	1.1440	0	1	.005	ND	.05
6	Methylene Chloride	11733	1.5770	381	1	2.054	D	.05
12	Chloroform	7419	3.4590	759	1	.592	D	.05
13	1,2-Dichloroethane	0	2.1960	0	1	.003	ND	.05
14	1,4-Difluorobenzene	0		0	14		IS	
16	1,1,1-Trichloroethane	0	2.9150	0	1	.002	ND	.05
17	Carbon Tetrachloride	0	2.7690	0	1	.002	ND	.05
22	Trichloroethene	0	2.3470	0	1	.002	ND	.05
25	Benzene (m/z = 50) vs IS #1	1554892	1.0676	852	1	401.912	D	.05
28	Chlorobenzene-d5	2137		1488	28		IS	
31	Tetrachloroethene	95	.3440	1321	28	.032	E	.05
33	Toluene (m/z = 65)	132261	.1430	1235	28	108.201	D	.05
34	Chlorobenzene	156	.7820	1490	28	.023	E	.05
35	Ethylbenzene	244	.4090	1526	28	.070	D	.05

SURROGATE SUMMARY		AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
39	Toluene-d8	2812	1.0550	1216	28	.467	D	311.0
41	1,2-Dichloroethane-d4	0	2.2600	0	1	.000	ND	.0
48	Benzene-d6	123223	6.8440	932	1	5.118	D	3411.8

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FILE NAME:HB478 SAMPLE ID 7B/1
RF FILE: VOST0611
DATE: 06/20/90
ANALYSIS DATE: 06/11/90
TLI Project Number:15916

QUANTITATION REPORT VOST METHOD 5040

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	910		748	1		IS	
2	Acrylonitrile	14912	.3180	455	1	12.841	D	.05
4	Vinyl Chloride	0	1.1440	0	1	.005	ND	.05
6	Methylene Chloride	11377	1.5770	376	1	1.982	D	.05
12	Chloroform	0	3.4590	0	1	.002	ND	.05
13	1,2-Dichloroethane	0	2.1860	0	1	.003	ND	.05
14	1,4-Difluorobenzene	4086		959	14		IS	
16	1,1,1-Trichloroethane	4988	.4890	789	14	.624	D	.05
17	Carbon Tetrachloride	0	.4650	0	14	.003	ND	.05
22	Trichloroethene	3802	.3930	988	14	.592	D	.05
25	Benzene (m/z = 50)	200500	.1800	869	14	66.153	D	.05
28	Chlorobenzene-d5	4425		1491	28		IS	
31	Tetrachloroethene	3597	.3440	1327	28	.591	D	.05
33	Toluene (m/z = 65)	155274	.1430	1240	28	61.346	D	.05
34	Chlorobenzene	5872	.7820	1496	28	.424	D	.05
35	Ethylbenzene	5647	.4080	1531	28	.780	D	.05

S U R R O G A T E S U M M A R Y		AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
39	Toluene-d8	5218	1.0550	1223	28	.279	D	186.3
41	1,2-Dichloroethane-d4	0	2.2600	0	1	.000	ND	.0
48	Benzene-d6	11498	1.1240	898	14	.626	D	417.3

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FILE NAME:HB479 SAMPLE ID 7C/1
RF FILE: VOST0611
DATE: 06/20/90
ANALYSIS DATE: 06/11/90
TLI Project Number:15916

QUANTITATION REPORT VOST METHOD 5040

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	757		719	1		IS	
2	Acrylonitrile	26964	.3180	460	1	27.809	D	.05
4	Vinyl Chloride	0	1.1440	0	1	.006	ND	.05
6	Methylene Chloride	4087	1.5770	379	1	.856	D	.05
12	Chloroform	8571	3.4590	757	1	.818	D	.05
13	1,2-Dichloroethane	0	2.1960	0	1	.003	ND	.05
14	1,4-Difluorobenzene	4119		943	14		IS	
16	1,1,1-Trichloroethane	5960	.4890	764	14	.740	D	.05
17	Carbon Tetrachloride	0	.4650	0	14	.003	ND	.05
22	Trichloroethene	4665	.3930	973	14	.720	D	.05
25	Benzene (m/z = 50)	407490	.1800	856	14	137.402	D	.05
28	Chlorobenzene-d5	4667		1490	28		IS	
31	Tetrachloroethene	4094	.3440	1325	28	.635	D	.05
33	Toluene (m/z = 65)	477789	.1430	1246	28	178.215	D	.05
34	Chlorobenzene	23526	.7820	1494	28	1.605	D	.05
35	Ethylbenzene	55473	.4090	1532	28	7.234	D	.05

SURROGATE SUMMARY		AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
39	Toluene-d8	5398	1.0550	1222	28	.273	D	181.9
41	1,2-Dichloroethane-d4	0	2.2600	0	1	.000	ND	.0
48	Benzene-d6	28874	1.1240	879	14	1.559	D	1039.4

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FILE NAME:HB480 SAMPLE ID 7A/2
RF FILE: VOST0611
DATE: 06/20/90
ANALYSIS DATE: 06/11/90
TLI Project Number:15916

QUANTITATION REPORT VOST METHOD 5040

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	1038		721	1		IS	
2	Acrylonitrile	31524	.3190	460	1	23.804	D	.05
4	Vinyl Chloride	20338	1.1440	100	1	4.282	D	.05
6	Methylene Chloride	1986	1.5770	377	1	.303	D	.05
12	Chloroform	8536	3.4590	759	1	.594	D	.05
13	1,2-Dichloroethane	0	2.1960	0	1	.002	ND	.05
14	1,4-Difluorobenzene	5164		943	14		IS	
16	1,1,1-Trichloroethane	5294	.4890	766	14	.524	D	.05
17	Carbon Tetrachloride	0	.4650	0	14	.002	ND	.05
22	Trichloroethene	4894	.3930	974	14	.603	D	.05
25	Benzene (m/z = 50)	345978	.1800	853	14	93.053	D	.05
28	Chlorobenzene-d5	4376		1489	28		IS	
31	Tetrachloroethene	4457	.3440	1322	28	.740	D	.05
33	Toluene (m/z = 65)	192192	.1430	1234	28	76.782	D	.05
34	Chlorobenzene	11302	.7820	1493	28	.826	D	.05
35	Ethylbenzene	6996	.4090	1529	28	.977	D	.05

SURROGATE SUMMARY		AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
39	Toluene-d8	5213	1.0550	1218	28	.262	D	166.2
41	1,2-Dichloroethane-d4	0	2.2600	0	1	.000	ND	.0
48	Benzene-d6	14986	1.1240	879	14	.645	D	430.3

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FILE NAME:HB486 SAMPLE ID 7B/2
RF FILE: VOST0611
DATE: 06/20/90
ANALYSIS DATE: 06/11/90
TLI Project Number:15916

QUANTITATION REPORT VOST METHOD 5040

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	Bromochloroethane	1096		718	1		IS	
2	Acrylonitrile	25679	.3190	454	1	18.357	D	.05
4	Vinyl Chloride	0	1.1440	0	1	.004	ND	.05
6	Methylene Chloride	1031	1.5770	376	1	.149	D	.05
12	Chloroform	7210	3.4590	756	1	.475	D	.05
13	1,2-Dichloroethane	0	2.1960	0	1	.002	ND	.05
14	1,4-Difluorobenzene	4859		839	14		IS	
16	1,1,1-Trichloroethane	3974	.4690	763	14	.418	D	.05
17	Carbon Tetrachloride	0	.4650	0	14	.002	ND	.05
22	Trichloroethene	4400	.3930	870	14	.578	D	.05
25	Benzene (m/z = 50)	334858	.1800	853	14	85.859	D	.05
28	Chlorobenzene-d5	5024		1483	28		IS	
31	Tetrachloroethene	5181	.3440	1318	28	.749	D	.05
33	Toluene (m/z = 65)	279186	.1430	1234	28	87.151	D	.05
34	Chlorobenzene	43810	.7820	1488	28	2.775	D	.05
35	Ethylbenzene	32308	.4090	1525	28	3.930	D	.05

SURROGATE SUMMARY		AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
39	Toluene-d8	5623	1.0550	1214	28	.265	D	176.8
41	1,2-Dichloroethane-d4	0	2.2600	0	1	.000	ND	.0
48	Benzene-d6	23483	1.1240	877	14	1.075	D	716.6

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FILE NAME:HB487 SAMPLE ID 7C/2
RF FILE: VOST0611
DATE: 06/20/90
ANALYSIS DATE: 08/11/90
TLI Project Number:15916

QUANTITATION REPORT VOST METHOD 5040

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	1199		717	1		IS	
2	Acrylonitrile	34767	.3190	459	1	22.722	D	.05
4	Vinyl Chloride	22771	1.1440	100	1	4.150	D	.05
6	Methylene Chloride	3715	1.5770	378	1	.491	D	.05
12	Chloroform	5360	3.4590	755	1	.323	D	.05
13	1,2-Dichloroethane	0	2.1960	0	1	.002	ND	.05
14	1,4-Difluorobenzene	5156		940	14		IS	
16	1,1,1-Trichloroethane	3548	.4890	763	14	.352	D	.05
17	Carbon Tetrachloride	0	.4650	0	14	.002	ND	.05
22	Trichloroethene	3420	.3930	989	14	.422	D	.05
25	Benzene (m/z = 50)	401908	.1800	860	14	108.263	D	.05
28	Chlorobenzene-d5	5270		1484	28		IS	
31	Tetrachloroethene	3486	.3440	1317	28	.481	D	.05
33	Toluene (m/z = 65)	128122	.1430	1227	28	42.503	D	.05
34	Chlorobenzene	16633	.7820	1489	28	1.009	D	.05
35	Ethylbenzene	10665	.4090	1524	28	1.237	D	.05

SURROGATE SUMMARY		AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
39	Toluene-d8	4921	1.0550	1208	28	.221	D	147.5
41	1,2-Dichloroethane-d4	2428	2.2600	859	1	.224	D	149.3
48	Benzene-d6	28224	1.1240	878	14	1.131	D	754.2

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FILE NAME:HB490 SAMPLE ID 7C/3
RF FILE: VOST0611
DATE: 06/20/90
ANALYSIS DATE: 06/11/90
TLI Project Number:15916

QUANTITATION REPORT VOST METHOD 5040

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	1046		716	1		IS	
2	Acrylonitrile	20461	.3190	454	1	15.325	D	.05
4	Vinyl Chloride	0	1.1440	0	1	.004	ND	.05
6	Methylene Chloride	2113	1.5770	373	1	.320	D	.05
12	Chloroform	7141	3.4590	754	1	.493	D	.05
13	1,2-Dichloroethane	0	2.1860	0	1	.002	ND	.05
14	1,4-Difluorobenzene	4050		938	14		IS	
16	1,1,1-Trichloroethane	3173	.4890	781	14	.401	D	.05
17	Carbon Tetrachloride	0	.4650	0	14	.003	ND	.05
22	Trichloroethene	3411	.3930	968	14	.536	D	.05
25	Benzene (m/z = 50)	180388	.1800	843	14	61.855	D	.05
28	Chlorobenzene-d5	4359		1485	28		IS	
31	Tetrachloroethene	4328	.3440	1318	28	.721	D	.05
33	Toluene (m/z = 65)	186366	.1430	1230	28	74.745	D	.05
34	Chlorobenzene	18655	.7820	1490	28	1.368	D	.05
35	Ethylbenzene	12987	.4090	1528	28	1.821	D	.05

SURROGATE SUMMARY		AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
39	Toluene-d8	2639	1.0550	1212	28	.143	D	95.6
41	1,2-Dichloroethane-d4	3040	2.2600	845	1	.321	D	214.3
48	Benzene-d6	8808	1.1240	872	14	.484	D	322.5

Triangle Laboratories, Inc.
801-10 Capitola Drive
Research Triangle Park, NC 27713
Telephone: (919) 544-5729

FILE NAME:HB489 SAMPLE ID 7B/3
RF FILE: VOST0611
DATE: 06/21/90
ANALYSIS DATE: 06/11/90
TLI Project Number:15916

QUANTITATION REPORT VOST METHOD 5040

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	Bromochloroethane	1034		714	1		IS	
2	Acrylonitrile	14402	.3180	453	1	10.915	D	.05
4	Vinyl Chloride	15359	1.1440	101	1	3.246	D	.05
6	Methylene Chloride	1856	1.5770	373	1	.285	D	.05
12	Chloroform	7193	3.4590	752	1	.503	D	.05
13	1,2-Dichloroethane	0	2.1960	0	1	.002	ND	.05
14	1,4-Difluorobenzene	5089		936	14		IS	
16	1,1,1-Trichloroethane	0	.4890	0	14	.002	ND	.05
17	Carbon Tetrachloride	0	.4650	0	14	.002	ND	.05
22	Trichloroethene	4101	.3930	968	14	.513	D	.05
25	Benzene (m/z = 50)	166276	.1800	841	14	45.380	D	.05
28	Chlorobenzene-d5	4828		1484	28		IS	
31	Tetrachloroethene	4482	.3440	1317	28	.675	D	.05
33	Toluene (m/z = 65)	152491	.1430	1227	28	55.218	D	.05
34	Chlorobenzene	11475	.7820	1489	28	.760	D	.05
35	Ethylbenzene	7138	.4090	1525	28	.903	D	.05

SURROGATE SUMMARY		AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
39	Toluene-d8	3032	1.0550	1208	28	.149	D	99.2
41	1,2-Dichloroethane-d4	2568	2.2600	843	1	.275	D	183.2
48	Benzene-d6	8092	1.1240	871	14	.354	D	235.8

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FILE NAME:HB488 SAMPLE ID 7A/3
RF FILE: VOST0611
DATE: 06/20/90
ANALYSIS DATE: 06/11/90
TLI Project Number:15916

QUANTITATION REPORT VOST METHOD 5040

	NAME	AREA	RF	SCAN	ISID	AMOUNT, ug	CODE	QUAN LIMIT
1	Bromochloromethane	1287		716	1		IS	
2	Acrylonitrile	20695	.3190	455	1	12.599	D	.05
4	Vinyl Chloride	0	1.1440	0	1	.003	ND	.05
6	Methylene Chloride	2025	1.5770	375	1	.249	D	.05
12	Chloroform	7486	3.4590	754	1	.420	D	.05
13	1,2-Dichloroethane	0	2.1960	0	1	.002	ND	.05
14	1,4-Difluorobenzene	5489		939	14		IS	
16	1,1,1-Trichloroethane	0	.4890	0	14	.002	ND	.05
17	Carbon Tetrachloride	0	.4650	0	14	.002	ND	.05
22	Trichloroethene	2903	.3930	869	14	.336	D	.05
25	Benzene (m/z = 50)	415998	.1800	858	14	105.261	D	.05
28	Chlorobenzene-d5	5308		1484	28		IS	
31	Tetrachloroethene	3391	.3440	1317	28	.464	D	.05
33	Toluene (m/z = 65)	61783	.1430	1222	28	20.349	D	.05
34	Chlorobenzene	14852	.7820	1489	28	.894	D	.05
35	Ethylbenzene	5085	.4090	1525	28	.586	D	.05

S U R R O G A T E S U M M A R Y		AREA	RF	SCAN	ISID	AMOUNT	CODE	% RECOVERY
39	Toluene-d8	4668	1.0550	1206	28	.208	D	138.9
41	1,2-Dichloroethane-d4	2446	2.2600	858	1	.210	D	140.2
48	Benzene-d6	23411	1.1240	878	14	.949	D	632.4

Appendix E

CEM Data
Calibrations/One-min Averages

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineracr

REASON: Second system cal - 5/30/90

DATE : 05-30-1990 TIME: 18:51 - 19:05

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
1	STACK	ppmTHC	0.0	7.6
1	STACK	ppmTHC	181.2	212.2
2	STACK	ppm CO	0.0	3.3
2	STACK	ppm CO	1263.0	1288.2
3	STACK	% O2	0.00	0.14
3	STACK	% O2	12.50	12.48

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Repeat of Direct cal of stack analyzers

DATE : 05-30-1990 TIME: 19:05 - 19:21

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
1	STACK	ppmTHC	0.0	2.0
1	STACK	ppmTHC	181.2	181.0
1	STACK	ppmTHC	282.0	282.4
2	STACK	ppm CO	0.0	0.7
2	STACK	ppm CO	457.5	451.4
2	STACK	ppm CO	1263.0	1278.7
3	STACK	% O2	0.00	0.12
3	STACK	% O2	12.50	12.55
3	STACK	% O2	20.60	20.68

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Second system cal - Boiler location

DATE : 05-30-1990 TIME: 19:21 - 20:01

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	3.1
6	BOILER	ppmSO2	218.0	241.8
7	BOILER	ppmNOx	0.0	2.1
7	BOILER	ppmNOx	240.0	241.7
8	BOILER	% O2	0.00	0.09
8	BOILER	% O2	12.50	12.39
10	BOILER	% CO2	0.00	0.03
10	BOILER	% CO2	11.01	11.03
1	STACK	ppmTHC	0.0	4.4
1	STACK	ppmTHC	181.2	181.3
2	STACK	ppm CO	0.0	0.0
2	STACK	ppm CO	1263.0	1268.0
3	STACK	% O2	0.00	0.11
3	STACK	% O2	12.50	12.52

Site 9 Sewage Sludge Incinerator 05-30-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2
20:06	2.7	1.2	20.65	0.07	101.5	1546.2*	17.87
20:07	2.9	1.7	20.64	0.08	103.1	1597.1*	17.76
20:08	3.1	2.0	20.62	0.09	104.1	1703.8*	17.54
20:09	3.0	1.0	13.92	0.03	104.0	1768.6*	17.43
20:10	2.7	0.9	12.49	0.01	104.0	1750.5*	17.41
20:11	2.6	0.8	12.48	0.01	100.6	1691.0*	17.38
20:12	2.6	0.9	12.48	-0.00	98.6	1681.0*	17.31
20:13	-20.0	0.8	12.49	0.01	98.0	1702.0*	17.25
20:14	-50.8	0.8	12.48	0.01	100.3	1749.8*	17.15
20:15	-14.9	0.8	12.48	0.00	98.5	1745.3*	17.02
AVERAGE VALUES FOR THE LAST HOUR: 10 MINUTES OF VALID DATA							
20:15	-6.6	1.1	15.07	0.03	101.3	1693.5	17.41
20:16	7.1	0.8	12.49	0.01	97.1	1723.9*	16.96
20:17	3.0	0.7	12.49	0.00	90.5	1714.8*	16.82
20:18	0.6	0.7	12.49	0.00	87.8	1662.6*	16.45
20:19	0.2	0.7	12.49	0.00	90.9	1672.5*	16.04
20:20	0.4	0.7	12.49	0.01	90.8	1680.8*	15.54
20:21	0.1	0.6	12.49	0.01	95.4	1808.0*	14.78
20:22	0.4	0.7	12.49	0.00	102.1	1875.5*	14.01
20:23	-0.0	0.7	12.49	-0.00	138.3	1875.5*	12.99
20:24	0.1	0.7	16.92	0.01	163.5	1875.4*	11.96
20:25	0.2	0.6	20.63	0.00	144.3	1863.6*	11.43
20:26	-0.0	0.7	6.34	8.29	193.3	1858.7*	10.66
20:27	0.0	0.6	0.08	11.07	372.7	1864.7*	10.99
20:28	0.1	0.6	0.06	11.02	734.4*	1875.5*	10.77
20:29	-0.3	0.5	0.05	11.04	937.0*	1875.5*	10.79
20:30	-0.2	0.5	0.04	11.04	964.5*	1875.5*	10.86
AVERAGE VALUES FOR THE LAST 15 MINUTES							
20:30	0.8	0.7	9.60	3.50	286.8	1806.8	13.40
20:31	-0.1	0.7	0.12	14.81	983.6*	1875.5*	10.55
20:32	0.0	0.5	0.05	17.95	800.3*	1875.5*	10.27
20:33	-0.3	0.5	0.06	17.95	389.2	1875.5*	10.17
20:34	-0.3	0.5	0.10	16.81	103.3	1608.3*	10.75
20:35	-0.3	0.5	0.07	11.03	35.3	654.9	11.73
20:36	-0.3	0.5	0.11	12.36	28.6	604.9	12.27
20:37	-0.3	0.5	0.08	17.61	25.5	685.7	12.39
20:38	-0.1	110.2	0.46	9.72	24.2	658.6	12.86
20:39	1.1	330.3	0.13	0.04	24.5	664.8	13.98
20:40	2.1	477.7	0.08	0.02	23.9	775.3	15.03
20:41	1.8	272.2	0.09	0.03	22.5	737.1	15.21
20:42	1.2	316.1	0.07	0.02	23.1	796.2	15.47
20:43	1.8	392.3	0.14	0.03	24.0	870.6	15.73
20:44	155.3	2.2	0.06	0.01	24.9	929.7	15.97
20:45	243.1	1.2	0.06	0.01	27.6	1045.1	16.28
AVERAGE VALUES FOR THE LAST 15 MINUTES							
20:45	27.0	127.1	0.11	7.89	170.7	1043.8	13.25
20:46	218.9	1.0	0.06	0.01	31.1	1176.3	16.55
20:47	219.0	1.0	0.06	0.01	33.4	1286.4	16.79

Site 9 Sewage Sludge Incinerator 05-30-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2
20:48	220.1	1.0	0.06	0.01	36.5	1360.8%	16.93
20:49	219.0	1.0	0.06	0.01	40.2	1434.3%	17.01
20:50	219.0	1.2	0.10	0.02	41.8	1449.5%	17.08
20:51	293.5	0.5	0.09	0.02	43.8	1461.3%	17.14
20:52	359.9	0.2	0.06	0.03	47.2	1508.4%	17.19
20:53	354.1	0.3	0.08	0.01	49.6	1528.4%	17.31
20:54	89.5	1.0	14.76	0.05	49.4	1492.2%	16.96
20:55	15.4	0.9	19.90	0.07	52.7	1486.1%	16.95
20:56	10.2	1.1	20.13	0.09	58.0	1469.0%	17.12
20:57	23.0	0.5	20.62	0.01	60.9	1424.0	17.28
20:58	2.6	0.4	20.69	0.01	70.3	1393.4	17.39
20:59	0.4	0.4	20.70	0.02	75.5	1406.2	17.46
21:00	0.2	0.3	20.70	0.00	77.0	1342.1	17.68
AVERAGE VALUES FOR THE LAST 15 MINUTES							
21:00	149.7	0.7	9.20	0.02	51.2	1414.6	17.12
21:01	-0.0	0.3	20.70	0.01	77.6	1284.1	17.88
21:02	-0.2	0.3	20.70	0.01	78.7	1289.0	18.06
21:03	-0.2	0.3	20.71	0.00	76.5	1243.6	18.14
21:04	-0.3	0.4	20.71	0.01	75.4	1224.6	18.25
21:05	-0.4	0.3	20.71	0.01	73.8	1189.6	18.32
21:06	-0.0	0.3	20.71	0.00	73.0	1166.3	18.39
21:07	0.0	0.2	14.10	0.01	72.2	1115.4	18.44
21:08	0.8	0.1	4.38	0.01	72.9	1071.4	18.48
21:09	1.3	0.1	4.38	0.03	72.7	1067.6	18.43
21:10	1.9	0.2	4.29	0.04	71.3	1057.8	18.30
21:11	2.5	0.2	4.10	0.03	68.1	1060.1	18.07
21:12	2.7	0.1	4.05	0.03	67.0	1083.8	17.85
21:13	3.0	0.1	3.93	0.03	64.9	1119.1	17.61
21:14	3.3	0.1	3.80	0.04	62.9	1153.8	17.44
21:15	4.0	0.1	3.80	0.03	62.8	1207.7	17.33
AVERAGE VALUES FOR THE LAST 15 MINUTES							
21:15	1.2	0.2	11.40	0.02	71.3	1155.6	18.07
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA							
21:15	44.7	32.2	7.58	2.86	145.0	1355.2	15.46
21:16	4.4	0.1	3.72	0.05	61.1	1212.2	17.31
21:17	4.9	0.1	3.72	0.05	61.5	1255.7	17.27
21:18	5.2	0.0	3.78	0.05	62.4	1291.7	17.24

COMMENTS: End of VOST Run 5/30/90

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: System cal of stack analyzers after VOST Run

DATE : 05-30-1990 TIME: 21:19 - 21:36

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
1	STACK	ppmTHC	0.0	8.5
1	STACK	ppmTHC	181.2	180.4
2	STACK	ppm CO	0.0	-2.8
2	STACK	ppm CO	1263.0	1261.4
3	STACK	% O2	0.00	0.14
3	STACK	% O2	12.50	12.60

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Initial system cal - 5/30/90

DATE : 05-30-1990 TIME: 10:31 - 11:09

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	6.4
6	BOILER	ppmSO2	218.0	210.4
6	BOILER	ppmSO2	218.0	203.3
7	BOILER	ppmNOx	0.0	2.9
7	BOILER	ppmNOx	240.0	238.3
8	BOILER	% O2	0.00	0.08
8	BOILER	% O2	12.50	12.38
10	BOILER	% CO2	0.00	0.04
10	BOILER	% CO2	11.01	10.89
1	STACK	ppmTHC	0.0	2.9
1	STACK	ppmTHC	181.2	179.6
2	STACK	ppm CO	0.0	2.7
2	STACK	ppm CO	1263.0	1277.6
3	STACK	% O2	0.00	0.13
3	STACK	% O2	12.50	12.39

Site 9 Sewage Sludge Incineraor 05-30-199(

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2
11:16	262.4	121.0	14.37	5.03	50.5	1517.2%	16.06
11:17	266.8	120.3	14.30	5.09	48.9	1452.2%	16.10
11:18	264.4	123.0	14.22	5.13	47.9	1417.1%	16.03
11:19	264.1	125.5	14.26	5.13	46.7	1345.8	15.99
11:20	259.2	129.1	14.12	5.23	46.6	1334.7%	16.03
11:21	262.7	129.0	14.08	5.19	47.2	1367.2%	15.86
11:22	264.7	127.8	14.01	5.32	48.8	1402.2%	15.91
11:23	266.6	115.2	13.95	5.28	50.7	1465.0%	15.88
11:24	253.4	107.4	14.06	5.16	51.2	1451.8%	15.91
11:25	235.1	100.7	13.94	5.34	54.6	1526.7%	15.95
11:26	221.6	93.7	13.83	5.36	55.3	1514.7%	15.81
11:27	210.8	88.0	13.76	5.41	57.3	1555.3%	15.80
11:28	202.0	83.1	13.50	5.64	57.1	1589.4%	15.62
11:29	208.7	99.7	13.74	5.47	54.5	1542.5%	15.77
11:30	269.4	113.6	13.55	5.61	56.3	1604.6%	15.68
AVERAGE VALUES FOR THE LAST 15 MINUTES							
11:30	247.5	111.8	13.98	5.29	51.6	1472.4	15.89

COMMENTS: Lost sample flow at Boiler Locatiom

Site 9 Sewage Sludge Incineraor 05-30-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2

Site 9 Sewage Sludge Incinerator 05-30-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2
12:14	120.1	125.0	16.34	3.21	57.3	1511.3*	17.44
12:15	118.5	122.8	16.43	3.18	61.1	1467.6*	17.50
12:16	117.4	120.1	16.45	3.09	62.1	1425.7	17.55
12:17	116.8	117.0	16.51	3.05	62.0	1377.3	17.55
12:18	113.9	113.4	16.51	3.06	62.7	1315.5	17.62
12:19	112.3	106.9	16.59	2.98	63.0	1293.1	17.63
12:20	114.5	101.4	16.49	3.07	62.8	1261.8	17.63
12:21	118.5	110.7	16.11	3.36	59.0	1249.3	17.54
12:22	131.9	126.5	15.41	3.77	46.8	1237.2	16.92
12:23	142.2	125.4	15.45	3.72	46.5	1234.0	16.90
12:24	138.0	110.5	15.74	3.48	46.8	1205.0	16.99
12:25	115.3	86.7	16.94	2.63	57.0	1170.9	17.63
12:26	92.3	85.4	17.12	2.50	61.3	1157.2	18.06
12:27	80.8	87.2	17.20	2.41	63.9	1259.8	18.11
12:28	70.5	89.6	17.11	2.42	68.0	1327.6	18.07
12:29	60.8	93.6	16.96	2.58	70.7	1299.5	18.06
12:30	62.9	106.3	16.28	2.97	62.2	1325.9	17.53
AVERAGE VALUES FOR THE LAST 15 MINUTES							
12:30	105.9	105.4	16.46	3.01	59.6	1276.0	17.59
AVERAGE VALUES FOR THE LAST HOUR: 17 MINUTES OF VALID DATA							
12:30	107.5	107.6	16.45	3.03	59.6	1301.1	17.57
12:31	72.7	115.7	15.72	3.42	58.1	1381.6	17.13
12:32	85.2	122.9	15.31	3.73	50.5	1401.3	16.76
12:33	71.6	129.1	15.01	3.93	25.4	827.9	16.77
12:34	75.6	133.1	14.76	4.12	21.8	29.4	16.52
12:35	95.0	139.9	14.56	4.24	40.2	975.1*	17.49
12:36	120.3	142.9	14.42	4.36	46.0	1519.5*	16.19
12:37	127.9	148.4	14.32	4.44	45.7	1564.3*	16.11
12:38	136.1	151.3	14.22	4.49	45.5	1604.2*	16.05
12:39	151.5	153.4	14.07	4.61	43.8	1601.2*	15.99
12:40	115.3	152.5	14.12	4.58	28.5	1409.4*	16.03
12:41	97.2	151.2	14.02	4.68	18.5	197.9	17.44
12:42	96.0	152.4	13.91	4.80	16.6	8.3	19.79
12:43	110.8	153.4	11.26	6.93	15.4	4.9	20.12
12:44	172.2	128.1	7.52	9.70	14.7	4.2	20.14
12:45	249.9	93.4	5.57	11.16	14.9	2.1	20.19
AVERAGE VALUES FOR THE LAST 15 MINUTES							
12:45	118.5	137.9	13.25	5.28	32.4	835.4	17.65
12:46	481.5	61.8	4.21	12.22	15.0	2.7	20.23
12:47	552.0	57.1	3.65	12.56	14.7	2.7	20.25
12:48	544.6	64.6	4.07	12.52	12.9	3.1	20.27
12:49	534.2	77.4	6.33	10.82	13.0	0.2	20.29
12:50	501.8	91.0	7.51	10.19	37.1	64.2*	20.32
12:51	555.0	70.6	6.25	11.26	305.5	1774.7*	10.95
12:52	622.1	77.2	5.17	11.90	958.3*	1875.5*	9.77
12:53	537.2	129.1	3.55	13.21	1000.2*	1875.5*	8.77
12:54	521.1	195.4	2.57	14.14	1000.2*	1875.5*	7.72
12:55	665.4	192.4	2.98	14.34	1000.2*	1875.5*	7.76

Site 9 Sewage Sludge Incineracr 05-30-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2
12:56	756.4	176.7	2.92	14.47	1000.2*	1875.5*	7.77
12:57	744.9	169.6	4.44	13.22	965.4*	1875.5*	8.57
12:58	757.2	175.0	5.66	12.38	626.5	1875.5*	9.32
12:59	706.6	205.6	7.58	10.80	232.3	1660.4*	10.36
13:00	576.7	247.8	9.75	9.16	74.1	684.0	11.80
AVERAGE VALUES FOR THE LAST 15 MINUTES							
13:00	603.8	132.7	5.11	12.21	483.7	1154.7	12.94
13:01	443.6	248.8	11.71	7.48	52.6	506.7	13.30
13:02	346.0	214.3	13.35	6.10	46.1	599.1	14.62
13:03	267.7	183.4	14.50	5.17	43.3	726.6	15.58
13:04	218.4	175.1	14.46	5.15	40.0	845.5	15.96
13:05	200.7	171.7	14.14	5.36	34.1	780.2	15.65
13:06	187.9	155.3	14.33	5.15	30.7	564.8	15.71
13:07	175.7	148.1	14.36	5.13	28.3	562.7	15.75
13:08	166.3	141.7	14.47	5.03	27.2	575.1	15.91
13:09	160.1	134.9	14.53	4.93	26.3	609.7	15.99
13:10	155.9	131.9	14.49	4.97	25.0	616.9	16.00
13:11	158.5	132.5	13.89	5.34	22.9	563.0	15.73
13:12	163.4	127.6	13.86	5.30	23.0	552.7	15.58
13:13	166.5	131.0	13.64	5.49	22.2	567.0	15.61
13:14	180.7	129.5	13.26	5.62	20.7	531.7	15.13
13:15	185.9	127.0	13.36	5.56	20.8	536.4	15.18
AVERAGE VALUES FOR THE LAST 15 MINUTES							
13:15	211.8	156.9	13.89	5.45	30.9	609.2	15.45
13:16	191.2	125.7	13.28	5.61	21.2	560.8	15.17
13:17	197.4	126.2	13.22	5.64	21.2	567.0	15.10
13:18	206.5	127.7	12.86	5.95	20.9	584.4	14.99
13:19	225.4	135.4	12.10	6.46	19.3	563.6	14.41
13:20	247.2	138.2	11.76	6.71	18.2	563.6	14.08
13:21	255.5	137.9	11.91	6.65	18.1	582.4	14.19
13:22	262.9	138.3	11.87	6.68	17.3	568.3	14.09
13:23	269.8	138.0	11.78	6.79	16.6	569.7	14.14
13:24	277.2	145.4	11.67	6.85	16.1	559.9	13.99
13:25	276.0	137.9	12.40	6.39	16.6	599.0	14.17
13:26	258.9	130.2	13.02	5.93	18.8	651.4	14.76
13:27	252.3	127.7	13.08	5.93	18.8	649.4	14.84
13:28	246.6	125.5	13.16	5.84	19.6	672.0	15.01
13:29	244.1	123.8	13.24	5.81	19.4	656.9	14.95
13:30	243.1	122.1	13.20	5.85	19.5	670.0	15.04
AVERAGE VALUES FOR THE LAST 15 MINUTES							
13:30	243.6	132.0	12.57	6.21	18.8	601.2	14.60
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA							
13:30	294.4	139.9	11.21	7.29	141.4	800.1	15.16
13:31	240.6	121.9	13.26	5.76	19.6	670.4	15.03
13:32	240.6	120.5	13.26	5.82	19.4	675.3	15.02
13:33	239.2	119.7	13.26	5.78	20.2	684.1	15.09
13:34	238.0	117.7	13.43	5.70	19.8	677.9	15.05

Site 9 Sewage Sludge Incinerator 05-30-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2
13:35	234.9	118.2	13.33	5.79	20.6	691.3	15.16
13:36	237.3	116.6	13.41	5.69	19.8	668.0	15.07
13:37	241.1	117.8	13.17	5.93	19.9	674.9	15.09
13:38	246.2	117.7	13.19	5.86	19.7	666.0	14.94
13:39	250.5	116.6	13.27	5.87	19.7	679.1	14.93
13:40	247.3	116.1	13.51	5.66	21.6	736.1	15.29
13:41	242.4	113.9	13.82	5.44	21.8	751.0	15.33
13:42	237.1	116.0	13.81	5.49	23.8	802.9	15.52
13:43	230.5	116.0	14.12	5.13	25.2	869.0	15.63
13:44	222.2	116.8	14.19	5.17	26.7	924.4	15.76
13:45	221.2	116.5	14.08	5.19	26.8	886.3	15.74
AVERAGE VALUES FOR THE LAST 15 MINUTES							
13:45	237.9	117.5	13.54	5.62	21.6	737.1	15.24
13:46	222.4	114.7	14.22	5.07	26.6	881.9	15.76
13:47	221.7	116.9	14.12	5.15	26.9	870.6	15.79
13:48	224.7	116.1	14.13	5.14	27.0	878.4	15.76
13:49	233.3	117.3	13.66	5.58	26.5	868.8	15.61
13:50	253.9	117.4	13.16	5.96	26.4	839.5	15.24
13:51	276.9	115.3	12.75	6.30	24.9	826.1	14.96
13:52	293.7	116.1	12.48	6.47	25.3	816.6	14.74
13:53	301.3	115.9	12.51	6.46	25.1	840.6	14.66
13:54	302.9	117.1	12.32	6.61	25.5	855.4	14.71
13:55	311.0	117.6	12.28	6.66	25.4	878.3	14.60
13:56	311.2	118.2	12.25	6.67	24.8	882.2	14.63
13:57	307.0	120.3	12.78	6.30	27.9	974.9	14.80
13:58	297.4	121.0	13.25	6.00	33.4	1073.9	15.25
13:59	284.9	121.8	13.55	5.72	34.3	1062.7	15.51
14:00	273.8	123.5	13.95	5.39	36.8	1108.0	15.68
AVERAGE VALUES FOR THE LAST 15 MINUTES							
14:00	274.4	118.0	13.16	5.96	27.8	910.5	15.18
14:01	258.0	126.1	14.16	5.19	39.8	1183.0	15.95
14:02	249.1	128.9	14.40	4.97	41.6	1205.0	16.05
14:03	242.5	131.1	14.49	4.91	46.4	1342.7%	16.22
14:04	236.8	133.0	14.67	4.71	48.5	1345.7	16.30
14:05	228.2	132.5	14.89	4.54	51.2	1281.5	16.41
14:06	220.3	133.8	15.05	4.40	50.5	1167.2	16.56
14:07	209.0	131.0	15.33	4.21	50.5	1076.3	16.72
14:08	198.7	123.7	15.75	3.87	54.8	1056.4	16.90
14:09	173.4	122.5	16.38	3.38	54.4	1156.8	17.17
14:10	161.8	122.4	16.53	3.25	61.4	1376.1	17.48
14:11	147.8	114.5	16.73	3.03	68.4	1378.2	17.65
14:12	133.9	113.0	16.91	2.90	68.5	1337.6	17.79
14:13	124.6	125.0	15.95	3.49	62.2	1295.7	17.33
14:14	117.6	127.2	15.78	3.52	57.1	1316.8	16.92
14:15	109.9	131.1	15.59	3.62	57.1	1362.7	16.95
AVERAGE VALUES FOR THE LAST 15 MINUTES							
14:15	187.5	126.4	15.51	4.00	54.2	1258.8	16.83
14:16	106.0	130.8	15.43	3.69	54.1	1351.6	16.77
14:17	99.8	129.5	15.67	3.49	57.2	1388.6	16.86

Site 9 Sewage Sludge Incinerator 05-30-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2
14:18	95.2	132.0	15.62	3.57	60.4	1438.2	16.96
14:19	96.2	135.0	15.29	3.67	56.5	1416.7	16.68
14:20	93.2	134.9	15.31	3.69	58.3	1443.9	16.67
14:21	93.2	136.5	15.16	3.82	58.4	1453.1*	16.62
14:22	101.4	139.4	15.13	3.84	60.3	1480.7*	16.55
14:23	101.0	141.4	15.20	3.72	63.7	1555.0*	16.60
14:24	90.9	137.5	15.41	3.54	69.4	1586.1*	16.71
14:25	82.2	133.9	15.55	3.44	75.9	1572.8*	16.83
14:26	76.1	136.9	15.19	3.67	77.1	1575.7*	16.80
14:27	82.4	148.0	14.57	4.09	65.6	1569.2*	16.23
14:28	93.1	152.9	14.29	4.29	63.5	1583.2*	16.04
14:29	101.0	156.6	14.14	4.37	61.0	1569.0*	15.93
14:30	105.2	160.0	14.08	4.41	60.7	1583.6*	15.87
AVERAGE VALUES FOR THE LAST 15 MINUTES							
14:30	94.5	140.4	15.07	3.82	62.8	1504.5	16.54
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA							
14:30	198.6	125.5	14.32	4.85	41.6	1102.7	15.95
14:31	105.6	158.7	14.41	4.16	63.2	1635.5*	15.97
14:32	99.1	145.6	15.32	3.57	79.8	1665.0*	16.68
14:33	199.8	24.1	15.57	3.43	87.6	1581.2*	16.93
14:34	229.7	14.1	15.05	3.80	88.8	1539.7*	16.96
14:35	105.4	212.5	13.57	4.79	72.0	1516.1*	15.73
14:36	11.8	244.2	13.15	5.08	71.7	1191.9*	15.37
14:37	4.6	244.0	13.39	4.88	65.9	844.0*	15.59
14:38	3.6	234.4	12.98	5.14	29.9	1618.8*	15.47
14:39	65.1	150.8	12.73	5.18	74.1	1623.0*	15.18
14:40	102.7	150.3	12.71	5.20	75.9	1659.7*	13.07
14:41	108.2	154.3	12.34	5.50	75.0	1599.9*	13.20
14:42	120.4	156.9	11.56	6.13	71.9	1313.2*	14.40
14:43	167.1	136.3	10.01	7.51	67.9	1683.2*	13.56
14:44	241.1	128.2	9.11	8.24	69.0	1744.4*	12.74
14:45	282.0	132.5	9.18	8.24	72.5	1768.7*	12.36
AVERAGE VALUES FOR THE LAST 15 MINUTES							
14:45	123.1	152.5	12.74	5.39	71.0	1532.3	14.88
14:46	305.6	129.4	7.95	9.16	107.8	1854.8*	12.03
14:47	343.0	125.4	9.12	8.19	152.0	1875.5*	11.91
14:48	340.6	129.9	9.99	7.74	221.8	1875.5*	13.04
14:49	367.8	159.2	8.94	8.62	260.5	1875.5*	12.56
14:50	422.3	153.2	7.51	9.81	183.5	1975.5*	11.33
14:51	471.9	116.6	6.73	10.49	268.9	1875.5*	10.98
14:52	549.2	107.4	5.65	11.38	617.5	1875.5*	10.16
14:53	576.4	128.5	4.64	12.12	989.8*	1875.5*	9.36
14:54	517.1	201.6	3.58	12.86	1000.2*	1875.5*	8.62
14:55	384.4	349.2	3.18	13.11	1000.2*	1875.5*	8.28
14:56	204.4	501.9	3.12	13.14	1000.2*	1875.5*	8.18
14:57	101.2	619.4	3.50	12.74	1000.2*	1875.5*	8.27
14:58	83.3	586.5	5.07	12.15	1000.2*	1875.5*	9.26
14:59	209.1	468.8	5.01	12.43	951.1*	1875.5*	9.38
15:00	503.5	361.8	6.14	11.71	338.5	1875.5*	9.64

Site 9 Sewage Sludge Incineraor 05-30-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2
AVERAGE VALUES FOR THE LAST 15 MINUTES							
15:00	358.7	275.3	6.01	11.04	606.2	1874.1	10.20
15:01	611.0	313.1	7.80	10.57	172.9	1850.7*	11.03
15:02	627.5	282.6	8.27	10.25	142.3	1760.5*	11.38
15:03	605.4	271.0	8.93	9.74	124.2	1696.5*	11.75
15:04	552.1	260.2	9.59	9.20	99.7	1386.3*	12.19
15:05	479.3	248.0	10.81	8.24	81.2	823.8	13.04
15:06	403.4	249.2	11.62	7.58	69.4	568.2	13.77
15:07	357.8	255.9	10.98	7.92	59.4	527.6	13.63
15:08	332.5	247.2	11.76	7.18	51.8	513.6	13.75
15:09	287.8	240.8	12.20	6.79	45.6	536.6	14.35
15:10	262.5	235.3	12.48	6.54	40.3	511.7	14.42
15:11	241.2	226.3	12.49	6.47	36.1	513.9	14.69
15:12	222.8	213.8	12.89	6.13	33.4	524.5	14.78
15:13	207.5	207.7	13.11	5.96	31.3	543.2	15.09
15:14	196.1	203.7	13.32	5.75	30.6	600.3	15.21
15:15	188.4	191.3	13.72	5.43	30.3	643.7	15.39
AVERAGE VALUES FOR THE LAST 15 MINUTES							
15:15	371.7	243.1	11.33	7.58	69.9	868.4	13.63
15:16	174.3	175.6	14.47	4.90	32.1	711.3	16.00
15:17	166.1	169.9	14.60	4.80	32.4	739.2	16.13
15:18	170.9	173.5	13.15	5.89	29.5	593.9	15.52
15:19	187.8	186.2	13.16	5.85	27.6	529.1	15.12
15:20	197.2	183.9	12.87	6.10	26.9	517.3	15.03
15:21	199.1	180.4	12.92	6.05	26.6	530.5	15.01
15:22	201.3	178.0	12.92	6.08	25.8	515.4	14.95
15:23	208.4	177.2	12.76	6.21	26.3	516.7	14.93
15:24	209.7	174.9	12.79	6.16	25.7	512.5	14.88
15:25	214.8	173.2	12.59	6.34	25.9	512.7	14.79
15:26	223.4	172.3	12.26	6.56	25.3	487.4	14.66
15:27	235.3	168.8	12.00	6.75	25.1	461.1	14.38
15:28	252.8	167.3	11.10	7.53	24.2	492.1	14.02
15:29	272.3	164.8	11.04	7.51	23.5	494.7	13.66
15:30	279.0	165.5	10.76	7.85	24.0	522.2	13.64
AVERAGE VALUES FOR THE LAST 15 MINUTES							
15:30	212.8	160.1	12.63	6.31	26.7	542.4	14.85
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA							
15:30	266.6	207.7	10.68	7.58	193.5	1204.3	13.39
15:31	294.5	156.3	10.44	8.06	20.5	524.1	13.43
15:32	307.3	154.4	10.19	8.36	59.8	542.8	13.24
15:33	325.5	153.6	9.63	8.77	73.2	587.3	13.02
15:34	348.4	154.7	9.38	9.00	21.2	636.0	12.65
15:35	365.3	158.8	8.92	9.34	19.2	706.8	12.54
15:36	384.4	167.3	8.83	9.41	18.9	778.4	12.25
15:37	396.4	171.9	8.57	9.66	18.6	827.6	12.25
15:38	396.1	186.3	8.95	9.31	17.2	665.2	12.21
15:39	392.4	192.6	8.73	9.57	15.8	585.4	12.23

Site 9 Sewage Sludge Incineracr 05-30-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2
15:40	408.4	196.6	8.57	9.69	15.0	605.0	12.09
15:41	409.0	204.1	9.23	9.16	14.9	533.6	12.16
15:42	378.5	216.9	9.50	9.03	14.7	478.4	12.55
15:43	379.0	226.4	9.32	9.17	13.8	454.4	12.39
15:44	373.2	227.7	9.62	8.87	13.7	453.7	12.61
15:45	351.8	227.0	10.11	8.47	13.4	444.4	12.86
AVERAGE VALUES FOR THE LAST 15 MINUTES							
15:45	367.3	186.3	9.33	9.06	30.0	588.2	12.57
15:46	332.6	226.6	10.24	8.38	13.0	443.8	13.19
15:47	324.3	221.5	10.51	8.10	12.9	441.3	13.26
15:48	314.0	216.3	10.67	7.98	12.8	444.5	13.39
15:49	304.7	214.8	10.84	7.79	12.9	458.7	13.58
15:50	295.2	208.9	11.12	7.58	12.6	456.0	13.67
15:51	285.6	210.1	11.11	7.59	12.5	454.3	13.81
15:52	284.1	202.1	11.30	7.36	12.8	459.3	13.76
15:53	275.8	204.0	11.43	7.28	12.8	462.2	14.01
15:54	267.6	200.1	11.61	7.08	12.9	468.5	14.08
15:55	263.4	200.7	11.64	7.08	12.8	466.4	14.16
15:56	263.4	198.6	11.70	6.97	12.7	467.3	14.19
15:57	256.9	194.5	11.91	6.77	12.6	470.9	14.25
15:58	248.6	189.5	12.17	6.56	13.1	484.2	14.48
15:59	237.0	184.1	12.38	6.41	13.3	492.5	14.58
16:00	231.4	180.7	12.52	6.29	13.5	503.7	14.73
AVERAGE VALUES FOR THE LAST 15 MINUTES							
16:00	279.0	203.5	11.41	7.28	12.9	464.9	13.94
16:01	219.7	171.1	12.83	6.02	14.1	530.9	14.89
16:02	211.3	167.7	13.06	5.85	15.0	586.7	15.05
16:03	202.2	161.2	13.14	5.77	15.7	646.2	15.18
16:04	200.6	154.3	13.19	5.72	16.3	633.6	15.15
16:05	201.2	150.9	13.09	5.77	16.2	636.1	15.17
16:06	204.6	146.0	13.06	5.80	17.0	635.6	15.08
16:07	208.4	146.3	12.90	5.95	16.9	633.6	15.02
16:08	213.6	144.9	12.86	5.95	17.2	621.5	14.99
16:09	219.3	143.4	13.02	5.89	17.9	640.3	14.96
16:10	224.2	147.3	12.56	6.27	18.0	647.6	14.88
16:11	238.3	146.1	12.26	6.44	17.1	607.4	14.48
16:12	248.5	146.2	12.02	6.65	17.2	609.1	14.33
16:13	254.7	146.6	11.87	6.73	17.0	603.1	14.20
16:14	263.3	148.4	11.68	6.96	16.8	606.7	14.04
16:15	277.6	153.3	11.26	7.26	16.8	602.3	13.86
AVERAGE VALUES FOR THE LAST 15 MINUTES							
16:15	225.8	151.6	12.59	6.20	16.6	616.0	14.75
16:16	289.0	153.1	11.36	7.25	16.3	594.3	13.70
16:17	294.0	154.6	11.04	7.55	16.6	601.9	13.73
16:18	304.4	156.5	10.95	7.57	15.9	583.2	13.48
16:19	313.2	160.7	10.68	7.89	15.6	585.2	13.42
16:20	325.1	161.3	10.46	8.04	15.6	585.4	13.27
16:21	340.2	165.3	10.25	8.30	15.2	598.4	13.06
16:22	351.9	168.0	9.94	8.53	15.2	614.9	12.98

Site 9 Sewage Sludge Incineraor 05-30-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2
16:23	360.6	174.9	9.76	8.73	14.7	579.3	12.80
16:24	400.6	187.2	8.04	9.92	14.4	542.2	11.91
16:25	447.7	201.2	8.21	9.75	15.4	560.2	11.38
16:26	431.5	224.7	8.52	9.60	13.4	416.4	11.88
16:27	444.2	237.8	7.90	10.05	12.5	392.1	11.49
16:28	448.8	233.0	8.73	9.44	12.2	373.4	11.79
16:29	431.5	237.3	8.98	9.27	12.2	365.2	11.95
16:30	426.1	229.4	8.88	9.35	11.7	346.0	12.10
AVERAGE VALUES FOR THE LAST 15 MINUTES							
16:30	374.1	189.7	9.58	8.75	14.5	515.9	12.59
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA							
16:30	311.6	182.8	10.73	7.82	18.5	546.3	13.46
16:31	433.2	224.1	8.90	9.28	11.7	337.9	12.09
16:32	449.6	222.7	9.25	9.02	11.7	328.7	12.14
16:33	435.2	224.0	9.54	8.77	11.3	324.2	12.51
16:34	403.7	208.6	10.91	7.62	12.3	371.7	13.02
16:35	334.3	202.5	11.79	7.01	14.5	459.6	14.22
16:36	311.2	208.6	11.22	7.29	12.9	381.0	13.70
16:37	302.9	206.2	11.58	7.02	12.9	402.6	13.82
16:38	286.8	202.2	11.71	6.85	12.9	410.3	14.09
16:39	275.2	194.4	12.02	6.61	13.4	434.0	14.13
16:40	266.0	194.8	11.89	6.71	13.1	433.0	14.31
16:41	267.2	205.8	11.50	6.98	12.3	399.1	13.97
16:42	279.3	211.3	11.55	7.00	11.7	391.9	13.91
16:43	272.9	205.3	11.79	6.70	11.8	395.7	14.09
16:44	264.9	204.1	11.96	6.61	12.3	420.2	14.19
16:45	254.9	201.2	11.97	6.57	11.9	421.3	14.35
AVERAGE VALUES FOR THE LAST 15 MINUTES							
16:45	322.5	207.7	11.17	7.33	12.4	394.1	13.64
16:46	250.1	197.1	12.14	6.42	12.4	435.1	14.31
16:47	244.8	196.3	12.08	6.48	12.4	449.8	14.47
16:48	242.0	193.3	12.22	6.35	12.6	457.2	14.37
16:49	241.8	195.3	12.16	6.47	12.7	474.0	14.46
16:50	241.4	193.4	12.12	6.43	12.3	466.7	14.43
16:51	243.4	197.6	12.03	6.56	12.8	464.7	14.31
16:52	251.9	201.2	11.68	6.80	12.3	453.5	14.26
16:53	256.3	198.0	11.91	6.62	12.3	463.8	14.11
16:54	256.9	204.6	11.59	6.91	12.1	462.9	14.19
16:55	267.3	205.4	11.48	6.97	12.0	442.2	13.90
16:56	279.2	216.8	10.86	7.58	11.4	416.2	13.68
16:57	301.5	225.7	10.30	7.90	10.9	366.0	13.24
16:58	316.6	228.5	10.35	7.99	11.0	364.7	13.10
16:59	323.9	229.7	10.19	8.09	10.7	356.8	13.16
17:00	326.2	229.5	10.53	7.74	10.9	366.7	13.07
AVERAGE VALUES FOR THE LAST 15 MINUTES							
17:00	269.5	207.5	11.44	7.02	11.9	429.3	13.94
17:01	311.7	223.0	10.79	7.65	11.5	398.2	13.58

Site 9 Sewage Sludge Incinerator 05-30-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2
17:02	310.9	218.7	10.94	7.49	11.5	390.0	13.43
17:03	311.0	221.1	10.76	7.73	11.6	392.9	13.51
17:04	320.4	222.8	10.54	7.82	11.4	375.1	13.36
17:05	328.9	224.6	10.59	7.85	11.1	368.6	13.18
17:06	336.7	231.1	10.38	8.02	11.1	362.7	13.34
17:07	334.3	229.0	10.57	7.83	11.3	362.2	13.21
17:08	335.3	231.5	10.44	8.00	11.4	362.0	13.30
17:09	328.6	223.8	11.04	7.41	11.3	373.2	13.40
17:10	297.7	211.0	11.87	6.80	12.5	448.4	14.11
17:11	276.5	207.3	11.84	6.77	12.3	449.3	14.27
17:12	275.6	207.3	11.78	6.89	12.5	456.0	14.12
17:13	281.6	209.3	11.50	7.09	12.1	435.5	14.09
17:14	287.8	206.7	11.66	6.95	12.3	443.8	13.97
17:15	260.3	204.4	11.74	6.93	12.3	453.6	14.13
AVERAGE VALUES FOR THE LAST 15 MINUTES							
17:15	307.4	218.1	11.10	7.42	11.7	404.8	13.67
17:16	275.3	202.1	11.78	6.85	12.3	458.6	14.13
17:17	277.9	203.5	11.71	7.00	12.3	470.6	14.11
17:18	277.8	201.7	11.64	6.94	12.3	461.6	14.13
17:19	275.4	199.5	11.85	6.81	12.5	473.8	14.09
17:20	272.8	202.8	11.60	7.01	12.3	462.4	14.17
17:21	279.7	200.0	11.59	7.02	12.2	451.6	13.91
17:22	287.3	208.1	11.26	7.36	11.9	447.3	13.91
17:23	299.1	208.9	11.13	7.42	11.7	421.2	13.72
17:24	308.6	212.0	11.05	7.56	11.7	427.2	13.67
17:25	306.7	208.1	11.17	7.41	11.7	418.3	13.76
17:26	298.7	204.1	11.50	7.12	11.9	434.4	13.84
17:27	287.4	204.9	11.47	7.12	12.2	441.6	14.03
17:28	282.6	200.3	11.68	6.95	12.3	456.1	13.99
17:29	289.3	213.5	10.74	7.83	11.6	419.5	13.76
17:30	313.0	215.9	10.47	7.94	11.0	377.4	13.16
AVERAGE VALUES FOR THE LAST 15 MINUTES							
17:30	288.8	205.7	11.38	7.22	12.0	441.4	13.89
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA							
17:30	297.1	209.8	11.27	7.25	12.0	417.4	13.78
17:31	331.4	223.4	10.32	8.06	11.1	384.4	13.11
17:32	313.5	200.1	11.78	6.86	12.6	513.2	13.75
17:33	257.8	165.1	13.58	5.59	17.3	721.7	15.24
17:34	229.0	153.2	13.81	5.42	18.7	779.0	15.77
17:35	220.7	141.5	14.03	5.16	20.3	803.0	15.70
17:36	217.9	136.1	14.06	5.26	21.0	814.6	15.85
17:37	218.5	131.9	14.00	5.26	21.6	816.8	15.83
17:38	222.8	129.6	14.06	5.22	22.0	839.6	15.73
17:39	224.5	131.6	13.92	5.40	23.3	895.5	15.82
17:40	230.0	129.3	13.91	5.27	23.1	894.2	15.64
17:41	233.8	127.0	13.68	5.57	23.9	900.8	15.72
17:42	246.9	115.0	12.30	6.42	24.4	760.1	15.11
17:43	275.5	104.5	12.04	6.57	24.8	685.6	14.41
17:44	295.2	104.3	11.38	7.11	25.6	669.2	14.32

Site 9 Sewage Sludge Incinerator 05-30-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2
17:45	320.4	105.7	11.05	7.41	29.9	717.9	13.95
AVERAGE VALUES FOR THE LAST 15 MINUTES							
17:45	255.9	139.9	12.93	6.04	21.3	746.4	15.06
17:46	346.6	112.9	11.16	7.49	26.1	681.1	13.91
17:47	344.5	117.2	11.96	6.88	23.4	618.7	14.26
17:48	334.0	114.7	12.02	6.93	23.0	621.1	14.36
17:49	335.6	116.7	11.74	7.08	23.1	622.1	14.37
17:50	344.6	116.1	11.75	7.15	22.8	608.3	14.22
17:51	350.6	115.8	11.46	7.38	23.4	612.3	14.17
17:52	357.8	125.4	12.12	6.95	22.7	620.2	14.40
17:53	360.1	119.0	12.09	7.12	23.2	633.8	14.61
17:54	370.0	122.1	12.01	7.13	22.9	630.1	14.59
17:55	368.0	118.8	12.27	6.94	23.1	621.8	14.61
17:56	358.7	120.2	12.44	6.79	25.1	654.4	14.84
17:57	347.4	117.3	12.85	6.56	26.0	654.2	14.91
17:58	342.1	117.2	12.72	6.60	26.9	679.5	15.00
17:59	338.0	116.2	12.78	6.40	27.2	691.3	15.07
18:00	329.6	114.3	13.17	6.29	27.9	704.9	15.26
AVERAGE VALUES FOR THE LAST 15 MINUTES							
18:00	348.5	117.6	12.17	6.91	24.5	643.6	14.57
18:01	323.3	113.8	13.12	6.32	27.8	717.4	15.29
18:02	329.7	112.3	12.85	6.41	28.2	722.7	15.19
18:03	331.3	114.5	13.21	6.28	29.7	787.0	15.24
18:04	329.3	114.5	12.93	6.43	31.2	821.0	15.29
18:05	332.4	113.7	13.05	6.33	30.7	819.5	15.21
18:06	335.4	114.5	12.97	6.34	32.3	858.5	15.25
18:07	337.1	113.2	12.96	6.43	32.9	864.7	15.21
18:08	344.6	114.5	13.01	6.45	32.9	906.4	15.12
18:09	352.0	128.5	12.55	6.58	35.1	1026.5	14.97
18:10	342.3	142.7	12.95	6.35	40.8	1388.4#	15.05
18:11	335.1	146.0	13.07	6.34	44.4	1451.3#	15.13
18:12	329.0	148.3	13.11	6.23	45.3	1499.5#	15.18
18:13	321.5	150.4	13.25	6.11	50.0	1541.2#	15.31
18:14	315.7	150.9	13.38	5.96	55.8	1561.9#	15.45
18:15	307.1	150.6	13.81	5.68	60.8	1574.8#	15.55
AVERAGE VALUES FOR THE LAST 15 MINUTES							
18:15	331.0	128.6	13.08	6.28	38.5	1102.7	15.23
18:16	285.9	147.4	14.29	5.15	67.4	1562.6#	15.93
18:17	262.9	147.6	15.17	4.57	70.2	1577.8#	16.30
18:18	241.0	145.6	15.36	4.25	77.3	1577.9#	16.65
18:19	226.5	142.0	15.68	4.03	80.5	1537.5#	16.84
18:20	218.7	137.4	15.89	3.83	80.1	1499.9#	17.02
18:21	209.3	132.0	16.06	3.74	81.5	1517.3#	17.11
18:22	203.4	127.4	16.29	3.53	81.3	1519.4#	17.21
18:23	198.8	124.6	16.27	3.55	84.4	1596.0#	17.31
18:24	197.2	119.1	16.37	3.47	88.1	1638.3#	17.31
18:25	195.2	114.7	16.34	3.48	92.5	1653.8#	17.42
18:26	200.4	126.8	15.20	4.15	116.6	1832.9#	16.77
18:27	226.3	131.3	15.11	4.13	129.9	1869.0#	16.26

Site 9 Sewage Sludge Incinerator 05-30-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2
18:28	219.2	123.4	16.20	3.53	99.4	1755.4*	17.06
18:29	203.5	127.1	15.33	4.13	115.8	1821.4*	16.92
18:30	242.6	142.6	14.10	5.03	142.9	1875.5*	15.89
AVERAGE VALUES FOR THE LAST 15 MINUTES							
18:30	222.1	132.6	15.58	4.04	93.9	1655.6	16.80
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA							
18:30	289.4	129.7	13.44	5.82	44.5	1037.1	15.42
18:31	281.6	150.5	13.51	5.50	186.9	1875.5*	15.39
18:32	309.4	158.4	12.82	6.02	187.3	1875.5*	15.09
18:33	341.7	168.2	11.31	7.09	202.7	1875.5*	13.96
18:34	374.1	171.8	12.04*	7.72	268.8	1875.5*	13.48
18:35	414.8	174.1	9.92	8.35	320.9	1875.5*	12.90
18:36	454.6	177.0	9.09	8.99	426.1	1875.5*	12.47
18:37	473.9	191.7	10.54	7.88	385.3	1875.5*	12.60
18:38	417.2	183.9	12.56	6.39	147.1	1852.5*	14.53
18:39	353.3	165.5	13.41	5.80	129.1	1851.1*	14.93
18:40	316.3	159.5	14.33	5.12	105.7	1802.1*	15.71
18:41	286.8	153.3	14.67	4.85	90.2	1709.5*	16.03
18:42	266.9	152.6	14.84	4.77	87.8	1724.8*	16.25
18:43	256.9	165.4	14.02	5.29	77.7	1599.6*	15.78
18:44	252.3	168.7	13.90	5.28	69.2	1531.5*	15.54
18:45	243.9	168.8	14.05	5.20	69.8	1579.4*	15.61
AVERAGE VALUES FOR THE LAST 15 MINUTES							
18:45	336.2	167.3	12.73	6.28	183.6	1785.3	14.69
18:46	240.0	170.3	13.98	5.22	68.7	1596.0*	15.70
18:47	243.0	170.0	13.91	5.29	64.9	1514.5*	15.56
18:48	240.4	170.3	14.07	5.19	65.6	1546.3*	15.63
18:49	236.3	169.4	14.02	5.20	65.9	1543.6*	15.74
18:50	239.2	167.9	13.92	5.33	64.2	1499.9*	15.59
18:51	250.6	170.4	13.49	5.71	61.1	1525.2*	15.40

COMMENTS: End of Run 2 - 16:45-18:45 5/30/90

Site 9 Sewage Sludge Incinerator Emissions Test
Averages of CEM Measurement Data

Run # 2 Run Type: MMtl/Ni
Run Time: 12:30 - 16:45, 17:15 - 18:45

	--- Furnace Outlet Location ---				--- Stack Location ---		
	SO2 (ppm,vd)	NOx (ppm,vd)	O2 (%,vd)	CO2 (%,vd)	THC (ppm,vd)	CO (ppm,vd)	O2 (%,vd)
Average:	284.9	162.3	12.00	6.77	40.7	647.9	14.51

NOTE - THC and CO averages are biased low because of the omission of data from periods when the analyzer ranges were exceeded, making it impossible to accurately measure the concentration levels.

Data not included in averages

Species	Period	Reason for omission
SO2	14:30 - 14:45	Calibration Check
NOx	14:30 - 14:45	Calibration Check
O2	14:30 - 14:45	Calibration Check
CO2	14:30 - 14:45	Calibration Check
THC	12:30 - 13:00	Lost power to sample pump
	14:30 - 14:45	Calibration Check
	14:45 - 15:00	Analyzer range exceeded
CO	12:30 - 13:00	Lost power to sample pump
	14:15 - 14:30	Analyzer range exceeded
	14:30 - 14:45	Calibration Check
	14:45 - 15:15	Analyzer range exceeded
O2	12:30 - 13:00	Lost power to sample pump
	14:30 - 14:45	Calibration Check

Site 9 Sewage Sludge Incinerator Emissions Test
Averages of CEM Measurement Data

Run # 2 Run Type: MMtl/Ni
Date 5/30/90 Run Time: 12:30 - 16:45, 17:15 - 18:45

	--- Furnace Outlet Location ---				--- Stack Location ---		
	SO2 (ppm,vd)	NOx (ppm,vd)	O2 (%,vd)	CO2 (%,vd)	THC (ppm,vd)	CO (ppm,vd)	O2 (%,vd)
Average:	284.9	162.3	12.00	6.77	40.7	647.9	14.51

NOTE - THC and CO averages are biased low because of the omission of data from periods when the analyzer ranges were exceeded, making it impossible to accurately measure the concentration levels.

Data not included in averages

Species	Period	Reason for omission
SO2	14:30 - 14:45	Calibration Check
NOx	14:30 - 14:45	Calibration Check
O2	14:30 - 14:45	Calibration Check
CO2	14:30 - 14:45	Calibration Check
THC	12:30 - 13:00	Lost power to sample pump
	14:30 - 14:45	Calibration Check
	14:45 - 15:00	Analyzer range exceeded
CO	12:30 - 13:00	Lost power to sample pump
	14:15 - 14:30	Analyzer range exceeded
	14:30 - 14:45	Calibration Check
	14:45 - 15:15	Analyzer range exceeded
O2	12:30 - 13:00	Lost power to sample pump
	14:30 - 14:45	Calibration Check

Site 9 Sewage Sludge Incinerator Emissions Test
Averages of CEM Measurement Data

Run # 7V2 Run Type: VOST
Date 5/30/90 Run Time: 16:45 - 17:45

	--- Furnace Outlet Location ---				--- Stack Location ---		
	SO2 (ppm,vd)	NOx (ppm,vd)	O2 (%,vd)	CO2 (%,vd)	THC (ppm,vd)	CO (ppm,vd)	O2 (%,vd)
Average:	280.4	192.8	46.85	6.93	14.2	505.5	14.14

Site 9 Sewage Sludge Incinerator Emissions Test
Averages of CEM Measurement Data

Run # 7V1 Run Type: VOST
Date 5/30/90 Run Time: 20:15 - 21:15

	--- Stack Location ---		
	THC (ppm,vd)	CO (ppm,vd)	O2 (%,vd)
Average:	61.3	1155.6	15.46

NOTE - THC and CO averages are biased low because of the omission of data from periods when the analyzer ranges were exceeded, making it impossible to accurately measure the concentration levels.

Data not included in averages

Species	Period	Reason for omission
THC	20:15 - 20:45	Analyzer range exceeded
CO	20:15 - 21:00	Analyzer range exceeded

Site 9 Sewage Sludge Incinerator Emissions Test
Averages of CEM Measurement Data

Run # 14 Run Type: EMSL Cr
Date 5/31/90 Run Time: 10:00 - 12:00

	--- Furnace Outlet Location ---				--- Stack Location ---		
	SO2 (ppm,vd)	NOx (ppm,vd)	O2 (%,vd)	CO2 (%,vd)	THC (ppm,vd)	CO (ppm,vd)	O2 (%,vd)
Average:	188.6	140.9	14.44	4.98	51.6	1054.3	15.57

NOTE - CO averages are biased low because of the omission of data from periods when the analyzer ranges were exceeded, making it impossible to accurately measure the concentration levels.

Data not included in averages

Species	Period	Reason for omission
SO2	11:26 - 11:29	Lost power to dilution system
THC	11:16 - 11:17	Probe pulled out of stack
	14:30 - 14:45	Lost power to sample pump
CO	10:16 - 10:30	Analyzer range exceeded
	10:46 - 12:00	Analyzer range exceeded
O2	11:16 - 11:17	Probe pulled out of stack
	14:30 - 14:45	Lost power to sample pump

Site 9 Sewage Sludge Incinerator Emissions Test
Averages of CEM Measurement Data

Run # 15 Run Type: EMSL Cr
Date 5/31/90 Run Time: 16:45 - 18:45

	--- Furnace Outlet Location ---				--- Stack Location ---		
	SO2 (ppm,vd)	NOx (ppm,vd)	O2 (%,vd)	CO2 (%,vd)	THC (ppm,vd)	CO (ppm,vd)	O2 (%,vd)
Average:	247.0	152.6	13.65	5.54	53.9	980.5	15.26

NOTE - CO averages are biased low because of the omission of data from periods when the analyzer ranges were exceeded, making it impossible to accurately measure the concentration levels.

Data not included in averages

Species	Period	Reason for omission
SO2	16:59 - 17:08	Changed sample pump
	17:45 - 17:46	Lost power
NOx	16:59 - 17:08	Changed sample pump
	17:45 - 17:46	Lost power
O2	16:59 - 17:08	Changed sample pump
	17:45 - 17:46	Lost power
CO2	16:59 - 17:08	Changed sample pump
	17:45 - 17:46	Lost power
THC	17:25 - 17:36	Sample flow problem
CO	16:45 - 17:47	Analyzer range exceeded
	17:54 - 17:58	Analyzer range exceeded
O2	17:25 - 17:36	Sample flow problem

Site 9 Sewage Sludge Incinerator Emissions Test
Averages of CEM Measurement Data

Run # 3 Run Type: Cr+6
Date 6/2/90 Run Time: 18:41 - 21:45

	--- Furnace Outlet Location ---				--- Stack Location ---		
	SO2 (ppm,vd)	NOx (ppm,vd)	O2 (%,vd)	CO2 (%,vd)	THC (ppm,vd)	CO (ppm,vd)	O2 (%,vd)
Average:	245.7	121.9	14.10	5.39	38.6	1026.4	15.72

NOTE - CO averages are biased slightly low because of the omission of data from periods when the analyzer ranges were exceeded, making it impossible to accurately measure the concentration levels.

Data not included in averages

Species	Period	Reason for omission
SO2	19:11 - 19:30	Sample flow problem
NOx	19:11 - 19:30	Sample flow problem
O2	19:11 - 19:30	Sample flow problem
CO2	19:11 - 19:30	Sample flow problem
CO	19:05 - 19:09	Analyzer range exceeded

Site 9 Sewage Sludge Incinerator Emissions Test
Averages of CEM Measurement Data

Run # 5 Run Type: Cr+6
Date 6/3/90 Run Time: 14:54 - 17:00

	--- Furnace Outlet Location ---				--- Stack Location ---		
	SO2 (ppm,vd)	NOx (ppm,vd)	O2 (%,vd)	CO2 (%,vd)	THC (ppm,vd)	CO (ppm,vd)	O2 (%,vd)
Average:	315.0	184.5	11.24	7.17	141.0	1338.4	13.71

NOTE - THC and CO averages are biased low because of the omission of data from periods when the analyzer ranges were exceeded, making it impossible to accurately measure the concentration levels. Only 31 minutes of valid CO data were obtained during this run.

Data not included in averages

Species	Period	Reason for omission
THC	15:25 - 15:27	Analyzer range exceeded
	15:32 - 15:37	Analyzer range exceeded
CO	14:55 - 15:00	Analyzer range exceeded
	15:02 - 15:03	Analyzer range exceeded
	15:12 - 15:39	Analyzer range exceeded
	15:41 - 15:50	Analyzer range exceeded
	16:00 - 16:09	Analyzer range exceeded
	16:11 - 16:49	Analyzer range exceeded

Site 9 Sewage Sludge Incinerator Emissions Test
Averages of CEM Measurement Data

Run # 4 Run Type: MMtl/Ni
Date 6/4/90 Run Time: 12:00 - 12:07, 12:10 - 13:22

	--- Furnace Outlet Location ---				--- Stack Location ---			
	SO2 (ppm,vd)	NOx (ppm,vd)	O2 (%,vd)	CO2 (%,vd)	THC (ppm,vd)	CO (ppm,vd)	O2 (%,vd)	CO2 (%,vd)
Average:	205.8	157.1	14.10	4.94	102.3	1147.3	15.70	3.57

NOTE - THC and CO averages are biased low because of the omission of data from periods when the analyzer ranges were exceeded, making it impossible to accurately measure the concentration levels.
Only 77 minutes of valid CO data were obtained during this run.
Only 38 minutes of valid CO data were obtained during this run.

No data was collected for the minutes ending at 12:08 and 12:09.

Data not included in averages

Species	Period	Reason for omission
THC	12:29 - 12:31	Analyzer range exceeded
CO	12:00 - 12:34	Analyzer range exceeded
	12:45 - 12:49	Analyzer range exceeded
	12:53 - 12:54	Analyzer range exceeded
	13:20 - 13:22	Analyzer range exceeded

Site 9 Sewage Sludge Incinerator Emissions Test
Averages of CEM Measurement Data

Run # 7A Run Type: MM5
Date 6/4/90 Run Time: 17:15 - 19:15

	--- Furnace Outlet Location ---				------ Stack Location ------			
	SO2 (ppm,vd)	NOx (ppm,vd)	O2 (%,vd)	CO2 (%,vd)	THC (ppm,vd)	CO (ppm,vd)	O2 (%,vd)	CO2 (%,vd)
Average:	294.9	195.7	13.38	5.98	91.1	1195.3	15.22	4.48

NOTE - CO averages are biased low because of the omission of data from periods when the analyzer range was exceeded, making it impossible to accurately measure the concentration levels. Only 16 minutes of valid CO data were obtained during this run.

Data not included in averages

Species	Period	Reason for omission
CO	17:16 - 18:36	Analyzer range exceeded
	18:42 - 18:43	Analyzer range exceeded
	18:55 - 19:15	Analyzer range exceeded

Site 9 Sewage Sludge Incinerator Emissions Test
Averages of CEM Measurement Data

Run # 8 Run Type: Cr+6
Date 6/5/90 Run Time: 12:15 - 14:30

	--- Furnace Outlet Location ---				--- Stack Location ---		
	SO2 (ppm,vd)	NOx (ppm,vd)	O2 (%,vd)	CO2 (%,vd)	THC (ppm,vd)	CO (ppm,vd)	CO2 (%,vd)
Average:	262.4	211.2	10.17	7.90	7.7	304.1	5.82

Site 9 Sewage Sludge Incinerator Emissions Test
Averages of CEM Measurement Data

Run # 9 Run Type: MMtl/Ni
Date 6/5/90 Run Time: 18:45 - 21:00

	--- Furnace Outlet Location ---				--- Stack Location ---		
	SO2 (ppm,vd)	NOx (ppm,vd)	O2 (%,vd)	CO2 (%,vd)	THC (ppm,vd)	CO (ppm,vd)	CO2 (%,vd)
Average:	251.3	213.7	10.61	7.69	6.5	307.3	5.82

Data not included in averages

Species	Period	Reason for omission
Furnace Outlet Location		
SO2	19:41 - 20:18	Sample flow problem
NOx	19:41 - 20:18	Sample flow problem
O2	19:41 - 20:18	Sample flow problem
CO2	19:41 - 20:18	Sample flow problem

Site 9 Sewage Sludge Incinerator Emissions Test
Averages of CEM Measurement Data

Run # 7C Run Type: MM5
Date 6/6/90 Run Time: 8:30 - 10:15

	--- Furnace Outlet Location ---				--- Stack Location ---		
	SO2 (ppm,vd)	NOx (ppm,vd)	O2 (%,vd)	CO2 (%,vd)	THC (ppm,vd)	CO (ppm,vd)	CO2 (%,vd)
Average:	250.9	212.5	10.87	7.33	6.6	365.4	5.85

Data not included in averages

Species	Period	Reason for omission
Furnace Outlet Location		
SO2	8:31 - 8:34	Probe not in stack
NOx	8:31 - 8:34	Probe not in stack
O2	8:31 - 8:34	Probe not in stack
CO2	8:31 - 8:34	Probe not in stack

Site 9 Sewage Sludge Incinerator Emissions Test
Averages of CEM Measurement Data

Run # 10 Run Type: Cr+6
Date 6/6/90 Run Time: 11:30 - 13:30

	--- Furnace Outlet Location ---				--- Stack Location ---		
	SO2 (ppm,vd)	NOx (ppm,vd)	O2 (%,vd)	CO2 (%,vd)	THC (ppm,vd)	CO (ppm,vd)	CO2 (%,vd)
Average:	258.4	214.1	10.78	7.48	7.0	368.0	5.65

Site 9 Sewage Sludge Incinerator Emissions Test
Averages of CEM Measurement Data

Run # 11 Run Type: MMtl/Ni
Date 6/6/90 Run Time: 15:45 - 17:45

	--- Furnace Outlet Location ---				--- Stack Location ---		
	SO2 (ppm,vd)	NOx (ppm,vd)	O2 (%,vd)	CO2 (%,vd)	THC (ppm,vd)	CO (ppm,vd)	CO2 (%,vd)
Average:	287.9	212.8	10.76	7.43	7.5	372.3	5.66

Site 9 Sewage Sludge Incinerator Emissions Test
Averages of CEM Measurement Data

Run # 12 Run Type: MMtl/Ni
Date 6/7/90 Run Time: 10:15 - 12:15

	--- Furnace Outlet Location ---				--- Stack Location ---		
	SO2 (ppm,vd)	NOx (ppm,vd)	O2 (%,vd)	CO2 (%,vd)	THC (ppm,vd)	CO (ppm,vd)	CO2 (%,vd)
Average:	262.6	241.1	9.97	8.20	5.7	303.3	5.88

Data not included in averages

Species	Period	Reason for omission
NOx	10:46 - 10:50, 10:56 - 11:00, 11:06 - 11:10, 11:16 - 11:20, 11:26 - 11:30, 11:36 - 11:40	Analyzer switched to measure NO only

Site 9 Sewage Sludge Incinerator Emissions Test
Averages of CEM Measurement Data

Run # 13 Run Type: MMtl/Ni
Date 6/7/90 Run Time: 16:00 - 18:00

	--- Furnace Outlet Location ---				--- Stack Location ---		
	SO2 (ppm,vd)	NOx (ppm,vd)	O2 (%,vd)	CO2 (%,vd)	THC (ppm,vd)	CO (ppm,vd)	CO2 (%,vd)
Average:	323.5	178.5	9.64	8.53	4.9	251.3	6.01

CONTINUOUS EMISSIONS MONITORING SET-UP

SOURCE: Site 9 Sewage Sludge Incineraor

DATE: 05-29-1990 TIME: 12:34

A/D CHAN	DESCRIP	UNITS	SPAN	INPUT VOLTAGE	ZERO OFFSET
6	BOILER	ppmSO2	400	10.00 V	0%
7	BOILER	ppmNOx	1000	10.00 V	0%
8	BOILER	% O2	25	1.00 V	0%
9	BOILER	% CO2	20	1.00 V	0%
1	STACK	ppmTHC	1000	10.00 V	0%
2	STACK	ppm CO	1500	1.00 V	0%
3	STACK	% O2	25	1.00 V	0%

AVERAGING PERIODS: 10 MINUTES, ONE HOUR,
NO EMISSION RATE CALCULATIONS

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Initial direct cal - 5/29/90

DATE : 05-29-1990 TIME: 13:05 - 14:07

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	0.8
6	BOILER	ppmSO2	218.0	217.5
6	BOILER	ppmSO2	361.4	360.8
7	BOILER	ppmNOx	0.0	0.4
7	BOILER	ppmNOx	240.0	240.2
7	BOILER	ppmNOx	475.0	478.2
8	BOILER	% O2	0.00	0.08
8	BOILER	% O2	12.50	12.50
8	BOILER	% O2	20.60	20.65
10	BOILER	% CO2	0.00	0.01
10	BOILER	% CO2	11.02	10.93
10	BOILER	% CO2	17.46	17.67
1	STACK	ppmTHC	0.0	0.8
2	STACK	ppm CO	0.0	0.9
2	STACK	ppm CO	457.5	456.1
2	STACK	ppm CO	1263.0	1292.7
3	STACK	% O2	0.00	0.12
3	STACK	% O2	12.50	12.50
3	STACK	% O2	20.60	20.59

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Continuation of THC initial direct cal

DATE : 05-29-1990 TIME: 14:08 - 14:12

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
1	STACK	ppmTHC	0.0	3.4

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Initial direct cal THC monitor

DATE : 05-29-1990 TIME: 14:12 - 14:27

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
1	STACK	ppmTHC	0.0	0.9
1	STACK	ppmTHC	181.2	181.7
1	STACK	ppmTHC	282.0	283.5

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Repeat of SO2 direct cal after range change

DATE : 05-29-1990 TIME: 14:28 - 15:02

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	0.8
6	BOILER	ppmSO2	218.0	218.8
6	BOILER	ppmSO2	361.4	368.4

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Initial direct cal - 5/30/90

DATE : 05-30-1990 TIME: 08:22 - 09:19

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Initial direct cal - 5/30/90

DATE : 05-30-1990 TIME: 09:30 - 10:02

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	0.8
6	BOILER	ppmSO2	218.0	218.0
6	BOILER	ppmSO2	361.4	363.8
7	BOILER	ppmNOx	0.0	0.5
7	BOILER	ppmNOx	240.0	239.9
7	BOILER	ppmNOx	475.0	476.6
8	BOILER	% O2	0.00	0.06
8	BOILER	% O2	12.50	12.50
8	BOILER	% O2	20.60	20.65
10	BOILER	% CO2	0.00	0.01
10	BOILER	% CO2	11.01	10.93
10	BOILER	% CO2	17.46	17.74

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Continuation of Initial direct cal

DATE : 05-30-1990 TIME: 10:06 - 10:22

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
1	STACK	ppmTHC	0.0	1.1
1	STACK	ppmTHC	181.2	180.9
1	STACK	ppmTHC	282.0	281.5
2	STACK	ppm CO	0.0	2.8
2	STACK	ppm CO	457.5	455.0
2	STACK	ppm CO	1263.0	1288.7
3	STACK	% 02	0.00	0.12
3	STACK	% 02	12.50	12.50
3	STACK	% 02	20.60	20.58

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Initial direct cal - 5/31/90

DATE : 05-31-1990 TIME: 09:47 - 09:58

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
1	STACK	ppmTHC	0.0	0.3
1	STACK	ppmTHC	181.2	181.4
1	STACK	ppmTHC	282.0	283.7
2	STACK	ppm CO	0.0	1.1
2	STACK	ppm CO	457.5	455.4
2	STACK	ppm CO	1263.0	1285.9
3	STACK	% O2	0.00	0.11
3	STACK	% O2	12.50	12.53
3	STACK	% O2	20.60	20.64

Site 9 Sewage Sludge Incinerator 05-31-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2
10:01	297.7	170.3	9.20	9.97	25.6	916.1	11.23
10:02	426.3	170.4	8.82	9.86	19.7	844.8	11.57
10:03	410.6	166.5	9.04	9.68	16.2	768.4	11.75
10:04	394.0	171.3	9.27	9.51	13.4	619.9	11.98
10:05	376.1	174.8	9.70	9.20	11.7	557.5	12.16
10:06	350.7	168.0	11.23	8.05	11.7	552.4	13.01
10:07	293.4	145.4	13.04	6.55	12.4	599.7	14.41
10:08	229.8	119.1	14.25	5.64	14.0	666.8	15.45
10:09	187.9	106.0	15.26	4.77	17.4	776.1	16.15
10:10	156.8	105.9	15.89	4.28	20.9	963.2	16.72
10:11	137.7	113.2	16.30	3.94	24.8	1191.5	17.03
10:12	124.6	117.1	16.04	4.04	26.0	1216.9	16.99
10:13	117.5	115.1	15.78	4.10	25.6	1058.2	16.62
10:14	114.5	118.1	15.87	4.03	26.8	1070.3	16.69
10:15	114.0	119.6	15.93	3.94	26.7	1112.7	16.78
AVERAGE VALUES FOR THE LAST HOUR: 15 MINUTES OF VALID DATA							
10:15	248.8	138.7	13.05	6.50	19.7	861.0	14.57
10:16	115.0	122.6	15.99	3.90	30.0	1130.0	16.80
10:17	114.4	128.0	16.16	3.76	34.9	1245.3	16.89
10:18	112.7	132.2	16.27	3.66	41.5	1373.5	17.01
10:19	109.6	135.2	16.43	3.51	46.6	1428.1	17.12
10:20	106.2	135.1	16.59	3.37	53.1	1511.9%	17.27
10:21	103.0	134.2	16.72	3.25	57.3	1547.1%	17.36
10:22	99.6	131.3	16.77	3.16	62.0	1570.7%	17.40
10:23	94.9	125.1	17.00	2.97	68.2	1585.2%	17.53
10:24	87.3	116.4	17.25	2.77	73.7	1567.3%	17.73
10:25	80.1	107.5	17.44	2.58	79.0	1553.3%	17.88
10:26	72.2	99.6	17.62	2.43	79.1	1485.7%	18.01
10:27	64.3	95.9	17.74	2.33	81.0	1463.3%	18.12
10:28	59.7	98.9	17.48	2.49	84.5	1477.3%	17.99
10:29	57.6	102.3	17.18	2.67	75.8	1462.8%	17.78
10:30	58.5	106.9	16.78	2.94	72.7	1445.2%	17.47
AVERAGE VALUES FOR THE LAST 15 MINUTES							
10:30	89.0	118.1	16.89	3.05	62.6	1456.4	17.49
10:31	61.9	113.7	16.55	3.12	67.4	1376.7	17.24
10:32	67.8	118.7	16.32	3.30	64.3	1352.5	17.04
10:33	76.7	125.9	15.91	3.63	59.9	1273.7	16.81
10:34	90.0	131.3	15.52	3.88	58.5	1272.5	16.56
10:35	100.7	134.6	15.50	3.90	55.7	1223.2	16.36
10:36	108.5	136.4	15.38	3.99	56.3	1250.5	16.34
10:37	112.6	133.0	15.40	3.96	57.6	1264.3	16.29
10:38	116.5	133.5	15.19	4.13	58.9	1263.5	16.32
10:39	123.3	131.9	15.10	4.19	58.8	1243.6	16.24
10:40	130.8	134.4	14.90	4.35	58.7	1204.8	16.12
10:41	138.5	133.7	14.88	4.33	57.5	1208.9	15.96
10:42	143.9	135.0	14.73	4.49	56.4	1174.9	15.81
10:43	152.3	137.9	14.38	4.80	56.4	1182.9	15.66
10:44	162.4	140.9	14.14	4.98	55.1	1211.2	15.40
10:45	175.3	141.8	13.75	5.34	54.2	1210.4	15.22

Site 9 Sewage Sludge Incinerator 05-31-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2
AVERAGE VALUES FOR THE LAST 15 MINUTES							
10:45	217.4	132.2	15.18	4.16	58.4	1247.6	16.23
10:46	189.9	140.3	13.48	5.53	54.6	1246.2	14.99
10:47	203.8	142.4	13.20	5.82	54.5	1274.5	14.74
10:48	217.4	140.0	12.87	6.04	55.3	1356.3*	14.43
10:49	236.7	142.5	12.47	6.38	63.0	1488.6*	14.17
10:50	262.3	143.4	11.85	6.81	83.5	1688.5*	13.76
10:51	273.6	161.7	12.47	6.48	51.0	1343.6*	13.99
10:52	266.5	162.3	12.18	6.67	48.4	1368.7*	14.07
10:53	275.2	162.7	11.94	6.89	51.5	1467.2*	13.76
10:54	293.4	162.6	11.50	7.29	63.2	1619.6*	13.57
10:55	309.4	161.5	11.50	7.24	71.3	1739.1*	13.34
10:56	298.1	177.4	12.59	6.52	43.5	1271.3*	14.03
10:57	263.5	176.5	13.17	6.05	41.2	1253.7	14.55
10:58	242.6	172.3	13.46	5.87	41.0	1270.3	14.84
10:59	229.7	171.4	13.69	5.64	41.9	1342.6	15.04
11:00	218.0	169.3	13.96	5.45	41.8	1355.5	15.21
AVERAGE VALUES FOR THE LAST 15 MINUTES							
11:00	252.0	159.1	12.69	6.31	53.7	1405.7	14.29
11:01	207.8	171.3	14.06	5.32	41.7	1409.5	15.31
11:02	202.0	170.7	14.26	5.18	42.5	1404.4	15.38
11:03	198.6	169.7	14.13	5.31	41.9	1425.6	15.44
11:04	199.7	167.4	14.15	5.30	41.2	1387.3	15.38
11:05	207.0	158.2	13.26	5.98	46.8	1534.6*	15.05
11:06	239.6	159.8	12.80	6.25	73.7	1803.2*	14.31
11:07	245.4	159.7	14.14	5.37	51.6	1445.3*	15.04
11:08	222.3	156.7	14.64	4.97	53.0	1471.6*	15.71
11:09	207.1	154.4	14.84	4.84	53.5	1442.5	15.91
11:10	201.8	152.9	14.92	4.72	52.8	1423.0	16.02
11:11	195.4	151.2	15.16	4.53	52.2	1379.0	16.07
11:12	189.9	149.9	15.23	4.48	51.7	1338.2	16.23
11:13	182.4	150.3	15.49	4.25	49.3	1298.4	16.44
11:14	178.7	148.1	15.46	4.29	75.9	1286.2	16.63
11:15	173.4	146.8	15.77	4.02	66.5	1284.9	16.64
AVERAGE VALUES FOR THE LAST 15 MINUTES							
11:15	203.4	157.8	14.56	4.99	52.9	1422.3	15.70
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA							
11:15	165.5	141.8	14.83	4.63	56.9	1383.0	15.93
11:16	165.5	140.2	14.90	4.53	12.7	569.8	18.28
11:17	170.6	140.3	14.74	4.56	28.3	732.0*	18.24
11:18	172.1	139.1	14.66	4.65	50.5	1324.6*	15.77
11:19	175.3	138.9	14.59	4.67	55.5	1400.3*	15.72
11:20	177.4	139.1	14.86	4.51	55.0	1309.2*	15.86
11:21	171.5	136.6	15.47	4.14	56.8	1276.0	16.40
11:22	162.6	133.2	15.73	3.91	57.3	1287.5	16.55
11:23	156.1	130.7	15.83	3.87	60.6	1303.9	16.68
11:24	152.3	128.9	15.98	3.73	60.9	1311.4	16.73

Site 9 Sewage Sludge Incinerator 05-31-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2
11:25	147.6	126.1	16.05	3.66	62.2	1317.0	16.85
		124.4	16.17	3.50			
		121.1	16.41	3.40			
		119.5	16.42	3.18			
		118.3	16.56	3.34	63.5	1255.1	17.20
		116.7	16.59	3.26	66.7	1304.0	17.23
AVERAGE VALUES FOR THE LAST 15 MINUTES							
11:30	142.2	130.2	15.66	3.93	48.3	1075.1	17.01
11:31	119.5	115.4	16.66	3.18	65.9	1287.2	17.20
11:32	117.2	116.0	16.68	3.20	66.1	1309.8	17.29
11:33	113.6	117.4	16.65	3.18	64.6	1314.3	17.20
11:34	112.5	118.8	16.50	3.35	65.0	1336.8	17.19
11:35	127.5	118.9	15.07	4.30	65.6	1293.8*	16.04
11:36	156.0	124.3	14.94	4.40	68.2	1353.6*	15.83
11:37	170.2	127.6	14.62	4.66	70.1	1427.7*	15.64
11:38	178.6	131.6	14.65	4.65	67.1	1389.1*	15.56
11:39	185.8	134.7	14.23	5.01	69.6	1467.0*	15.36
11:40	195.5	136.6	14.15	5.04	67.8	1447.5*	15.20
11:41	198.9	140.3	14.07	5.17	66.9	1423.3*	15.25
11:42	201.0	143.0	14.10	5.09	61.8	1356.2*	15.19
11:43	199.2	147.4	14.20	5.06	58.7	1291.3	15.32
11:44	196.1	146.7	14.04	5.18	56.8	1286.1	15.21
11:45	197.0	148.2	14.21	5.04	56.4	1287.2	15.30
AVERAGE VALUES FOR THE LAST 15 MINUTES							
11:45	164.6	131.1	14.98	4.43	64.7	1351.4	15.92
11:46	194.1	147.5	14.21	5.03	56.6	1315.7	15.38
11:47	189.4	147.9	14.36	4.88	56.0	1311.8	15.43
11:48	185.9	148.1	14.28	4.97	56.2	1338.2	15.47
11:49	185.6	148.2	14.17	5.05	55.1	1329.1	15.33
11:50	189.8	150.5	14.08	5.16	55.1	1336.2	15.30
11:51	197.4	151.0	13.62	5.54	55.0	1333.0	15.00
11:52	214.4	154.1	13.25	5.85	55.0	1359.2	14.70
11:53	232.9	155.9	12.63	6.34	56.5	1404.3*	14.32
11:54	257.9	159.9	12.15	6.74	57.8	1436.6*	13.94
11:55	287.0	163.0	11.35	7.37	69.0	1663.0*	13.42
11:56	321.5	162.7	10.72	7.94	76.9	1707.8*	12.90
11:57	360.4	162.2	10.00	8.55	104.3	1854.0*	12.46
11:58	396.9	159.6	9.54	8.87	167.0	1874.6*	12.07
11:59	408.1	188.2	10.79	7.96	85.9	1599.5*	12.66
12:00	350.4	195.7	12.22	6.88	47.9	1472.4*	13.87
AVERAGE VALUES FOR THE LAST 15 MINUTES							
12:00	264.6	159.6	12.49	6.48	70.3	1469.0	14.15
12:01	303.3	194.1	12.82	6.42	47.6	1466.9*	14.29
12:02	282.1	190.0	13.29	6.07	48.5	1531.1*	14.72
12:03	257.1	183.1	13.90	5.51	54.4	1577.4*	15.10
12:04	231.9	179.9	14.47	5.09	56.0	1568.8*	15.57
12:05	211.4	178.2	14.79	4.77	58.2	1596.6*	15.83
12:06	194.3	176.1	15.16	4.47	59.9	1593.1*	16.08
12:07	182.8	174.5	15.28	4.37	59.6	1582.3*	16.24

Site 9 Sewage Sludge Incineracr 05-31-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2
12:08	177.5	172.1	15.27	4.38	59.4	1585.6%	16.27
12:09	178.0	170.7	15.32	4.37	58.6	1551.2%	16.29
12:10	177.9	167.5	15.28	4.40	57.8	1529.2%	16.30
12:11	177.1	164.2	15.39	4.28	57.3	1502.8%	16.35
12:12	174.5	162.2	15.48	4.24	56.9	1485.8%	16.42

COMMENTS: End of EMSL Run

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: DIrect cal check after EMSL Run

DATE : 05-31-1990 TIME: 12:12 - 13:06

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	1.6
6	BOILER	ppmSO2	218.0	204.6
6	BOILER	ppmSO2	361.4	342.8
7	BOILER	ppmNOx	0.0	1.1
7	BOILER	ppmNOx	240.0	245.3
7	BOILER	ppmNOx	475.0	489.4
8	BOILER	% O2	0.00	0.07
8	BOILER	% O2	12.50	12.53
8	BOILER	% O2	20.60	20.70
10	BOILER	% CO2	0.00	0.01
10	BOILER	% CO2	11.01	11.00
10	BOILER	% CO2	17.46	17.72
1	STACK	ppmTHC	0.0	1.3
1	STACK	ppmTHC	181.2	178.2
2	STACK	ppm CO	0.0	5.0
2	STACK	ppm CO	1263.0	1288.9
3	STACK	% O2	0.00	0.11
3	STACK	% O2	12.50	12.44

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON:

DATE : 05-31-1990 TIME: 13:07 - 14:20

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	0.4
6	BOILER	ppmSO2	218.0	219.0
6	BOILER	ppmSO2	361.4	364.1
7	BOILER	ppmNOx	0.0	0.4
7	BOILER	ppmNOx	240.0	240.4
7	BOILER	ppmNOx	475.0	479.1
8	BOILER	% O2	0.00	0.06
8	BOILER	% O2	12.50	12.52
8	BOILER	% O2	20.60	20.68
10	BOILER	% CO2	0.00	0.00
10	BOILER	% CO2	11.01	10.93
10	BOILER	% CO2	17.46	17.73
1	STACK	ppmTHC	0.0	0.3
1	STACK	ppmTHC	181.2	181.7
1	STACK	ppmTHC	282.0	284.6
2	STACK	ppm CO	0.0	4.2
2	STACK	ppm CO	457.5	456.6
2	STACK	ppm CO	1263.0	1289.4
3	STACK	% O2	0.00	0.09
3	STACK	% O2	12.50	12.50
3	STACK	% O2	20.60	20.59

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: System cal after third direct cal

DATE : 05-31-1990 TIME: 14:20 - 14:45

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	1.6
6	BOILER	ppmSO2	218.0	206.4
7	BOILER	ppmNOx	0.0	0.9
7	BOILER	ppmNOx	240.0	238.2
8	BOILER	% O2	0.00	0.09
8	BOILER	% O2	12.50	12.45
10	BOILER	% CO2	0.00	0.01
10	BOILER	% CO2	11.01	10.91
1	STACK	ppmTHC	0.0	4.6
1	STACK	ppmTHC	181.2	182.0
2	STACK	ppm CO	0.0	2.4
2	STACK	ppm CO	1263.0	1276.3
3	STACK	% O2	0.00	0.11
3	STACK	% O2	12.50	12.48

Site 9 Sewage Sludge Incineraor 05-31-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2
15:49	258.9	154.3	11.94	6.81	39.0	980.2	14.01
15:50	268.3	155.1	11.66	7.01	38.7	971.2	13.84
15:51	276.8	154.9	11.55	7.14	38.6	980.4	13.74
15:52	288.7	157.5	11.22	7.48	36.7	941.3	13.55

COMMENTS: Pulled Boiler Probe to change glass wool filter

Site 9 Sewage Sludge Incinerator 05-31-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2
16:45	184.2	142.1	12.93	5.88	49.4	1294.2	14.75
AVERAGE VALUES FOR THE LAST HOUR: 1 MINUTES OF VALID DATA							
16:45	184.2	142.1	12.93	5.88	49.4	1294.2	14.75
16:46	195.4	153.7	12.73	6.00	49.6	1330.1	14.55
16:47	205.3	148.9	13.33	5.63	53.5	1472.1*	14.96
16:48	182.6	149.2	13.45	5.55	56.1	1476.5*	15.12
16:49	179.2	149.5	13.38	5.61	56.5	1513.3*	15.10
16:50	186.3	150.1	13.36	5.65	59.8	1576.4*	15.03
16:51	195.1	149.5	13.26	5.69	59.5	1573.8*	14.93
16:52	193.5	147.4	13.50	5.55	58.4	1535.9*	15.08
16:53	191.5	149.9	13.42	5.58	59.7	1579.4*	15.00
16:54	193.9	151.9	13.42	5.61	57.6	1532.6*	15.04
16:55	193.2	153.7	13.40	5.64	56.8	1549.4*	15.01
16:56	199.3	149.8	13.41	5.63	57.5	1575.3*	14.98
16:57	206.6	151.7	13.29	5.72	55.3	1528.8*	14.96
16:58	209.6	152.1	13.26	5.77	56.6	1564.0*	14.94
16:59	131.3	113.8	17.13	3.52	56.3	1589.2*	14.89
17:00	24.0	9.4	20.18*	0.93	55.2	1467.2*	14.68*
AVERAGE VALUES FOR THE LAST 15 MINUTES							
17:00	179.1	136.7	14.04	5.21	56.6	1524.3	14.95
17:01	15.8	25.1	20.42	0.43	60.2	1646.8*	14.74
17:02	28.8	15.1	20.45	0.43	58.7	1644.8*	14.72
17:03	17.4	3.9	20.45	0.44	54.0	1533.4*	14.77
17:04	7.1	2.1	20.39	0.42	54.6	1558.0*	14.76
17:05	3.8	1.6	20.32	0.42	58.2	1626.8*	14.64
17:06	3.1	1.4	20.38	0.41	58.4	1610.6*	14.57
17:07	2.6	1.2	20.46	0.42	63.5	1625.3*	14.53
17:08	16.3	71.8	18.09	2.48	61.9	1559.3*	14.84
17:09	154.1	144.2	15.12	4.44	58.6	1412.7	16.06
17:10	187.9	142.9	15.40	4.27	58.5	1382.9	16.44
17:11	192.9	141.0	14.27	5.10	60.7	1458.9*	16.29
17:12	226.6	145.1	13.20	5.83	72.2	1772.1*	14.99
17:13	242.9	146.4	14.25	5.08	71.3	1670.5*	15.01
17:14	218.5	145.3	15.04	4.50	60.9	1405.2	16.08
17:15	203.9	144.0	15.28	4.36	58.1	1356.4	16.33
AVERAGE VALUES FOR THE LAST 15 MINUTES							
17:15	101.4	75.4	17.57	2.60	60.6	1550.9	15.25
17:16	196.0	142.4	15.44	4.23	56.8	1317.0	16.42
17:17	194.9	140.6	15.36	4.28	57.2	1340.5	16.50
17:18	197.4	143.4	15.50	4.19	57.1	1327.8	16.45
17:19	193.6	140.5	15.55	4.12	56.7	1305.6	16.52
17:20	185.4	129.6	16.09	3.74	57.2	1267.4	16.76
17:21	175.9	133.6	15.47	4.20	58.0	1252.2	16.97
17:22	204.5	140.8	14.31	4.91	71.7	1662.0*	15.75
17:23	211.1	142.3	15.55	4.13	64.4	1357.2*	16.11
17:24	191.9	137.6	15.91	3.85	60.7	1269.0	16.77
17:25	178.9	135.1	15.98	3.84	62.0	1323.1	16.94
17:26	192.4	134.0	13.35	5.69	77.1	1539.9*	15.41

Site 9 Sewage Sludge Incinerator 05-31-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2
17:27	254.1	135.3	12.35	6.35	123.7	1869.7*	14.15
17:28	289.0	145.9	13.08	5.79	106.6	1777.2*	14.11
17:29	257.5	144.1	15.11	4.48	63.2	1349.9	15.99
17:30	230.8	129.2	14.29	5.04	68.3	1477.4*	16.04
AVERAGE VALUES FOR THE LAST 15 MINUTES							
17:30	210.2	138.3	14.89	4.59	69.4	1429.1	16.06
17:31	244.5	133.5	14.64	4.76	18.7	177.3	19.69
17:32	227.0	143.1	15.41	4.26	8.2	5.7	20.68
17:33	209.1	148.8	15.18	4.38	82.0	4.5	20.67
17:34	210.5	150.9	14.28	5.06	23.8	5.3	20.67
17:35	238.2	148.8	13.31	5.79	8.7	124.9	20.56
17:36	261.9	150.6	13.08	5.94	38.9	1180.6*	16.92
17:37	275.4	153.4	12.86	6.07	55.1	1656.9*	14.40
17:38	286.5	153.6	12.70	6.25	59.6	1709.3*	
17:39	296.6	155.0	12.40	6.45	72.4	1784.1*	
17:40	312.0	157.9	12.23	6.61	69.8	1764.7*	13.90
17:41	321.2	158.4	12.06	6.75	74.4	1786.4*	13.85
17:42	328.7	159.1	11.79	6.93	104.1	1826.2*	13.66
17:43	345.4	159.5	11.55	7.16	102.9	1824.2*	13.49
17:44	342.6	159.1	12.07		126.4	1858.1*	13.36
17:45	137.6	75.3	17.71	3.57	148.7	1865.4*	13.15
AVERAGE VALUES FOR THE LAST 15 MINUTES							
17:45	269.1	147.1	13.42	5.81	66.2	1171.6	16.22
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA							
17:45	190.0	124.9	14.98	4.55	63.2	1419.0	15.62
17:46	350.5	155.6	10.98	7.71	147.8	1863.2*	13.03
17:47	381.2	158.1	10.68	7.98	152.6	1847.0*	12.92
17:48	394.5	170.5	11.30	7.52	48.3	1192.6	13.36
17:49	368.7	169.2	11.77	7.24	38.5	1030.5	13.78
17:50	354.8	166.4	11.74	7.23	36.3	974.0	13.93
17:51	354.4	167.5	11.47	7.47	34.0	914.0	13.78
17:52	374.6	170.9	10.92	8.08	31.2	865.0	13.41
17:53	415.3	168.9	9.94	8.89	30.0	868.1	12.80
17:54	490.0	164.9	8.47	10.01	46.4	1190.3*	11.93
17:55	637.2	166.2	7.10	10.99	108.7	1785.6*	10.90
17:56	779.1	183.2	7.25	10.78	152.2	1875.5*	10.84
17:57	766.9	200.3	7.78	10.38	130.2	1875.0*	11.24
17:58	640.2	214.8	9.52	9.05	58.4	1454.9*	12.33
17:59	474.4	213.7	11.34	7.61	27.6	823.7	13.58
18:00	352.2	202.3	12.65	6.58	25.3	754.1	14.64
AVERAGE VALUES FOR THE LAST 15 MINUTES							
18:00	468.9	178.2	10.19	8.50	71.8	1288.9	12.83
18:01	290.6	188.7	13.33	6.04	24.9	761.0	15.06
18:02	257.3	174.8	13.96	5.56	25.6	757.8	15.50
18:03	230.9	171.4	14.63	5.12	26.2	839.9	16.05
18:04	209.0	166.2	15.22	4.53	28.7	928.3	16.41
18:05	188.3	166.9	15.67	4.22	31.1	1018.9	16.82

Site 9 Sewage Sludge Incineraor 05-31-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2
18:06	171.8	168.7	15.98	4.01	33.4	1091.9	17.05
18:07	160.4	167.7	15.49	4.29	33.8	1069.5	16.82
18:08	169.1	163.8	14.24	5.11	29.3	830.4	15.84
18:09	185.6	161.7	13.91	5.35	27.2	767.0	15.55
18:10	190.5	157.5	14.00	5.22	27.0	753.5	15.54
18:11	187.0	156.3	14.31	4.98	27.7	788.9	15.72
18:12	181.1	154.8	14.30	4.98	28.4	812.0	15.81
18:13	179.4	153.6	14.45	4.83	29.9	844.2	15.84
18:14	177.3	152.3	14.56	4.71	31.1	893.9	15.90
18:15	175.5	149.8	14.62	4.69	32.2	904.5	16.02
AVERAGE VALUES FOR THE LAST 15 MINUTES							
18:15	196.9	163.6	14.58	4.91	29.1	870.8	15.99
18:16	174.9	146.5	14.74	4.54	33.4	911.6	16.06
18:17	173.0	145.9	14.82	4.49	35.1	945.7	16.13
18:18	176.4	144.0	14.74	4.56	35.3	956.1	16.14
18:19	178.1	143.5	14.80	4.44	36.8	988.0	16.12
18:20	176.7	140.5	14.98	4.34	39.9	1032.1	16.23
18:21	175.7	140.8	14.99	4.33	41.1	1064.9	16.26
18:22	175.9	140.4	14.99	4.30	41.2	1056.8	16.28
18:23	177.8	139.7	14.96	4.36	41.4	1046.8	16.24
18:24	183.0	139.5	14.79	4.49	41.0	1050.4	16.12
18:25	188.2	139.5	14.70	4.55	40.5	1048.3	16.09
18:26	189.8	138.2	14.84	4.41	41.5	1068.6	16.12
18:27	186.6	138.9	14.84	4.44	42.2	1101.2	16.15
18:28	187.8	139.5	14.78	4.47	41.7	1078.1	16.09
18:29	189.0	139.8	14.80	4.48	41.8	1094.7	16.12
18:30	190.0	139.0	14.66	4.61	41.6	1080.0	16.02
AVERAGE VALUES FOR THE LAST 15 MINUTES							
18:30	181.5	141.0	14.83	4.45	39.6	1034.9	16.14
18:31	195.7	141.8	14.52	4.72	40.8	1067.3	15.92
18:32	193.0	141.5	14.54	4.72	41.1	1078.1	15.92
18:33	199.2	141.9	14.47	4.78	41.0	1071.9	15.87
18:34	199.9	143.3	14.42	4.82	41.2	1064.8	15.83
18:35	200.8	143.8	14.49	4.74	41.8	1127.8	15.84
18:36	198.4	145.3	14.48	4.77	40.6	1093.9	15.85
18:37	196.9	145.7	14.41	4.80	41.4	1113.2	15.79
18:38	199.1	149.2	14.23	5.00	42.1	1154.6	15.70
18:39	208.3	150.1	14.05	5.18	41.8	1119.5	15.55
18:40	211.8	149.3	13.85	5.33	40.7	1079.6	15.38
18:41	217.6	151.3	13.73	5.41	40.8	1062.3	15.22
18:42	225.1	152.7	13.50	5.64	39.3	1017.9	15.13
18:43	237.0	152.8	13.10	5.97	38.3	976.4	14.83
18:44	250.0	154.0	12.86	6.13	37.9	974.2	14.59
18:45	265.4	156.3	12.34	6.59	36.2	938.8	14.29
AVERAGE VALUES FOR THE LAST 15 MINUTES							
18:45	213.5	147.9	13.93	5.24	40.3	1062.7	15.45

Site 9 Sewage Sludge Incineraor 05-31-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA							
18:45	265.2	157.7	13.38	5.78	45.2	1064.3	15.10
18:46	289.8	159.1	11.66	7.18	34.4	907.0	13.81
18:47	320.5	163.7	10.91	7.78	32.2	875.4	13.25
18:48	362.9	164.9	9.96	8.58	31.0	903.5	12.59
18:49	405.3	166.9	10.40	8.24	34.4	1096.9	12.92
18:50	383.1	168.0	12.12	6.97	32.5	953.0	14.03
18:51	343.5	164.4	12.36	6.68	32.6	1055.1	14.20

COMMENTS: End of Run - 16:45-18:45 5/31/90

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: System cal after Run 16:45-18:45

DATE : 05-31-1990 TIME: 18:52 - 19:32

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	4.7
6	BOILER	ppmSO2	218.0	215.1
7	BOILER	ppmNOx	0.0	0.8
7	BOILER	ppmNOx	240.0	240.9
8	BOILER	% O2	0.00	0.08
8	BOILER	% O2	12.50	12.50
10	BOILER	% CO2	0.00	0.02
10	BOILER	% CO2	11.01	10.92
1	STACK	ppmTHC	0.0	1.6
1	STACK	ppmTHC	181.2	180.0
2	STACK	ppm CO	0.0	3.0
2	STACK	ppm CO	1263.0	1275.4
3	STACK	% O2	0.00	0.08
3	STACK	% O2	12.50	12.55

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Inial direct cal - 6/1/90

DATE : 08-01-1990 TIME: 07:46 - 08:33

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	0.8
6	BOILER	ppmSO2	218.0	218.5
6	BOILER	ppmSO2	361.4	363.4
7	BOILER	ppmNOx	0.0	0.5
7	BOILER	ppmNOx	240.0	239.9
7	BOILER	ppmNOx	475.0	478.9
8	BOILER	% O2	0.00	0.05
8	BOILER	% O2	12.50	12.50
8	BOILER	% O2	20.60	20.64
10	BOILER	% CO2	0.00	0.01
10	BOILER	% CO2	11.01	11.03
10	BOILER	% CO2	17.46	17.81
1	STACK	ppmTHC	0.0	0.7
1	STACK	ppmTHC	181.2	181.7
1	STACK	ppmTHC	282.0	283.6
2	STACK	ppm CO	0.0	0.8
2	STACK	ppm CO	457.5	455.9
2	STACK	ppm CO	457.5	454.9
2	STACK	ppm CO	1263.0	1287.5
3	STACK	% O2	0.00	0.11
3	STACK	% O2	12.50	12.50

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incinerator

REASON: Initial direct cal - 6/3/90

DATE : 06-03-1990 TIME: 09:55 - 14:22

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	1.2
6	BOILER	ppmSO2	218.0	217.5
6	BOILER	ppmSO2	361.4	362.5
7	BOILER	ppmNOx	0.0	0.5
7	BOILER	ppmNOx	240.0	240.3
7	BOILER	ppmNOx	475.0	477.1
8	BOILER	% O2	0.00	0.07
8	BOILER	% O2	12.50	12.50
8	BOILER	% O2	20.60	20.64
10	BOILER	% CO2	0.00	-0.00
10	BOILER	% CO2	11.01	10.94
10	BOILER	% CO2	17.46	17.67
1	STACK	ppmTHC	0.0	-0.0
1	STACK	ppmTHC	181.2	181.0
1	STACK	ppmTHC	282.0	283.7
2	STACK	ppm CO	0.0	-0.9
2	STACK	ppm CO	457.5	449.6
2	STACK	ppm CO	1263.0	1271.9
3	STACK	% O2	0.00	0.11
3	STACK	% O2	12.50	12.50
3	STACK	% O2	20.60	20.58

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Initial system cal - 6/3/90

DATE : 06-03-1990 TIME: 14:22 - 14:51

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	1.9
6	BOILER	ppmSO2	218.0	206.8
7	BOILER	ppmNOx	0.0	1.0
7	BOILER	ppmNOx	240.0	236.6
8	BOILER	% O2	0.00	0.08
8	BOILER	% O2	12.50	12.41
10	BOILER	% CO2	0.00	0.03
10	BOILER	% CO2	11.01	10.81
1	STACK	ppmTHC	0.0	2.9
1	STACK	ppmTHC	181.2	179.4
2	STACK	ppm CO	0.0	-0.8
2	STACK	ppm CO	1263.0	1257.9
3	STACK	% O2	0.00	0.11
3	STACK	% O2	12.50	12.38

Site 9 Sewage Sludge Incinerator 06-03-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2
14:55	84.5	127.3	15.94	3.32	100.0	1718.3*	16.93
14:56	86.8	123.8	16.03	3.24	102.6	1686.1*	16.98
14:57	85.8	119.7	16.17	3.17	103.1	1639.9*	17.09
14:58	79.7	114.3	16.32	3.02	102.4	1585.9*	17.23
14:59	76.0	109.4	16.39	2.97	106.8	1561.5*	17.28
15:00	73.3	104.0	16.43	2.94	111.3	1506.7*	17.32
AVERAGE VALUES FOR THE LAST HOUR: 5 MINUTES OF VALID DATA							
15:00	81.0	116.4	16.21	3.11	104.4	1616.4	17.14
15:01	70.3	97.3	16.58	2.81	117.4	1460.0	17.37
15:02	65.7	93.3	16.69	2.71	119.3	1447.8*	17.50
15:03	60.5	89.8	16.83	2.59	123.5	1445.0*	17.60
15:04	57.2	86.9	17.01	2.41	120.4	1379.5	17.73
15:05	56.9	82.2	17.17	2.28	122.0	1381.6	17.87
15:06	56.1	76.5	17.31	2.14	125.8	1360.6	17.98
15:07	52.4	70.0	17.48	1.97	130.0	1273.7	18.10
15:08	43.9	62.4	17.71	1.86	134.5	1150.9	18.29
15:09	34.8	62.6	17.48	1.96	131.7	1054.9	18.26
15:10	27.3	69.0	17.15	2.13	126.0	1058.3	17.93
15:11	22.9	85.9	16.29	2.70	121.9	1302.5	17.60
15:12	22.4	96.3	15.81	2.97	119.9	1452.3*	17.09
15:13	22.3	108.0	15.40	3.25	111.5	1586.6*	16.93
15:14	25.3	124.0	14.72	3.72	107.4	1672.8*	16.63
15:15	31.7	140.3	13.88	4.20	95.2	1696.4*	15.96
AVERAGE VALUES FOR THE LAST 15 MINUTES							
15:15	43.3	89.6	16.50	2.65	120.4	1381.5	17.52
15:16	40.0	152.6	13.44	4.52	93.5	1752.9*	15.73
15:17	50.2	172.1	12.47	5.23	81.2	1811.1*	15.03
15:18	66.1	182.7	11.81	5.78	74.0	1834.9*	14.64
15:19	94.6	188.8	10.73	6.66	64.7	1804.5*	13.98
15:20	139.4	180.0	9.28	7.92	59.4	1756.8*	13.14
15:21	229.2	135.6	6.76	9.93	84.6	1812.4*	11.68
15:22	366.1	126.1	5.68	10.48	426.3	1875.5*	10.20
15:23	426.4	163.5	7.63	9.40	521.4	1875.5*	10.64
15:24	412.2	158.5	8.69	8.91	657.9	1875.5*	12.17
15:25	406.7	163.4	8.08	9.33	909.1*	1875.5*	11.86
15:26	400.5	196.9	8.06	9.44	994.3*	1875.5*	11.51
15:27	406.2	190.6	8.06	9.68	904.1*	1875.5*	11.82
15:28	443.5	181.6	6.75	10.65	815.9	1875.5*	11.12
15:29	521.4	182.4	5.93	11.25	575.2	1875.5*	10.33
15:30	555.8	196.9	6.20	10.98	728.4	1875.5*	9.86
AVERAGE VALUES FOR THE LAST 15 MINUTES							
15:30	303.9	171.4	8.64	8.68	466.0	1843.5	12.25
15:31	535.0	188.3	6.95	10.60	495.5	1875.5*	10.62
15:32	542.9	191.3	6.64	10.83	778.2*	1875.5*	10.43
15:33	542.4	207.7	6.33	11.14	980.4*	1875.5*	10.21
15:34	533.6	223.4	5.90	11.57	1000.2*	1875.5*	9.93
15:35	525.6	237.7	5.56	11.88	1000.2*	1875.5*	9.68
15:36	521.2	257.2	5.51	11.92	1000.2*	1875.5*	9.48

Site 9 Sewage Sludge Incineraor 06-03-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2
15:37	531.5	269.9	5.62	11.96	822.2*	1875.5*	9.58
15:38	551.7	268.4	7.18	10.76	289.3	1875.0*	10.38
15:39	519.0	250.2	9.00	9.43	90.1	1350.1*	11.69
15:40	446.4	262.9	11.15	7.65	60.7	1147.3	13.12
15:41	366.2	230.3	12.42	6.61	61.4	1412.5*	14.43
15:42	320.3	206.3	12.54	6.41	60.8	1367.6*	14.61
15:43	293.7	200.0	13.11	5.96	60.8	1418.5*	14.91
15:44	269.9	195.4	13.61	5.57	65.6	1586.2*	15.25
15:45	251.3	195.9	13.68	5.51	67.3	1647.4*	15.50
AVERAGE VALUES FOR THE LAST 15 MINUTES							
15:45	450.1	225.7	9.01	9.19	455.5	1662.2	11.99
15:46	241.0	194.1	13.93	5.30	67.0	1654.0*	15.56
15:47	229.3	191.8	14.09	5.15	67.2	1657.3*	15.77
15:48	218.2	191.7	14.32	4.95	67.5	1667.3*	15.87
15:49	209.5	190.1	14.47	4.81	63.6	1668.0*	16.01
15:50	204.0	185.6	13.02	5.88	63.6	1557.0*	15.50
15:51	221.4	180.7	11.97	6.47	55.2	1338.4	14.26
15:52	235.7	181.3	11.96	6.48	53.9	1339.9	14.06
15:53	243.0	186.0	12.40	6.31	52.4	1343.6	14.41
15:54	245.9	179.5	11.66	6.77	49.6	1274.0	14.20
15:55	259.7	182.5	11.16	7.09	45.0	1158.4	13.69
15:56	264.4	188.1	11.17	7.04	43.3	1168.0	13.66
15:57	267.7	186.1	11.03	7.20	43.2	1170.4	13.58
15:58	279.7	185.3	10.76	7.40	43.2	1180.6	13.42
15:59	298.2	183.7	10.32	7.76	45.4	1310.2	13.19
16:00	320.4	182.1	10.04	8.00	52.3	1502.9*	12.87
AVERAGE VALUES FOR THE LAST 15 MINUTES							
16:00	249.2	185.9	12.15	6.44	54.5	1399.3	14.40
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA							
16:00	261.6	168.2	11.58	6.74	274.1	1571.6	14.04
16:01	343.2	183.5	9.63	8.25	87.1	1767.6*	12.67
16:02	351.0	193.6	11.49	6.89	83.9	1699.9*	12.94
16:03	303.7	194.3	13.34	5.67	51.8	1497.3*	14.91
16:04	273.1	186.7	13.59	5.43	56.4	1591.4*	15.25
16:05	262.1	184.3	13.81	5.30	59.9	1592.3*	15.38
16:06	260.6	183.0	13.73	5.37	59.8	1555.6*	15.41
16:07	259.8	182.8	13.73	5.39	58.0	1549.6*	15.30
16:08	261.6	183.7	13.59	5.50	56.2	1515.4*	15.26
16:09	266.6	187.7	12.46	6.36	47.7	1362.3*	14.76
16:10	286.8	189.0	12.12	6.59	43.4	1270.8	14.21
16:11	301.6	180.3	11.22	7.32	50.6	1347.3*	13.92
16:12	350.4	176.7	10.11	8.15	116.5	1864.5*	12.87
16:13	388.0	179.6	9.71	8.46	151.8	1875.5*	12.53
16:14	404.6	180.7	9.57	8.60	143.9	1868.7*	12.38
16:15	419.8	181.4	9.29	8.84	155.5	1872.0*	12.16
AVERAGE VALUES FOR THE LAST 15 MINUTES							
16:15	315.5	184.5	11.83	6.81	81.5	1615.3	14.00

Site 9 Sewage Sludge Incineraor 06-03-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2
16:16	426.8	181.3	9.02	9.05	146.6	1862.4*	12.07
16:17	434.5	180.6	8.99	9.10	157.3	1862.8*	11.97
16:18	422.4	183.3	10.12	8.14	134.5	1853.7*	12.33
16:19	381.3	188.5	11.22	7.25	94.2	1851.8*	13.27
16:20	354.0	185.2	11.27	7.23	89.1	1853.3*	13.59
16:21	348.6	183.2	11.17	7.29	91.9	1861.2*	13.59
16:22	351.2	182.3	11.20	7.31	96.1	1870.0*	13.54
16:23	352.4	180.2	11.05	7.44	93.9	1861.4*	13.57
16:24	357.1	178.7	10.91	7.59	99.6	1867.5*	13.52
16:25	380.9	176.7	9.79	8.40	169.9	1872.9*	12.68
16:26	398.4	177.7	9.72	8.47	207.6	1874.3*	12.53
16:27	410.2	184.3	9.69	8.53	248.1	1875.5*	12.48
16:28	416.4	188.5	9.58	8.58	279.9	1875.5*	12.41
16:29	416.3	191.4	9.63	8.51	253.2	1875.5*	12.37
16:30	408.5	189.6	9.62	8.53	228.9	1875.5*	12.45
AVERAGE VALUES FOR THE LAST 15 MINUTES							
16:30	390.6	183.4	10.20	8.09	159.4	1866.2	12.82
16:31	404.9	191.5	9.56	8.56	214.8	1875.5*	12.43
16:32	404.9	191.4	9.58	8.55	221.0	1875.5*	12.39
16:33	407.4	193.4	9.49	8.65	222.1	1875.5*	12.37
16:34	410.8	197.6	9.43	8.71	236.2	1875.5*	12.32
16:35	415.1	203.2	9.27	8.81	244.5	1875.5*	12.26
16:36	422.0	206.2	9.13	8.91	237.4	1875.5*	12.12
16:37	437.8	218.6	8.31	9.59	259.9	1875.5*	11.96
16:38	466.3	231.3	7.85	9.88	314.5	1875.5*	11.47
16:39	480.8	244.9	7.56	10.07	290.0	1875.5*	11.20
16:40	495.9	250.2	7.03	10.48	241.3	1875.5*	10.96
16:41	511.8	252.3	7.33	10.36	165.9	1875.5*	10.79
16:42	525.1	234.3	6.73	10.91	150.8	1875.5*	10.73
16:43	589.2	222.4	5.66	11.87	159.9	1875.5*	10.07
16:44	679.8	222.4	4.78	12.56	231.0	1875.5*	9.44
16:45	741.3	242.4	4.74	12.50	313.8	1875.5*	9.28
AVERAGE VALUES FOR THE LAST 15 MINUTES							
16:45	492.9	220.1	7.76	10.03	234.9	1875.5	11.32
16:46	727.2	283.7	5.74	11.71	211.3	1875.5*	9.89
16:47	667.9	312.7	7.35	10.45	122.7	1875.5*	10.71
16:48	551.0	295.8	9.34	9.06	58.9	1864.7*	12.11
16:49	458.6	275.3	10.46	8.27	39.3	1455.6*	12.93
16:50	381.7	275.3	11.48	7.38	24.6	969.4	13.61
16:51	324.9	269.1	12.24	6.72	21.4	961.0	14.12
16:52	289.6	248.8	12.93	6.21	21.9	1010.7	14.55
16:53	266.4	233.2	13.43	5.96	21.7	1017.6	15.12
16:54	259.6	217.9	13.70	5.72	22.0	988.5	15.32
16:55	256.4	210.2	13.79	5.68	22.0	1000.9	15.37
16:56	257.5	209.2	13.68	5.79	22.5	993.1	15.44
16:57	261.5	205.5	13.64	5.80	21.6	973.7	15.31
16:58	269.3	204.5	13.48	5.98	21.2	968.1	15.21
16:59	273.5	202.4	13.43	5.96	21.7	981.4	15.20
17:00	274.0	198.2	13.19	6.15	21.5	967.9	15.08

Site 9 Sewage Sludge Incinerator 06-03-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2
AVERAGE VALUES FOR THE LAST 15 MINUTES							
17:00	367.9	242.8	11.86	7.12	45.0	1193.6	14.00
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA							
17:00	391.7	207.7	10.41	8.01	130.2	1e37.6	13.03
17:01	277.0	197.1	12.85	6.32	21.3	930.7	14.76
17:02	281.1	192.0	12.58	6.43	21.1	920.6	14.62
17:03	288.6	188.1	12.22	6.71	21.7	938.2	14.30
17:04	296.2	187.7	12.13	6.75	22.6	966.9	14.27
17:05	297.1	187.0	12.25	6.68	23.7	1009.3	14.27
17:06	293.3	188.5	12.24	6.66	25.8	1080.9	14.38
17:07	289.8	189.1	12.48	6.48	28.8	1162.6	14.45
17:08	289.7	189.9	12.45	6.52	32.7	1276.5	14.59
17:09	290.2	187.5	12.44	6.49	37.5	1310.0	14.59
17:10	298.1	186.5	12.36	6.58	36.8	1321.0	14.47
17:11	302.3	111.8	12.16	6.75	39.0	1364.9	14.46
17:12	314.7	177.0	11.86	6.98	37.1	1351.5	14.18
17:13	331.9	107.3	11.50	7.28	34.4	1334.1	13.97
17:14	343.6	173.0	11.42	7.36	33.6	1312.9	13.79
17:15	339.6	104.9	11.64	7.15	33.9	1318.0	13.90
AVERAGE VALUES FOR THE LAST 15 MINUTES							
17:15	302.2	171.2	12.17	6.75	30.0	1173.2	14.33

COMMENTS: End of Run 15:00-17:00 6/3/90

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineracr

REASON: Second system cal

DATE : 06-03-1990 TIME: 17:16 - 18:24

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	3.1
6	BOILER	ppmSO2	218.0	209.3
7	BOILER	ppmNOx	0.0	1.7
7	BOILER	ppmNOx	240.0	237.0
8	BOILER	% O2	0.00	0.09
8	BOILER	% O2	12.35	12.34
10	BOILER	% CO2	0.00	0.04
10	BOILER	% CO2	11.01	10.84
1	STACK	ppmTHC	0.0	2.1
1	STACK	ppmTHC	181.2	177.7
2	STACK	ppm CO	0.0	-1.4
2	STACK	ppm CO	1263.0	1254.3
3	STACK	% O2	0.00	0.11
3	STACK	% O2	12.50	12.32

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Initial direct cal - 6/4/90

DATE : 06-04-1990 TIME: 09:12 - 10:03

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	2.2
6	BOILER	ppmSO2	218.0	219.7
6	BOILER	ppmSO2	361.4	363.2
7	BOILER	ppmNOx	0.0	0.3
7	BOILER	ppmNOx	240.0	241.0
7	BOILER	ppmNOx	475.0	478.4
8	BOILER	% O2	0.00	0.05
8	BOILER	% O2	12.50	12.50
8	BOILER	% O2	20.60	20.63
10	BOILER	% CO2	0.00	0.00
10	BOILER	% CO2	11.01	10.96
10	BOILER	% CO2	17.46	17.73
1	STACK	ppmTHC	0.0	1.0
1	STACK	ppmTHC	181.2	181.5
1	STACK	ppmTHC	282.0	284.0
2	STACK	ppm CO	0.0	0.3
2	STACK	ppm CO	457.5	455.3
2	STACK	ppm CO	1263.0	1294.2
3	STACK	% O2	0.00	0.05
3	STACK	% O2	12.50	12.50
3	STACK	% O2	20.60	20.60
4	STACK	% CO2	0.00	0.02
4	STACK	% CO2	11.01	10.95
4	STACK	% CO2	17.46	17.56

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Initial system cal

DATE : 06-04-1990 TIME: 10:03 - 10:49

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	3.1
6	BOILER	ppmSO2	361.4	336.1
7	BOILER	ppmNOx	0.0	1.0
7	BOILER	ppmNOx	240.0	235.7
8	BOILER	% O2	0.00	0.06
8	BOILER	% O2	12.50	12.31
10	BOILER	% CO2	0.00	0.01
10	BOILER	% CO2	11.01	10.89
1	STACK	ppmTHC	0.0	8.7
1	STACK	ppmTHC	181.2	183.4
2	STACK	ppm CO	0.0	1.2
2	STACK	ppm CO	1263.0	1283.2
3	STACK	% O2	0.00	0.09
3	STACK	% O2	12.50	12.38
4	STACK	% CO2	0.00	-0.04
4	STACK	% CO2	11.01	10.77

Site 9 Sewage Sludge Incinerator 06-04-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2	CHAN 4 STACK % CO2
10:52	521.8	535.4	7.27	10.80	141.7	1612.0*	9.56	9.02
10:53	446.9	458.2	9.88	8.72	66.3	802.0	11.73	7.25
10:54	376.8	396.2	11.32	7.55	56.4	809.4	13.16	6.07
10:55	335.0	346.1	12.09	6.91	51.4	860.6	13.93	5.47
10:56	300.8	306.9	12.84	6.23	47.4	912.2	14.48	4.94
10:57	266.8	279.6	13.50	5.75	46.2	979.4	15.00	4.54
10:58	236.8	257.9	14.00	5.33	45.9	1046.8	15.49	4.12
10:59	210.6	246.3	14.38	5.01	44.9	1094.6	15.78	3.82
11:00	194.5	239.8	14.42	4.94	44.4	1164.5	15.91	3.68
AVERAGE VALUES FOR THE LAST HOUR: 9 MINUTES OF VALID DATA								
11:00	321.1	340.7	12.19	6.80	60.5	1031.3	13.89	5.44
11:01	185.5	236.7	14.36	4.92	41.6	1076.2	15.74	3.76
11:02	180.4	235.0	14.46	4.83	40.3	1098.1	15.76	3.67
11:03	177.0	233.0	14.51	4.79	38.2	1093.9	15.82	3.65
11:04	173.3	230.5	14.58	4.69	37.7	1136.3	15.87	3.61
11:05	171.0	229.1	14.56	4.76	37.2	1156.0	15.89	3.60
11:06	173.1	228.1	14.49	4.79	36.1	1145.8	15.86	3.60
11:07	174.0	229.2	14.38	4.88	36.1	1188.3	15.81	3.62
11:08	171.4	221.8	14.54	4.71	37.2	1212.1	15.85	3.61
11:09	170.4	220.6	14.49	4.80	37.6	1246.9	15.85	3.57
11:10	175.3	227.3	13.76	5.44	28.1	1045.9	15.66	3.73
11:11	192.6	225.3	12.79	6.14	26.2	1008.3	14.98	4.24
11:12	208.2	226.7	11.85	6.74	25.3	911.6	14.22	4.77
11:13	220.9	221.0	11.51	6.99	24.9	858.6	13.88	5.04
11:14	233.0	218.7	11.74	6.85	24.6	829.0	13.78	5.21
11:15	239.3	221.6	11.80	6.92	24.5	876.1	14.11	5.00
AVERAGE VALUES FOR THE LAST 15 MINUTES								
11:15	189.7	227.0	13.59	5.48	33.0	1058.9	15.27	4.05
11:16	249.9	217.3	11.48	7.19	24.4	863.9	13.92	5.15
11:17	264.7	221.3	11.11	7.59	24.1	838.6	13.67	5.34
11:18	282.5	229.7	10.77	7.82	23.2	821.9	13.42	5.50
11:19	295.4	230.9	11.50	7.37	22.1	795.1	13.63	5.52
11:20	292.2	229.1	11.37	7.47	21.9	794.4	13.82	5.37
11:21	293.1	222.3	11.48	7.39	21.8	804.4	13.77	5.38
11:22	294.8	225.3	11.30	7.58	21.7	776.8	13.76	5.43
11:23	300.5	217.0	11.24	7.60	20.6	748.1	13.54	5.57
11:24	303.2	223.1	11.10	7.77	20.0	723.0	13.50	5.63
11:25	304.2	218.8	11.11	7.72	19.5	699.0	13.44	5.65
11:26	306.3	224.7	10.94	7.93	18.7	673.1	13.32	5.77
11:27	309.9	219.1	10.99	7.83	18.0	649.8	13.26	5.81
11:28	304.3	219.2	11.30	7.56	18.3	670.4	13.37	5.76
11:29	290.2	212.8	11.75	7.14	18.6	663.7	13.73	5.47
11:30	280.3	210.5	11.66	7.22	18.1	661.0	13.84	5.36
AVERAGE VALUES FOR THE LAST 15 MINUTES								
11:30	291.4	221.4	11.27	7.54	20.7	745.6	13.60	5.51
11:31	281.8	202.9	11.33	7.44	19.7	697.5	13.63	5.46
11:32	282.3	196.7	11.65	7.15	20.3	826.3	13.71	5.40
11:33	274.3	196.8	11.91	6.92	22.0	891.4	13.85	5.29

Site 9 Sewage Sludge Incinerator 06-04-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2	CHAN 4 STACK % CO2
11:34	267.0	195.3	12.33	6.63	21.6	900.3	14.16	5.07
11:35	257.7	194.4	12.45	6.53	22.5	926.8	14.36	4.93
11:36	252.8	189.8	12.70	6.35	22.6	926.4	14.47	4.82
11:37	245.6	189.9	12.82	6.25	23.7	976.8	14.61	4.70
11:38	240.1	187.7	13.04	6.07	23.8	977.1	14.72	4.59
11:39	232.9	187.1	13.30	5.89	24.9	1006.0	14.92	4.47
11:40	226.1	184.7	13.73	5.54	26.8	1091.1	15.31	4.15
11:41	223.6	185.2	13.73	5.58	28.3	1163.9	15.43	4.06
11:42	221.7	179.8	14.00	5.30	30.1	1171.9	15.53	3.94
11:43	223.2	182.4	14.00	5.35	32.6	1243.5	15.63	3.90
11:44	221.6	179.3	14.14	5.16	34.0	1282.7	15.66	3.81
11:45	218.6	181.2	14.28	5.11	37.1	1335.3	15.79	3.74
AVERAGE VALUES FOR THE LAST 15 MINUTES								
11:45	244.6	188.9	13.03	6.09	26.0	1027.8	14.79	4.56
11:46	216.8	179.0	14.51	4.84	38.8	1396.8%	15.88	3.61
11:47	214.0	180.6	14.86	4.61	43.7	1473.9%	16.16	3.42
11:48	211.6	178.9	15.19	4.28	48.8	1540.6%	16.39	3.20
11:49	207.3	176.0	15.36	4.19	56.1	1556.2%	16.59	3.08
11:50	206.4	170.7	15.50	4.06	59.5	1576.4%	16.69	2.96
11:51	201.5	165.2	15.69	3.91	66.6	1605.6%	16.79	2.87
11:52	197.3	159.6	15.82	3.81	71.1	1615.2%	16.95	2.75
11:53	194.8	153.8	15.99	3.65	72.6	1577.8%	17.03	2.69
11:54	186.6	149.3	16.15	3.53	76.6	1605.8%	17.20	2.59
11:55	179.3	145.9	16.38	3.31	76.9	1615.8%	17.33	2.47
11:56	167.6	139.7	16.61	3.12	79.8	1623.2%	17.51	2.36
11:57	156.4	132.0	16.79	2.96	82.3	1622.2%	17.68	2.22
11:58	146.7	125.3	16.96	2.81	84.8	1607.8%	17.80	2.12
11:59	136.2	125.8	16.69	2.95	93.3	1623.7%	17.73	2.12
12:00	125.5	124.2	16.51	2.98	97.9	1675.1%	17.42	2.25
AVERAGE VALUES FOR THE LAST 15 MINUTES								
12:00	183.2	153.7	15.93	3.67	69.9	1581.1	17.01	2.71
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA								
12:00	227.2	197.7	13.46	5.69	37.4	1103.3	15.17	4.21
12:01	113.1	120.3	16.65	2.84	96.6	1635.8%	17.47	2.20
12:02	105.4	118.1	16.72	2.79	101.3	1618.1%	17.51	2.16
12:03	99.4	119.3	16.70	2.78	110.7	1689.2%	17.57	2.13
12:04	96.6	121.5	16.55	2.93	114.7	1677.5%	17.49	2.15
12:05	100.8	128.6	15.91	3.35	113.9	1706.6%	17.10	2.35
12:06	112.5	144.0	15.31	3.78	109.6	1803.3%	16.75	2.54
12:07	130.2	154.5	14.98	4.02	102.5	1872.8%	16.35	2.81

Site 9 Sewage Sludge Incineraor 06-04-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2	CHAN 4 STACK % CO2
12:10	183.2	178.8	13.99	4.80	75.3	1875.5*	15.57	3.44
12:11	192.8	181.5	13.85	4.87	74.7	1875.5*	15.57	3.43
12:12	196.6	183.7	13.88	4.86	74.4	1975.5*	15.48	3.50
12:13	199.4	183.1	13.72	4.99	73.2	1875.5*	15.49	3.50
12:14	206.8	182.9	13.63	5.08	74.1	1875.5*	15.33	3.62
12:15	214.6	183.0	13.30	5.37	73.8	1875.5*	15.26	3.71
AVERAGE VALUES FOR THE LAST HOUR: 6 MINUTES OF VALID DATA								
12:15	198.9	182.2	13.73	5.00	74.3	1875.5	15.45	3.53
12:16	226.3	182.0	13.20	5.45	70.0	1875.5*	15.02	3.87
12:17	235.1	181.2	12.84	5.82	68.5	1875.5*	14.91	4.04
12:18	248.2	180.3	12.48	6.04	66.0	1875.5*	14.63	4.19
12:19	265.5	178.2	12.13	6.39	66.5	1875.5*	14.38	4.48
12:20	285.8	175.5	11.51	6.84	66.3	1875.5*	14.08	4.70
12:21	314.3	172.6	10.93	7.44	69.9	1875.5*	13.56	5.14
12:22	347.7	168.4	10.01	8.20	77.2	1873.5*	13.17	5.47
12:23	390.1	165.7	9.38	8.80	100.0	1875.0*	12.48	5.99
12:24	436.9	164.6	8.34	9.54	139.9	1875.5*	12.01	6.37
12:25	483.1	172.8	7.90	9.86	250.3	1875.5*	11.42	6.75
12:26	510.7	184.2	7.17	10.40	326.0	1875.5*	11.15	7.00
12:27	529.5	206.6	7.04	10.65	443.0	1875.5*	10.99	7.17
12:28	547.8	226.0	6.16	11.37	622.0	1875.5*	10.61	7.43
12:29	555.8	250.9	5.40	12.00	939.8*	1875.5*	10.11	7.79
12:30	536.6	279.5	4.65	12.66	1000.2*	1875.5*	9.66	8.17
AVERAGE VALUES FOR THE LAST 15 MINUTES								
12:30	394.2	192.6	9.28	8.76	287.0	1875.3	12.55	5.90
12:31	494.6	361.4	4.95	12.33	995.1*	1875.5*	9.26	8.54
12:32	482.4	361.7	6.06	11.65	465.1	1875.5*	10.01	8.11
12:33	560.7	296.2	6.58	11.61	137.5	1826.8*	10.27	8.10
12:34	599.5	257.6	6.74	11.60	60.5	1113.8*	10.46	7.99
12:35	603.5	253.5	6.86	11.50	45.6	804.6	10.07	8.40
12:36	591.3	260.2	7.59	10.82	35.6	854.8	10.34	8.25
12:37	510.2	302.7	9.92	8.86	29.5	670.3	11.61	7.31
12:38	399.3	290.9	11.71	7.20	28.5	767.4	13.14	6.08
12:39	303.5	265.0	13.19	6.08	28.9	882.1	14.64	4.85
12:40	239.4	225.7	14.36	5.03	28.9	928.5	15.35	4.18
12:41	197.9	201.2	15.14	4.39	31.2	1011.1	16.12	3.51
12:42	169.8	187.4	15.59	4.01	32.8	1086.7	16.60	3.06
12:43	153.7	181.2	15.90	3.82	34.8	1196.4	16.89	2.84
12:44	143.7	175.8	16.18	3.55	37.4	1312.6	17.10	2.68
12:45	134.8	173.5	16.51	3.25	43.1	1420.8*	17.35	2.46
AVERAGE VALUES FOR THE LAST 15 MINJTES								
12:45	372.3	252.9	11.15	7.71	135.6	1175.1	13.28	5.76
12:46	129.5	170.0	16.77	3.02	49.8	1492.8*	17.57	2.31
12:47	124.8	165.4	16.97	2.86	57.1	1493.8*	17.75	2.18
12:48	122.6	157.9	17.10	2.68	103.9	1471.1*	17.86	2.08
12:49	117.8	149.8	17.28	2.53	72.3	1482.5*	18.01	1.97
12:50	111.6	140.1	17.40	2.42	74.1	1420.4	18.10	1.91
12:51	106.4	136.6	16.98	2.69	77.5	1444.7	17.96	1.93

Site 9 Sewage Sludge Incinerator 06-04-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2	CHAN 4 STACK % CO2
12:52	101.7	125.8	17.03	2.54	84.5	1448.8	17.80	1.98
12:53	94.3	112.5	17.31	2.29	88.2	1462.68	17.99	1.88
12:54	81.1	98.6	17.53	2.07	93.3	1444.48	18.22	1.69
12:55	70.7	87.3	17.75	1.92	96.7	1328.8	18.35	1.59
12:56	60.5	80.2	17.82	1.87	90.3	1197.4	18.48	1.50
12:57	53.1	73.5	17.78	1.85	93.7	1137.3	18.35	1.51
12:58	47.3	71.7	17.86	1.82	93.3	1099.0	18.39	1.50
12:59	42.3	68.8	17.95	1.75	91.0	1059.3	18.47	1.44
13:00	37.0	67.8	17.83	1.78	90.6	1007.3	18.45	1.41
AVERAGE VALUES FOR THE LAST 15 MINUTES								
13:00	86.7	113.7	17.42	2.27	83.8	1332.7	18.12	1.79
13:01	32.2	68.6	17.80	1.80	91.9	991.5	18.36	1.44
13:02	30.7	72.4	17.70	1.87	91.0	954.8	18.34	1.46
13:03	33.8	78.2	17.45	2.01	92.6	966.5	18.15	1.57
13:04	40.0	84.7	17.25	2.20	92.8	997.3	18.00	1.69
13:05	49.5	89.6	17.12	2.32	93.5	1042.0	17.84	1.82
13:06	61.1	97.6	16.79	2.63	93.9	1093.2	17.74	1.88
13:07	74.6	105.1	16.43	2.89	95.2	1227.8	17.38	2.14
13:08	85.3	103.3	16.74	2.64	97.4	1314.3	17.41	2.15
13:09	84.2	101.6	16.91	2.56	99.6	1297.1	17.67	1.99
13:10	83.3	100.8	16.89	2.56	95.2	1313.3	17.66	1.99
13:11	84.5	103.3	16.80	2.65	92.9	1336.0	17.58	2.04
13:12	86.5	99.9	16.84	2.61	90.6	1325.2	17.56	2.06
13:13	87.8	102.5	16.65	2.80	89.3	1289.9	17.50	2.10
13:14	95.0	106.9	16.26	3.15	86.1	1291.7	17.24	2.28
13:15	103.6	105.3	16.19	3.17	88.5	1319.5	17.14	2.35
AVERAGE VALUES FOR THE LAST 15 MINUTES								
13:15	68.8	94.6	16.92	2.52	92.7	1184.0	17.70	1.93
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA								
13:15	230.5	163.5	13.69	5.32	149.8	1391.8	15.41	3.85
13:16	104.9	102.3	16.36	3.05	95.8	1329.1	17.23	2.32
13:17	100.6	98.2	16.39	3.00	91.3	1322.2	17.30	2.25
13:18	95.6	102.0	16.02	3.26	93.1	1220.7	17.05	2.36
13:19	95.0	107.5	15.79	3.38	87.4	1308.0	16.67	2.58
13:20	95.7	117.1	15.47	3.58	84.4	1444.28	16.67	2.55
13:21	98.6	118.1	15.53	3.52	88.0	1529.18	16.70	2.56
13:22	94.7	115.2	15.73	3.32	87.8	1574.18	16.82	2.46

COMMENTS: End of Run 4 12:15-13:15 6/4/90

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: System cal after Run 4

DATE : 06-04-1990 TIME: 13:22 - 14:25

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	5.3
6	BOILER	ppmSO2	361.4	329.9
7	BOILER	ppmNOx	0.0	3.6
7	BOILER	ppmNOx	240.0	232.5
8	BOILER	% O2	0.00	0.02
8	BOILER	% O2	12.50	12.15
10	BOILER	% CO2	0.00	0.03
10	BOILER	% CO2	11.01	10.95
1	STACK	ppmTHC	0.0	8.9
1	STACK	ppmTHC	181.2	186.1
2	STACK	ppm CO	0.0	4.2
2	STACK	ppm CO	1263.0	1285.6
3	STACK	% O2	0.00	0.08
3	STACK	% O2	12.50	12.24
4	STACK	% CO2	0.00	-0.10
4	STACK	% CO2	11.01	10.62

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Second direct cal

DATE : 06-04-1990 TIME: 14:26 - 15:13

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	2.7
6	BOILER	ppmSO2	218.0	218.4
6	BOILER	ppmSO2	218.0	203.0
6	BOILER	ppmSO2	361.4	357.3
7	BOILER	ppmNOx	0.0	0.5
7	BOILER	ppmNOx	240.0	240.9
7	BOILER	ppmNOx	475.0	479.0
8	BOILER	% O2	0.00	0.05
8	BOILER	% O2	12.50	12.50
8	BOILER	% O2	20.60	20.65
1	STACK	ppmTHC	0.0	1.2
1	STACK	ppmTHC	181.2	180.8
1	STACK	ppmTHC	282.0	282.0
3	STACK	% O2	0.00	0.12
3	STACK	% O2	12.50	12.50
3	STACK	% O2	20.60	20.51
4	STACK	% CO2	0.00	0.00
4	STACK	% CO2	11.01	11.00
4	STACK	% CO2	17.46	17.74

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: System cal before MM-5 Run

DATE : 06-04-1990 TIME: 15:14 - 15:46

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	3.9
6	BOILER	ppmSO2	361.4	343.7
7	BOILER	ppmNOx	0.0	0.5
7	BOILER	ppmNOx	240.0	241.7
8	BOILER	% O2	0.00	0.08
8	BOILER	% O2	0.00	12.52
1	STACK	ppmTHC	0.0	3.0
1	STACK	ppmTHC	181.2	181.2
3	STACK	% O2	0.00	0.09
3	STACK	% O2	12.50	12.47
4	STACK	% CO2	0.00	0.01
4	STACK	% CO2	11.01	10.99

Site 9 Sewage Sludge Incineraor 06-04-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2	CHAN 4 STACK % CO2
16:16	273.9	174.0	13.27	5.96	71.4	1779.5*	15.07	4.49
16:17	276.1	178.0	13.32	5.98	66.6	1732.4*	14.90	4.70
16:18	281.4	183.0	12.98	6.24	64.6	1784.7*	14.90	4.73
16:19	286.1	186.3	12.99	6.19	58.0	1726.5*	14.81	4.89
16:20	296.1	191.7	12.63	6.52	53.7	1743.2*	14.56	5.03
16:21	306.8	196.1	12.39	6.66	46.3	1691.0*	14.22	5.20
16:22	318.8	197.6	12.04	7.03	40.8	1625.9*	14.02	5.48
16:23	334.2	198.3	11.57	7.39	36.8	1562.6*	13.71	5.64
16:24	354.5	194.3	11.10	7.91	33.9	1460.5*	13.33	6.01
16:25	384.8	194.3	10.43	8.46	32.0	1295.4*	12.93	6.30
16:26	419.8	196.6	9.97	8.88	30.1	1217.4*	12.38	6.74
16:27	425.2	223.5	10.96	8.28	22.8	981.4	13.03	6.49
16:28	422.3	222.9	10.56	8.67	20.4	889.4	12.89	6.53
16:29	453.5	226.0	9.45	9.58	18.5	700.5	12.44	6.89
16:30	515.0	232.1	8.32	10.47	18.8	785.0	11.49	7.55
16:31	598.1	230.7	7.38	11.09	25.8	1155.1*	10.98	8.08
16:32	591.6	238.9	8.46	10.24	22.9	1047.8*	11.68	7.58
16:33	528.9	247.4	9.61	9.33	23.6	882.9	12.25	7.16
16:34	429.9	257.0	11.38	7.83	16.2	616.0	13.40	6.32
16:35	345.4	234.8	12.86	6.55	14.8	579.8	14.37	5.53
16:36	277.0	210.7	14.31	5.44	17.4	697.8	15.53	4.55
16:37	230.3	184.9	15.16	4.72	20.2	851.5	16.23	3.84
16:38	203.9	178.4	15.48	4.48	22.4	925.6	16.62	3.44
16:39	206.6	178.2	15.14	4.77	21.1	914.7	16.41	3.62
16:40	207.6	178.5	15.38	4.52	23.5	1012.7	16.46	3.61
16:41	200.6	178.3	15.75	4.26	26.6	1163.5	16.71	3.43
16:42	192.3	177.1	15.86	4.14	32.9	1376.6	16.90	3.22
16:43	190.9	178.2	16.01	4.03	38.5	1514.6*	17.00	3.14
16:44	192.1	178.5	15.32	4.40	38.9	1532.2*	16.53	3.32
16:45	196.4	179.1	15.26	4.41	38.9	1492.8*	16.26	3.57
AVERAGE VALUES FOR THE LAST HOUR: 30 MINUTES OF VALID DATA								
16:45	331.4	200.8	12.51	6.82	33.3	1224.6	14.39	5.24
16:46	199.6	178.6	15.18	4.46	45.5	1574.0*	16.24	3.57
16:47	201.8	177.5	15.36	4.24	46.3	1650.5*	16.32	3.46
16:48	200.5	175.2	15.51	4.16	53.8	1718.5*	16.47	3.34
16:49	198.1	173.5	15.65	3.99	56.2	1760.6*	16.59	3.19
16:50	196.2	171.6	15.82	3.92	63.6	1826.7*	16.73	3.10
16:51	191.9	167.4	15.95	3.75	68.3	1832.9*	16.86	2.96
16:52	187.2	162.6	16.20	3.58	76.8	1868.8*	17.00	2.87
16:53	180.9	158.6	16.30	3.46	85.6	1870.4*	17.17	2.69
16:54	175.3	150.7	16.62	3.22	93.0	1871.9*	17.32	2.62
16:55	164.0	144.9	16.75	3.09	99.7	1866.3*	17.52	2.46
16:56	148.0	120.6	17.41	2.52	119.4	1873.7*	17.81	2.28
16:57	127.5	116.5	17.05	2.89	134.3	1839.1*	17.88	2.15
16:58	121.5	113.2	16.67	3.01	145.4	1838.1*	17.57	2.30
16:59	118.6	117.5	16.43	3.18	150.0	1815.2*	17.39	2.41
17:00	117.2	117.0	16.33	3.22	148.7	1840.4*	17.29	2.45
AVERAGE VALUES FOR THE LAST 15 MINUTES								
17:00	168.5	149.7	16.22	3.51	92.4	1803.1	17.08	2.79
17:01	120.2	124.5	16.24	3.33	148.7	1838.6*	17.17	2.55

Site 9 Sewage Sludge Incineraor 06-04-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2	CHAN 4 STACK % CO2
17:02	123.1	127.8	16.07	3.45	147.1	1830.5*	17.21	2.53
17:03	124.7	120.8	16.16	3.35	144.7	1805.0*	17.13	2.57
17:04	123.8	123.8	16.19	3.40	144.1	1781.4*	17.13	2.61
17:05	131.9	144.0	15.36	4.01	143.1	1831.3*	16.90	2.70
17:06	159.3	155.2	15.01	4.24	132.3	1875.5*	16.36	3.08
17:07	173.0	157.5	14.96	4.29	124.7	1875.5*	16.28	3.20
17:08	181.0	163.2	14.75	4.42	117.6	1875.5*	16.20	3.25
17:09	191.5	166.7	14.67	4.48	109.1	1875.5*	16.02	3.36
17:10	196.8	171.2	14.48	4.67	106.9	1875.5*	15.96	3.46
17:11	204.8	174.4	14.32	4.75	103.3	1875.5*	15.84	3.55
17:12	210.0	177.3	14.31	4.80	99.7	1875.5*	15.74	3.64
17:13	215.0	179.8	14.03	5.09	97.4	1875.5*	15.71	3.67
17:14	221.9	181.2	14.07	4.99	93.4	1875.5*	15.55	3.79
17:15	224.7	178.9	14.06	5.04	96.3	1875.5*	15.52	3.90
AVERAGE VALUES FOR THE LAST 15 MINUTES								
17:15	173.5	156.4	14.98	4.29	120.6	1856.1	16.31	3.19
17:16	222.1	164.8	14.44	4.75	136.4	1875.5*	16.08	3.51
17:17	220.4	162.0	14.56	4.72	137.9	1875.5*	16.01	3.50
17:18	220.3	166.3	14.31	4.97	136.8	1875.5*	15.96	3.58
17:19	227.9	171.9	13.99	5.15	136.0	1875.5*	15.78	3.70
17:20	237.6	174.5	13.93	5.28	132.6	1875.5*	15.59	3.90
17:21	245.5	177.5	13.56	5.61	131.6	1875.5*	15.47	4.01
17:22	258.9	180.7	13.27	5.79	130.6	1875.5*	15.19	4.20
17:23	274.7	183.8	13.06	6.00	125.1	1875.5*	15.01	4.45
17:24	283.5	183.6	12.81	6.20	121.1	1875.5*	15.03	4.43
17:25	300.3	187.8	12.44	6.46	128.8	1875.5*	14.53	4.76
17:26	323.3	191.0	11.86	6.96	135.4	1875.5*	14.28	5.05
17:27	349.7	195.8	11.24	7.41	159.1	1875.5*	13.85	5.35
17:28	377.0	203.2	10.85	7.80	180.8	1875.5*	13.46	5.68
17:29	400.4	200.8	10.16	8.38	209.0	1875.5*	13.25	5.87
17:30	410.5	203.5	10.21	8.30	330.4	1875.5*	12.98	6.06
AVERAGE VALUES FOR THE LAST 15 MINUTES								
17:30	290.1	183.1	12.71	6.25	155.4	1875.5	14.83	4.54
17:31	407.8	199.6	11.30	7.59	192.1	1875.5*	13.59	5.81
17:32	388.1	186.3	11.54	7.40	193.0	1875.5*	14.13	5.34
17:33	385.7	182.4	11.53	7.45	219.5	1875.5*	14.03	5.40
17:34	394.4	179.5	11.45	7.52	239.1	1875.5*	14.09	5.39
17:35	392.8	184.9	11.58	7.33	318.5	1875.5*	14.09	5.33
17:36	387.6	188.3	11.61	7.38	289.5	1875.5*	14.13	5.36
17:37	381.2	188.6	11.53	7.42	259.3	1875.5*	14.17	5.32
17:38	372.4	188.2	11.95	7.18	222.8	1875.5*	14.08	5.37
17:39	377.6	185.2	11.40	7.67	166.9	1875.5*	14.05	5.46
17:40	387.8	182.5	11.44	7.62	134.4	1875.5*	14.07	5.48
17:41	386.5	181.3	11.56	7.53	111.2	1875.5*	14.04	5.53
17:42	381.0	176.8	11.81	7.42	97.3	1875.5*	14.19	5.43
17:43	371.8	189.4	11.97	7.21	86.0	1864.8*	14.32	5.29
17:44	354.0	212.8	12.45	6.85	77.9	1790.2*	14.46	5.21
17:45	336.6	215.2	12.57	6.73	75.0	1766.9*	14.69	5.03

Site 9 Sewage Sludge Incineraor 06-04-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2	CHAN 4 STACK % CO2
AVERAGE VALUES FOR THE LAST 15 MINUTES								
17:45	380.4	189.4	11.71	7.35	176.8	1861.8	14.14	5.38
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA								
17:45	253.1	169.7	13.91	5.35	136.8	1849.1	15.59	3.97
17:46	325.0	219.3	12.81	6.51	70.5	1703.6*	14.72	5.03
17:47	308.5	225.9	13.24	6.26	68.7	1685.1*	15.08	4.72
17:48	309.9	218.8	12.90	6.54	67.7	1668.6*	14.90	4.87
17:49	311.8	221.8	13.05	6.36	63.1	1667.6*	14.87	4.86
17:50	310.6	222.9	13.11	6.34	58.7	1657.9*	14.88	4.88
17:51	308.6	225.5	13.07	6.37	54.0	1701.9*	14.97	4.79
17:52	313.1	221.2	12.99	6.41	45.6	1627.0*	14.78	4.93
17:53	317.3	221.1	12.80	6.60	43.6	1603.3*	14.77	4.98
17:54	321.4	216.1	12.87	6.45	43.5	1610.6*	14.74	4.95
17:55	320.8	209.2	13.08	6.36	52.9	1700.3*	14.89	4.89
17:56	317.7	203.5	13.26	6.16	63.8	1734.4*	15.14	4.64
17:57	313.6	197.2	13.52	5.99	69.1	1666.5*	15.29	4.54
17:58	312.1	199.4	13.28	6.18	70.8	1679.1*	15.35	4.44
17:59	319.0	198.7	12.87	6.39	65.8	1649.1*	14.83	4.81
18:00	327.7	198.3	12.70	6.60	65.4	1631.3*	14.80	4.90
AVERAGE VALUES FOR THE LAST 15 MINUTES								
18:00	315.8	213.3	13.04	6.37	60.2	1665.7	14.93	4.81
18:01	329.0	200.7	12.64	6.58	63.4	1565.0*	14.73	4.90
18:02	326.8	200.6	12.84	6.52	61.7	1551.5*	14.79	4.97
18:03	320.0	204.0	12.91	6.40	60.8	1525.8*	14.92	4.80
18:04	311.6	203.2	13.15	6.22	61.2	1516.0*	14.99	4.77
18:05	301.9	205.7	13.19	6.20	61.4	1535.2*	15.19	4.59
18:06	295.1	203.5	13.09	6.18	61.8	1514.1*	14.98	4.68
18:07	289.2	204.9	13.27	6.09	64.0	1561.8*	15.14	4.60
18:08	283.6	207.3	13.24	6.07	62.0	1534.2*	15.16	4.52
18:09	282.1	208.9	13.38	6.02	62.5	1557.6*	15.17	4.59
18:10	278.8	210.6	13.34	6.00	64.1	1584.9*	15.28	4.45
18:11	279.6	207.8	13.47	5.90	63.4	1547.8*	15.21	4.51
18:12	280.6	210.5	13.37	6.00	65.8	1606.9*	15.27	4.47
18:13	276.9	206.0	13.55	5.83	63.4	1554.8*	15.28	4.42
18:14	265.9	198.2	14.06	5.43	65.2	1596.2*	15.32	4.42
18:15	270.6	209.1	13.45	5.93	63.9	1605.9*	15.29	4.41
AVERAGE VALUES FOR THE LAST 15 MINUTES								
18:15	292.8	205.4	13.26	6.09	63.0	1557.2	15.12	4.61
18:16	276.7	204.5	13.58	5.80	62.0	1580.6*	15.28	4.45
18:17	278.1	207.7	13.47	5.92	62.5	1613.9*	15.31	4.40
18:18	281.3	205.1	13.45	5.91	60.2	1550.0*	15.24	4.46
18:19	284.1	205.5	13.43	5.98	59.4	1608.3*	15.23	4.52
18:20	285.1	206.2	13.43	5.92	58.6	1566.9*	15.21	4.47
18:21	284.7	205.8	13.46	5.91	59.1	1584.7*	15.24	4.51
18:22	289.0	207.2	13.23	6.11	59.3	1599.9*	15.25	4.47
18:23	289.9	203.1	13.49	5.85	59.2	1564.9*	15.20	4.53
18:24	283.4	204.1	13.48	5.94	61.1	1611.7*	15.34	4.42

Site 9 Sewage Sludge Incineraor 06-04-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2	CHAN 4 STACK % CO2
18:25	286.9	202.1	13.40	5.93	60.6	1549.6*	15.22	4.45
18:26	289.7	201.0	13.48	5.93	60.0	1560.3*	15.25	4.48
18:27	289.6	201.0	13.47	5.90	60.2	1504.0*	15.28	4.44
18:28	289.3	199.3	13.44	5.93	59.6	1502.1*	15.19	4.56
18:29	293.6	204.9	13.26	6.10	60.0	1489.1*	15.20	4.54
18:30	297.4	202.1	13.27	6.06	59.3	1415.2*	15.10	4.60
AVERAGE VALUES FOR THE LAST 15 MINUTES								
18:30	286.5	204.0	13.42	5.95	60.1	1553.4	15.23	4.49
18:31	292.6	202.2	13.49	5.93	61.1	1471.8*	15.26	4.50
18:32	287.1	203.2	13.51	5.88	60.3	1413.5*	15.32	4.41
18:33	283.0	199.2	13.72	5.75	61.7	1414.0*	15.42	4.38
18:34	276.5	201.3	13.81	5.66	69.9	1413.3*	15.58	4.23
18:35	271.2	196.3	13.91	5.56	61.3	1366.2*	15.57	4.21
18:36	273.0	198.0	13.78	5.72	62.9	1408.2*	15.59	4.21
18:37	274.4	195.1	13.84	5.64	60.8	1325.7	15.53	4.21
18:38	272.6	194.2	13.83	5.68	60.3	1328.1	15.51	4.27
18:39	277.2	196.8	13.69	5.77	59.1	1333.2	15.53	4.26
18:40	281.5	191.9	13.58	5.86	57.8	1270.2	15.33	4.39
18:41	292.8	192.8	13.35	6.07	57.6	1296.3	15.15	4.58
18:42	299.3	200.0	13.25	6.16	56.9	1359.8*	15.17	4.56
18:43	302.6	200.4	13.15	6.21	57.0	1351.8*	15.04	4.72
18:44	314.2	204.4	12.75	6.60	50.1	1342.2	14.76	4.90
18:45	351.7	200.4	11.28	7.91	42.7	1198.5	13.97	5.59
AVERAGE VALUES FOR THE LAST 15 MINUTES								
18:45	290.0	198.4	13.40	6.03	58.0	1352.8	15.25	4.49
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA								
18:45	296.3	205.3	13.28	6.11	60.3	1532.3	15.13	4.60
18:46	385.4	205.1	11.80	7.27	45.0	1244.0	13.78	5.75
18:47	383.5	196.4	11.07	7.95	48.9	1173.9	13.85	5.68
18:48	403.8	198.5	11.08	7.99	45.3	1082.7	13.70	5.82
18:49	447.2	177.3	9.38	9.40	41.8	1195.3	12.77	6.41
18:50	484.7	216.7	9.85	8.95	33.4	989.5	12.58	6.73
18:51	426.4	227.3	11.44	7.59	31.6	934.4	13.50	6.09
18:52	347.2	208.2	13.61	5.96	36.0	1069.9	15.14	4.87
18:53	283.9	194.1	14.61	5.20	39.4	1175.0	15.95	4.07
18:54	253.5	187.1	15.18	4.74	43.3	1248.6	16.35	3.78
18:55	236.3	187.0	15.46	4.53	47.6	1371.2*	16.72	3.43
18:56	225.7	186.1	15.69	4.32	49.9	1415.9*	16.82	3.28
18:57	223.5	186.0	15.91	4.15	53.8	1440.4*	16.95	3.23
18:58	217.3	185.4	16.06	4.06	60.6	1565.1*	17.14	3.05
18:59	211.1	181.8	16.21	3.90	63.1	1623.4*	17.23	2.92
19:00	209.0	178.8	16.37	3.78	69.2	1663.4*	17.34	2.87
AVERAGE VALUES FOR THE LAST 15 MINUTES								
19:00	315.9	194.4	13.58	5.99	47.2	1279.5	15.32	4.53
19:01	210.1	183.8	15.67	4.20	76.8	1789.8*	16.92	3.04
19:02	218.0	187.5	15.34	4.34	78.8	1870.8*	16.43	3.41
19:03	217.2	187.0	15.41	4.28	79.8	1875.5*	16.44	3.37

Site 9 Sewage Sludge Incineraor 06-04-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2	CHAN 4 STACK % CO2
19:04	216.2	185.3	15.41	4.26	84.5	1875.5*	16.50	3.33
19:05	211.6	184.3	15.57	4.13	90.6	1875.5*	16.61	3.24
19:06	203.5	179.0	15.90	3.89	100.0	1875.5*	16.79	3.07
19:07	192.0	177.1	16.05	3.78	108.2	1875.5*	17.01	2.91
19:08	185.9	172.0	16.27	3.57	113.7	1875.5*	17.13	2.81
19:09	177.7	168.9	16.38	3.53	124.4	1875.5*	17.29	2.68
19:10	175.2	180.5	15.90	3.77	114.1	1875.5*	17.03	2.78
19:11	174.8	178.3	15.98	3.70	114.8	1875.5*	16.99	2.83
19:12	168.0	175.2	16.15	3.59	122.4	1875.5*	17.11	2.75
19:13	159.4	168.9	16.22	3.52	122.9	1875.5*	17.21	2.68
19:14	151.6	164.8	16.33	3.41	127.3	1875.5*	17.24	2.63
19:15	148.8	164.2	16.31	3.46	132.4	1875.5*	17.22	2.67
AVERAGE VALUES FOR THE LAST 15 MINUTES								
19:15	187.3	177.1	15.92	3.83	106.0	1869.4	16.93	2.95
19:16	148.9	168.5	16.09	3.64	127.3	1875.5*	17.17	2.69
19:17	150.6	166.7	16.07	3.61	126.1	1875.5*	17.00	2.79
19:18	153.2	159.4	16.36	3.53	120.8	1856.7*	17.35	2.70
19:19	154.7	159.7	16.15	3.69	118.2	1831.8*	17.34	2.65
19:20	157.8	159.2	16.26	3.57	114.1	1803.8*	17.24	2.72

COMMENTS: End of Run 7A - 17:15-19:15

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: System cal after Run 7A

DATE : 06-04-1990 TIME: 19:22 - 19:54

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
5	BOILER	ppmSO2	0.0	5.5
5	BOILER	ppmSO2	361.4	381.0
5	BOILER	ppmSO2	361.4	361.9
7	BOILER	ppmNOx	0.0	2.1
7	BOILER	ppmNOx	240.0	242.3
8	BOILER	% O2	0.00	0.06
8	BOILER	% O2	12.50	12.71
10	BOILER	% CO2	0.00	0.05
10	BOILER	% CO2	11.01	10.98
1	STACK	ppmTHC	0.0	10.7
1	STACK	ppmTHC	181.2	183.7
2	STACK	ppm CO	0.0	1.5
2	STACK	ppm CO	1263.0	1284.3
3	STACK	% O2	0.00	0.09
3	STACK	% O2	12.50	12.60
4	STACK	% CO2	0.00	0.05
4	STACK	% CO2	11.01	11.05

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: System cal after Run 18:45-22:00

DATE : 06-02-1990 TIME: 22:05 - 22:33

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	2.2
6	BOILER	ppmSO2	218.0	210.2
7	BOILER	ppmNOx	0.0	1.2
7	BOILER	ppmNOx	240.0	240.9
8	BOILER	% O2	0.00	0.09
8	BOILER	% O2	12.50	12.32
10	BOILER	% CO2	0.00	0.05
10	BOILER	% CO2	11.01	10.92
1	STACK	ppmTHC	0.0	3.0
1	STACK	ppmTHC	181.2	177.3
2	STACK	ppm CO	0.0	1.3
2	STACK	ppm CO	1263.0	1268.9
3	STACK	% O2	0.00	0.08
3	STACK	% O2	12.50	12.30

Site 9 Sewage Sludge Incinerator 06-02-199(

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2
18:42	359.1	160.1	11.38	7.66	15.7	590.6	14.28
18:43	454.9	155.3	10.27	8.61	20.2	626.0	13.24
18:44	496.2	165.9	10.43	8.57	15.1	545.3	13.30
18:45	498.7	172.4	10.77	8.17	11.2	475.9	13.31
AVERAGE VALUES FOR THE LAST HOUR: 4 MINUTES OF VALID DATA							
18:45	452.2	163.4	10.71	8.25	15.5	559.5	13.53
18:46	424.8	160.9	12.30	6.71	11.8	466.7	14.22
18:47	331.0	148.0	13.87	5.51	13.5	540.4	15.31
18:48	263.3	142.1	14.81	4.69	16.3	676.2	16.10
18:49	224.8	141.5	15.45	4.18	21.0	896.7	16.56
18:50	209.7	144.1	15.57	4.11	25.0	1032.9	16.78
18:51	202.1	144.9	15.86	3.88	30.6	1148.6	16.92
18:52	200.2	145.1	15.82	3.96	34.3	1229.0	17.04
18:53	203.4	143.8	15.41	4.09	31.7	1143.8	16.71
18:54	201.6	140.4	15.53	4.04	35.7	1198.4	16.78
18:55	200.2	138.7	15.58	3.96	37.6	1253.9	16.81
18:56	198.0	137.6	15.68	3.92	40.0	1265.4	16.90
18:57	197.6	135.6	15.34	4.10	40.0	1276.7	16.74
18:58	197.9	132.7	15.31	4.08	41.1	1248.3	16.61
18:59	193.4	130.6	15.44	3.93	44.0	1333.6	16.72
19:00	187.5	127.9	15.65	3.78	48.0	1369.7	16.84
AVERAGE VALUES FOR THE LAST 15 MINUTES							
19:00	229.0	140.9	15.17	4.33	31.4	1072.0	16.47
19:01	180.6	124.2	15.89	3.66	52.3	1408.4	16.98
19:02	177.7	123.9	15.82	3.64	53.6	1414.5	17.02
19:03	176.2	122.0	15.83	3.60	53.5	1390.1	17.00
19:04	174.2	119.8	16.04	3.44	56.5	1409.2	17.10
19:05	168.2	120.1	16.19	3.34	58.5	1419.7*	17.22
19:06	163.8	121.5	16.24	3.30	61.8	1465.8*	17.31
19:07	164.2	118.6	16.31	3.18	62.6	1457.3*	17.25
19:08	151.9	113.2	16.68	2.92	71.4	1508.0*	17.53
19:09	145.9		16.73	2.90	69.2	1426.0*	17.55
19:10	143.7	113.7	16.62	2.97	68.8	1411.8	17.47
19:11	145.2	114.5	16.58	3.03	67.3	1334.0	17.42
19:12	150.3	122.0	16.24	3.34	62.6	1324.1	17.15
19:13	162.6	127.9	15.62	3.69	52.8	1244.7	16.68
19:14	176.2	127.7	15.34	3.91	47.4	1215.0	16.45
19:15	92.7	9.4	15.65	4.04	43.2	1165.2	16.24
AVERAGE VALUES FOR THE LAST 15 MINUTES							
19:15	158.3	112.8	16.11	3.40	58.8	1372.9	17.09
19:16	13.2	2.0	15.76	4.02	42.1	1133.2	16.04
19:17	5.1	1.7	15.73	4.03	39.5	1118.4	15.89
19:18	4.0	1.7	15.75	4.04	37.4	1058.2	15.73
19:19	3.5	1.6	15.82	4.02	36.9	1076.6	15.81
19:20	3.6	1.6	15.82	4.02	35.8	1008.0	15.45
19:21	3.1	1.5	15.80	4.03	35.2	992.9	15.29
19:22	2.9	1.5	15.80	4.03	34.3	927.0	15.12
19:23	2.7	1.5	15.83	4.01	34.4	914.5	14.97

Site 9 Sewage Sludge Incinerator 06-02-199

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2
19:24	2.5	1.5	15.81	4.02	37.3	1045.3	15.55
19:25	8.9	21.2	17.32	2.87	43.2	1285.9	16.46
19:26	21.2	4.2	20.68	0.12	47.0	1337.7	16.62
19:27	6.6	2.7	20.71	0.10	47.7	1323.3	16.72
19:28	3.7	2.1	20.67	0.16	39.1	1123.1	16.15
19:29	38.7	77.3	16.74	3.34	37.8	1062.8	15.98
19:30	174.4	119.6	14.46	4.86	36.9	1073.2	15.83
AVERAGE VALUES FOR THE LAST 15 MINUTES							
19:30	19.6	16.1	16.85	3.18	39.0	1099.7	15.93
19:31	204.5	126.6	14.25	5.03	36.3	1001.2	15.72
19:32	214.6	124.4	14.06	5.21	36.1	1014.2	15.55
19:33	222.5	122.7	13.86	5.38	35.7	966.2	15.42
19:34	227.2	121.9	13.85	5.41	35.7	958.7	15.35
19:35	220.8	126.4	13.73	5.44	35.6	934.6	15.29
19:36	222.5	122.9	13.64	5.53	36.0	954.3	15.25
19:37	233.8	122.0	13.51	5.63	35.0	921.0	15.14
19:38	242.2	121.2	13.35	5.78	35.2	904.5	15.06
19:39	253.8	119.1	13.19	5.90	34.6	887.7	14.92
19:40	264.6	118.5	13.03	6.03	34.0	858.6	14.87
19:41	274.4	118.4	12.92	6.13	33.7	874.2	14.75
19:42	287.4	117.7	12.49	6.48	32.7	835.1	14.56
19:43	313.4	117.6	12.01	6.84	31.7	840.9	14.22
19:44	338.0	118.1	11.63	7.16	29.7	792.4	13.98
19:45	364.8	116.1	11.10	7.66	29.2	813.1	13.68
AVERAGE VALUES FOR THE LAST 15 MINUTES							
19:45	259.0	120.9	13.11	5.97	34.1	903.8	14.92
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA							
19:45	166.5	97.7	15.31	4.22	40.8	1111.9	16.08
19:46	401.2	113.7	10.65	8.12	28.2	817.9	13.34
19:47	433.2	108.1	10.07	8.57	27.3	865.5	13.01
19:48	466.5	106.5	9.69	8.88	27.8	932.2	12.62
19:49	478.6	111.5	9.63	8.89	29.3	953.2	12.57
19:50	464.7	119.1	9.95	8.64	30.1	1017.8	12.63
19:51	442.9	125.7	10.38	8.29	28.2	958.7	12.93
19:52	413.3	128.0	11.10	7.76	24.1	848.4	13.35
19:53	393.5	127.4	11.23	7.72	22.3	756.4	13.58
19:54	389.2	124.5	11.15	7.76	20.4	752.9	13.47
19:55	404.7	120.6	10.75	8.17	20.8	768.3	13.25
19:56	433.6	118.1	10.46	8.37	27.9	877.2	12.90
19:57	437.0	127.0	11.18	7.83	22.6	743.5	13.16
19:58	405.6	128.7	11.64	7.44	16.5	598.8	13.63
19:59	376.7	132.0	12.04	7.08	14.9	550.4	13.94
20:00	348.1	130.8	12.55	6.65	14.2	541.1	14.25
AVERAGE VALUES FOR THE LAST 15 MINUTES							
20:00	419.2	121.4	10.83	8.01	23.6	798.8	13.24
20:01	309.8	129.9	13.38	5.98	15.2	550.7	14.79
20:02	260.2	124.5	14.37	5.16	16.9	600.7	15.58

Site 9 Sewage Sludge Incinerator 06-02-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2
20:03	223.0	122.1	14.65	4.90	18.5	680.2	15.99
20:04	204.4	120.1	14.70	4.80	19.0	686.2	15.97
20:05	194.1	117.6	14.45	4.92	19.4	683.9	15.94
20:06	189.2	117.8	14.48	4.85	19.3	670.6	15.91
20:07	187.3	116.1	14.60	4.74	19.8	690.0	15.98
20:08	182.4	115.1	14.73	4.59	21.4	739.4	16.14
20:09	176.8	113.6	14.96	4.42	23.2	774.8	16.24
20:10	175.2	113.1	14.96	4.42	24.8	799.1	16.33
20:11	177.6	113.0	15.04	4.33	26.2	813.3	16.33
20:12	179.3	113.1	15.03	4.35	28.4	862.1	16.41
20:13	176.8	112.6	15.27	4.14	30.7	917.1	16.49
20:14	172.7	112.5	15.47	4.01	34.5	983.5	16.66
20:15	165.9	112.1	15.62	3.87	37.5	1025.1	16.74
AVERAGE VALUES FOR THE LAST 15 MINUTES							
20:15	198.3	116.9	14.78	4.63	23.6	766.8	16.10
20:16	164.2	111.6	15.70	3.80	40.1	1079.4	16.82
20:17	163.6	111.7	15.70	3.77	42.1	1121.8	16.87
20:18	162.0	111.2	15.87	3.64	44.9	1187.1	16.93
20:19	157.7	110.5	15.94	3.58	47.7	1260.5	17.01
20:20	153.8	109.6	15.80	3.66	49.6	1312.9	16.98
20:21	153.5	108.9	15.52	3.81	46.5	1236.5	16.71
20:22	155.1	109.2	15.50	3.81	46.5	1212.3	16.66
20:23	156.9	108.6	15.51	3.82	46.4	1200.7	16.66
20:24	155.4	108.0	15.64	3.69	48.6	1247.6	16.73
20:25	152.2	108.6	15.65	3.70	50.6	1273.3	16.78
20:26	152.0	108.5	15.59	3.75	50.7	1273.4	16.73
20:27	155.4	109.6	15.50	3.83	50.1	1236.6	16.71
20:28	160.3	110.9	15.34	3.94	50.3	1214.6	16.63
20:29	168.8	111.2	15.05	4.15	47.9	1123.5	16.43
20:30	180.6	112.0	14.80	4.34	44.6	1047.3	16.22
AVERAGE VALUES FOR THE LAST 15 MINUTES							
20:30	159.4	110.0	15.54	3.82	47.1	1201.8	16.73
20:31	195.0	113.4	14.33	4.74	42.5	1007.0	15.95
20:32	215.7	115.7	13.87	5.17	39.1	970.1	15.59
20:33	234.2	117.5	13.85	5.15	38.0	976.5	15.41
20:34	232.3	120.7	14.28	4.90	40.7	1045.7	15.90
20:35	229.8	122.2	14.31	4.82	42.7	1107.7	15.90
20:36	228.2	123.0	14.31	4.87	42.8	1097.4	15.92
20:37	230.1	124.5	14.25	4.88	42.5	1102.3	15.87
20:38	231.4	124.6	14.20	4.99	43.2	1097.7	15.85
20:39	237.3	125.7	14.00	5.14	41.5	1093.2	15.68
20:40	241.7	127.0	13.90	5.25	41.2	1079.2	15.62
20:41	245.2	127.9	13.80	5.30	39.6	1072.5	15.55
20:42	241.2	125.6	13.84	5.31	40.6	1091.2	15.53
20:43	244.7	125.7	13.65	5.46	40.2	1081.3	15.48
20:44	249.6	124.8	13.62	5.47	38.6	1064.5	15.40
20:45	253.2	125.2	13.44	5.63	38.1	1044.8	15.28
AVERAGE VALUES FOR THE LAST 15 MINUTES							
20:45	234.0	122.9	13.98	5.14	40.7	1062.1	15.66

Site 9 Sewage Sludge Incineraor 06-02-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA							
20:45	252.7	117.8	13.78	5.40	33.8	957.4	15.43
20:46	258.4	126.0	13.35	5.70	37.7	1041.7	15.21
20:47	263.7	126.7	13.27	5.78	38.4	1053.9	15.16
20:48	266.4	126.1	13.14	5.86	36.7	1013.1	15.07
20:49	272.9	124.4	13.06	5.96	35.9	987.5	14.98
20:50	279.6	122.8	12.85	6.14	34.5	943.7	14.88
20:51	289.6	120.8	12.70	6.28	34.4	941.8	14.75
20:52	297.3	120.7	12.57	6.34	33.0	907.2	14.65
20:53	298.8	120.4	12.52	6.40	32.2	873.9	14.55
20:54	306.5	118.4	12.34	6.53	31.6	860.0	14.49
20:55	318.0	117.3	12.14	6.71	30.1	824.5	14.34
20:56	326.3	116.9	11.94	6.89	29.3	811.1	14.24
20:57	334.9	120.7	12.29	6.60	27.5	782.5	14.28
20:58	317.2	124.7	12.71	6.36	27.1	844.8	14.66
20:59	316.2	124.7	12.53	6.50	26.2	849.7	14.56
21:00	325.1	121.4	12.34	6.63	25.4	825.0	14.37
AVERAGE VALUES FOR THE LAST 15 MINUTES							
21:00	298.1	122.1	12.65	6.31	32.0	904.0	14.68
21:01	331.4	121.0	12.42	6.57	25.2	831.0	14.38
21:02	315.7	122.2	12.90	6.18	25.5	832.3	14.68
21:03	294.9	122.8	13.12	6.01	26.2	872.4	14.93
21:04	283.7	122.6	13.30	5.87	25.5	845.5	15.01
21:05	283.1	122.9	13.17	5.98	24.8	844.5	14.99
21:06	293.2	121.8	12.91	6.20	23.2	791.9	14.82
21:07	306.3	121.7	12.75	6.32	21.8	777.9	14.69
21:08	308.1	122.4	12.62	6.24	21.8	777.4	14.65
21:09	298.1	124.0	13.03	6.07	22.1	801.0	14.81
21:10	283.2	124.1	13.38	5.78	23.4	853.3	15.07
21:11	269.5	124.5	13.63	5.56	25.1	898.2	15.26
21:12	259.2	124.4	13.84	5.36	26.8	949.1	15.44
21:13	251.1	123.7	14.07	5.19	28.2	967.4	15.60
21:14	241.4	124.8	14.23	5.04	30.6	1014.8	15.72
21:15	242.5	123.1	14.16	5.10	29.8	981.9	15.71
AVERAGE VALUES FOR THE LAST 15 MINUTES							
21:15	284.1	123.1	13.32	5.83	25.3	869.2	15.05
21:16	245.7	122.6	14.16	5.12	31.2	1024.0	15.72
21:17	247.6	123.2	14.36	4.91	33.3	1046.3	15.78
21:18	239.6	126.5	15.06	4.39	45.6	1218.7	16.35
21:19	223.8	127.5	14.90	4.41	41.9	1200.7	16.25
21:20	209.9	127.6	15.19	4.18	45.3	1256.5	16.37
21:21	194.5	124.4	15.92	3.69	53.2	1284.2	16.87
21:22	180.6	114.5	16.44	3.32	60.7	1293.8	17.30
21:23	168.9	115.3	15.98	3.63	61.6	1306.0	17.21
21:24	176.5	115.7	15.30	4.02	57.0	1304.2	16.62
21:25	182.5	116.3	15.24	4.08	54.1	1297.6	16.52
21:26	184.6	115.9	15.16	4.14	54.5	1293.7	16.49
21:27	190.8	115.4	15.05	4.21	59.4	1315.3	16.40
21:28	199.7	120.6	14.86	4.34	62.1	1272.3	16.25

Site 9 Sewage Sludge Incineraor 06-02-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2
21:29	207.4	121.4	15.09	4.20	66.9	1214.1	16.33
21:30	204.5	119.4	15.45	4.01	68.5	1230.0	16.60
AVERAGE VALUES FOR THE LAST 15 MINUTES							
21:30	203.8	120.4	15.21	4.18	65.0	1237.2	16.47
21:31	199.6	120.1	15.49	3.96	65.6	1218.8	16.66
21:32	199.7	116.9	15.38	4.03	65.8	1281.7	16.52
21:33	199.1	115.5	15.53	3.91	59.2	1320.8	16.62
21:34	189.7	113.4	15.69	3.79	59.4	1306.8	16.77
21:35	182.2	110.3	15.83	3.67	62.7	1288.7	16.91
21:36	176.5	108.6	15.90	3.66	61.8	1269.7	16.95
21:37	173.1	107.3	15.89	3.66	62.3	1273.3	16.98
21:38	171.1	108.6	15.99	3.58	60.0	1258.5	17.00
21:39	166.7	108.9	16.08	3.51	59.5	1267.8	17.05
21:40	161.9	109.8	16.19	3.41	60.4	1317.6	17.11
21:41	155.1	108.4	16.28	3.35	60.6	1308.3	17.21
21:42	152.3	108.7	16.27	3.37	61.9	1334.1	17.19
21:43	151.7	109.2	16.24	3.39	60.6	1305.8	17.12
21:44	147.7	109.6	16.28	3.33	62.5	1346.4	17.19
21:45	145.5	113.9	16.10	3.51	61.2	1345.6	17.10
AVERAGE VALUES FOR THE LAST 15 MINUTES							
21:45	171.4	111.3	15.94	3.61	60.9	1296.3	16.96
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA							
21:45	239.3	119.2	14.28	4.98	42.8	1076.7	15.79
21:46	155.0	124.8	15.29	4.05	54.9	1286.0	16.58
21:47	173.9	130.0	15.04	4.20	49.4	1224.4	16.27
21:48	184.2	132.3	14.82	4.38	48.5	1225.1	16.18
21:49	194.0	133.1	14.74	4.43	47.0	1209.2	16.02
21:50	202.1	134.5	14.43	4.72	45.9	1205.1	15.93
21:51	211.3	134.9	14.29	4.79	45.3	1184.8	15.75
21:52	216.8	135.4	14.25	4.86	45.2	1175.0	15.70
21:53	219.7	133.5	14.21	4.87	45.8	1213.5	15.68
21:54	223.2	133.5	14.18	4.94	44.6	1132.0	15.61
21:55	225.9	133.8	14.07	5.01	44.8	1149.2	15.62
21:56	228.8	135.1	14.09	5.01	44.7	1139.7	15.54
21:57	229.8	135.0	13.89	5.18	45.5	1160.4	15.51
21:58	238.5	134.7	13.78	5.27	45.4	1150.1	15.34
21:59	245.4	136.9	13.62	5.43	45.6	1172.1	15.29
22:00	257.7	132.5	13.04	5.91	45.2	1172.6	15.01
AVERAGE VALUES FOR THE LAST 15 MINUTES							
22:00	213.8	133.3	14.25	4.87	46.5	1186.6	15.74
22:01	307.9	121.1	11.59	6.99	46.1	1169.6	13.87
22:02	371.9	117.7	10.88	7.58	65.4	1628.2*	13.25
22:03	424.2	118.3	10.32	8.03	102.6	1829.8*	12.86
22:04	441.9	125.7	10.81	7.66	117.8	1814.1*	12.97
22:05	421.4	124.1	10.86	7.69	101.8	1767.5*	13.23

COMMENTS: End of Run - 19:54-22:00

(CONTINUED ON THE NEXT PAGE)

Site 9 Sewage Sludge Incineraor 06-02-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2
	6/2/90						

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Initial direct cal of Oxygen analyzers

DATE : 06-05-1990 TIME: 06:01 - 06:40

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
8	BOILER	% O2	0.00	0.06
8	BOILER	% O2	12.50	12.50
8	BOILER	% O2	20.60	20.65
3	STACK	% O2	0.00	0.11
3	STACK	% O2	12.50	12.50
3	STACK	% O2	20.60	20.61

Site 9 Sewage Sludge Incineraor 06-05-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN1C BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2	CHAN 4 STACK % CO2
06:43	19.4	-1.0	16.86	2.28	-0.5	-2.7	16.81	0.15
06:44	19.3	-1.0	16.87	2.27	-0.4	-2.7	16.79	0.15
06:45	19.2	-1.0	16.88	2.27	-0.3	-2.6	16.77	0.15
AVERAGE VALUES FOR THE LAST HOUR: 3 MINUTES OF VALID DATA								
06:45	19.3	-1.0	16.87	2.28	-0.4	-2.7	16.79	0.15
06:46	19.3	-1.0	16.87	2.26	-0.4	-2.7	16.78	0.15
06:47	19.6	-1.0	16.81	2.31	-0.5	-2.7	16.59	0.15
06:48	19.3	-1.0	16.54	2.52	-0.5	-2.6	16.14	0.15
06:49	19.4	-1.0	15.84	2.95	-0.5	-2.7	15.14	0.15
06:50	19.2	-1.0	15.67	3.03	-0.5	-2.4	14.97	0.15
06:51	19.6	-1.0	15.64	3.04	-0.5	-2.5	15.00	0.15
06:52	19.8	-1.0	15.65	3.03	-0.5	-2.4	14.90	0.15
06:53	19.4	-1.0	15.65	3.03	-0.5	-2.5	14.93	0.15
06:54	19.5	-1.0	15.65	3.03	-0.5	-2.5	14.94	0.15
06:55	19.5	-1.0	15.66	3.03	-0.5	-2.4	14.93	0.15
06:56	19.1	-1.0	15.66	3.03	-0.4	-2.4	14.90	0.15
06:57	19.0	-1.0	15.65	3.03	-0.3	-2.2	14.89	0.15
06:58	19.2	-1.0	15.62	3.04	-0.4	-2.3	14.93	0.15
06:59	19.7	-1.0	15.63	3.03	-0.5	-2.3	14.94	0.15
07:00	19.6	-1.0	15.64	3.03	-0.4	-2.3	14.93	0.15
AVERAGE VALUES FOR THE LAST 15 MINUTES								
07:00	19.4	-1.0	15.86	2.89	-0.5	-2.5	15.26	0.15
07:01	19.3	-1.0	15.64	3.02	-0.2	-2.3	14.98	0.15
07:02	19.5	-1.0	15.64	3.03	-0.7	-2.3	14.98	0.15
07:03	19.5	-1.0	15.63	3.03	0.9	-2.2	14.99	0.14
07:04	19.6	-1.0	15.65	3.02	0.4	-2.1	14.97	0.14
07:05	19.7	-1.0	15.63	3.03	-0.5	-2.3	14.98	0.14
07:06	19.5	-1.0	15.64	3.02	-1.1	-2.0	14.94	0.15
07:07	19.1	-1.0	15.64	3.02	0.8	-2.1	15.00	0.14
07:08	19.3	-1.0	15.66	3.01	0.7	-2.0	14.96	0.14
07:09	19.5	-1.0	15.62	3.03	-0.7	-2.1	14.95	0.14
07:10	19.5	-1.0	15.65	3.01	0.7	-2.0	15.01	0.14
07:11	19.6	-1.0	15.62	3.03	0.5	-2.0	14.95	0.14
07:12	19.4	-1.0	15.59	3.04	-0.6	-2.0	14.95	0.15
07:13	19.3	-1.0	15.63	3.01	-0.2	-1.9	15.02	0.14
07:14	19.9	-1.0	15.64	3.00	0.2	-2.0	15.03	0.14
07:15	19.8	-1.0	15.64	3.01	0.1	-2.0	15.03	0.14
AVERAGE VALUES FOR THE LAST 15 MINUTES								
07:15	19.5	-1.0	15.64	3.02	0.0	-2.1	14.98	0.14
07:16	19.7	-1.0	15.66	2.99	-0.0	-1.9	15.02	0.14
07:17	19.2	-1.0	15.66	2.99	0.3	-1.8	15.04	0.14
07:18	19.2	-1.0	15.69	2.97	0.4	-1.8	15.03	0.15
07:19	19.8	-1.0	15.68	2.97	-0.9	-1.8	15.09	0.14
07:20	19.8	-1.0	15.68	2.98	-0.4	-1.8	15.09	0.14
07:21	20.0	-1.0	15.68	2.97	-0.1	-1.8	15.12	0.15
07:22	19.6	-1.0	15.66	2.98	-0.1	-1.8	15.03	0.14
07:23	19.3	-1.0	15.68	2.98	0.4	-1.8	15.11	0.14
07:24	19.9	-1.0	15.67	2.98	1.2	-1.8	15.12	0.14

Site 9 Sewage Sludge Incineraor 06-05-199(

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2	CHAN 4 STACK % CO2
07:25	20.0	-1.0	15.68	2.97	-0.3	-1.8	15.08	0.14
07:26	19.4	-1.0	15.69	2.96	1.1	-1.7	15.08	0.14
07:27	19.7	-1.0	15.68	2.97	0.1	-1.8	15.09	0.14
07:28	19.8	-1.0	15.69	2.96	0.9	-1.8	15.12	0.14
07:29	19.5	-1.0	15.69	2.96	-0.1	-1.8	15.11	0.14
07:30	19.8	-1.0	15.68	2.96	-0.2	-1.7	15.12	0.14
AVERAGE VALUES FOR THE LAST 15 MINUTES								
07:30	19.6	-1.0	15.68	2.97	0.2	-1.8	15.08	0.14
07:31	19.5	-1.0	15.68	2.97	1.0	-1.6	15.05	0.14
07:32	19.4	-1.0	16.12	2.64	-1.3	-1.8	15.75	0.14
07:33	19.6	-1.0	16.84	2.21	-0.3	-1.8	16.74	0.14
07:34	19.5	-1.0	16.77	2.30	-0.8	-1.8	16.59	0.14
07:35	19.8	-1.0	15.80	2.89	0.2	-1.8	15.22	0.14
07:36	19.8	-1.0	15.75	2.91	0.6	-1.8	15.16	0.14
07:37	19.3	-1.0	15.76	2.90	0.6	-1.7	15.16	0.14
07:38	19.7	-1.0	15.75	2.90	0.1	-1.6	15.19	0.14
07:39	19.6	-1.0	15.77	2.89	0.3	-1.7	15.18	0.14
07:40	19.8	-0.9	15.75	2.90	0.1	-1.6	15.15	0.14
07:41	20.2	-1.0	15.74	2.89	-0.4	-1.5	15.18	0.14
07:42	20.3	-1.0	15.75	2.88	-1.2	-1.4	15.18	0.14
07:43	20.1	-1.0	15.76	2.88	1.2	-1.4	15.20	0.14
07:44	19.6	-0.9	15.77	2.88	-1.4	-1.5	15.25	0.14
07:45	19.9	-1.0	15.76	2.88	-0.2	-1.5	15.24	0.14
AVERAGE VALUES FOR THE LAST 15 MINUTES								
07:45	19.7	-1.0	15.92	2.80	-0.1	-1.6	15.42	0.14
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA								
07:45	19.6	-1.0	15.78	2.92	-0.1	-2.0	15.19	0.14
07:46	19.9	-1.0	15.78	2.87	-0.5	-1.5	15.20	0.14
07:47	20.2	-1.0	15.76	2.88	0.7	-1.5	15.18	0.14
07:48	19.8	-1.0	15.76	2.88	0.4	-1.4	15.18	0.14
07:49	19.4	-1.0	15.72	2.91	-1.4	-1.4	15.22	0.14
07:50	19.6	-1.0	15.70	2.92	-0.4	-1.4	15.21	0.14
07:51	20.4	-0.9	15.72	2.90	0.2	-1.3	15.14	0.14
07:52	20.3	-0.9	15.67	2.92	-0.1	-1.2	15.16	0.14
07:53	20.1	-0.9	15.69	2.92	-0.0	-1.2	15.14	0.14
07:54	19.6	-0.9	15.65	2.95	0.4	-1.2	15.11	0.14
07:55	19.8	-1.0	15.62	2.96	0.9	-1.4	14.99	0.14
07:56	19.8	-1.0	15.58	2.99	-0.2	-1.2	15.01	0.14
07:57	19.5	-0.9	15.55	3.01	0.5	-1.2	14.98	0.14
07:58	19.8	-1.0	15.51	3.03	0.8	-1.3	15.04	0.14
07:59	19.9	-0.9	15.49	3.04	-1.0	-1.2	15.00	0.14
08:00	19.8	-0.9	15.49	3.04	0.8	-1.1	15.02	0.14
AVERAGE VALUES FOR THE LAST 15 MINUTES								
08:00	19.9	-0.9	15.65	2.95	0.1	-1.3	15.11	0.14
08:01	19.8	-0.9	15.47	3.05	0.8	-1.3	14.99	0.14
08:02	19.8	-0.9	15.48	3.05	0.5	-1.4	14.99	0.14
08:03	20.2	-1.0	15.45	3.07	-0.4	-1.4	14.95	0.13

Site 9 Sewage Sludge Incinerator 06-05-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2	CHAN 4 STACK % CO2
08:04	19.9	-0.9	15.45	3.07	-0.4	-1.4	14.98	0.14
08:05	19.8	-0.9	15.42	3.08	-0.7	-1.5	14.88	0.13
08:06	14.0	-0.9	15.45	3.07	-0.5	-1.3	14.93	0.14
08:07	9.1	8.4	15.44	3.07	-0.2	-1.2	14.87	0.14
08:08	8.5	10.2	15.45	3.06	0.2	-1.2	14.98	0.14
08:09	7.7	10.1	15.44	3.06	-0.3	-1.1	14.95	0.14
08:10	7.8	10.1	15.45	3.06	-0.1	-1.2	14.93	0.14
08:11	7.4	10.2	15.44	3.05	-3.0	-1.1	14.92	0.14
08:12	7.4	10.1	15.45	3.05	-7.7	-1.2	14.82	0.14
08:13	7.2	10.3	15.44	3.04	-7.2	-1.2	14.91	0.14
08:14	7.4	10.6	15.42	3.05	-7.4	-1.2	14.81	0.14
08:15	7.2	11.5	15.32	3.13	-7.5	-1.1	14.66	0.14
AVERAGE VALUES FOR THE LAST 15 MINUTES								
08:15	12.2	5.7	15.44	3.06	-2.3	-1.3	14.91	0.14
08:16	7.4	13.4	15.14	3.27	-7.3	-1.1	14.35	0.14
08:17	8.1	15.5	14.95	3.42	-7.3	-1.1	14.04	0.14
08:18	9.5	18.2	14.66	3.64	-7.4	-1.1	13.79	0.14
08:19	11.7	20.5	14.44	3.82	-7.4	-1.1	13.42	0.14
08:20	13.4	22.2	14.22	3.98	-7.4	-1.0	13.17	0.14
08:21	15.0	23.3	14.08	4.09	-7.3	-1.0	13.09	0.15
08:22	16.9	24.3	13.94	4.19	-7.5	-1.0	12.84	0.15
08:23	17.7	24.3	13.89	4.23	-7.3	-0.9	12.84	0.15
08:24	18.4	23.6	14.27	4.05	-7.5	-0.9	13.16	0.15
08:25	19.3	24.7	14.14	4.12	-7.4	-0.9	14.09	0.15
08:26	19.4	24.3	14.29	4.06	-7.5	-0.8	14.05	0.15
08:27	20.1	24.9	13.61	4.58	-7.6	-0.4	12.57	0.15
08:28	23.4	26.5	13.27	4.90	-7.6	-0.7	12.30	0.15
08:29	26.0	27.9	12.97	5.17	-7.6	-0.6	11.85	0.15
08:30	27.9	29.2	12.63	5.44	-7.7	-0.8	11.61	0.15
AVERAGE VALUES FOR THE LAST 15 MINUTES								
08:30	16.9	22.9	14.03	4.20	-7.4	-0.9	13.15	0.15
08:31	30.4	30.0	12.42	5.64	-7.7	-0.7	11.42	0.15
08:32	32.4	31.5	12.12	5.89	-7.8	-0.5	10.91	0.15
08:33	34.5	34.6	11.34	6.56	-7.8	-0.6	10.21	0.15
08:34	40.0	37.7	10.60	7.18	-6.5	-0.6	9.21	0.15
08:35	46.7	40.8	9.60	8.06	-7.7	-0.6	8.13	0.15
08:36	55.7	41.5	8.62	8.95	-7.8	-0.6	6.87	0.15
08:37	69.0	44.3	7.50	9.78	-7.8	-0.7	5.29	0.15
08:38	85.0	46.7	6.42	10.69	-7.8	-0.5	3.80	0.15
08:39	105.9	46.6	5.80	11.00	-4.1	-0.5	2.68	0.15
08:40	125.3	47.0	5.58	11.21	1.0	-0.4	2.45	0.15
08:41	129.4	46.3	5.90	11.01	0.8	-0.6	2.20	0.15
08:42	125.7	45.2	6.11	10.81	0.4	-0.5	2.17	0.15
08:43	118.8	43.2	7.05	10.12	0.3	-0.4	3.39	0.15
08:44	104.2	44.6	8.87	8.76	0.1	-0.4	5.48	0.15
08:45	84.9	44.3	9.51	8.22	-0.1	-0.6	6.42	0.15
AVERAGE VALUES FOR THE LAST 15 MINUTES								
08:45	79.2	41.6	8.50	8.92	-4.2	-0.6	6.04	0.15

Site 9 Sewage Sludge Incinerator 06-05-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 3 STACK % O2	CHAN 4 STACK % CO2
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA								
08:45	32.1	17.3	13.40	4.78	-3.4	-1.0	12.30	0.14
08:46	72.5	44.6	9.90	7.95	-0.1	-0.6	6.71	0.15
08:47	66.4	44.2	10.10	7.76	-0.2	-0.6	7.23	0.15
08:48	63.4	43.2	10.13	7.72	-0.3	-0.4	7.19	0.15
08:49	61.5	44.4	10.28	7.62	-0.3	-0.5	7.28	0.15
08:50	60.5	43.6	10.14	7.74	-0.4	-0.5	7.29	0.15

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineracr

REASON: Initial direct cal

DATE : 06-05-1990 TIME: 08:50 - 09:44

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	2.7
6	BOILER	ppmSO2	218.0	217.8
6	BOILER	ppmSO2	361.4	359.1
7	BOILER	ppmNOx	0.0	0.1
7	BOILER	ppmNOx	240.0	240.7
7	BOILER	ppmNOx	475.0	479.2
8	BOILER	% O2	0.00	0.05
8	BOILER	% O2	12.50	12.50
8	BOILER	% O2	20.60	20.67
10	BOILER	% CO2	0.00	0.01
10	BOILER	% CO2	11.01	10.99
10	BOILER	% CO2	17.46	17.67
1	STACK	ppmTHC	0.0	0.7
1	STACK	ppmTHC	181.2	182.6
1	STACK	ppmTHC	282.0	284.3
2	STACK	ppm CO	0.0	0.9
2	STACK	ppm CO	457.5	457.0
2	STACK	ppm CO	1263.0	1289.2
4	STACK	% CO2	0.00	0.04
4	STACK	% CO2	11.01	11.03
4	STACK	% CO2	17.46	17.63

Site 9 Sewage Sludge Incinerator 06-05-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
09:51	344.7	226.9	9.70	8.56	6.8	235.5	6.05	7.98
09:52	329.0	226.7	10.09	8.18	5.2	158.4	6.02	7.72
09:53	311.6	236.0	10.28	8.08	5.2	186.4	5.90	7.85
09:54	299.3	232.3	10.28	8.04	5.2	186.8	5.79	7.99
09:55	296.4	234.4	10.30	8.04	5.1	196.8	5.82	8.12
09:56	292.6	238.5	10.24	8.11	5.1	188.6	5.77	9.81
09:57	296.5	231.6	10.06	8.23	5.0	197.0	5.87	16.41
09:58	301.5	240.8	9.99	8.38	5.1	188.2	5.91	15.69
09:59	309.5	232.8	9.72	8.52	4.9	174.3	6.00	14.95
10:00	316.8	240.4	9.59	8.70	5.0	169.8	6.15	14.58
AVERAGE VALUES FOR THE LAST HOUR: 10 MINUTES OF VALID DATA								
10:00	309.7	234.0	10.03	8.26	5.2	188.2	5.93	11.07
10:01	326.3	239.0	9.55	8.64	4.8	160.8	6.20	14.38
10:02	327.0	232.6	9.57	8.63	4.7	163.1	6.19	14.25
10:03	324.7	238.2	9.63	8.65	4.8	163.9	6.15	14.14
10:04	330.6	229.3	9.41	8.76	4.7	161.6	6.22	14.06
10:05	329.1	237.7	9.59	8.67	4.7	169.7	6.18	14.00
10:06	329.8	234.9	9.54	8.62	4.7	160.3	6.20	13.96
10:07	325.4	231.0	9.54	8.71	4.8	170.1	6.15	13.92
10:08	334.5	236.9	9.36	8.78	4.7	167.9	6.20	13.89
10:09	340.0	229.9	9.29	8.91	4.6	155.3	6.32	13.87
10:10	336.2	237.3	9.51	8.72	4.8	161.3	6.28	13.85
10:11	332.6	230.8	9.48	8.69	4.8	177.3	6.21	13.84
10:12	326.7	231.2	9.58	8.72	4.8	191.7	6.20	10.89
10:13	326.1	241.0	9.53	8.62	4.8	180.7	6.14	9.28
10:14	324.0	226.4	9.47	8.76	4.9	184.0	6.20	9.30
10:15	332.2	233.2	9.46	8.81	5.1	202.0	6.20	9.14
AVERAGE VALUES FOR THE LAST 15 MINUTES								
10:15	329.7	234.0	9.50	8.71	4.8	171.3	6.20	12.85
10:16	343.1	226.1	9.19	8.92	4.8	186.9	6.32	8.90
10:17	344.3	226.7	9.41	8.88	4.7	189.1	6.28	9.09
10:18	347.3	229.8	9.25	8.85	5.1	197.5	6.24	10.75
10:19	351.2	219.6	9.12	9.07	5.0	192.0	6.32	12.50
10:20	362.2	233.7	9.35	8.81	5.3	194.5	6.22	16.05
10:21	362.7	216.5	8.82	9.20	4.7	168.0	6.35	20.67
10:22	373.9	220.0	8.94	9.07	4.7	186.3	6.41	8.75
10:23	382.0	213.6	8.63	9.24	4.9	178.7	6.43	0.10
10:24	392.6	210.8	8.85	9.18	5.1	190.7	6.51	5.56
10:25	379.5	218.3	9.87	8.18	5.7	239.2	6.39	10.27
10:26	324.6	206.6	10.51	7.85	7.8	349.5	5.92	11.20
10:27	303.9	209.8	10.89	7.44	8.2	375.9	5.65	11.52
10:28	292.3	203.0	10.73	7.56	8.2	366.0	5.66	11.66
10:29	285.4	201.9	11.03	7.41	8.4	380.0	5.59	11.84
10:30	279.7	200.6	10.97	7.26	9.0	400.3	5.46	11.81
AVERAGE VALUES FOR THE LAST 15 MINUTES								
10:30	341.7	215.8	9.70	8.46	6.1	253.0	6.12	10.71
10:31	278.5	197.5	10.98	7.46	8.7	403.1	5.55	11.89
10:32	278.8	199.9	11.06	7.27	9.3	416.1	5.45	11.74

Site 9 Sewage Sludge Incinerator 06-05-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
10:33	276.0	195.5	10.79	7.53	9.1	402.6	5.56	11.74
10:34	277.2	195.3	10.98	7.42	9.0	413.9	5.52	11.65
10:35	279.8	196.7	10.67	7.57	9.5	405.9	5.55	11.41
10:36	282.0	194.7	10.70	7.65	9.5	406.2	5.62	11.25
10:37	285.5	196.4	10.46	7.75	9.5	405.4	5.65	10.84
10:38	291.8	183.6	10.26	7.96	10.5	408.4	5.85	10.44
10:39	291.9	193.1	10.41	7.85	10.2	424.9	5.74	10.30
10:40	293.2	193.8	10.26	7.96	10.1	398.8	5.81	10.14
10:41	294.5	193.4	10.30	7.99	9.8	401.8	5.83	9.94
10:42	282.5	197.9	11.39	6.98	10.4	419.6	5.66	10.64
10:43	242.4	191.5	11.50	7.09	9.6	442.0	5.23	11.75
10:44	263.7	196.1	10.42	7.79	9.4	412.2	5.60	10.34
10:45	256.9	199.8	11.58	6.93	9.4	403.0	5.59	10.89
AVERAGE VALUES FOR THE LAST 15 MINUTES								
10:45	278.3	195.0	10.78	7.55	9.6	410.9	5.61	11.00
10:46	234.9	194.7	11.62	6.93	9.6	442.5	5.21	11.48
10:47	246.0	196.4	10.42	7.87	9.5	397.7	5.49	10.50
10:48	268.1	186.3	10.80	7.61	9.5	375.8	5.87	10.14
10:49	269.8	192.0	10.26	7.98	10.0	424.0	5.58	10.18
10:50	276.9	188.1	10.14	8.13	9.3	373.1	5.91	9.30
10:51	284.5	193.1	10.05	8.14	9.5	398.3	5.90	8.96
10:52	291.8	192.3	9.78	8.41	9.6	376.8	6.02	8.54
10:53	302.4	185.8	9.57	8.53	9.1	371.7	6.13	8.50
10:54	313.6	188.8	9.37	8.68	9.5	372.0	6.17	7.93
10:55	315.7	185.8	9.40	8.69	9.3	363.5	6.27	7.78
10:56	321.2	189.9	9.12	8.86	9.5	377.6	6.30	7.62
10:57	329.8	186.4	8.96	8.99	9.4	341.9	6.42	7.51
10:58	336.0	188.3	9.08	8.91	9.4	363.4	6.42	7.71
10:59	336.2	192.1	8.99	8.96	9.8	359.1	6.44	7.91
11:00	335.3	187.8	9.15	8.86	9.2	349.8	6.37	8.25
AVERAGE VALUES FOR THE LAST 15 MINUTES								
11:00	297.5	189.8	9.78	8.37	9.5	379.1	6.03	8.83
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA								
11:00	311.8	208.7	9.94	8.27	7.5	303.6	5.99	10.85
11:01	329.8	194.3	9.26	8.76	9.5	357.0	6.32	8.23
11:02	323.6	193.9	9.34	8.67	9.1	328.7	6.31	8.32
11:03	304.3	197.9	9.86	8.23	9.1	351.4	6.14	8.80
11:04	285.7	199.0	10.00	8.07	9.5	348.7	5.91	9.14
11:05	276.1	193.4	9.99	8.16	9.2	361.8	5.94	9.21
11:06	277.9	200.9	9.99	8.11	9.7	360.8	5.88	8.98
11:07	278.1	192.8	9.75	8.34	9.5	349.8	6.00	8.83
11:08	286.5	195.9	9.71	8.37	9.2	360.1	6.04	8.53
11:09	294.1	195.9	9.54	8.46	8.9	334.0	6.08	8.15
11:10	296.6	192.4	9.53	8.51	9.4	352.4	6.13	8.02
11:11	306.6	197.7	9.23	8.72	9.5	339.6	6.18	7.64
11:12	329.9	188.7	8.84	9.08	8.9	329.2	6.41	7.29
11:13	340.9	198.4	9.04	8.89	9.3	341.5	6.48	7.40
11:14	328.9	202.8	9.26	8.70	8.9	320.2	6.33	7.73
11:15	312.7	209.7	9.55	8.49	8.0	301.1	6.22	8.42

Site 9 Sewage Sludge Incineraor 06-05-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
AVERAGE VALUES FOR THE LAST 15 MINUTES								
11:15	304.8	196.9	9.52	8.50	9.2	342.4	6.16	8.31
11:16	301.5	212.2	9.74	8.27	8.0	305.8	6.08	8.69
11:17	292.5	203.8	9.73	8.33	7.9	305.4	6.08	8.95
11:18	293.9	211.1	9.82	8.27	8.1	312.6	6.03	9.09
11:19	290.4	206.1	9.71	8.34	8.1	318.4	6.07	9.27
11:20	286.3	207.0	9.93	8.18	8.4	338.4	5.98	9.36
11:21	287.8	207.0	9.81	8.20	8.4	330.6	5.98	9.27
11:22	288.6	202.9	9.71	8.34	8.1	331.6	6.04	9.36
11:23	295.7	207.8	9.68	8.33	7.7	327.3	6.02	9.15
11:24	300.1	201.2	9.49	8.54	8.1	310.3	6.13	9.17
11:25	304.3	209.4	9.58	8.45	7.8	326.7	6.11	9.02
11:26	304.4	204.6	9.51	8.47	7.9	308.6	6.10	8.92
11:27	304.0	202.5	9.66	8.39	7.9	315.7	6.15	8.95
11:28	299.7	207.9	9.75	8.24	8.3	332.3	5.99	9.08
11:29	298.0	198.8	9.68	8.39	8.5	328.6	6.09	9.06
11:30	296.0	205.6	9.92	8.16	8.3	339.3	6.00	9.18
AVERAGE VALUES FOR THE LAST 15 MINUTES								
11:30	296.2	205.9	9.72	8.33	8.1	322.1	6.06	9.10
11:31	290.6	202.6	9.74	8.28	8.8	332.4	5.96	9.09
11:32	287.4	202.3	9.85	8.24	8.3	338.6	5.96	9.30
11:33	290.7	202.4	9.78	8.20	8.7	325.3	5.98	9.09
11:34	291.6	197.4	9.79	8.27	8.4	335.5	6.03	9.27
11:35	289.0	204.2	9.97	8.12	8.4	335.5	5.90	9.34
11:36	287.6	197.2	9.74	8.30	8.3	327.3	5.99	9.29
11:37	292.3	201.8	9.80	8.28	8.3	342.0	5.94	9.30
11:38	293.5	201.0	9.64	8.36	8.4	328.0	6.00	9.04
11:39	303.4	194.0	9.43	8.56	8.3	321.6	6.07	8.89
11:40	305.8	200.9	9.58	8.41	8.5	328.0	6.00	8.85
11:41	309.1	192.5	9.46	8.55	8.3	320.2	6.09	8.74
11:42	313.6	200.3	9.53	8.48	8.2	337.5	6.05	8.86
11:43	308.6	197.7	9.53	8.46	8.6	304.5	6.03	8.96
11:44	310.3	194.1	9.52	8.49	7.8	308.9	6.04	8.93
11:45	310.2	214.0	10.03	8.10	8.4	337.1	5.92	9.25
AVERAGE VALUES FOR THE LAST 15 MINUTES								
11:45	298.9	200.2	9.69	8.34	8.4	328.2	6.00	9.08
11:46	297.2	213.3	10.25	8.02	7.1	292.8	5.83	9.89
11:47	291.7	215.0	10.33	8.01	7.2	313.9	5.73	9.98
11:48	291.8	209.7	10.23	7.99	8.0	313.3	5.79	9.88
11:49	287.7	209.3	10.34	7.96	8.1	349.7	5.77	10.05
11:50	286.7	209.7	10.34	7.87	8.2	345.0	5.76	10.05
11:51	284.5	205.5	10.31	7.96	7.9	341.0	5.80	9.96
11:52	286.3	211.0	10.35	7.90	8.2	349.0	5.73	9.93
11:53	285.1	207.6	10.21	8.06	8.4	330.9	5.80	9.91
11:54	291.7	218.0	10.25	7.99	7.5	332.4	5.85	9.86
11:55	280.5	218.9	10.66	7.64	7.7	320.3	5.74	10.20
11:56	267.1	217.5	10.77	7.58	7.5	330.0	5.62	10.50
11:57	263.6	217.9	10.83	7.49	8.0	344.8	5.56	10.50
11:58	261.4	213.3	10.79	7.55	8.2	341.1	5.60	10.39

Site 9 Sewage Sludge Incinerator 06-05-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
11:59	258.3	213.1	10.92	7.41	8.3	361.9	5.58	10.55
12:00	254.6	210.3	10.86	7.43	8.5	358.5	5.52	10.47
AVERAGE VALUES FOR THE LAST 15 MINUTES								
12:00	279.2	212.7	10.50	7.79	7.9	335.0	5.71	10.14
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA								
12:00	294.8	203.9	9.86	8.24	8.4	331.9	5.98	9.16
12:01	255.5	209.1	10.87	7.45	8.3	365.1	5.56	10.41
12:02	254.9	219.2	10.82	7.46	8.6	359.7	5.56	10.36
12:03	253.5	221.0	10.75	7.57	7.6	331.2	5.59	10.27
12:04	258.7	225.6	10.62	7.65	7.5	337.6	5.66	9.80
12:05	258.5	224.6	10.63	7.67	7.8	326.8	5.67	9.63
12:06	258.5	227.4	10.60	7.68	7.8	347.5	5.68	9.57
12:07	262.0	228.7	10.13	8.09	7.1	319.0	5.77	9.14
12:08	273.1	224.6	9.84	8.28	7.0	314.0	5.98	8.74
12:09	286.5	225.7	9.55	8.56	7.0	316.8	6.16	8.26
12:10	304.7	222.0	9.21	8.85	6.6	282.5	6.28	7.80
12:11	322.3	222.5	8.96	9.03	6.5	289.7	6.40	7.46
12:12	324.1	228.5	9.41	8.65	6.8	273.8	6.42	7.48
12:13	314.2	230.6	9.47	8.62	6.9	284.1	6.36	7.88
12:14	308.2	237.4	9.78	8.38	6.8	280.3	6.36	8.37
12:15	296.7	232.5	9.88	8.26	6.8	282.6	6.22	8.48
AVERAGE VALUES FOR THE LAST 15 MINUTES								
12:15	282.1	225.3	10.03	8.15	7.3	314.0	5.98	8.91
12:16	291.6	236.1	9.90	8.29	6.8	284.8	6.18	8.68
12:17	286.5	234.0	10.01	8.15	6.6	265.9	6.12	8.79
12:18	278.6	233.7	10.13	8.06	6.7	282.7	6.12	9.15
12:19	270.1	233.3	10.47	7.74	7.0	290.1	5.94	9.58
12:20	261.5	227.8	10.49	7.72	7.4	305.6	5.81	10.03
12:21	252.1	230.6	10.77	7.51	7.3	312.9	5.78	10.13
12:22	243.8	228.3	10.86	7.38	7.4	310.5	5.64	10.06
12:23	240.4	228.4	10.80	7.45	8.0	332.6	5.67	10.27
12:24	236.4	228.9	10.99	7.26	8.0	325.7	5.53	10.32
12:25	236.9	226.3	10.83	7.38	7.9	333.4	5.60	10.43
12:26	234.6	227.6	11.05	7.24	8.1	342.9	5.57	10.46
12:27	229.7	223.5	11.22	7.03	8.5	355.2	5.47	10.63
12:28	221.1	222.2	11.34	6.98	9.2	385.1	5.39	10.90
12:29	220.0	221.2	11.37	6.90	9.1	372.1	5.30	10.96
12:30	219.3	223.8	11.18	7.10	9.2	386.4	5.41	10.78
AVERAGE VALUES FOR THE LAST 15 MINUTES								
12:30	248.2	228.4	10.76	7.48	7.8	325.7	5.70	10.08
12:31	222.5	223.6	11.30	6.99	8.9	376.0	5.41	10.73
12:32	222.0	220.9	11.15	7.10	9.1	374.0	5.43	10.82
12:33	224.1	223.2	11.20	7.11	9.3	385.5	5.48	10.71
12:34	223.2	220.9	11.22	7.03	9.4	378.5	5.41	10.65
12:35	219.3	218.4	11.36	6.93	9.5	393.3	5.40	10.86
12:36	211.5	208.1	12.04	6.45	10.2	440.2	5.11	11.86
12:37	206.1	213.7	11.60	6.73	9.9	416.3	5.13	11.53

Site 9 Sewage Sludge Incinerator 06-05-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
12:38	204.2	211.6	11.69	6.68	10.3	430.1	5.15	11.23
12:39	205.5	208.1	11.50	6.80	10.1	403.1	5.21	10.80
12:40	210.3	209.7	11.38	6.96	9.9	411.7	5.32	10.49
12:41	215.0	208.1	11.39	6.87	10.2	395.5	5.34	10.42
12:42	212.9	205.4	11.37	6.88	9.8	390.0	5.35	10.27
12:43	214.4	207.0	11.36	6.91	10.0	397.7	5.36	10.22
12:44	219.4	206.1	11.25	7.00	9.5	376.1	5.38	10.03
12:45	219.8	212.1	11.08	7.20	9.4	387.8	5.42	9.90
AVERAGE VALUES FOR THE LAST 15 MINUTES								
12:45	215.3	213.1	11.39	6.91	9.7	397.2	5.33	10.70
12:46	228.2	215.8	10.78	7.46	9.4	348.3	5.58	9.39
12:47	235.6	218.2	10.43	7.73	9.1	350.3	5.75	9.06
12:48	243.5	217.8	10.25	7.85	9.3	341.0	5.87	8.65
12:49	246.4	213.2	10.15	7.85	9.4	337.6	5.86	8.66
12:50	248.6	215.0	10.21	7.90	9.3	342.0	5.98	8.59
12:51	242.2	208.2	10.83	7.42	9.6	360.3	5.67	9.72
12:52	238.7	215.2	10.27	7.84	9.4	358.5	5.82	8.78
12:53	246.7	218.4	10.12	7.97	9.4	338.1	5.91	8.52
12:54	253.9	214.4	9.99	8.06	8.8	320.6	6.03	8.58
12:55	253.8	217.1	10.14	7.98	9.2	335.0	6.00	8.82
12:56	255.7	210.6	10.06	8.02	8.7	321.0	6.00	9.07
12:57	257.4	209.2	10.19	7.93	8.7	340.7	5.98	9.36
12:58	256.4	205.9	10.05	8.00	8.9	344.3	5.90	9.51
12:59	264.3	199.3	10.56	7.73	8.5	357.0	5.94	10.90
13:00	272.9	201.9	9.84	8.19	8.2	348.8	5.98	10.14
AVERAGE VALUES FOR THE LAST 15 MINUTES								
13:00	249.6	212.0	10.26	7.86	9.1	342.9	5.88	9.19
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA								
13:00	248.8	219.7	10.61	7.60	8.5	345.0	5.72	9.72
13:01	266.4	200.2	10.59	7.53	9.1	348.4	5.94	10.63
13:02	252.3	189.5	10.82	7.31	9.2	385.6	5.65	10.88
13:03	236.9	196.6	10.91	7.27	10.6	407.7	5.35	10.83
13:04	248.9	203.3	10.02	8.07	8.2	350.8	5.69	10.34
13:05	259.5	198.9	10.10	7.86	8.4	345.0	5.85	10.14
13:06	260.2	197.8	9.81	8.23	8.4	351.0	5.86	10.06
13:07	275.7	204.6	9.73	8.18	8.0	337.6	5.99	9.43
13:08	252.9	201.8	10.21	7.84	8.8	352.0	5.71	9.95
13:09	272.9	199.0	9.06	8.88	7.8	337.1	6.01	8.75
13:10	310.6	206.0	8.92	8.81	7.8	299.8	6.46	8.14
13:11	305.3	200.6	9.27	8.62	8.2	319.7	6.28	8.41
13:12	301.6	207.1	9.45	8.50	8.0	319.0	6.13	8.49
13:13	305.8	204.0	9.18	8.71	8.0	305.4	6.25	8.66
13:14	289.5	213.3	9.73	8.26	7.4	303.1	6.11	9.22
13:15	273.7	213.8	10.04	7.93	7.7	306.3	5.93	9.49
AVERAGE VALUES FOR THE LAST 15 MINUTES								
13:15	274.1	202.4	9.86	8.13	8.4	337.9	5.95	9.56
13:16	262.6	212.3	9.93	8.10	7.8	324.0	5.79	9.60

Site 9 Sewage Sludge Incineraor 06-05-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
13:17	250.8	208.9	10.81	7.18	8.4	332.9	5.75	9.96
13:18	214.2	199.6	11.23	6.90	9.8	399.9	5.11	11.03
13:19	222.9	205.5	10.44	7.66	8.6	390.0	5.27	10.71
13:20	255.2	206.2	9.67	8.28	7.9	322.1	5.80	9.83
13:21	279.1	204.1	9.48	8.47	7.2	319.2	6.07	9.60
13:22	288.5	206.5	9.47	8.39	7.2	306.0	6.09	9.34
13:23	287.8	202.8	9.53	8.38	7.1	298.4	6.08	9.35
13:24	291.4	204.4	9.63	8.31	7.5	318.3	5.98	9.46
13:25	293.4	198.7	9.51	8.39	7.5	307.7	6.05	9.65
13:26	293.3	198.3	9.60	8.33	7.4	330.7	6.01	9.58
13:27	294.6	197.3	9.48	8.41	7.7	317.8	6.06	9.55
13:28	297.4	194.3	9.55	8.39	7.3	319.3	6.08	9.56
13:29	296.3	199.4	9.50	8.40	7.6	324.0	6.01	9.47
13:30	298.9	193.5	9.31	8.63	7.3	312.0	6.13	9.47
AVERAGE VALUES FOR THE LAST 15 MINUTES								
13:30	275.1	202.2	9.81	8.15	7.8	328.2	5.89	9.74
13:31	305.7	199.5	9.45	8.48	7.6	322.7	6.13	9.60
13:32	300.1	201.5	9.33	8.56	7.3	305.2	6.14	9.42
13:33	301.9	200.5	9.33	8.63	7.4	306.9	6.15	9.51
13:34	298.1	206.8	9.43	8.43	7.5	305.6	6.10	9.43
13:35	292.4	200.4	9.32	8.61	7.2	300.0	6.14	9.43
13:36	299.4	205.6	9.27	8.65	7.0	299.4	6.19	9.32
13:37	299.2	203.8	9.18	8.69	6.9	276.0	6.23	9.19
13:38	301.5	206.5	9.21	8.71	6.6	280.8	6.24	9.21
13:39	301.1	209.8	9.18	8.67	6.2	260.4	6.20	9.03
13:40	302.7	206.1	9.17	8.73	6.4	265.2	6.27	9.16
13:41	301.7	214.2	9.35	8.57	6.2	255.5	6.20	9.22
13:42	298.4	211.3	9.28	8.63	6.1	248.2	6.23	9.40
13:43	295.4	211.8	9.38	8.56	6.2	262.1	6.17	9.72
13:44	295.2	211.6	9.38	8.49	6.2	252.1	6.09	9.60
13:45	293.8	208.3	9.40	8.53	6.2	257.1	6.15	9.59
AVERAGE VALUES FOR THE LAST 15 MINUTES								
13:45	299.1	206.5	9.31	8.59	6.7	279.8	6.18	9.39
13:46	292.0	215.5	9.50	8.43	5.9	254.4	6.07	9.62
13:47	290.0	208.6	9.40	8.52	5.7	238.2	6.14	9.52
13:48	291.5	213.6	9.42	8.51	6.0	255.6	6.11	9.48
13:49	288.6	212.7	9.46	8.42	5.7	247.2	6.11	9.49
13:50	283.1	213.0	9.54	8.38	6.1	252.2	6.08	9.66
13:51	278.4	215.6	9.79	8.14	6.5	259.4	5.98	9.63
13:52	270.5	215.6	9.99	8.10	6.2	267.6	5.91	9.83
13:53	271.9	219.7	9.95	8.17	6.3	270.1	5.83	9.78
13:54	277.3	221.9	9.73	8.30	5.8	239.7	5.95	9.53
13:55	278.9	223.1	9.84	8.25	5.3	226.4	6.01	9.85
13:56	279.1	226.0	9.87	8.18	5.5	232.3	5.97	9.89
13:57	276.5	223.5	9.76	8.29	5.6	235.5	5.99	9.77
13:58	277.1	226.0	9.95	8.13	5.4	238.6	5.96	9.66
13:59	272.9	221.8	9.91	8.15	5.7	240.7	5.96	9.65
14:00	270.2	227.1	9.96	8.15	5.7	257.4	5.91	9.71

Site 9 Sewage Sludge Incinerator 06-05-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
AVERAGE VALUES FOR THE LAST 15 MINUTES								
14:00	279.9	218.9	9.74	8.27	5.8	247.7	6.00	9.67
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA								
14:00	282.1	207.5	9.68	8.29	7.2	298.4	6.00	9.59
14:01	276.3	225.6	9.78	8.23	5.8	247.5	5.89	9.73
14:02	279.9	221.7	9.66	8.40	5.4	241.5	6.06	9.79
14:03	284.9	226.1	9.97	8.05	5.5	234.4	6.02	9.74
14:04	267.4	220.0	10.36	7.78	6.8	283.9	5.84	10.19
14:05	256.1	224.1	10.49	7.68	6.9	293.0	5.71	10.44
14:06	252.5	220.7	10.52	7.61	7.0	286.9	5.64	10.42
14:07	247.1	220.3	10.55	7.63	7.1	301.1	5.65	10.59
14:08	242.6	221.6	10.72	7.38	7.0	292.4	5.56	10.65
14:09	239.9	217.7	10.72	7.42	7.3	304.6	5.53	10.74
14:10	236.6	220.3	10.89	7.30	7.3	316.1	5.50	10.78
14:11	231.6	215.9	10.94	7.17	7.4	316.6	5.45	10.89
14:12	215.0	208.3	11.90	6.54	8.4	385.9	5.20	11.64
14:13	209.1	212.8	11.10	7.08	8.5	379.0	5.08	11.26
14:14	218.8	213.1	10.66	7.53	8.0	354.0	5.40	10.63
14:15	239.8	218.6	10.10	7.96	6.8	305.8	5.68	9.91
AVERAGE VALUES FOR THE LAST 15 MINUTES								
14:15	246.5	219.1	10.56	7.58	7.0	302.9	5.61	10.49
14:16	255.6	207.0	9.76	8.16	7.1	301.1	5.93	9.32
14:17	260.0	209.4	9.84	8.15	7.0	303.2	5.96	9.29
14:18	262.6	205.6	9.75	8.17	7.0	288.4	5.92	9.46
14:19	265.5	198.8	9.87	8.13	6.8	308.4	5.95	9.76
14:20	269.8	195.8	9.73	8.10	7.0	313.5	5.83	10.13
14:21	280.8	184.3	9.56	8.41	7.0	304.1	5.97	10.28
14:22	293.4	184.8	9.67	8.24	6.9	328.4	5.87	10.50
14:23	300.3	179.8	9.37	8.49	7.1	324.5	6.05	10.72
14:24	303.9	178.3	9.64	8.16	7.3	359.8	6.00	11.08
14:25	299.2	177.4	9.66	8.18	8.2	373.1	5.89	11.15

COMMENTS: DATA FOR RUNS 7B & 8

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Direct cal check after Run 8

DATE : 06-05-1990 TIME: 14:25 - 14:54

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	3.3
6	BOILER	ppmSO2	361.4	331.3
7	BOILER	ppmNOx	0.0	1.6
7	BOILER	ppmNOx	240.0	233.9
8	BOILER	% O2	0.00	0.06
8	BOILER	% O2	12.50	12.23
10	BOILER	% CO2	0.00	0.00
10	BOILER	% CO2	11.01	10.98
1	STACK	ppmTHC	0.0	1.6
1	STACK	ppmTHC	181.2	179.1
2	STACK	ppm CO	0.0	7.3
2	STACK	ppm CO	457.5	461.5
4	STACK	% CO2	0.00	0.00
4	STACK	% CO2	11.01	10.89
3	HEARTH	% O2	0.00	0.08
3	HEARTH	% O2	12.50	12.72

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Repeat of direct cal after analyzer adjustments

DATE : 06-05-1990 TIME: 14:54 - 16:23

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	2.7
6	BOILER	ppmSO2	218.0	219.4
6	BOILER	ppmSO2	361.4	365.4
7	BOILER	ppmNOx	0.0	1.4
7	BOILER	ppmNOx	240.0	240.9
7	BOILER	ppmNOx	475.0	477.1
8	BOILER	% O2	0.00	0.06
8	BOILER	% O2	12.50	12.50
3	HEARTH	% O2	0.00	0.06
3	HEARTH	% O2	12.50	12.50

Site 9 Sewage Sludge Incineraor 06-05-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
17:37	283.1	207.6	9.70	8.46	6.8	267.3	6.12	8.08
17:38	278.0	214.4	9.91	8.22	6.9	287.9	5.98	8.47
17:39	273.1	210.1	9.84	8.27	6.9	277.4	5.94	8.50
17:40	269.6	219.0	10.07	8.08	6.4	277.4	5.97	9.02
17:41	263.9	219.8	10.08	8.01	6.5	284.6	5.79	9.38
17:42	259.5	212.8	10.06	8.16	6.5	268.5	5.89	9.57
17:43	261.3	220.8	10.16	7.99	6.3	292.4	5.76	9.58
17:44	259.2	213.3	9.96	8.19	6.5	280.9	5.83	9.63
17:45	265.0	217.0	10.05	8.12	6.2	284.0	5.90	9.67
AVERAGE VALUES FOR THE LAST HOUR: 9 MINUTES OF VALID DATA								
17:45	268.1	215.0	9.98	8.16	6.6	280.0	5.91	9.10
17:46	266.5	214.9	9.85	8.21	6.4	286.6	5.86	9.65
17:47	268.1	215.3	10.03	8.15	6.1	273.2	5.91	9.64
17:48	268.2	220.2	10.09	8.03	6.2	301.3	5.83	9.72
17:49	264.2	213.3	10.12	8.07	6.2	289.5	5.85	9.80
17:50	258.8	217.6	10.23	7.96	6.5	315.3	5.77	9.81
17:51	260.0	217.6	9.91	8.21	6.4	305.8	5.86	9.54
17:52	261.4	218.8	10.02	8.15	6.2	297.7	5.90	9.48
17:53	266.2	221.6	9.82	8.25	6.2	312.1	5.93	9.21
17:54	266.3	218.6	9.84	8.32	6.1	293.7	5.99	9.11
17:55	272.5	222.4	9.71	8.40	6.1	303.0	6.01	8.91
17:56	279.7	217.2	9.48	8.62	6.1	282.6	6.16	8.62
17:57	285.2	220.0	9.71	8.38	5.9	275.2	6.20	8.68
17:58	277.2	223.0	9.94	8.18	6.2	303.2	6.03	9.06
17:59	265.8	222.0	10.21	8.00	6.4	292.1	5.98	9.48
18:00	263.3	226.3	10.31	7.88	6.2	319.8	5.84	9.72
AVERAGE VALUES FOR THE LAST 15 MINUTES								
18:00	268.2	219.3	9.95	8.19	6.2	296.7	5.94	9.36
18:01	258.1	220.6	10.15	8.07	6.4	301.4	5.88	9.66
18:02	258.1	222.6	10.33	7.88	6.3	301.4	5.90	9.70
18:03	254.7	223.0	10.30	7.90	6.4	323.3	5.82	9.57
18:04	253.7	222.3	10.37	7.86	6.3	305.6	5.88	9.71
18:05	251.2	225.2	10.29	7.86	6.6	331.0	5.78	9.65
18:06	253.1	221.2	10.24	7.99	6.6	313.3	5.87	9.64
18:07	254.4	227.2	10.28	7.90	6.3	318.3	5.88	9.69
18:08	250.0	224.7	10.26	7.97	6.5	322.8	5.86	9.56
18:09	251.5	225.7	10.12	8.05	6.4	304.3	5.93	9.61
18:10	254.9	225.5	10.09	8.04	6.3	317.2	5.88	9.59
18:11	247.9	222.3	10.32	7.89	6.3	295.5	5.94	9.74
18:12	237.9	216.8	10.44	7.75	6.5	318.9	5.79	9.83
18:13	236.0	219.7	10.31	7.96	6.7	309.2	5.83	9.90
18:14	252.2	217.7	10.51	7.82	6.4	303.5	5.81	10.08
18:15	249.7	160.7	12.69	5.71	6.7	326.3	5.73	10.02
AVERAGE VALUES FOR THE LAST 15 MINUTES								
18:15	250.9	218.4	10.45	7.78	6.4	312.8	5.85	9.73
18:16	111.9	4.9	20.66	0.11	6.9	307.8	5.80	10.01
18:17	40.3	119.7	15.41	4.49	6.8	338.5	5.73	9.97
18:18	142.3	204.6	10.51	7.82	7.1	327.1	5.78	9.94

Site 9 Sewage Sludge Incineraor 06-05-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
18:19	194.8	207.2	10.63	7.70	6.7	335.8	5.77	9.82
18:20	204.4	212.4	10.37	7.88	6.9	338.4	5.71	9.69
18:21	214.8	212.8	10.44	7.90	6.7	317.2	5.83	9.63
18:22	223.4	216.3	10.36	7.93	7.0	334.0	5.83	9.45
18:23	230.8	213.5	10.24	8.07	6.8	316.2	5.90	9.28
18:24	235.9	218.4	10.41	7.89	6.7	334.5	5.87	9.11
18:25	232.2	219.7	10.33	7.98	6.9	330.1	5.85	9.14
18:26	233.3	218.2	10.36	7.94	6.7	318.6	5.88	9.16
18:27	233.6	223.8	10.30	7.96	6.8	340.3	5.88	9.10
18:28	231.0	221.4	10.33	7.94	6.9	318.7	5.91	9.27
18:29	234.1	222.7	10.27	7.98	6.6	329.6	5.89	9.14
18:30	235.4	220.4	10.33	7.94	6.7	319.5	5.94	9.13
AVERAGE VALUES FOR THE LAST 15 MINUTES								
18:30	199.9	195.7	11.40	7.17	6.8	327.1	5.84	9.46
18:31	230.5	222.3	10.44	7.86	6.6	316.9	5.88	9.40
18:32	228.7	222.4	10.35	7.87	6.7	331.3	5.85	9.31
18:33	231.7	219.6	10.31	7.94	6.6	296.4	5.92	9.30
18:34	233.8	225.7	10.33	7.91	6.7	319.6	5.88	9.20
18:35	237.1	224.0	10.33	7.92	6.6	297.2	5.90	9.29
18:36	237.5	228.8	10.31	7.94	6.3	295.4	5.91	9.37
18:37	244.1	226.4	10.20	8.02	6.3	299.2	5.92	9.17
18:38	244.7	224.3	10.37	7.91	6.1	278.1	5.96	9.22
18:39	245.4	226.7	10.34	7.87	6.1	302.6	5.87	9.25
18:40	247.1	218.6	10.34	7.94	6.5	291.9	5.88	9.39
18:41	245.4	223.7	10.52	7.74	6.5	311.1	5.82	9.59
18:42	245.7	222.1	10.43	7.84	6.8	317.3	5.77	9.87
18:43	244.9	220.8	10.62	7.67	6.6	305.8	5.79	9.97
18:44	244.4	221.1	10.55	7.64	6.7	329.6	5.65	9.99
18:45	244.1	218.6	10.57	7.73	7.1	320.3	5.79	10.15
AVERAGE VALUES FOR THE LAST 15 MINUTES								
18:45	240.3	223.0	10.40	7.85	6.6	307.5	5.85	9.50
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA								
18:45	239.8	214.1	10.55	7.75	6.5	311.0	5.87	9.51
18:46	244.7	220.0	10.71	7.54	6.9	346.7	5.69	10.11
18:47	242.2	217.1	10.57	7.73	7.2	340.4	5.73	10.18
18:48	242.7	219.3	10.71	7.58	7.1	335.4	5.72	10.26
18:49	241.8	217.0	10.60	7.64	7.6	374.9	5.63	10.35
18:50	239.5	217.3	10.63	7.67	7.0	338.1	5.74	10.25
18:51	242.8	218.0	10.51	7.67	6.9	350.8	5.70	10.08
18:52	244.4	214.6	10.53	7.75	7.0	333.7	5.77	10.06
18:53	246.0	217.2	10.57	7.66	6.7	338.3	5.75	9.99
18:54	245.5	214.8	10.56	7.71	6.9	350.2	5.69	10.03
18:55	249.4	213.3	10.66	7.66	6.6	334.6	5.78	10.13
18:56	248.1	214.7	10.63	7.61	7.0	371.3	5.66	10.07
18:57	249.7	212.3	10.57	7.74	6.7	338.8	5.78	10.07
18:58	251.7	215.1	10.61	7.66	6.9	359.3	5.76	9.83
18:59	252.8	210.5	10.47	7.80	7.4	349.4	5.76	9.81
19:00	249.0	208.6	10.61	7.69	7.2	342.9	5.79	9.67

Site 9 Sewage Sludge Incinerator 06-05-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
AVERAGE VALUES FOR THE LAST 15 MINUTES								
19:00	246.0	215.3	10.60	7.67	7.0	347.0	5.73	10.06
19:01	249.8	209.3	10.44	7.77	7.4	364.5	5.78	9.37
19:02	253.1	207.9	10.54	7.75	7.7	347.4	5.84	9.45
19:03	253.7	212.2	10.40	7.83	7.1	353.2	5.82	9.24
19:04	254.9	211.0	10.31	7.96	7.0	331.9	5.89	9.08
19:05	265.4	208.5	10.41	7.87	7.1	339.6	5.91	9.25
19:06	266.6	209.7	10.30	7.93	7.3	333.7	5.90	9.26
19:07	268.4	209.4	10.37	7.91	6.8	313.9	5.98	9.26
19:08	264.0	212.5	10.53	7.75	6.9	334.8	5.87	9.34
19:09	261.6	209.9	10.45	7.86	6.8	313.1	5.89	9.38
19:10	261.8	211.6	10.43	7.82	6.5	320.4	5.89	9.38
19:11	261.1	211.4	10.30	7.93	6.7	313.1	5.90	9.30
19:12	267.7	209.7	10.44	7.84	6.6	294.9	5.91	9.46
19:13	265.0	221.3	10.63	7.66	6.1	308.5	5.82	9.53
19:14	260.4	220.9	10.62	7.69	6.0	285.4	5.86	9.34
19:15	253.9	222.9	10.73	7.56	5.8	299.9	5.79	9.86
AVERAGE VALUES FOR THE LAST 15 MINUTES								
19:15	260.5	212.5	10.46	7.81	6.8	323.3	5.87	9.40
19:16	252.9	225.0	10.55	7.72	5.9	289.9	5.83	9.57
19:17	258.0	223.1	10.62	7.71	5.6	296.5	5.93	9.43
19:18	266.0	224.5	10.52	7.72	5.8	288.7	5.91	9.26
19:19	266.7	216.6	10.57	7.68	5.9	272.7	5.99	9.16
19:20	258.6	217.7	10.69	7.58	6.2	298.1	5.91	9.05
19:21	254.5	211.6	10.57	7.70	6.4	283.5	5.95	8.99
19:22	249.7	206.3	10.74	7.47	6.3	285.0	5.99	9.00
19:23	234.5	183.7	10.61	7.67	7.1	297.4	5.93	8.72
19:24	223.6	168.9	10.69	7.60	7.2	297.2	6.08	8.51
19:25	217.0	166.9	10.65	7.56	7.4	323.6	6.00	8.41
19:26	210.0	157.8	10.78	7.53	7.4	308.4	6.10	8.44
19:27	200.7	171.3	10.83	7.34	7.0	311.3	5.99	8.87
19:28	196.0	173.9	10.81	7.52	7.9	316.3	5.90	8.68
19:29	241.0	184.2	10.43	7.86	7.8	317.1	5.99	8.43
19:30	270.7	190.3	10.39	7.83	8.3	321.8	5.99	8.35
AVERAGE VALUES FOR THE LAST 15 MINUTES								
19:30	240.0	194.8	10.63	7.63	6.8	299.8	5.97	8.86
19:31	271.5	185.2	10.44	7.86	7.7	304.5	6.07	8.31
19:32	274.7	196.2	10.53	7.84	7.2	314.3	5.98	8.50
19:33	270.2	200.5	10.50	7.70	7.2	296.2	5.97	8.50
19:34	262.3	200.1	10.68	7.67	6.7	292.6	5.94	8.77
19:35	258.0	205.7	10.68	7.59	6.8	292.4	5.89	8.54
19:36	257.4	202.1	10.49	7.84	6.6	278.1	6.01	8.79
19:37	262.1	212.3	10.56	7.73	6.1	277.1	5.98	9.06
19:38	260.7	212.7	10.59	7.65	5.8	256.1	6.04	9.19
19:39	251.2	212.1	10.90	7.46	6.0	278.9	5.88	9.55
19:40	244.1	212.3	10.79	7.46	6.2	285.1	5.81	9.58
19:41	238.8	208.9	10.97	7.40	5.7	270.8	5.90	9.83
19:42	229.5	211.6	11.03	7.21	5.9	291.8	5.80	9.89
19:43	143.9	49.5	11.28	7.35	6.2	278.3	5.85	9.94

Site 9 Sewage Sludge Incineraor 06-05-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
19:44	29.8	2.5	11.38	7.39	5.9	292.0	5.81	9.94
19:45	7.2	2.0	11.44	7.40	6.0	288.2	5.83	9.98
AVERAGE VALUES FOR THE LAST 15 MINUTES								
19:45	216.8	167.6	10.82	7.57	6.4	285.8	5.92	9.22
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA								
19:45	240.8	197.6	10.63	7.67	6.7	314.0	5.87	9.39
19:46	5.2	1.9	11.52	7.39	6.1	289.6	5.85	10.20
19:47	4.4	1.8	11.57	7.38	6.2	312.1	5.70	10.24
19:48	3.9	1.7	11.60	7.38	6.0	291.0	5.83	10.24
19:49	3.4	1.8	11.67	7.37	6.0	324.0	5.66	10.24
19:50	3.3	1.7	11.68	7.37	6.4	317.3	5.75	10.27
19:51	3.0	1.7	11.70	7.38	6.1	307.1	5.81	10.08
19:52	3.0	1.7	11.75	7.35	6.1	321.7	5.77	9.95
19:53	2.9	1.6	11.83	7.34	6.0	296.0	5.86	9.96
19:54	3.0	1.6	11.83	7.35	6.1	316.9	5.75	9.66
19:55	2.7	1.6	11.84	7.33	6.0	294.3	5.86	9.85
19:56	3.0	1.6	11.84	7.33	6.1	307.9	5.79	9.91
19:57	3.1	1.6	11.85	7.33	6.4	328.3	5.68	10.19
19:58	2.6	1.6	11.86	7.32	6.8	367.3	5.22	10.72
19:59	2.8	1.5	11.91	7.32	6.3	340.2	5.63	9.99
20:00	2.5	1.5	11.96	7.32	6.3	302.9	5.88	9.57
AVERAGE VALUES FOR THE LAST 15 MINUTES								
20:00	3.2	1.7	11.76	7.35	6.2	314.4	5.74	10.09
20:01	2.5	1.5	12.02	7.30	6.1	320.8	5.81	9.57
20:02	2.4	1.5	12.02	7.30	6.5	317.4	5.78	9.60
20:03	2.3	1.5	12.03	7.28	6.1	308.1	5.83	9.45
20:04	2.0	1.5	12.06	7.29	6.4	307.5	5.69	9.27
20:05	2.0	1.5	12.14	7.28	6.1	285.9	6.03	9.10
20:06	2.3	1.5	12.28	7.27	6.0	296.1	5.97	9.03
20:07	2.3	1.5	12.37	7.26	6.1	281.8	6.00	9.12
20:08	2.1	1.5	12.51	7.26	5.8	286.0	5.96	9.12
20:09	1.7	1.5	12.69	7.27	5.9	285.8	5.94	9.09
20:10	2.2	1.5	12.90	7.25	6.1	274.2	6.01	9.10
20:11	1.9	1.5	13.16	7.24	6.0	290.5	5.92	8.91
20:12	1.8	1.5	13.45	7.24	6.1	275.7	5.93	8.97
20:13	2.0	1.5	13.77	7.22	6.0	286.8	5.93	9.00
20:14	2.3	1.5	14.12	7.22	6.1	276.4	5.94	9.14
20:15	2.0	1.5	14.47	7.22	6.0	267.6	6.03	9.20
AVERAGE VALUES FOR THE LAST 15 MINUTES								
20:15	2.1	1.5	12.80	7.26	6.1	290.7	5.93	9.18
20:16	1.9	1.5	14.83	7.21	5.8	275.7	5.90	9.20
20:17	31.5	104.2	12.81	7.59	6.0	271.8	5.92	9.39
20:18	191.4	231.9	10.47	7.85	6.0	290.9	5.82	9.37
20:19	223.4	230.2		7.94	6.2	280.5	5.86	9.46
20:20	226.5	230.2	10.43	7.88	5.9	279.9	5.85	9.63
20:21	225.9	231.8	10.35	7.87	6.2	281.8	5.92	9.45
20:22	230.7	227.9	10.33	7.94	6.1	269.4	5.97	9.41

Site 9 Sewage Sludge Incinerator 06-05-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
20:23	230.7	233.2	10.53	7.80	5.7	279.7	5.81	9.55
20:24	230.6	228.6	10.48	7.82	6.2	278.0	5.76	9.58
20:25	232.2	229.1	10.57	7.75	6.0	287.0	5.78	9.76
20:26	232.4	228.5	10.57	7.70	6.2	269.1	5.70	9.82
20:27	231.2	227.6	10.71	7.64	5.9	290.5	5.72	9.98
20:28	232.7	228.6	10.63	7.63	6.2	309.4	5.62	9.75
20:29	237.4	224.5	10.51	7.83	6.0	292.4	5.76	9.68
20:30	243.9	227.7	10.57	7.74	6.4	306.3	5.77	9.84
AVERAGE VALUES FOR THE LAST 15 MINUTES								
20:30	200.2	205.7	10.94	7.75	6.1	285.5	5.80	9.59
20:31	245.2	224.7	10.53	7.75	6.2	300.3	5.71	9.71
20:32	250.1	224.4	10.30	8.06	6.0	288.2	5.82	9.61
20:33	265.3	227.2	10.09	8.06	5.9	281.0	5.92	9.30
20:34	270.5	222.2	10.21	8.06	6.1	276.4	6.00	9.37
20:35	270.9	224.5	10.19	8.12	5.9	285.5	5.95	9.41
20:36	274.9	221.4	9.99	8.26	5.9	269.6	6.04	9.35
20:37	277.9	224.2	10.11	8.21	6.0	273.6	6.04	9.46
20:38	286.7	224.0	9.76	8.40	5.7	256.6	6.10	9.32
20:39	289.7	222.7	9.98	8.30	5.6	251.4	6.13	9.55
20:40	291.5	230.5	10.09	8.15	5.6	257.9	6.07	9.48
20:41	283.4	228.5	10.18	8.11	5.9	260.1	5.99	9.68
20:42	279.9	231.6	10.31	7.96	5.7	274.9	5.91	9.83
20:43	279.9	226.1	10.00	8.23	6.1	270.2	5.92	9.53
20:44	283.2	226.3	10.22	8.08	6.2	267.5	6.02	9.35
20:45	275.3	222.3	10.45	7.77	6.5	298.9	5.80	9.57
AVERAGE VALUES FOR THE LAST 15 MINUTES								
20:45	275.0	225.4	10.16	8.10	5.9	274.1	5.96	9.50
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA								
20:45	120.1	108.6	11.42	7.61	6.1	291.2	5.86	9.59
20:46	275.4	228.8	10.24	8.09	6.5	287.2	5.84	9.52
20:47	284.1	227.0	10.23	8.02	6.3	283.6	5.79	9.56
20:48	289.7	226.2	10.16	8.10	6.4	264.8	5.95	9.47
20:49	272.8	216.3	11.77	6.68	8.1	352.7	5.64	10.45
20:50	236.8	212.0	12.29	6.33	9.4	391.5	5.13	11.33
20:51	210.7	206.9	12.64	6.14	9.4	417.3	4.81	12.01
20:52	205.0	209.9	12.34	6.32	9.3	420.2	4.92	11.98
20:53	198.6	203.8	12.92	5.86	8.5	442.0	4.88	12.99
20:54	183.8	202.9	13.14	5.63	8.1	472.0	4.61	13.88

COMMENTS: End of Run 9

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Direct cal check after Run 9

DATE : 06-05-1990 TIME: 20:55 - 21:30

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	1.9
6	BOILER	ppmSO2	218.0	226.7
7	BOILER	ppmNOx	0.0	1.5
7	BOILER	ppmNOx	240.0	242.2
8	BOILER	% O2	0.00	0.05
8	BOILER	% O2	12.50	12.61
10	BOILER	% CO2	0.00	0.00
10	BOILER	% CO2	11.01	11.03
1	STACK	ppmTHC	0.0	1.0
1	STACK	ppmTHC	181.2	179.0
2	STACK	ppm CO	0.0	6.9
2	STACK	ppm CO	457.5	458.3
4	STACK	% CO2	0.00	-0.02
4	STACK	% CO2	11.01	10.92
3	HEARTH	% O2	0.00	0.06
3	HEARTH	% O2	12.50	12.60

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Initial direct cal - 6/6/90

DATE : 06-06-1990 TIME: 07:40 - 08:28

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	2.7
6	BOILER	ppmSO2	218.0	219.7
6	BOILER	ppmSO2	361.4	362.6
7	BOILER	ppmNOx	7.0	0.0
7	BOILER	ppmNOx	240.0	239.7
8	BOILER	% O2	0.00	0.05
8	BOILER	% O2	12.50	12.50
8	BOILER	% O2	20.60	20.65
10	BOILER	% CO2	0.00	0.00
10	BOILER	% CO2	11.01	11.00
10	BOILER	% CO2	17.46	17.62
1	STACK	ppmTHC	0.0	1.0
1	STACK	ppmTHC	181.2	182.5
2	STACK	ppm CO	0.0	1.3
2	STACK	ppm CO	457.5	457.8
4	STACK	% CO2	0.00	0.05
4	STACK	% CO2	11.01	11.04
3	HEARTH	% O2	0.00	0.03
3	HEARTH	% O2	12.50	12.50
3	HEARTH	% O2	20.60	20.68

Site 9 Sewage Sludge Incinerator 06-06-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
08:31	2.4	0.1	20.59	0.06	6.9	354.4	5.53	7.56
08:32	15.8	87.0	16.75	3.46	7.8	408.1	5.37	7.82
08:33	147.5	210.3	11.20	7.11	7.6	418.2	5.40	7.82
08:34	199.5	225.4	11.40	6.97	7.6	425.2	5.43	8.05
08:35	209.8	229.0	11.39	7.04	7.3	432.4	5.32	8.09
08:36	213.8	228.8	11.28	7.11	7.1	422.7	5.43	8.64
08:37	212.7	229.8	11.32	7.07	7.0	409.6	5.43	8.96
08:38	210.7	228.5	11.46	6.97	7.1	416.5	5.38	9.25
08:39	205.9	233.3	11.44	6.98	7.1	414.8	5.36	9.53

Site 9 Sewage Sludge Incineraor 06-06-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
08:45	237.8	227.1	10.93	7.47	7.2	393.2	5.59	9.35
08:46	241.3	218.7	11.25	7.05	7.0	404.7	5.45	9.23
08:47	239.9	220.2	11.28	7.09	7.2	413.2	5.41	9.32
08:48	244.0	219.6	11.02	7.28	7.1	399.4	5.45	9.31
08:49	256.0	223.2	10.87	7.47	7.0	382.2	5.53	8.90
08:50	260.3	220.4	10.83	7.45	6.6	361.5	5.72	8.55
08:51	256.3	217.2	11.00	7.29	6.8	367.0	5.55	8.65
08:52	252.9	216.2	10.96	7.36	6.7	375.4	5.62	8.75
08:53	253.2	212.6	11.03	7.25	6.9	372.6	5.50	8.80
08:54	252.5	212.3	11.02	7.29	7.1	379.3	5.59	8.82
08:55	250.1	207.4	11.13	7.14	7.3	381.7	5.48	8.82
08:56	246.9	209.9	11.14	7.18	7.0	389.5	5.49	8.93
08:57	244.3	207.3	11.15	7.14	7.2	397.2	5.43	9.03
08:58	247.5	208.7	11.07	7.25	7.0	388.1	5.50	8.94
08:59	246.9	208.7	11.01	7.23	6.9	379.6	5.52	8.94
09:00	248.6	209.9	11.11	7.25	6.9	386.2	5.50	8.95
09:01	251.3	211.3	10.79	7.47	7.0	377.0	5.56	8.94
09:02	254.9	210.8	11.00	7.31	6.3	362.1	5.61	8.90
09:03	250.4	211.9	10.88	7.43	6.9	374.6	5.62	9.02
09:04	253.2	213.9	10.96	7.31	6.9	365.8	5.55	8.83
09:05	255.4	216.0	10.83	7.46	6.8	365.0	5.64	8.86
09:06	253.6	209.9	11.03	7.22	6.8	354.1	5.57	8.80
09:07	251.2	210.9	11.01	7.27	6.8	365.4	5.55	8.92
09:08	247.4	209.4	11.10	7.13	7.0	386.6	5.49	9.10
09:09	242.3	205.5	11.30	7.00	6.9	379.3	5.41	9.29
09:10	239.8	203.8	11.28	6.92	7.1	387.5	5.37	9.33
09:11	241.6	206.1	11.21	7.09	7.0	368.8	5.33	9.35
09:12	242.0	205.9	11.18	7.06	6.8	375.6	5.42	9.39
09:13	241.9	207.9	11.27	7.04	6.9	381.2	5.36	9.37
09:14	242.5	208.0	11.07	7.17	6.9	381.7	5.42	9.49
09:15	247.9	211.2	11.10	7.18	6.8	372.6	5.41	9.36
09:16	250.5	211.7	10.97	7.29	6.7	369.8	5.50	9.44
09:17	251.7	212.0	11.00	7.23	6.6	358.9	5.46	9.40
09:18	252.5	213.5	10.89	7.38	6.4	358.2	5.55	9.37
09:19	258.6	213.5	10.59	7.56	6.2	342.1	5.56	9.22
09:20	264.2	214.6	10.32	7.78	6.3	334.5	5.75	8.79
09:21	266.7	215.4	10.31	7.75	6.1	324.5	5.80	8.55
09:22	268.5	217.7	10.18	7.91	6.0	324.3	5.80	8.40
09:23	275.0	216.0	10.05	7.97	5.9	309.2	5.92	8.26
09:24	281.2	220.0	9.99	8.06	5.9	303.5	5.93	8.29
09:25	285.8	222.2	9.70	8.29	5.6	297.3	6.04	8.16
09:26	288.1	220.1	10.12	7.93	5.3	284.3	6.07	8.15
09:27	272.8	217.0	10.41	7.73	6.3	317.8	5.93	8.74
09:28	269.3	214.7	10.57	7.54	6.4	320.4	5.73	8.92
09:29	264.8	213.8	10.53	7.63	6.2	327.9	5.72	9.13
09:30	261.5	210.8	10.95	7.18	6.2	333.4	5.68	9.44
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA								
09:30	236.8	210.5	11.22	7.12	6.8	374.0	5.54	8.94
09:31	251.9	210.2	11.25	7.04	6.5	358.6	5.43	10.25
09:32	244.2	204.4	11.36	6.88	6.5	371.2	5.32	10.56
09:33	242.4	205.5	11.50	6.82	6.6	381.4	5.19	10.65
09:34	242.7	203.6	11.35	6.90	6.6	385.2	5.27	10.67

Site 9 Sewage Sludge Incineraor 06-06-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
09:35	240.4	200.6	11.57	6.74	6.9	398.6	5.15	10.78
09:36	235.6	200.9	11.49	6.79	6.9	400.8	5.21	11.02
09:37	236.2	199.1	11.61	6.67	7.1	416.9	5.10	10.98
09:38	236.0	202.0	11.45	6.85	7.3	413.2	5.20	10.89
09:39	237.9	199.4	11.52	6.72	7.4	420.4	5.14	10.76
09:40	239.3	204.4	11.05	7.13	6.7	396.3	5.27	10.34
09:41	245.3	203.2	10.93	7.12	6.7	378.7	5.43	9.81
09:42	246.4	203.9	10.97	7.19	6.7	373.1	5.47	9.73
09:43	251.6	205.6	10.71	7.33	6.8	364.1	5.53	9.42
09:44	254.5	206.4	10.74	7.39	6.6	365.4	5.58	9.13
09:45	261.2	206.1	10.56	7.46	6.4	334.9	5.71	8.91
AVERAGE VALUES FOR THE LAST 15 MINUTES								
09:45	244.4	203.7	11.20	7.00	6.8	383.9	5.33	10.26
09:46	259.1	207.2	10.67	7.43	6.7	348.2	5.64	8.71
09:47	261.0	206.4	10.44	7.59	6.5	332.3	5.75	8.61
09:48	260.9	208.3	10.54	7.53	6.5	341.8	5.69	8.38
09:49	261.3	207.8	10.50	7.54	6.6	328.4	5.82	8.28
09:50	256.1	207.5	10.74	7.36	6.7	345.2	5.66	8.25
09:51	250.8	206.6	10.65	7.46	6.7	352.0	5.69	8.26
09:52	253.9	207.6	10.73	7.36	6.5	346.0	5.64	7.99
09:53	255.0	211.1	10.60	7.49	6.7	346.4	5.71	8.03
09:54	252.6	206.8	10.77	7.28	6.4	330.4	5.65	8.05
09:55	252.7	207.7	10.70	7.40	6.5	354.4	5.62	8.02
09:56	252.3	205.1	10.73	7.30	6.9	349.8	5.60	8.16
09:57	250.7	206.3	10.79	7.33	6.8	358.2	5.59	8.40
09:58	252.2	205.6	10.67	7.35	6.5	356.5	5.59	8.58
09:59	257.8	210.8	10.55	7.51	6.5	353.2	5.54	8.57
10:00	264.3	209.6	10.37	7.63	6.4	334.4	5.76	8.49
AVERAGE VALUES FOR THE LAST 15 MINUTES								
10:00	256.1	207.6	10.63	7.44	6.6	345.2	5.66	8.32
10:01	266.3	211.6	10.46	7.60	6.2	332.6	5.69	8.58
10:02	268.8	213.1	10.23	7.80	6.0	331.0	5.81	8.66
10:03	271.0	211.4	10.43	7.61	6.0	323.2	5.74	8.65
10:04	270.9	212.3	10.34	7.74	5.8	320.5	5.79	8.93
10:05	267.3	208.5	10.56	7.46	6.0	327.5	5.67	9.12
10:06	264.6	212.5	10.43	7.67	6.0	329.3	5.66	9.25
10:07	268.3	212.2	10.48	7.51	5.8	327.8	5.64	9.36
10:08	266.1	213.8	10.43	7.65	5.7	321.7	5.64	9.43
10:09	265.1	211.4	10.49	7.52	5.6	332.6	5.67	9.39
10:10	262.9	211.5	10.56	7.52	6.1	328.5	5.57	9.47
10:11	262.6	212.2	10.44	7.54	6.0	342.6	5.63	9.60
10:12	261.1	210.9	10.62	7.45	5.9	339.1	5.52	9.62
10:13	263.4	214.4	10.36	7.64	5.8	343.4	5.67	9.62
10:14	265.2	211.5	10.62	7.41	6.0	343.9	5.54	9.57
10:15	263.2	214.0	10.32	7.71	5.9	342.9	5.66	9.62
AVERAGE VALUES FOR THE LAST 15 MINUTES								
10:15	265.8	212.1	10.45	7.59	5.9	332.4	5.66	9.26
10:16	265.4	212.3	10.58	7.45	5.7	338.5	5.60	9.56
10:17	263.6	215.1	10.37	7.70	5.7	332.3	5.64	9.64

Site 9 Sewage Sludge Incinerator 06-06-1996

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
10:18	266.1	212.3	10.55	7.44	5.5	336.0	5.59	9.65
10:19	260.6	212.6	10.51	7.56	5.7	329.0	5.61	9.61
10:20	263.8	212.4	10.43	7.52	5.8	330.7	5.61	9.61
10:21	262.6	212.7	10.54	7.53	6.0	326.8	5.59	9.66
10:22	266.5	211.6	10.36	7.58	5.9	339.6	5.64	9.67
10:23	265.7	210.8	10.58	7.49	5.9	342.9	5.56	9.67
10:24	264.3	213.7	10.41	7.57	6.3	357.7	5.64	9.65
10:25	261.9	212.5	10.72	7.32	6.2	363.3	5.51	9.88
10:26	256.4	214.4	10.52	7.47	6.2	368.3	5.55	9.88
10:27	255.7	213.2	10.68	7.32	6.4	369.2	5.44	9.76
10:28	264.8	216.2	10.32	7.75	6.3	353.4	5.63	9.38
10:29	269.4	213.4	10.42	7.46	6.0	337.6	5.67	8.87
10:30	268.7	211.6	10.66	7.43	6.4	355.3	5.61	9.30
AVERAGE VALUES FOR THE LAST 15 MINUTES								
10:30	263.2	213.0	10.51	7.51	6.0	345.4	5.59	9.57
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA								
10:30	257.3	209.1	10.70	7.38	6.3	351.7	5.56	9.35
10:31	259.2	208.7	10.57	7.38	6.5	358.6	5.60	9.24
10:32	263.4	207.5	10.55	7.54	6.4	356.8	5.66	9.60
10:33	271.3	202.4	10.22	7.70	6.7	353.5	5.79	8.33
10:34	281.3	201.3	10.28	7.71	6.4	374.4	5.77	7.61
10:35	284.3	195.6	10.05	7.89	6.8	355.3	5.93	7.11
10:36	293.6	195.3	10.14	7.82	7.0	393.1	5.85	6.48
10:37	285.0	193.1	10.30	7.65	8.0	389.3	5.91	6.52
10:38	278.2	193.5	10.39	7.55	8.8	438.7	5.64	6.55
10:39	282.4	195.5	10.13	7.87	8.9	418.4	5.77	6.39
10:40	285.8	194.2	10.20	7.66	9.2	411.1	5.93	6.23
10:41	277.8	198.1	10.32	7.68	9.2	413.3	5.77	6.30
10:42	276.1	197.9	10.29	7.64	9.2	389.8	5.77	6.22
10:43	268.5	197.4	10.56	7.41	8.8	409.2	5.66	6.29
10:44	265.7	198.1	10.41	7.57	8.2	385.3	5.67	6.29
10:45	268.3	201.2	10.41	7.55	8.0	404.3	5.68	6.20
AVERAGE VALUES FOR THE LAST 15 MINUTES								
10:45	276.1	198.6	10.32	7.64	7.9	390.1	5.75	6.98
10:46	270.8	200.4	10.36	7.57	7.8	371.6	5.77	6.17
10:47	265.0	199.6	10.63	7.33	8.3	406.1	5.67	6.48
10:48	253.9	195.1	10.70	7.26	8.4	401.1	5.56	6.74
10:49	253.7	199.4	10.72	7.26	8.7	418.7	5.50	6.85
10:50	252.7	198.4	10.70	7.27	8.2	398.6	5.53	
10:51	251.5	198.5	10.75	7.20	8.7	414.8	5.48	8.50
10:52	249.2	200.9	10.74	7.28	8.4	422.6	5.47	12.24
10:53	251.2	199.3	10.66	7.29	8.4	401.7	5.51	12.42
10:54	252.6	199.1	10.75	7.26	8.3	415.3	5.50	7.69
10:55	253.8	199.0	10.62	7.33	8.1	392.6	5.55	7.34
10:56	255.9	198.9	10.61	7.37	7.7	418.9	5.52	7.33
10:57	260.8	199.5	11.41	1.95	7.6	386.2	5.61	7.11
10:58	264.4	200.5	12.04	0.00	7.6	405.5	5.57	7.13
10:59	265.5	198.3	3.39	8.67	7.3	377.0	5.66	7.06
11:00	265.7	198.6	0.07	11.04	7.3	405.7	5.61	7.02

Site 7 Sewage Sludge Incineracr 06-06-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
11:02	262.7	195.6	3.74	6.76	7.5	422.5	5.51	7.04
11:03	264.3	198.1	12.24	0.01	7.2	402.4	5.60	7.05
11:04	265.2	196.3	12.50	0.00	7.7	413.4	5.62	6.85
11:05	263.8	196.1	11.44	5.58	7.6	419.4	5.59	7.05
11:06	261.5	195.2	10.92	7.40	8.0	417.4	5.55	7.16
11:07	262.7	194.8	10.99	7.36	8.0	425.7	5.55	6.96
11:08	265.0	193.8	10.84	7.49	8.0	401.8	5.59	6.81
11:09	264.6	194.8	10.93	7.39	8.4	428.0	5.54	6.87
11:10	264.1	193.5	10.91	7.45	8.0	393.5	5.64	6.67
11:11	263.6	194.8	10.91	7.43	8.5	419.9	5.57	6.54
11:12	265.3	194.3	10.80	7.53	8.1	394.3	5.61	6.64
					8.3	410.7	5.62	6.46
11:14	184.6	62.2	10.89	6.80	8.3	404.0	5.58	6.59
11:15	115.9	150.3	10.84	7.33	8.3	403.7	5.60	6.45
AVERAGE VALUES FOR THE LAST 15 MINUTES								
11:15	248.6	183.4	9.93	6.47	8.0	408.0	5.59	6.79
11:16	258.7	199.9	10.66	7.69	7.9	391.3	5.67	6.24
11:17	269.7	198.9	10.79	7.52	7.6	371.6	5.76	6.08
11:18	263.9	199.6	10.93	7.44	7.9	395.8	5.66	6.35
11:19	262.8	197.0	10.86	7.50	7.9	380.0	5.63	6.32
11:20	265.0	198.9	10.89	7.45	7.8	396.6	5.64	6.31
11:21	264.7	197.8	10.81	7.53	7.3	375.8	5.66	6.34
11:22	262.6	198.7	10.93	7.40	7.6	392.3	5.64	6.52
11:23	263.9	198.1	10.76	7.60	7.5	369.7	5.64	6.58
11:24	267.9	200.6	10.80	7.52	7.4	376.6	5.66	6.51
11:25	268.9	197.1	10.74	7.59	7.1	358.5	5.71	
11:26	270.8	198.6	10.67	7.65	7.6	379.0	5.66	16.71
11:27	275.9	199.7	10.62	7.74	7.0	360.3	5.74	17.90
11:28	276.2	198.1	10.67	7.61	7.1	363.4	5.72	17.65
11:29	269.6	198.5	10.85	7.55	7.1	374.7	5.70	17.71
11:30	270.1	196.9	10.75	7.56	7.6	371.7	5.62	17.90
AVERAGE VALUES FOR THE LAST 15 MINUTES								
11:30	267.4	198.5	10.78	7.56	7.5	377.1	5.67	10.17
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA								
11:30	262.5	194.9	10.16	7.12	7.9	394.4	5.65	7.85
11:31	268.7	198.2	10.87	7.46	7.4	385.1	5.59	18.11
11:32	265.7	196.7	10.87	7.47	7.5	368.5	5.61	18.19
11:33	263.3	198.0	10.89	7.41	7.4	390.8	5.54	18.43
11:34	260.4	197.7	10.91	7.40	7.3	370.9	5.55	19.78
11:35	259.7	199.3	10.95	7.35	7.4	394.9	5.53	20.52
11:36	258.6	195.1	11.00	7.32	7.4	371.2	5.56	20.62
11:37	253.0	196.5	11.14	7.20	7.7	394.8	5.45	20.63
11:38	253.6	194.5	11.00	7.33	7.1	381.6	5.49	20.63
11:39	258.1	195.6	10.98	7.34	7.6	387.3	5.50	20.64
11:40	260.3	197.8	10.93	7.42	7.2	380.2	5.56	20.64
11:41	259.2	196.5	10.97	7.36	7.1	366.6	5.59	20.65
11:42	256.6	197.2	10.99	7.35	7.3	376.9	5.58	20.65
11:43	256.0	194.5	11.07	7.25	7.2	364.3	5.53	20.65
11:44	255.1	197.9	11.07	7.25	7.5	378.3	5.49	20.65

Site 9 Sewage Sludge Incinerator 06-06-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
11:45	253.0	194.5	11.15	7.19	7.0	364.6	5.51	20.65
AVERAGE VALUES FOR THE LAST 15 MINUTES								
11:45	258.8	196.7	10.99	7.34	7.3	378.4	5.54	20.10
11:46	250.2	197.1	11.10	7.20	7.4	385.5	5.48	20.65
11:47	250.7	197.5	11.10	7.24	7.2	372.5	5.46	18.33
11:48	252.3	200.5	11.06	7.27	7.3	370.1	5.51	9.74
11:49	251.9	198.0	11.08	7.23	7.2	369.3	5.49	7.78
11:50	250.4	202.4	11.13	7.22	7.1	373.5	5.45	7.61
11:51	252.2	200.3	11.06	7.25	6.9	365.7	5.52	7.56
11:52	254.1	203.4	11.00	7.36	7.1	361.6	5.50	7.59
11:53	260.4	206.0	10.92	7.49	6.7	348.9	5.63	7.67
11:54	259.3	203.9	10.97	7.32	7.0	351.6	5.57	7.70
11:55	259.8	205.5	10.84	7.51	6.8	357.8	5.60	7.74
11:56	257.7	201.8	10.80	7.47	6.8	338.2	5.63	7.44
11:57	261.3	201.5	10.75	7.57	6.9	352.2	5.67	7.31
11:58	259.8	200.5	10.81	7.49	6.6	335.1	5.72	7.28
11:59	256.8	200.5	10.81	7.49	6.7	357.7	5.64	7.25
12:00	257.8	197.5	10.83	7.45	6.7	348.4	5.68	7.12
AVERAGE VALUES FOR THE LAST 15 MINUTES								
12:00	255.6	201.1	10.94	7.37	7.0	359.2	5.57	9.25
12:01	255.9	200.0	10.82	7.50	6.8	369.9	5.57	7.14
12:02	258.5	198.6	10.67	7.58	6.7	347.5	5.70	6.84
12:03	260.7	198.7	10.75	7.53	7.0	360.0	5.67	6.64
12:04	263.8	200.3	10.61	7.69	6.8	345.0	5.73	6.53
12:05	265.9	199.2	10.67	7.59	7.0	354.4	5.72	6.37
12:06	265.3	199.6	10.71	7.63	6.8	356.2	5.73	6.55
12:07	263.7	195.8	10.74	7.53	7.0	354.5	5.68	6.58
12:08	261.6	196.1	10.83	7.51	6.6	374.9	5.62	6.62
12:09	260.4	194.0	10.78	7.50	7.1	364.4	5.65	6.57
12:10	259.0	196.1	10.70	7.62	6.9	385.8	5.56	6.65
12:11	272.8	193.4	10.50	7.73	6.7	344.7	5.80	6.31
12:12	275.7	193.8	10.64	7.64	6.9	379.9	5.73	6.51
12:13	276.3	195.5	10.51	7.80	6.6	356.9	5.80	6.11
12:14	280.1	198.3	10.66	7.63	6.8	362.6	5.82	5.86
12:15	271.1	196.3	10.67	7.62	6.7	355.4	5.76	6.03
AVERAGE VALUES FOR THE LAST 15 MINUTES								
12:15	266.1	197.0	10.68	7.61	6.8	360.8	5.70	6.49
12:16	271.4	200.2	10.56	7.71	7.0	356.8	5.73	6.10
12:17	270.5	199.7	10.75	7.57	6.9	354.1	5.77	6.37
12:18	260.8	196.9	10.83	7.44	7.1	348.8	5.61	6.48
12:19	259.9	198.8	10.76	7.55	6.8	362.7	5.66	6.45
12:20	264.1	198.8	10.58	7.66	6.8	336.3	5.71	6.15
12:21	268.0	199.3	10.59	7.69	6.7	350.3	5.69	5.96
12:22	267.1	199.7	10.59	7.69	6.6	325.1	5.75	5.89
12:23	268.0	200.7	10.57	7.68	6.6	343.6	5.70	6.13
12:24	269.7	199.5	10.50	7.78	6.3	328.3	5.77	5.87
12:25	270.0	200.2	10.76	7.48	6.8	347.4	5.73	6.24
12:26	254.0	193.7	10.96	7.34	7.2	367.2	5.60	6.75
12:27	252.5	197.2	10.88	7.36	7.8	404.1	5.50	6.96

Site 9 Sewage Sludge Incineraor 06-06-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
12:28	258.8	198.6	10.59	7.70	6.9	366.0	5.63	6.85
12:29	275.4	197.8	10.48	7.75	6.8	339.4	5.73	6.57
12:30	283.5	196.5	10.42	7.90	6.3	342.3	5.82	6.34
AVERAGE VALUES FOR THE LAST 15 MINUTES								
12:30	266.2	198.5	10.65	7.62	6.9	351.5	5.69	6.34
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA								
12:30	261.7	198.3	10.82	7.49	7.0	362.5	5.63	10.54
12:31	282.8	200.2	10.60	7.61	6.9	338.0	5.87	6.28
12:32	266.5	196.2	10.91	7.36	7.3	377.4	5.61	6.74
12:33	255.4	197.8	10.97	7.25	7.1	360.8	5.60	6.93
12:34	243.3	190.5	11.56	6.79	7.7	423.5	5.41	7.65
12:35	236.4	191.3	11.59	6.78	8.4	434.5	5.27	7.90
12:36	224.0	190.2	12.16	6.32	8.2	464.3	5.08	9.87
12:37	226.6	181.6	12.05	6.35	8.8	503.1	4.98	9.75
12:38	198.8	167.0	12.88	5.71	11.5	599.4	4.68	9.44
12:39	180.5	165.0	12.83	5.78	11.6	635.6	4.29	9.93
12:40	192.2	173.4	12.27	6.19	10.4	583.7	4.44	9.42
12:41	207.6	181.3	11.96	6.46	9.3	510.0	4.74	8.96
12:42	216.4	180.4	11.70	6.61	8.7	484.3	4.93	8.44
12:43	225.6	182.4	11.58	6.70	8.4	469.5	5.09	8.04
12:44	230.3	179.6	11.49	6.75	8.5	456.7	5.15	7.96
12:45	226.2	176.8	11.66	6.59	8.7	495.5	5.13	8.06
AVERAGE VALUES FOR THE LAST 15 MINUTES								
12:45	227.5	183.6	11.75	6.62	8.8	475.8	5.09	8.36
12:46	223.9	174.1	11.68	6.62	9.1	505.2	5.08	8.31
12:47	225.0	177.1	11.55	6.73	9.1	527.1	5.08	8.51
12:48	229.9	178.3	11.44	6.81	8.8	500.5	5.17	8.50
12:49	235.9	184.0	11.28	6.99	8.5	488.1	5.25	8.44
12:50	245.8	185.8	10.91	7.28	8.5	464.6	5.42	8.24
12:51	259.7	193.9	10.73	7.50	7.9	434.8	5.58	7.87
12:52	271.8	201.2	10.08	8.06	7.6	407.3	5.81	7.64
12:53	288.8	206.9	9.60	8.43	6.9	345.4	6.12	7.11
12:54	299.7	208.3	9.32	8.68	6.6	314.8	6.38	6.47
12:55	302.4	213.1	9.39	8.59	6.5	279.6	6.42	6.46
12:56	303.3	217.5	9.37	8.63	6.1	275.2	6.43	6.49
12:57	296.0	218.8	9.87	8.21	5.7	260.8	6.34	6.57
12:58	283.9	219.8	10.15	8.08	5.8	283.5	6.11	7.00
12:59	279.3	218.1	10.16	8.06	5.7	279.5	6.04	7.12
13:00	280.8	218.0	10.17	8.04	5.9	291.3	6.02	7.12
AVERAGE VALUES FOR THE LAST 15 MINUTES								
13:00	268.4	201.0	10.38	7.78	7.2	377.2	5.82	7.46
13:01	275.2	215.6	10.27	7.94	5.7	287.4	6.07	7.13
13:02	275.6	219.3	10.20	8.04	5.7	297.5	5.97	7.09
13:03	274.5	217.6	10.25	7.95	5.7	292.9	6.05	7.07
13:04	268.3	215.4	10.56	7.67	5.8	307.2	5.88	7.12
13:05	262.6	216.6	10.54	7.75	5.8	307.4	5.87	7.36
13:06	259.5	213.8	10.68	7.55	5.9	301.0	5.74	7.11

Site 9 Sewage Sludge Incinerator 06-06-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
13:07	258.4	211.3	10.74	7.51	6.0	314.7	5.79	6.95
13:08	253.0	207.2	11.00	7.28	6.2	327.1	5.66	7.11
13:09	241.1	204.6	11.17	7.11	6.9	373.8	5.54	7.49
13:10	235.6	201.0	11.25	7.01	6.9	379.5	5.42	7.56
13:11	233.2	200.3	11.28	6.98	7.1	411.7	5.36	7.72
13:12	230.8	199.1	11.32	6.95	7.0	406.9	5.33	7.79
13:13	234.7	203.9	11.04	7.20	7.3	427.3	5.36	7.83
13:14	240.3	203.6	10.61	7.45	6.6	374.6	5.59	7.53
13:15	245.7	208.3	10.65	7.46	6.4	358.6	5.66	7.45
AVERAGE VALUES FOR THE LAST 15 MINUTES								
13:15	252.6	209.3	10.77	7.46	6.3	344.5	5.69	7.35
13:16	248.4	209.2	10.42	7.66	6.2	345.3	5.73	7.52
13:17	252.9	210.9	10.41	7.69	6.4	338.9	5.80	7.25
13:18	255.1	211.2	10.35	7.76	6.4	343.4	5.91	7.04
13:19	260.8	213.6	10.23	7.81	6.2	323.8	5.86	6.98
13:20	266.3	215.1	10.02	8.04	6.0	316.1	5.98	6.78
13:21	272.2	214.4	9.99	8.03	5.9	295.3	6.08	6.51
13:22	273.2	218.8	9.96	8.12	5.9	301.8	6.09	6.48
13:23	277.4	219.0	9.80	8.24	5.6	284.5	6.10	6.36
13:24	283.2	218.6	9.69	8.31	5.4	277.7	6.19	6.11
13:25	286.4	217.0	9.72	8.29	5.4	263.2	6.26	5.89
13:26	284.3	218.9	9.86	8.22	5.6	268.5	6.23	5.88
13:27	281.9	214.9	9.86	8.15	5.4	263.5	6.20	6.09
13:28	277.6	215.7	10.09	7.99	5.5	268.7	6.10	6.26
13:29	276.9	213.3	10.00	8.06	5.5	269.8	6.05	6.13
13:30	275.6	212.9	10.52	7.66	6.0	285.3	5.95	6.33
AVERAGE VALUES FOR THE LAST 15 MINUTES								
13:30	271.5	214.9	10.06	8.00	5.8	296.4	6.03	6.51
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA								
13:30	255.0	202.2	10.74	7.46	7.0	373.5	5.66	7.42
13:31	268.5	214.4	10.60	7.65	5.8	306.0	5.81	6.65
13:32	262.9	211.2	10.67	7.51	6.2	316.6	5.72	6.74
13:33	259.4	210.2	10.84	7.41	6.0	337.1	5.66	6.96
13:34	258.8	207.5	10.63	7.57	6.2	328.8	5.63	6.73
13:35	261.3	207.7	10.79	7.41	6.2	348.2	5.66	6.72
13:36	257.9	207.1	10.84	7.40	6.4	332.6	5.64	6.87
13:37	256.7	209.6	10.79	7.43	6.3	358.7	5.59	6.92
13:38	256.8	206.7	10.76	7.43	6.3	333.7	5.65	6.72
13:39	255.8	206.4	10.88	7.33	6.3	354.8	5.61	6.74
13:40	253.3	203.3	10.94	7.26	6.5	350.9	5.57	6.83
13:41	252.1	206.3	10.96	7.24	6.8	365.2	5.52	6.92
13:42	249.6	204.9	10.97	7.24	6.4	352.9	5.51	7.18
13:43	248.4	203.2	11.03	7.18	6.7	360.7	5.52	7.19
13:44	246.8	205.2	11.07	7.17	6.5	365.2	5.45	7.26
13:45	246.9	202.4	10.97	7.23	6.7	355.3	5.49	7.11
AVERAGE VALUES FOR THE LAST 15 MINUTES								
13:45	255.7	207.1	10.85	7.36	6.4	344.4	5.60	6.90

Site 9 Sewage Sludge Incineraor 06-06-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
13:46	246.8	207.2	10.94	7.28	6.5	365.4	5.52	7.11
13:47	249.6	203.1	10.98	7.23	6.9	349.6	5.53	7.14
13:48	249.4	205.7	10.93	7.26	6.7	369.5	5.55	7.10
13:49	250.9	206.7	10.88	7.35	6.6	352.9	5.54	7.12
13:50	256.4	209.7	10.78	7.39	6.9	352.7	5.65	7.12
13:51	253.8	207.9	10.93	7.26	6.7	348.8	5.58	7.26
13:52	251.5	209.2	10.89	7.32	6.9	355.0	5.60	7.40
13:53	253.5	209.3	10.76	7.40	6.8	352.7	5.61	7.48
13:54	257.5	212.4	10.79	7.42	6.9	343.2	5.66	7.52
13:55	258.3	211.5	10.79	7.48	6.6	348.2	5.68	7.56
13:56	259.1	213.7	10.75	7.49	6.8	345.2	5.64	7.56
13:57	260.5	213.0	10.73	7.48	6.8	341.1	5.73	7.64
13:58	260.2	213.6	10.74	7.46	6.7	336.8	5.64	7.73
13:59	262.9	218.2	10.48	7.73	6.4	338.4	5.73	7.79
14:00	271.9	216.5	10.40	7.75	6.1	312.0	5.85	7.67
AVERAGE VALUES FOR THE LAST 15 MINUTES								
14:00	256.1	210.5	10.78	7.42	6.7	347.4	5.64	7.41

COMMENTS: End of Run ? & Run 10

Run __ __:__ - __:__

Run 10 __:__ - __:__

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Direct cal check after Run ? & Run 10

DATE : 06-06-1990 TIME: 14:01 - 14:33

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	1.8
6	BOILER	ppmSO2	218.0	200.2
7	BOILER	ppmNOx	0.0	1.6
7	BOILER	ppmNOx	240.0	230.1
8	BOILER	% O2	0.00	0.06
8	BOILER	% O2	12.50	12.36
10	BOILER	% CO2	0.00	-0.01
10	BOILER	% CO2	11.01	11.03
1	STACK	ppmTHC	0.0	1.0
1	STACK	ppmTHC	181.2	178.4
2	STACK	ppm CO	0.0	7.6
2	STACK	ppm CO	457.5	463.5
4	STACK	% CO2	0.00	-0.05
4	STACK	% CO2	11.01	10.89
3	HEARTH	% O2	0.00	0.06
3	HEARTH	% O2	12.50	12.35

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Direct cal of analyzers after adjustments

DATE : 06-06-1990 TIME: 14:33 - 14:43

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	2.4
6	BOILER	ppmSO2	218.0	217.4
7	BOILER	ppmNOx	0.0	1.4
7	BOILER	ppmNOx	240.0	240.8

Site 9 Sewage Sludge Incineracr 06-06-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
15:15	291.7	210.0	10.59	7.62	8.0	416.6	5.76	6.72
15:16	296.6	205.8	10.67	7.56	8.1	383.0	5.79	6.71
15:17	297.6	207.1	10.59	7.61	8.1	410.6	5.74	6.68
15:18	299.0	203.0	10.69	7.51	7.7	394.7	5.74	6.68
15:19	294.9	204.5	10.78	7.45	8.5	435.5	5.65	6.77
15:20	291.0	200.9	10.83	7.35	8.5	423.6	5.62	6.95
15:21	283.6	200.1	10.96	7.27	8.8	458.3	5.54	7.33
15:22	283.0	198.9	11.00	7.22	9.2	459.8	5.49	7.54
15:23	278.0	198.2	11.02	7.20	9.2	466.4	5.46	7.37
15:24	280.7	199.2	10.99	7.26	9.1	465.4	5.48	7.54
15:25	279.5	197.8	10.99	7.23	9.0	451.0	5.51	7.60
15:26	282.2	199.3	11.01	7.22	9.0	471.2	5.51	7.29
15:27	277.5	196.1	11.10	7.13	9.1	450.9	5.52	7.31
15:28	271.6	197.0	11.17	7.05	9.2	485.1	5.41	7.32
15:29	275.9	196.3	11.06	7.17	9.0	447.1	5.42	7.25
15:30	275.7	196.5	11.03	7.17	9.2	480.1	5.42	6.96
AVERAGE VALUES FOR THE LAST 15 MINUTES								
15:30	284.5	200.0	10.93	7.29	8.8	445.5	5.55	7.15
AVERAGE VALUES FOR THE LAST HOUR: 16 MINUTES OF VALID DATA								
15:30	284.9	200.7	10.91	7.31	8.7	443.7	5.57	7.13
15:31	279.7	195.1	11.06	7.16	8.6	449.6	5.52	6.78
15:32	278.2	199.8	11.02	7.22	9.1	480.4	5.48	6.67
15:33	282.2	198.0	10.86	7.33	8.7	449.0	5.49	6.80
15:34	289.9	202.9	10.78	7.44	8.3	436.3	5.65	6.65
15:35	285.8	200.3	10.95	7.26	8.0	419.8	5.65	6.62
15:36	284.2	206.5	10.81	7.40	8.4	430.2	5.62	6.61
15:37	285.4	205.0	10.93	7.26	8.3	410.6	5.65	6.56
15:38	277.7	211.4	10.88	7.31	8.2	421.2	5.64	6.73
15:39	279.6	207.5	11.03	7.17	8.3	401.8	5.56	6.86
15:40	274.0	207.2	11.11	7.05	8.6	428.0	5.56	6.99
15:41	268.2	204.9	11.24	6.99	8.6	423.3	5.41	7.26
15:42	268.5	206.7	11.19	7.01	9.1	441.3	5.46	7.32
15:43	268.2	205.2	11.30	6.93	8.9	425.8	5.35	7.42
15:44	263.8	207.6	11.23	6.97	8.9	455.5	5.37	7.66
15:45	267.2	207.6	11.17	7.05	8.5	428.4	5.35	7.47
AVERAGE VALUES FOR THE LAST 15 MINUTES								
15:45	276.8	204.4	11.04	7.17	8.6	433.4	5.52	6.96
15:46	271.3	212.0	11.01	7.18	8.7	437.8	5.49	7.56
15:47	278.4	210.4	10.99	7.20	8.2	394.1	5.52	7.24
15:48	278.3	210.6	10.96	7.22	8.4	414.4	5.57	7.31
15:49	274.5	208.1	11.09	7.10	8.5	406.7	5.49	7.27
15:50	272.9	209.8	11.03	7.16	8.4	413.1	5.55	7.26
15:51	271.3	209.3	11.14	7.05	8.1	402.2	5.48	7.36
15:52	270.8	208.8	11.04	7.14	8.0	399.5	5.51	7.51
15:53	271.8	209.1	11.11	7.10	8.2	404.0	5.46	7.46
15:54	270.2	207.7	11.10	7.06	8.2	407.6	5.45	7.49
15:55	273.7	208.7	11.11	7.11	8.4	412.6	5.48	7.30
15:56	276.0	206.2	11.02	7.12	8.0	397.7	5.44	7.36

Site 9 Sewage Sludge Incineraor 06-06-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
15:57	273.7	205.2	11.23	6.98	8.1	405.6	5.45	7.40
15:58	266.3	202.4	11.30	6.88	8.5	412.7	5.33	7.45
15:59	263.2	205.3	11.35	6.86	8.7	444.7	5.33	7.63
16:00	261.7	200.1	11.36	6.86	8.2	431.3	5.26	7.66
AVERAGE VALUES FOR THE LAST 15 MINUTES								
16:00	271.6	207.6	11.12	7.07	8.3	412.3	5.45	7.42
16:01	262.2	203.0	11.29	6.89	8.7	449.2	5.32	7.65
16:02	263.6	199.2	11.36	6.85	8.5	425.4	5.30	7.66
16:03	264.0	205.3	11.23	6.96	8.9	451.3	5.31	7.60
16:04	266.0	202.7	11.30	6.91	8.3	420.4	5.37	7.63
16:05	265.1	207.6	11.25	6.92	8.5	447.6	5.38	7.70
16:06	264.0	205.8	11.30	6.91	8.3	412.8	5.32	7.60
16:07	263.4	209.4	11.30	6.89	8.4	427.1	5.40	7.78
16:08	263.2	206.8	11.34	6.86	8.1	413.1	5.29	7.79
16:09	267.3	209.0	11.14	7.05	8.0	410.5	5.40	7.78
16:10	270.8	207.1	11.21	7.00	7.9	385.7	5.45	7.61
16:11	273.9	211.7	10.97	7.22	8.1	405.1	5.47	7.58
16:12	279.1	211.3	11.00	7.19	7.7	378.3	5.54	7.40
16:13	279.1	213.7	10.93	7.26	7.7	377.5	5.62	7.38
16:14	278.7	212.5	10.94	7.27	7.5	367.3	5.55	7.40
16:15	281.2	212.3	10.92	7.24	7.8	379.3	5.56	7.52
AVERAGE VALUES FOR THE LAST 15 MINUTES								
16:15	269.4	207.8	11.17	7.03	8.2	410.0	5.42	7.50
16:16	278.0	217.3	10.96	7.29	7.7	379.9	5.51	7.54
16:17	278.9	214.2	10.93	7.23	7.3	373.2	5.50	7.51
16:18	278.3	218.5	10.97	7.29	7.7	377.3	5.59	7.50
16:19	276.6	215.7	11.00	7.16	7.3	367.5	5.58	7.57
16:20	273.8	217.0	11.04	7.19	7.8	379.1	5.54	7.72
16:21	274.9	214.6	11.04	7.15	7.4	367.1	5.50	7.71
16:22	276.4	217.2	10.97	7.24	7.7	378.2	5.56	7.65
16:23	274.3	213.3	11.12	7.07	7.6	372.6	5.52	7.59
16:24	272.7	216.4	11.03	7.16	7.9	391.8	5.51	7.62
16:25	278.2	213.7	11.06	7.14	7.5	367.3	5.51	7.58
16:26	277.1	215.6	11.02	7.16	7.8	389.3	5.50	7.64
16:27	279.8	212.8	11.03	7.19	7.7	373.7	5.46	7.50
16:28	285.7	215.0	10.87	7.28	7.9	395.2	5.50	7.56
16:29	280.7	210.2	11.10	7.10	7.9	383.8	5.44	7.65
16:30	274.4	209.6	11.06	7.13	7.7	400.6	5.51	7.60
AVERAGE VALUES FOR THE LAST 15 MINUTES								
16:30	277.3	214.7	11.01	7.18	7.7	379.8	5.52	7.60
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA								
16:30	273.8	208.6	11.08	7.11	8.2	408.9	5.48	7.40
16:31	274.5	205.7	11.12	7.07	8.0	394.2	5.40	7.54
16:32	271.4	206.9	11.10	7.11	8.2	423.2	5.44	7.48
16:33	272.7	203.8	11.09	7.10	7.9	404.2	5.44	7.29
16:34	275.2	204.9	11.09	7.12	8.1	427.2	5.44	7.21
16:35	276.5	200.9	11.09	7.13	7.9	411.3	5.45	6.99

Site 9 Sewage Sludge Incineraor 06-06-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
16:36	278.1	203.2	11.07	7.12	8.2	432.9	5.46	6.87
16:37	279.4	202.5	11.03	7.17	8.2	413.8	5.43	6.64
16:38	280.7	206.9	10.96	7.20	8.4	433.6	5.48	6.71
16:39	278.9	202.5	11.09	7.12	8.2	400.5	5.47	6.75
16:40	275.1	206.0	11.06	7.09	8.5	442.3	5.44	6.71
16:41	272.5	203.6	11.24	7.00	8.2	415.4	5.40	7.02
16:42	270.6	206.5	11.14	7.04	8.7	431.7	5.38	7.08
16:43	272.0	204.0	11.20	7.00	8.0	406.4	5.35	7.05
16:44	269.0	208.0	11.20	7.02	8.5	427.5	5.41	7.10
16:45	269.7	205.2	11.18	6.99	8.1	407.7	5.32	7.17
AVERAGE VALUES FOR THE LAST 15 MINUTES								
16:45	274.4	204.7	11.11	7.09	8.2	418.1	5.42	7.04
16:46	271.6	211.1	11.03	7.19	8.5	409.7	5.45	6.82
16:47	273.3	207.1	11.14	7.04	7.9	393.6	5.42	6.90
16:48	269.0	210.2	11.18	7.04	8.8	407.4	5.40	7.15
16:49	268.6	210.1	11.13	7.06	8.4	407.9	5.36	7.23
16:50	272.1	211.0	11.04	7.18	8.1	387.9	5.46	7.10
16:51	273.3	213.6	10.98	7.23	7.5	386.0	5.46	7.10
16:52	274.4	211.6	11.00	7.18	7.6	369.4	5.49	7.25
16:53	273.1	214.1	10.94	7.24	7.6	381.4	5.47	7.11
16:54	282.7	215.8	10.76	7.44	7.3	358.6	5.61	6.67
16:55	286.8	214.3	10.63	7.52	7.1	347.1	5.65	6.88
16:56	291.4	219.1	10.44	7.74	6.9	329.4	5.80	6.32
16:57	297.2	216.7	10.46	7.71	6.6	321.8	5.83	6.23
16:58	299.2	219.0	10.35	7.78	6.9	338.2	5.83	6.20
16:59	307.2	216.5	10.26	7.92	6.6	313.7	5.91	6.04
17:00	312.0	219.0	10.10	8.01	6.6	332.1	5.97	5.75
AVERAGE VALUES FOR THE LAST 15 MINUTES								
17:00	283.5	213.9	10.76	7.42	7.5	365.6	5.61	6.72
17:01	317.7	218.3	10.02	8.11	6.5	304.8	6.07	5.45
17:02	320.7	218.7	10.02	8.10	6.6	314.4	6.12	5.47
17:03	321.8	222.9	10.01	8.17	6.7	308.2	6.16	5.55
17:04	322.8	219.4	9.97	8.16	6.5	297.0	6.17	5.45
17:05	321.2	226.3	9.91	8.19	6.4	300.2	6.22	5.44
17:06	325.4	224.9	9.78	8.37	6.4	282.7	6.20	5.20
17:07	338.8	224.8	9.56	8.53	6.1	279.7	6.35	5.04
17:08	344.0	224.6	9.61	8.45	6.2	261.6	6.38	4.91
17:09	337.0	224.2	9.76	8.34	6.1	268.6	6.32	5.14
17:10	335.2	227.9	9.79	8.34	6.0	265.2	6.28	5.21
17:11	329.1	223.6	9.90	8.24	6.0	259.2	6.22	5.67
17:12	323.5	225.3	10.04	8.08	6.4	290.0	6.14	5.98
17:13	321.6	225.3	9.85	8.26	6.2	274.8	6.14	5.90
17:14	326.2	221.5	10.03	8.12	5.7	272.9	6.20	6.06
17:15	321.0	223.5	10.16	7.94	6.2	281.5	6.09	6.55
AVERAGE VALUES FOR THE LAST 15 MINUTES								
17:15	327.1	223.4	9.89	8.23	6.3	284.1	6.20	5.53
17:16	310.5	220.4	10.36	7.80	6.2	293.6	5.99	6.89
17:17	302.9	220.2	10.53	7.65	6.6	319.4	5.84	7.33
17:18	295.7	216.7	10.59	7.63	6.6	322.1	5.81	7.37

Site 9 Sewage Sludge Incineraor 06-06-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
17:19	292.4	215.4	10.72	7.46	6.7	360.9	5.69	7.41
17:20	288.6	213.7	10.65	7.49	6.6	341.3	5.68	7.50
17:21	290.9	213.0	10.79	7.43	6.8	359.9	5.65	7.67
17:22	286.3	214.3	10.86	7.33	7.1	367.5	5.57	7.80
17:23	284.6	211.1	10.77	7.44	7.0	354.6	5.59	7.66
17:24	283.6	211.6	10.84	7.37	7.2	382.0	5.58	7.40
17:25	286.5	210.0	10.68	7.53	6.8	354.1	5.68	7.24
17:26	287.8	210.4	10.82	7.37	7.1	390.1	5.66	7.12
17:27	288.5	210.4	10.66	7.49	7.3	382.1	5.67	7.06
17:28	293.5	212.0	10.60	7.60	6.9	377.2	5.74	6.85
17:29	295.1	214.0	10.53	7.65	7.0	377.6	5.80	6.83
17:30	300.0	213.5	10.45	7.77	6.8	356.9	5.81	6.58
AVERAGE VALUES FOR THE LAST 15 MINUTES								
17:30	292.4	213.8	10.66	7.53	6.8	356.0	5.72	7.25
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA								
17:30	294.3	214.0	10.61	7.57	7.2	355.9	5.74	6.64
17:31	298.8	214.7	10.58	7.58	7.2	374.4	5.84	6.66
17:32	292.6	212.0	10.62	7.59	7.2	366.4	5.77	6.66
17:33	295.8	214.5	10.48	7.71	7.1	386.9	5.79	6.63
17:34	302.2	213.6	10.40	7.76	7.1	361.5	5.88	6.49
17:35	306.6	213.5	10.33	7.85	6.5	356.6	5.88	6.35
17:36	308.6	217.4	10.33	7.86	6.7	349.9	5.99	6.17
17:37	307.7	216.4	10.38	7.83	6.7	337.2	5.94	6.17
17:38	309.4	219.6	10.29	7.88	6.9	357.8	5.97	6.34
17:39	309.3	214.9	10.26	7.91	6.8	335.9	5.98	6.25
17:40	310.1	218.0	10.34	7.86	6.8	352.6	5.98	6.25
17:41	310.0	219.3	10.22	7.94	6.8	339.3	5.97	6.03
17:42	312.5	216.7	10.29	7.91	6.6	341.8	5.97	6.14
17:43	313.6	219.5	10.21	7.96	7.1	358.9	5.95	6.09
17:44	318.4	218.7	10.11	8.10	6.4	318.9	6.04	6.12
17:45	317.4	218.6	10.25	7.91	6.5	347.1	6.03	6.14
AVERAGE VALUES FOR THE LAST 15 MINUTES								
17:45	307.5	216.5	10.34	7.84	6.8	352.3	5.93	6.30
17:46	313.4	216.0	10.22	7.95	6.7	330.0	6.01	6.18
17:47	314.6	216.0	10.22	7.98	6.8	353.5	5.96	6.50
17:48	316.0	218.7	10.26	7.91	6.9	349.4	5.99	6.62
17:49	313.6	214.1	10.28	7.93	6.6	346.0	5.93	6.85
17:50	313.4	215.9	10.24	7.93	7.0	367.6	5.86	6.80

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Direct cal check at end of testing for the day

DATE : 06-06-1990 TIME: 17:50 - 18:17

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	2.0
6	BOILER	ppmSO2	218.0	222.0
7	BOILER	ppmNOx	0.0	1.7
7	BOILER	ppmNOx	240.0	239.1
8	BOILER	% O2	0.00	0.06
8	BOILER	% O2	12.50	12.36
10	BOILER	% CO2	0.00	-0.01
10	BOILER	% CO2	11.01	10.99
1	STACK	ppmTHC	0.0	0.5
1	STACK	ppmTHC	181.2	177.4
2	STACK	ppm CO	0.0	9.1
2	STACK	ppm CO	457.5	464.0
4	STACK	% CO2	0.00	-0.07
4	STACK	% CO2	11.01	10.85
3	HEARTH	% O2	0.00	0.05
3	HEARTH	% O2	12.50	12.36

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Initial direct cal - 6/7/90

DATE : 06-07-1990 TIME: 06:36 - 07:22

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	1.3
6	BOILER	ppmSO2	218.0	219.2
6	BOILER	ppmSO2	361.4	361.3
7	BOILER	ppmNOx	0.0	0.4
7	BOILER	ppmNOx	240.0	241.4
7	BOILER	ppmNOx	475.0	479.2
8	BOILER	% O2	0.00	0.05
8	BOILER	% O2	12.50	12.50
8	BOILER	% O2	20.60	20.67
10	BOILER	% CO2	0.00	0.00
10	BOILER	% CO2	11.01	11.00
10	BOILER	% CO2	17.46	17.73
1	STACK	ppmTHC	0.0	0.4
1	STACK	ppmTHC	181.2	181.9
1	STACK	ppmTHC	282.0	284.0
2	STACK	ppm CO	0.0	3.7
2	STACK	ppm CO	457.5	457.5
2	STACK	ppm CO	1263.0	1289.3
4	STACK	% CO2	0.00	0.03
4	STACK	% CO2	11.01	10.97
4	STACK	% CO2	17.46	17.57
3	HEARTH	% O2	0.00	0.09
3	HEARTH	% O2	12.50	12.50
3	HEARTH	% O2	20.60	20.61

Site 9 Sewage Sludge Incineraor 06-07-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
07:47	264.2	218.8	10.95	7.46	1.0	3.3	0.06	9.78
07:48	266.2	218.6	10.89	7.55	1.2	3.3	0.07	9.76
07:49	271.7	217.5	10.87	7.53	1.0	3.5	0.07	9.83
07:50	270.8	215.0	10.92	7.50	1.1	17.3	0.25	9.76
07:51	268.0	212.3	10.97	7.41	2.7	156.6	1.83	9.70
07:52	270.2	213.9	10.89	7.54	5.5	367.6	5.37	9.71
07:53	274.7	212.9	10.79	7.58	5.5	364.7	5.42	9.80
07:54	279.3	216.8	10.71	7.71	5.5	352.7	5.51	9.82
07:55	284.4	215.1	10.59	7.75	5.4	347.9	5.54	9.71
07:56	285.9	217.6	10.66	7.74	5.6	342.0	5.57	9.43
07:57	285.3	217.4	10.55	7.83	5.5	342.2	5.59	9.34
07:58	289.5	219.5	10.57	7.82	5.5	334.6	5.62	9.27
07:59	287.0	215.3	10.59	7.78	5.6	343.9	5.61	9.30
08:00	284.3	215.3	10.71	7.69	5.7	343.6	5.53	9.40
AVERAGE VALUES FOR THE LAST HOUR: 14 MINUTES OF VALID DATA								
08:00	277.2	216.2	10.76	7.64	4.0	237.4	3.72	9.62
08:01	286.3	214.2	10.56	7.82	5.7	349.0	5.59	9.44
08:02	287.4	215.9	10.65	7.74	5.8	334.9	5.58	9.32
08:03	288.2	213.0	10.53	7.86	5.8	351.3	5.59	9.31
08:04	288.5	215.1	10.65	7.73	5.6	341.6	5.54	9.37
08:05	285.5	214.1	10.55	7.85	6.1	348.0	5.60	9.50
08:06	289.0	215.6	10.63	7.77	6.2	339.7	5.56	9.59
08:07	288.4	216.3	10.49	7.91	6.4	343.1	5.62	9.61
08:08	293.0	216.6	10.47	7.91	6.4	335.7	5.62	9.65
08:09	296.4	218.2	10.28	8.12	6.7	333.3	5.74	9.63
08:10	300.3	219.9	10.29	8.04	6.5	332.8	5.69	9.60
08:11	295.9	218.3	10.40	7.98	6.6	330.6	5.71	9.52
08:12	292.5	215.4	10.53	7.80	6.6	339.8	5.63	9.45
08:13	290.7	219.7	10.50	7.89	6.7	332.0	5.61	9.53
08:14	292.8	218.2	10.41	7.92	6.4	326.5	5.64	9.70
08:15	287.3	215.0	10.72	7.70	6.6	335.7	5.60	9.75
AVERAGE VALUES FOR THE LAST 15 MINUTES								
08:15	290.8	216.4	10.51	7.87	6.3	338.3	5.62	9.53
08:16	276.7	210.7	10.85	7.53	6.6	356.9	5.47	9.67
08:17	267.9	209.5	11.09	7.34	7.1	365.4	5.35	9.71
08:18	264.1	207.4	11.05	7.37	7.6	381.5	5.31	9.85
08:19	267.2	209.1	11.06	7.35	7.3	360.8	5.31	10.07
08:20	269.6	206.6	10.92	7.48	8.1	376.4	5.38	10.24
08:21	265.7	201.3	11.20	7.20	8.2	379.9	5.31	10.24
08:22	260.9	195.8	11.17	7.24	8.0	399.5	5.26	10.20
08:23	259.9	188.7	11.33	7.06	7.9	416.5	5.15	10.29
08:24	257.6	183.0	11.35	7.07	8.6	445.5	5.20	10.48
08:25	256.7	167.1	11.71	6.76	8.9	491.9	4.98	10.51
08:26	252.9	158.3	11.72	6.79	9.8	555.5	5.00	10.76
08:27	250.7	142.6	11.99	6.48	10.4	644.7	4.77	11.14
08:28	251.8	138.1	11.92	6.67	12.3	702.6	4.81	11.41
08:29	264.0	137.8	11.62	6.75	14.3	828.3	4.82	11.63
08:30	267.9	130.9	11.90	6.62	14.7	849.3	4.89	11.70

Site 9 Sewage Sludge Incineraor 06-07-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
AVERAGE VALUES FOR THE LAST 15 MINUTES								
08:30	262.2	179.1	11.39	7.05	9.3	503.7	5.13	10.53
08:31	271.0	130.4	11.58	6.81	15.9	881.2	4.89	11.75
08:32	276.5	129.8	11.34	6.95	15.9	918.4	4.92	11.83
08:33	289.6	135.3	10.79	7.50	14.6	872.4	5.25	12.00
08:34	296.7	133.8	10.88	7.34	13.9	848.7	5.33	12.03
08:35	301.3	134.9	10.46	7.82	13.5	824.7	5.48	11.83
08:36	313.9	138.4	10.13	8.06	12.5	754.9	5.58	11.57
08:37	341.0	148.8	9.10	9.10	10.7	638.1	6.04	11.21
08:38	391.3	160.4	8.33	9.63	9.2	553.5	6.45	10.61
08:39	441.7	164.1	7.19	10.69	8.1	470.1	6.96	9.83
08:40	529.0	167.6	5.81	11.78	7.5	508.3	7.51	9.30
08:41	637.3	160.3	4.59	12.89	10.5	891.6	8.37	8.69
08:42	690.8	162.8	5.31	12.09	13.7	1028.9	8.72	7.69
08:43	567.2	220.5	7.31	10.54	10.5	426.6	8.11	6.12
08:44	425.8	240.8	9.11	9.12	7.8	286.6	6.97	5.32
08:45	356.8	231.9	9.79	8.63	6.6	319.2	6.43	6.10
AVERAGE VALUES FOR THE LAST 15 MINUTES								
08:45	408.7	165.3	8.78	9.26	11.4	681.5	6.47	9.72
08:46	329.9	227.8	10.06	8.41	6.4	329.3	6.08	7.37
08:47	327.4	227.9	9.69	8.74	6.1	314.3	6.11	8.17
08:48	332.8	226.8	9.53	8.75	5.6	286.8	6.31	8.00
08:49	327.4	226.9	9.76	8.59	5.5	285.9	6.25	7.41
08:50	315.7	225.3	9.96	8.42	5.4	287.9	6.16	7.52
08:51	307.4	223.8	10.24	8.20	5.4	295.2	6.03	7.73
08:52	291.5	219.1	10.57	7.91	5.6	304.1	5.87	8.16
08:53	276.9	213.9	10.84	7.66	5.9	329.3	5.67	8.37
08:54	266.6	209.7	11.03	7.49	5.9	334.9	5.61	8.60
08:55	254.4	203.9	11.16	7.31	6.2	355.4	5.40	8.62
08:56	251.5	206.0	10.98	7.46	6.4	346.0	5.52	8.46
08:57	244.5	202.8	11.12	7.23	6.4	352.9	5.45	8.45
08:58	234.9	199.2	11.41	7.01	6.8	375.6	5.34	8.83
08:59	226.1	197.8	11.48	6.90	6.9	384.7	5.17	9.14
09:00	223.1	193.9	11.68	6.77	7.3	399.1	5.12	9.36
AVERAGE VALUES FOR THE LAST 15 MINUTES								
09:00	280.7	213.6	10.63	7.79	6.1	332.1	5.74	8.28
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA								
09:00	310.6	193.6	10.33	7.99	8.3	463.9	5.74	9.51
09:01	220.0	191.3	11.68	6.72	7.3	419.6	4.99	9.60
09:02	221.0	190.0	11.74	6.68	7.7	429.1	4.99	9.85
09:03	221.6	188.8	11.74	6.67	7.7	440.0	4.93	10.12
09:04	225.8	187.6	11.66	6.73	8.1	454.0	4.94	10.28
09:05	230.1	186.7	11.56	6.79	8.3	478.4	4.96	10.28
09:06	236.4	191.0	11.42	6.92	8.0	456.6	5.04	10.24
09:07	241.9	190.2	11.30	7.00	7.6	452.8	5.12	10.25
09:08	249.5	197.1	11.12	7.21	7.4	420.3	5.23	9.97
09:09	255.9	199.8	10.95	7.32	7.2	405.6	5.27	9.77

Site 9 Sewage Sludge Incineraor 06-07-1996

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
09:10	257.8	200.4	11.03	7.28	7.1	375.8	5.36	9.61
09:11	255.5	199.1	11.31	7.09	6.7	383.7	5.24	9.86
09:12	253.2	200.5	11.43	7.03	6.9	379.2	5.15	10.08
09:13	251.2	196.3	11.42	7.01	6.7	389.7	5.12	10.19
09:14	249.3	196.6	11.55	6.90	6.7	379.6	5.08	10.33
09:15	244.9	192.0	11.59	6.86	6.5	397.5	5.06	10.36
AVERAGE VALUES FOR THE LAST 15 MINUTES								
09:15	240.9	193.8	11.43	6.95	7.3	417.5	5.10	10.05
09:16	238.3	185.7	11.88	6.61	6.8	401.8	4.95	10.48
09:17	229.0	174.9	12.14	6.42	7.2	449.1	4.80	10.84
09:18	218.0	163.8	12.44	6.18	7.9	477.9	4.62	11.20
09:19	213.8	162.4	12.15	6.42	8.5	519.0	4.51	11.56
09:20	223.4	160.7	11.98	6.51	8.1	518.4	4.62	11.62
09:21	231.4	165.3	11.58	6.88	8.3	513.5	4.83	11.54
09:22	243.8	161.7	11.49	6.90	7.9	514.1	4.92	11.43
09:23	251.0	162.6	11.24	7.20	8.4	511.1	5.12	11.12
09:24	255.4	157.1	11.06	7.22	8.7	536.7	5.08	10.70
09:25	267.2	164.8	10.55	7.77	8.5	517.7	5.40	10.29
09:26	285.4	169.3	9.95	8.14	8.3	509.3	5.60	9.81
09:27	300.0	176.3	9.84	8.38	7.9	475.0	5.87	9.27
09:28	312.2	183.9	9.21	8.84	7.6	465.2	6.05	8.95
09:29	330.3	190.9	9.14	8.95	7.4	442.4	6.22	8.43
09:30	342.5	200.0	8.47	9.47	7.1	416.7	6.44	7.95
AVERAGE VALUES FOR THE LAST 15 MINUTES								
09:30	262.8	172.0	10.87	7.46	7.9	484.5	5.27	10.35
09:31	360.6	213.1	8.40	9.54	6.6	379.2	6.62	7.31
09:32	366.9	217.1	7.91	9.93	6.1	357.1	6.83	7.23
09:33	369.8	222.7	8.22	9.61	6.1	334.5	6.81	6.79
09:34	366.1	225.3	8.02	9.86	5.8	327.5	6.84	6.86
09:35	373.1	234.4	7.90	9.91	5.7	302.9	6.82	6.42
09:36	382.4	237.0	7.65	10.15	5.4	284.5	7.06	6.16
09:37	379.1	236.7	8.19	9.68	5.2	272.2	6.97	5.87
09:38	363.4	234.8	8.44	9.59	5.6	283.3	6.87	6.23
09:39	360.1	237.7	8.65	9.44	5.2	266.3	6.76	6.40
09:40	347.2	239.6	8.84	9.34	5.2	263.4	6.69	6.63
09:41	338.3	237.4	8.96	9.15	4.9	253.7	6.50	6.70
09:42	316.8	241.6	9.31	8.88	5.3	255.7	6.41	6.91
09:43	296.4	241.1	9.55	8.68	5.1	269.9	6.22	7.44
09:44	289.1	243.3	9.75	8.53	5.4	271.4	6.18	7.89
09:45	279.9	240.9	9.77	8.50	5.2	275.1	6.06	8.23
AVERAGE VALUES FOR THE LAST 15 MINUTES								
09:45	345.9	233.5	8.64	9.39	5.5	293.1	6.64	6.87
09:46	277.0	240.6	9.88	8.41	5.4	273.0	6.08	8.22
09:47	267.5	239.1	10.06	8.22	5.3	288.5	5.94	8.51
09:48	258.3	236.8	10.36	7.97	5.4	292.0	5.82	8.79
09:49	250.9	235.4	10.36	7.96	5.5	305.6	5.72	9.10
09:50	247.7	234.7	10.49	7.84	5.7	305.2	5.71	9.19
09:51	247.2	235.8	10.34	7.96	5.6	315.0	5.69	9.28
09:52	247.9	232.5	10.51	7.78	5.5	305.1	5.67	9.49

Site 9 Sewage Sludge Incineraor 06-07-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 5 HEARTH % O2
09:53	241.5	230.8	10.67	7.64	5.8	328.1	5.58	9.67
09:54	236.7	227.4	10.75	7.55	5.8	326.7	5.48	9.85
09:55	236.7	227.2	10.63	7.66	5.9	332.1	5.47	9.85
09:56	236.1	221.5	10.81	7.44	5.8	336.0	5.41	9.96
09:57	233.9	221.4	10.82	7.45	6.0	353.1	5.36	10.18
09:58	232.3	215.6	10.82	7.37	5.9	355.2	5.32	10.36
09:59	234.4	217.5	10.82	7.48	6.3	360.4	5.38	10.32
10:00	236.9	212.6	10.73	7.47	6.2	363.2	5.30	10.26
AVERAGE VALUES FOR THE LAST 15 MINUTES								
10:00	245.7	228.6	10.54	7.75	5.7	322.6	5.59	9.53
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA								
10:00	273.8	207.0	10.37	7.89	6.6	379.4	5.65	9.20
10:01	242.2	217.2	10.60	7.66	6.3	365.9	5.48	10.10
10:02	241.1	207.0	10.71	7.47	6.3	379.3	5.38	10.15
10:03	233.5	202.8	11.05	7.27	6.9	404.6	5.34	10.26
10:04	232.4	202.9	10.72	7.53	6.8	427.8	5.27	10.32
10:05	244.1	206.4	10.59	7.67	6.8	407.0	5.51	10.20
10:06	253.7	210.1	10.12	8.08	6.5	398.7	5.65	9.98
10:07	262.6	211.6	10.10	8.08	6.4	386.5	5.78	9.61
10:08	270.0	214.5	9.74	8.43	6.6	389.1	5.95	9.24
10:09	275.8	213.9	9.83	8.28	6.6	383.5	5.96	9.01
10:10	281.0	218.3	9.44	8.71	6.9	393.9	6.13	9.01
10:11	292.5	217.7	9.34	8.72	6.8	369.6	6.15	8.84
10:12	302.4	220.7	9.02	9.06	6.8	362.7	6.39	8.60
10:13	309.9	221.8	9.04	8.95	6.3	338.1	6.31	8.50
10:14	310.1	227.1	8.85	9.23	6.3	329.4	6.49	8.48
10:15	319.8	232.3	8.57	9.35	5.9	300.2	6.49	8.35
AVERAGE VALUES FOR THE LAST 15 MINUTES								
10:15	271.4	215.0	9.85	8.30	6.5	375.7	5.88	9.38
10:16	332.7	238.8	8.16	9.80	5.6	277.8	6.78	7.96
10:17	352.0	243.7	7.87	9.91	5.3	249.9	6.85	7.58
10:18	367.5	244.3	7.84	10.01	5.1	239.9	7.02	7.04
10:19	366.7	245.5	8.09	9.77	5.1	228.4	6.91	6.64
10:20	349.0	246.1	8.66	9.33	5.0	230.6	6.72	6.84
10:21	320.1	245.1	9.29	8.82	5.0	239.7	6.37	7.51
10:22	293.9	244.9	9.65	8.53	5.2	254.2	6.11	8.29
10:23	280.3	241.6	9.75	8.46	5.1	259.3	6.02	8.78
10:24	276.0	243.3	9.65	8.35	5.3	259.2	6.01	8.98
10:25	272.2	243.9	9.79	8.44	5.1	258.6	6.01	8.98
10:26	272.0	241.7	9.87	8.31	5.2	255.2	5.99	8.86
10:27	266.2	238.9	10.04	8.19	5.3	265.5	5.95	8.79
10:28	253.9	233.8	10.43	7.83	5.4	280.8	5.77	8.79
10:29	238.2	228.9	10.81	7.47	5.8	318.6	5.52	8.98
10:30	227.3	229.4	10.85	7.47	5.8	323.1	5.38	9.42
AVERAGE VALUES FOR THE LAST 15 MINUTES								
10:30	297.9	240.7	9.40	8.71	5.3	262.7	6.23	8.23
10:31	227.5	231.2	10.70	7.58	5.9	331.3	5.44	9.63

Site 9 Sewage Sludge Incineraor 06-07-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
10:32	231.8	234.6	10.58	7.69	5.7	315.5	5.50	9.66
10:33	234.7	232.5	10.51	7.74	5.9	320.8	5.57	9.58
10:34	236.7	231.3	10.52	7.68	5.7	314.8	5.54	9.53
10:35	236.1	233.7	10.52	7.73	5.8	322.6	5.54	9.77
10:36	236.5	232.6	10.46	7.73	5.7	319.5	5.51	9.83
10:37	240.5	234.6	10.47	7.76	5.9	324.6	5.56	9.89
10:38	240.9	231.1	10.47	7.72	5.6	329.9	5.49	9.59
10:39	241.3	233.7	10.52	7.74	6.0	331.9	5.56	9.95
10:40	243.2	229.6	10.43	7.76	5.7	335.7	5.52	9.97
10:41	245.7	233.8	10.43	7.82	6.1	336.4	5.59	9.94
10:42	249.3	232.6	10.23	7.96	5.8	334.7	5.64	9.81
10:43	253.3	236.5	10.21	7.99	5.8	322.6	5.74	9.60
10:44	258.0	235.5	9.97	8.19	5.5	316.6	5.81	9.29
10:45	263.0	238.0	10.01	8.15	5.6	300.6	5.89	8.98
AVERAGE VALUES FOR THE LAST 15 MINUTES								
10:45	242.6	233.4	10.40	7.82	5.8	323.3	5.59	9.69
10:46	262.7	202.8	9.87	8.32	5.7	316.3	5.94	8.89
10:47	267.6	197.3	9.82	8.33	5.8	293.5	5.93	8.99
10:48	270.2	198.6	9.72	8.42	5.7	300.4	6.00	8.94
10:49	271.4	200.8	9.75	8.41	5.5	286.0	5.97	8.76
10:50	278.3	205.6	9.55	8.57	5.4	287.4	6.10	8.64
10:51	275.9	238.6	9.78	8.36	5.5	282.4	6.02	8.39
10:52	268.2	243.0	9.83	8.35	5.6	290.5	5.97	8.44
10:53	264.2	240.4	9.88	8.27	5.5	293.0	5.90	8.66
10:54	267.7	246.0	9.59	8.57	5.6	290.6	5.99	8.63
10:55	274.4	242.8	9.56	8.55	5.4	278.5	6.05	8.48
10:56	275.1	209.2	9.65	8.52	5.5	279.9	6.07	8.34
10:57	272.6	203.4	9.71	8.44	5.2	279.7	5.98	8.56
10:58	268.5	205.7	9.95	8.25	5.6	281.7	5.98	8.55
10:59	259.3	199.0	10.17	8.05	5.5	298.8	5.83	8.84
11:00	252.4	198.8	10.28	7.98	5.5	300.1	5.77	9.19
AVERAGE VALUES FOR THE LAST 15 MINUTES								
11:00	268.6	215.5	9.81	8.36	5.5	290.6	5.97	8.69
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA								
11:00	270.1	226.1	9.86	8.30	5.8	313.2	5.92	9.00
11:01	251.5	240.2	10.11	8.12	5.4	304.1	5.76	9.33
11:02	253.5	243.6	10.13	8.09	5.5	288.8	5.83	9.29
11:03	252.5	241.4	10.16	8.07	5.7	307.7	5.80	9.18
11:04	248.6	242.5	10.22	8.01	5.8	306.5	5.75	9.17
11:05	251.1	240.8	10.17	8.05	5.7	318.7	5.78	9.30
11:06	248.5	199.2	10.38	7.86	5.7	311.6	5.71	9.39
11:07	246.6	196.8	10.18	8.06	5.7	324.2	5.71	9.53
11:08	249.8	194.3	10.29	7.93	5.8	308.0	5.75	9.44
11:09	248.9	194.1	10.21	8.01	5.8	332.0	5.72	9.46
11:10	251.7	196.5	10.13	8.04	5.5	314.3	5.72	9.55
11:11	257.7	240.1	9.94	8.27	5.7	314.8	5.87	9.51
11:12	261.4	242.6	9.97	8.16	5.7	301.0	5.87	9.28
11:13	259.4	244.8	10.02	8.19	5.6	307.0	5.90	9.14
11:14	256.6	242.2	9.95	8.20	5.5	307.3	5.83	9.26

Site 9 Sewage Sludge Incinerator 06-07-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
11:15	258.5	242.8	9.98	8.24	5.6	308.1	5.92	9.31
AVERAGE VALUES FOR THE LAST 15 MINUTES								
11:15	253.1	226.8	10.12	8.09	5.7	310.3	5.79	9.34
11:16	260.0	201.5	9.87	8.28	5.3	306.3	5.86	9.26
11:17	262.2	202.8	9.91	8.30	5.5	296.1	5.96	9.26
11:18	266.3	202.5	9.74	8.40	5.3	303.4	5.95	9.18
11:19	265.9	205.2	9.86	8.31	5.6	291.5	5.99	9.05
11:20	269.5	207.5	9.56	8.58	5.5	296.2	6.01	8.93
11:21	276.3	244.4	9.60	8.52	5.5	276.4	6.12	8.76
11:22	278.2	247.4	9.53	8.59	5.3	288.6	6.10	8.61
11:23	275.2	245.8	9.77	8.37	5.4	280.1	6.05	8.69
11:24	269.3	243.3	9.78	8.39	5.6	303.5	5.99	8.71
11:25	265.3	244.3	9.99	8.20	5.7	290.9	5.91	8.86
11:26	260.9	222.(	9.83	8.35	5.7	303.8	5.90	9.10
11:27	264.9	207.4	9.72	8.42	5.6	282.8	5.96	9.05
11:28	272.2	210.3	9.58	8.56	5.6	279.7	6.08	8.92
11:29	274.2	209.9	9.69	8.42	5.3	268.9	6.03	8.68
11:30	273.7	209.8	9.72	8.44	5.6	278.0	6.04	8.68
AVERAGE VALUES FOR THE LAST 15 MINUTES								
11:30	268.9	220.3	9.74	8.41	5.5	289.8	6.00	8.91
11:31	269.4	245.9	9.77	8.32	5.4	271.5	5.98	8.64
11:32	264.5	245.8	10.12	8.08	5.6	285.1	5.95	8.62
11:33	257.0	246.2	10.16	8.02	5.3	293.8	5.77	8.83
11:34	253.4	244.1	10.29	7.93	5.7	293.0	5.80	9.05
11:35	246.0	239.1	10.47	7.74	5.6	312.7	5.68	9.09
11:36	240.2		10.56	7.68	6.9	319.6	5.60	9.31
11:37	238.0	192.4	10.55	7.69	7.5	330.4	5.57	9.43
11:38	236.9	192.5	10.66	7.58	7.7	329.5	5.57	9.49
11:39	236.3	190.7	10.61	7.62	7.5	338.6	5.54	9.63
11:40	235.2	193.7	10.54	7.67	7.0	330.0	5.54	9.79
11:41	237.4	235.3	10.44	7.77	6.6	337.9	5.60	9.76
11:42	238.7	238.4	10.57	7.64	6.4	331.0	5.58	9.73
11:43	238.4	237.2	10.49	7.74	6.4	345.7	5.56	9.80
11:44	241.8	240.1	10.37	7.82	6.3	343.3	5.60	9.84
11:45	247.3	241.6	10.14	8.03	6.0	331.6	5.74	9.72
AVERAGE VALUES FOR THE LAST 15 MINUTES								
11:45	245.4	225.7	10.38	7.82	6.4	319.6	5.67	9.38
11:46	247.3	238.4	10.38	7.79	6.1	332.0	5.69	9.62
11:47	247.5	238.9	10.17	8.02	6.0	336.4	5.71	9.76

Site 9 Sewage Sludge Incinerator 06-07-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
11:49	255.0	237.8	9.87	8.34	6.4	354.7	5.88	9.72
11:50	259.7	240.2	9.93	8.16	5.6	321.1	5.81	9.65
11:51	264.4	244.7	9.88	8.30	5.8	313.7	5.92	9.48
11:52	267.7	243.0	9.78	8.31	5.6	317.5	5.88	9.38
11:53	269.7	247.2	9.84	8.36	5.8	310.3	5.98	9.26
11:54	270.4	245.8	9.69	8.44	5.4	305.5	5.96	9.10
11:55	270.0	244.9	9.96	8.23	5.5	299.3	6.00	9.01
11:56	263.0	242.0	10.00	8.19	5.5	318.5	5.85	9.13
11:57	261.1	244.2	10.08	8.10	5.6	311.7	5.86	9.35
11:58	260.3	241.6	10.05	8.14	5.5	329.8	5.83	9.48
11:59	258.1	243.5	10.17	8.03	6.0	325.5	5.78	9.62
12:00	258.1	239.9	10.03	8.16	5.5	337.8	5.81	9.61
AVERAGE VALUES FOR THE LAST 15 MINUTES								
12:00	260.4	242.1	10.00	8.17	5.8	322.9	5.85	9.46
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA								
12:00	257.0	228.7	10.06	8.12	5.8	310.6	5.83	9.27
12:01	257.4	242.8	10.19	8.03	5.7	330.1	5.83	9.56
12:02	257.6	243.0	9.96	8.23	5.7	332.8	5.84	9.44
12:03	261.0	243.7	10.01	8.16	5.7	315.1	5.87	9.36
12:04	262.8	244.0	9.82	8.36	5.5	321.1	5.95	9.37

Site 9 Sewage Sludge Incinerator 06-07-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
12:09	267.4	247.7	9.77	8.33	5.3	289.3	5.95	9.14
12:10	266.3	247.4	9.85	8.32	5.6	292.4	6.00	9.07
12:11	268.6	246.6	9.77	8.34	5.4	289.7	5.93	9.11
12:12	265.9	246.1	9.94	8.25	5.5	293.2	5.96	17.83
12:13	261.3	246.5	9.93	8.24	5.4	299.5	5.87	20.42
12:14	259.8	247.5	10.09	8.12	5.6	295.2	5.89	20.43
12:15	254.7	244.0	10.13	8.05	5.4	311.3	5.76	20.46
AVERAGE VALUES FOR THE LAST 15 MINUTES								
12:15	263.4	245.7	9.93	8.24	5.5	307.1	5.90	12.10
12:16	252.5	244.5	10.30	7.92	5.8	309.1	5.74	17.01
12:17	250.9	241.2	10.22	7.97	5.7	313.8	5.71	9.90
12:18	246.8	241.8	10.36	7.83	5.7	315.9	5.70	9.96
12:19	242.3	239.4	10.35	7.88	5.8	348.5	5.62	9.99
12:20	244.0	240.7	10.38	7.82	5.8	326.8	5.67	10.10
12:21	244.5	238.8	10.32	7.88	5.8	343.7	5.65	10.13
12:22	245.0	241.7	10.29	7.90	5.8	329.6	5.66	10.22
12:23	248.4	241.7	10.17	8.01	5.6	334.2	5.74	10.21
12:24	246.0	239.1	10.44	7.71	5.6	322.7	5.64	10.27
12:25	241.8	238.2	10.43	7.78	6.0	351.1	5.58	10.26
12:26	242.3	241.2	10.37	7.78	5.8	337.8	5.57	10.19
12:27	245.8	245.0	10.14	8.04	5.6	325.6	5.71	9.97
12:28	250.6	244.5	10.12	7.96	5.5	312.2	5.72	9.91
12:29	249.5	243.9	10.26	7.91	5.7	312.7	5.75	9.81
12:30	244.9	240.9	10.30	7.83	5.7	327.8	5.62	9.90
AVERAGE VALUES FOR THE LAST 15 MINUTES								
12:30	246.3	241.5	10.30	7.88	5.7	327.4	5.67	10.52
12:31	243.8	241.0	10.37	7.84	5.9	326.2	5.68	9.96
12:32	243.4	241.0	10.27	7.86	5.4	327.9	5.60	9.93
12:33	244.3	242.4	10.40	7.81	5.8	325.7	5.66	10.06

COMMENTS: End of Sampling after Run 12?

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Second direct cal check - NO ADJUSTMENTS MADE

DATE : 06-07-1990 TIME: 12:34 - 13:10

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	3.1
6	BOILER	ppmSO2	218.0	190.6
7	BOILER	ppmNOx	0.0	1.5
7	BOILER	ppmNOx	240.0	235.9
8	BOILER	% O2	0.00	0.06
8	BOILER	% O2	12.50	12.15
10	BOILER	% CO2	0.00	0.02
10	BOILER	% CO2	11.01	11.08
1	STACK	ppmTHC	0.0	0.9
1	STACK	ppmTHC	181.2	178.6
2	STACK	ppm CO	0.0	10.0
2	STACK	ppm CO	457.5	463.6
4	STACK	% CO2	0.00	0.01
4	STACK	% CO2	11.01	10.89
3	HEARTH	% O2	0.00	0.05
3	HEARTH	% O2	12.50	12.22

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Third direct cal of selected analyzers

DATE : 06-07-1990 TIME: 13:24 - 13:32

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	2.4
6	BOILER	ppmSO2	218.0	220.2
8	BOILER	% O2	0.00	0.07
8	BOILER	% O2	12.50	12.50
3	HEARTH	% O2	0.00	0.06
3	HEARTH	% O2	12.50	12.50

Site 9 Sewage Sludge Incinerator 06-07-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
14:21	606.6	127.1	9.50	8.58	4.2	211.4	6.56	8.62
14:22	424.7	137.4	9.86	8.12	4.9	241.6	6.09	9.79
14:23	336.3	136.5	10.65	7.48	5.7	353.9	5.46	11.24
14:24	289.0	131.9	10.89	7.27	6.4	371.6	5.20	12.59
14:25	277.2	137.3	9.70	8.32	5.8	329.3	5.49	12.89
14:26	324.5	120.0	8.58	9.11	4.9	223.4	6.24	12.03
14:27	369.1	103.3	8.39	9.32	4.5	218.2	6.54	11.08
14:28	392.3	102.4	8.46	9.20	4.5	205.2	6.53	10.41
14:29	387.3	101.0	8.82	8.93	4.6	223.3	6.38	10.27
14:30	369.5	97.8	9.24	8.60	4.8	223.6	6.19	10.45
AVERAGE VALUES FOR THE LAST 15 MINUTES								
14:30	409.2	116.3	8.81	8.94	4.6	204.8	6.34	10.35
14:31	335.4	145.2	11.04	7.34	5.6	295.0	5.74	10.93
14:32	289.6	147.9	10.65	7.59	5.7	308.3	5.61	11.59
14:33	277.2	148.9	10.49	7.58	5.2	278.0	5.70	11.54
14:34	264.0	148.2	11.47	7.04	5.5	350.9	5.34	11.48
14:35	253.3	150.5	11.05	7.27	5.8	323.2	5.38	11.74
14:36	257.5	91.8	10.35	7.81	5.3	295.1	5.57	11.62
14:37	261.6	78.1	11.77	6.82	6.3	331.1	5.51	11.41
14:38	247.0	60.1	12.62	6.34	7.7	507.9	4.89	11.74
14:39	232.5	54.5	12.45	6.37	8.0	530.9	4.74	12.02
14:40	232.4	53.7	12.35	6.46	8.3	531.1	4.82	12.13
14:41	237.4	144.7	11.99	6.74	7.5	493.4	4.83	12.18
14:42	247.6	152.9	11.58	6.99	7.2	470.6	5.11	11.72
14:43	254.5	150.5	11.15	7.35	7.7	467.0	5.17	11.20
14:44	274.4	161.6	10.81	7.68	7.4	396.6	5.59	10.70
14:45	277.2	158.4	11.15	7.38	7.3	428.6	5.35	10.43
AVERAGE VALUES FOR THE LAST 15 MINUTES								
14:45	262.8	123.1	11.39	7.12	6.7	400.5	5.29	11.49
14:46	272.5	156.1	11.23	7.37	7.6	434.2	5.38	10.82
14:47	270.2	155.5	11.27	7.27	7.6	451.1	5.24	11.01
14:48	271.1	157.0	11.22	7.39	7.7	433.7	5.37	11.11
14:49	273.3	156.3	11.12	7.41	7.4	447.8	5.29	11.02
14:50	274.1	155.0	11.23	7.41	7.7	433.8	5.38	11.11
14:51	276.3	155.4	11.04	7.51	7.4	446.7	5.34	11.00
14:52	279.0	155.5	11.21	7.39	7.5	428.0	5.42	10.90
14:53	281.4	156.1	10.82	7.73	7.5	444.7	5.42	10.90
14:54	287.0	158.2	10.96	7.58	7.4	414.5	5.52	10.73
14:55	288.5	156.7	10.77	7.73	7.5	439.6	5.54	10.44
14:56	282.8	155.7	11.08	7.44	7.5	435.2	5.46	10.47
14:57	280.1	153.7	10.86	7.68	7.7	452.2	5.47	10.57
14:58	283.2	155.9	10.97	7.54	7.6	435.1	5.50	10.48
14:59	281.0	152.1	10.87	7.66	7.8	455.1	5.51	10.47
15:00	282.4	153.5	10.93	7.58	7.7	445.5	5.45	10.48
AVERAGE VALUES FOR THE LAST 15 MINUTES								
15:00	278.9	155.5	11.04	7.51	7.6	439.8	5.42	10.77

Site 9 Sewage Sludge Incineraor 06-07-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA								
15:00	315.0	132.3	10.33	7.90	5.9	315.5	5.74	10.95
15:01	286.9	98.4	10.67	7.88	7.6	445.8	5.59	10.25
15:02	292.4	69.2	10.54	7.89	7.3	429.3	5.58	10.10
15:03	302.4	71.5	10.36	8.15	7.4	402.7	5.81	10.05
15:04	306.1	76.6	10.32	8.07	7.0	383.9	5.77	9.78
15:05	303.8	73.6	10.51	7.99	7.1	384.7	5.80	9.61
15:06	299.6	156.4	10.35	8.05	6.8	388.2	5.69	9.65
15:07	306.1	163.8	10.29	8.21	6.9	374.1	5.84	9.73
15:08	312.6	166.4	9.40	8.77	6.5	361.4	5.97	9.43
15:09	323.9	163.7	9.02	9.04	6.5	323.7	6.40	8.41
15:10	329.9	166.6	8.88	9.09	6.3	313.8	6.42	7.71
15:11	328.3	165.3	9.18	8.82	6.3	300.1	6.39	7.63
15:12	321.7	164.5	9.08	8.96	6.3	310.0	6.36	7.64
15:13	316.5	166.1	8.87	9.02	6.1	296.8	6.26	7.78
15:14	322.1	164.6	8.56	9.27	6.0	278.5	6.54	7.70
15:15	325.5	164.3	8.50	9.30	5.7	273.9	6.50	7.52
AVERAGE VALUES FOR THE LAST 15 MINUTES.								
15:15	312.0	135.4	9.63	8.57	6.6	351.1	6.06	8.87
15:16	322.2	95.9	8.76	9.08	5.8	265.6	6.46	7.55
15:17	317.2	93.6	8.77	9.10	5.8	275.7	6.39	7.75
15:18	316.4	94.7	8.83	9.02	5.8	260.3	6.39	7.81
15:19	313.7	96.5	8.83	9.05	5.8	254.8	6.37	7.85
15:20	312.5	97.1	8.90	9.00	5.6	258.7	6.31	7.92
15:21	306.7	161.5	9.20	8.75	5.4	256.9	6.25	8.06
15:22	296.7	165.2	9.22	8.72	5.5	270.9	6.16	8.21
15:23	294.2	167.0	9.26	8.69	5.7	261.6	6.11	8.39
15:24	295.6	169.3	9.54	8.56	5.7	262.0	6.08	8.38
15:25	297.6	173.2	9.55	8.54	5.4	257.6	6.05	8.23
15:26	295.4	101.7	9.76	8.40	5.5	259.7	6.00	8.31
15:27	286.4	96.3	9.85	8.30	5.5	269.4	5.88	8.56
15:28	284.9	96.2	9.85	8.30	5.8	275.7	5.90	8.69
15:29	280.3	95.1	9.99	8.15	5.5	285.3	5.82	8.79
15:30	277.3	92.8	10.07	8.11	5.7	289.4	5.77	9.02
AVERAGE VALUES FOR THE LAST 15 MINUTES								
15:30	299.8	119.8	9.36	8.65	5.6	266.9	6.13	8.24
15:31	275.0	171.2	10.15	7.99	5.8	304.8	5.69	9.31
15:32	270.5	169.7	10.22	7.97	6.0	305.8	5.69	9.52
15:33	268.9	170.4	10.21	7.92	5.8	323.5	5.62	9.68
15:34	270.1	168.0	10.21	8.01	6.1	316.5	5.67	9.67
15:35	277.3	169.1	9.96	8.13	6.0	331.1	5.65	9.91
15:36	282.7	167.3	10.04	8.14	6.1	314.0	5.78	9.84
15:37	285.6	168.7	9.84	8.26	5.9	330.9	5.73	9.87
15:38	291.2	168.9	9.79	8.37	6.0	313.6	5.89	9.80
15:39	296.5	170.2	9.50	8.55	6.0	320.1	5.87	9.75
15:40	305.4	169.6	9.48	8.65	6.1	304.0	6.06	9.54
15:41	315.1	171.1	9.20	8.80	5.4	301.2	6.06	9.41
15:42	316.2	170.2	9.39	8.70	5.9	293.4	6.12	9.34
15:43	314.3	172.6	9.33	8.70	5.6	303.7	6.05	9.26

Site 9 Sewage Sludge Incineraor 06-07-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
15:44	311.9	171.2	9.54	8.56	5.5	293.4	6.09	9.28
15:45	309.9	173.2	9.35	8.70	5.7	301.2	6.02	9.26
AVERAGE VALUES FOR THE LAST 15 MINUTES								
15:45	292.7	170.1	9.75	8.36	5.9	310.5	5.86	9.58
15:46	313.7	174.3	9.36	8.72	5.7	284.4	6.11	9.12
15:47	323.0	177.8	8.99	9.01	5.3	275.3	6.22	8.84
15:48	326.8	177.3	9.26	8.78	5.5	261.7	6.26	8.74
15:49	323.3	176.5	9.31	8.79	5.4	271.4	6.18	8.73
15:50	321.5	176.4	9.41	8.66	5.5	267.2	6.15	8.78
15:51	316.7	176.2	9.33	8.77	5.4	272.5	6.13	8.76
15:52	318.1	176.9	9.33	8.74	5.4	258.4	6.17	8.76
15:53	321.8	176.7	9.17	8.89	5.3	260.9	6.20	8.67
15:54	323.6	176.5	9.27	8.80	5.3	250.4	6.22	8.50
15:55	325.6	175.1	9.22	8.85	5.1	259.4	6.20	8.53
15:56	323.8	174.8	9.38	8.71	5.4	254.3	6.18	8.51
15:57	318.1	173.5	9.46	8.64	5.2	272.6	6.09	8.56
15:58	310.9	173.6	9.73	8.42	5.4	268.3	6.00	8.71
15:59	305.5	173.7	9.59	8.56	5.5	277.7	5.99	8.90
16:00	307.5	174.1	9.67	8.47	5.1	264.5	5.98	8.94
AVERAGE VALUES FOR THE LAST 15 MINUTES								
16:00	318.7	175.6	9.37	8.72	5.4	266.6	6.14	8.74
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA								
16:00	305.8	150.2	9.53	8.58	5.9	298.8	6.05	8.85
16:01	306.4	174.0	9.62	8.53	5.3	274.6	5.97	9.10
16:02	306.5	176.9	9.62	8.53	5.3	258.7	5.99	9.17
16:03	310.8	176.0	9.49	8.63	5.3	266.3	6.03	9.14
16:04	311.7	176.7	9.61	8.53	5.2	259.4	6.00	9.08
16:05	311.0	176.3	9.63	8.53	5.2	267.5	6.02	9.04
16:06	304.6	175.5	9.86	8.30	5.3	265.5	5.91	9.07
16:07	300.3	174.7	9.78	8.40	5.2	281.4	5.90	9.30
16:08	300.5	175.8	9.84	8.32	5.0	270.1	5.88	9.35
16:09	304.4	175.8	9.61	8.54	5.4	276.0	5.96	9.43
16:10	307.7	176.6	9.71	8.43	5.2	267.2	5.94	9.27
16:11	309.1	176.5	9.63	8.53	5.1	268.7	5.99	9.18
16:12	312.7	177.5	9.58	8.53	5.1	264.7	5.99	9.13
16:13	314.1	176.9	9.49	8.66	5.1	268.5	6.04	9.13
16:14	315.7	177.1	9.61	8.48	4.9	263.6	6.02	9.09
16:15	310.6	174.0	9.67	8.49	5.1	277.9	5.95	9.20
AVERAGE VALUES FOR THE LAST 15 MINUTES								
16:15	308.4	176.0	9.65	8.50	5.2	268.7	5.97	9.18
16:16	311.4	174.4	9.63	8.50	5.1	273.1	5.92	9.29
16:17	318.0	174.3	9.52	8.60	5.1	268.5	6.01	9.28
16:18	313.2	174.8	9.71	8.41	5.2	272.9	5.97	9.25
16:19	309.1	173.5	9.75	8.40	5.2	281.2	5.94	9.38
16:20	310.1	173.0	9.68	8.41	5.2	281.0	5.87	9.53
16:21	312.8	171.3	9.66	8.51	5.3	276.4	5.95	9.46
16:22	314.7	172.7	9.59	8.50	5.1	274.4	5.93	9.50

Site 9 Sewage Sludge Incineraor 06-07-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
16:23	321.2	171.1	9.49	8.65	5.3	275.0	6.03	9.52
16:24	330.2	171.9	9.34	8.73	5.1	275.3	6.06	9.55
16:25	335.0	170.2	9.38	8.73	5.3	272.8	6.11	9.51
16:26	331.0	170.3	9.48	8.62	5.0	274.5	6.03	9.65
16:27	328.9	168.8	9.59	8.56	5.2	277.6	6.01	9.77
16:28	324.1	169.0	9.65	8.47	5.2	290.5	5.94	9.80
16:29	322.1	167.8	9.74	8.44	5.2	290.5	5.93	9.94
16:30	318.6	171.3	9.65	8.49	5.2	293.9	5.86	10.01
AVERAGE VALUES FOR THE LAST 15 MINUTES								
16:30	320.0	171.6	9.59	8.54	5.2	278.5	5.97	9.56
16:31	319.7	174.3	9.53	8.64	5.4	279.5	5.95	9.85
16:32	325.2	179.3	9.37	8.73	5.0	266.1	6.05	9.41
16:33	332.6	181.9	9.30	8.81	4.8	247.9	6.15	9.14
16:34	338.0	182.7	9.10	8.95	5.1	239.2	6.22	8.92
16:35	340.9	181.7	9.33	8.76	4.9	235.0	6.27	8.68
16:36	333.1	181.6	9.31	8.80	4.8	238.8	6.19	8.51
16:37	332.1	183.5	9.28	8.83	4.9	231.1	6.25	8.24
16:38	333.5	183.7	9.25	8.84	4.9	233.3	6.25	7.80
16:39	329.9	184.1	9.40	8.72	4.7	226.9	6.22	7.58
16:40	331.0	183.8	9.25	8.85	5.0	229.8	6.25	7.49
16:41	331.7	184.5	9.45	8.68	4.9	230.2	6.21	7.39
16:42	324.1	182.2	9.55	8.61	4.9	240.2	6.15	7.33
16:43	314.5	183.6	9.72	8.45	4.9	242.6	6.04	7.46
16:44	310.7	182.7	9.70	8.49	4.9	245.0	6.04	7.60
16:45	305.4	183.4	9.87	8.32	5.1	247.5	5.97	7.78
AVERAGE VALUES FOR THE LAST 15 MINUTES								
16:45	326.8	182.2	9.43	8.70	4.9	242.2	6.15	8.21
16:46	302.1	184.1	9.81	8.40	4.8	251.5	5.93	7.97
16:47	303.4	184.1	9.85	8.34	5.0	248.0	5.95	7.99
16:48	301.7	182.6	9.85	8.35	4.9	254.5	5.93	8.11
16:49	303.0	185.1	9.81	8.38	4.9	241.0	5.93	8.14
16:50	304.9	185.3	9.67	8.51	4.8	245.0	5.98	8.16
16:51	312.7	186.4	9.64	8.52	4.9	235.3	6.04	8.08
16:52	318.5	185.6	9.63	8.53	4.8	241.4	6.02	8.01
16:53	311.6	184.7	9.90	8.29	4.8	241.6	5.95	8.12
16:54	306.7	185.3	9.77	8.41	5.0	252.0	5.91	8.36
16:55	310.4	185.5	9.74	8.42	4.9	237.1	5.97	8.31
16:56	312.8	184.0	9.66	8.49	4.8	240.8	5.99	8.16
16:57	313.3	182.6	9.84	8.33	4.9	243.5	5.94	8.05
16:58	310.4	181.3	9.72	8.43	4.8	257.2	5.92	8.30
16:59	313.4	182.6	9.79	8.40	4.8	246.8	5.93	8.40
17:00	316.3	183.1	9.62	8.51	4.8	257.9	5.98	8.32
AVERAGE VALUES FOR THE LAST 15 MINUTES								
17:00	309.4	184.2	9.75	8.42	4.9	246.2	5.96	8.17
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA								
17:00	316.2	176.5	9.61	8.54	5.0	258.9	6.01	8.78
17:01	318.7	182.3	9.69	8.47	4.9	245.7	5.96	8.28

Site 9 Sewage Sludge Incinerator 06-07-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
17:02	318.7	182.4	9.66	8.46	5.0	257.4	5.98	8.39
17:03	316.0	182.7	9.81	8.35	4.8	247.8	5.92	8.52
17:04	315.6	181.6	9.66	8.47	4.9	260.8	5.91	8.63
17:05	319.1	183.2	9.63	8.51	5.0	245.8	5.97	8.60
17:06	327.5	183.7	9.43	8.68	4.8	244.2	6.06	8.47
17:07	329.8	182.6	9.60	8.53	4.8	236.3	6.03	8.50
17:08	327.2	180.4	9.54	8.60	4.7	242.1	6.01	8.66
17:09	329.8	181.3	9.52	8.59	4.6	230.9	6.01	8.60
17:10	332.6	180.2	9.48	8.65	4.7	235.6	6.09	8.60
17:11	335.6	179.7	9.46	8.63	4.6	226.9	6.08	8.50
17:12	334.5	176.9	9.57	8.58	4.8	238.8	6.04	8.50
17:13	330.6	178.2	9.66	8.47	4.7	233.6	5.96	8.70
17:14	326.6	177.7	9.72	8.46	4.8	239.6	5.98	8.98
17:15	322.8	176.8	9.75	8.40	4.5	238.4	5.92	9.01
AVERAGE VALUES FOR THE LAST 15 MINUTES								
17:15	325.7	180.6	9.61	8.53	4.8	241.6	6.00	8.60
17:16	321.5	176.9	9.74	8.44	4.9	243.6	5.93	9.10
17:17	320.0	178.7	9.71	8.44	4.7	238.2	5.91	9.16
17:18	323.9	177.6	9.75	8.45	4.6	241.1	5.91	9.29
17:19	322.3	177.0	9.81	8.35	4.7	248.2	5.88	9.27
17:20	319.6	176.9	9.87	8.33	4.8	255.1	5.87	9.37
17:21	315.6	176.0	9.96	8.25	4.8	263.7	5.79	9.53
17:22	316.2	176.8	9.88	8.32	4.9	264.9	5.82	9.58
17:23	319.1	178.0	9.90	8.28	4.7	265.0	5.82	9.58
17:24	315.8	178.9	9.86	8.34	5.0	266.1	5.82	9.64
17:25	319.1	180.5	9.77	8.41	4.9	259.9	5.88	9.57
17:26	322.3	182.2	9.65	8.53	4.9	249.8	5.95	9.56
17:27	328.0	182.6	9.57	8.58	4.8	247.6	6.00	9.30
17:28	333.1	184.1	9.41	8.74	4.9	241.0	6.08	9.07
17:29	342.3	184.2	9.33	8.78	4.7	230.1	6.17	8.69
17:30	343.5	184.1	9.36	8.77	4.6	225.9	6.15	8.57
AVERAGE VALUES FOR THE LAST 15 MINUTES								
17:30	324.2	179.6	9.70	8.47	4.8	249.3	5.93	9.28
17:31	341.1	182.8	9.42	8.72	4.7	228.1	6.17	8.51
17:32	338.6	182.5	9.55	8.62	4.7	229.8	6.09	8.63
17:33	339.7	183.9	9.48	8.69	4.6	229.2	6.11	8.72
17:34	343.8	184.7	9.35	8.78	4.6	222.3	6.15	8.53
17:35	343.3	183.9	9.54	8.64	4.7	225.6	6.18	8.25
17:36	336.9	183.6	9.63	8.56	4.7	226.4	6.08	8.26
17:37	335.8	183.1	9.61	8.59	4.7	232.9	6.11	8.31
17:38	334.7	181.9	9.74	8.46	4.7	227.9	6.06	8.40
17:39	330.1	180.7	9.75	8.48	4.8	238.0	6.02	8.44
17:40	328.4	180.7	9.79	8.41	4.8	236.9	5.98	8.57
17:41	328.7	181.2	9.83	8.39	4.7	243.1	5.98	8.77
17:42	325.9	179.4	9.92	8.31	4.9	246.0	5.90	8.88
17:43	320.9	178.9	9.97	8.28	5.0	259.5	5.89	9.04
17:44	321.4	178.6	9.95	8.28	5.0	254.1	5.85	9.17
17:45	324.0	179.8	9.84	8.38	4.9	259.0	5.91	9.33

Site 9 Sewage Sludge Incineraor 06-07-1990

TIME	CHAN 6 BOILER ppmSO2	CHAN 7 BOILER ppmNOx	CHAN 8 BOILER % O2	CHAN10 BOILER % CO2	CHAN 1 STACK ppmTHC	CHAN 2 STACK ppm CO	CHAN 4 STACK % CO2	CHAN 3 HEARTH % O2
AVERAGE VALUES FOR THE LAST 15 MINUTES								
17:45	332.9	181.7	9.69	8.51	4.8	237.3	6.03	8.65
17:46	327.6	179.5	9.86	8.35	5.0	252.0	5.91	9.41
17:47	329.2	179.5	9.75	8.45	5.1	261.3	5.96	9.39
17:48	335.1	178.8	9.70	8.49	4.9	247.7	5.99	9.46
17:49	338.1	179.0	9.64	8.53	4.9	255.2	6.01	9.35
17:50	338.2	180.2	9.65	8.52	5.0	243.1	6.02	9.24
17:51	337.1	180.7	9.75	8.46	5.0	256.2	6.00	9.29
17:52	336.8	180.7	9.65	8.52	4.8	249.2	5.99	9.35
17:53	342.2	182.3	9.55	8.65	4.9	250.5	6.05	9.36
17:54	347.0	182.8	9.49	8.66	4.9	235.1	6.10	9.16
17:55	347.7	183.2	9.48	8.70	4.9	245.3	6.15	9.04
17:56	347.2	182.7	9.52	8.62	4.9	238.3	6.12	9.01
17:57	346.6	183.5	9.55	8.65	5.1	245.4	6.11	9.06
17:58	344.2	183.0	9.61	8.56	4.9	240.5	6.07	9.10
17:59	340.9	183.2	9.58	8.62	5.3	245.0	6.08	9.20
18:00	345.6	182.9	9.46	8.68	5.2	235.1	6.10	9.16
AVERAGE VALUES FOR THE LAST 15 MINUTES								
18:00	340.2	181.5	9.62	8.56	5.0	246.7	6.04	9.24
AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA								
18:00	330.7	180.9	9.66	8.52	4.8	243.7	6.00	8.94
18:01	351.5	183.7	9.39	8.76	5.0	233.2	6.16	9.19
18:02	359.7	184.9	9.20	8.93	5.0	219.1	6.24	9.09
18:03	361.9	185.1	9.25	8.91	5.0	219.3	6.29	8.87
18:04	362.8	183.8	9.22	8.91	4.9	215.2	6.28	8.64
18:05	361.8	184.7	9.37	8.80	5.0	219.5	6.24	8.62

COMMENTS: End of Sampling

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Final direct cal check (fourth)

DATE : 08-07-1990 TIME: 18:06 - 18:38

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	1.6
6	BOILER	ppmSO2	218.0	235.9
7	BOILER	ppmNOx	0.0	2.0
7	BOILER	ppmNOx	240.0	234.7
8	BOILER	% O2	0.00	0.06
8	BOILER	% O2	12.50	12.55
10	BOILER	% CO2	0.00	0.04
10	BOILER	% CO2	11.01	11.09
1	STACK	ppmTHC	0.0	1.2
1	STACK	ppmTHC	181.2	178.0
2	STACK	ppm CO	0.0	11.2
2	STACK	ppm CO	457.5	465.7
4	STACK	% CO2	0.00	-0.03
4	STACK	% CO2	11.01	10.84
3	HEARTH	% O2	0.00	0.08
3	HEARTH	% O2	12.50	12.50

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Recheck of Direct cal - SO2 & NOx

DATE : 06-01-1990 TIME: 09:54 - 10:14

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	3.5
6	BOILER	ppmSO2	218.0	218.2
6	BOILER	ppmSO2	361.4	365.3
7	BOILER	ppmNOx	0.0	1.6
7	BOILER	ppmNOx	240.0	239.9
7	BOILER	ppmNOx	475.0	476.3

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Second direct cal (abbreviated two-point)

DATE : 06-01-1990 TIME: 16:07 - 16:26

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	0.0
6	BOILER	ppmSO2	218.0	218.7
7	BOILER	ppmNOx	0.0	0.5
7	BOILER	ppmNOx	240.0	239.8
8	BOILER	% O2	0.00	0.06
8	BOILER	% O2	12.50	12.50
10	BOILER	% CO2	0.00	0.01
10	BOILER	% CO2	11.01	11.02
1	STACK	ppmTHC	0.0	1.1
1	STACK	ppmTHC	181.2	180.9
2	STACK	ppm CO	0.0	1.1
2	STACK	ppm CO	1263.0	1286.3
3	STACK	% O2	0.00	0.12
3	STACK	% O2	12.50	12.50

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Initial system cal - 6/1/90

DATE : 06-01-1990 TIME: 16:29 - 16:40

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	0.4
7	BOILER	ppmNOx	0.0	0.8
8	BOILER	% O2	0.00	0.10
8	BOILER	% O2	12.50	12.38
10	BOILER	% CO2	0.00	0.01
10	BOILER	% CO2	11.01	10.98

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Initial direct cal - 6/2/90

DATE : 06-02-1990 TIME: 10:11 - 11:22

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	0.0
6	BOILER	ppmSO2	218.0	217.2
6	BOILER	ppmSO2	361.4	362.4
7	BOILER	ppmNOx	0.0	-0.0
7	BOILER	ppmNOx	240.0	240.5
7	BOILER	ppmNOx	475.0	479.0
8	BOILER	% O2	0.00	0.14
8	BOILER	% O2	12.50	12.50
8	BOILER	% O2	20.60	20.58
10	BOILER	% CO2	0.00	0.01
10	BOILER	% CO2	11.01	11.01
10	BOILER	% CO2	17.46	17.79
1	STACK	ppmTHC	0.0	1.0
1	STACK	ppmTHC	181.2	182.2
1	STACK	ppmTHC	282.0	284.1
2	STACK	ppm CO	0.0	1.2
2	STACK	ppm CO	457.5	453.6
2	STACK	ppm CO	1263.0	1288.4
3	STACK	% O2	0.00	0.06
3	STACK	% O2	12.50	12.50
3	STACK	% O2	20.60	20.64

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Second direct cal check (abbreviated two-point)

DATE : 06-02-1990 TIME: 17:37 - 18:15

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	0.9
6	BOILER	ppmSO2	218.0	218.8
6	BOILER	ppmSO2	361.4	361.0
7	BOILER	ppmNOx	0.0	1.0
7	BOILER	ppmNOx	240.0	240.3
8	BOILER	% O2	0.00	0.08
8	BOILER	% O2	12.50	12.50
10	BOILER	% CO2	0.00	0.01
10	BOILER	% CO2	11.01	10.92
1	STACK	ppmTHC	0.0	0.2
1	STACK	ppmTHC	181.2	182.2
1	STACK	ppmTHC	282.0	283.8
2	STACK	ppm CO	0.0	-0.0
2	STACK	ppm CO	1263.0	1282.7
3	STACK	% O2	0.00	0.09
3	STACK	% O2	12.50	12.50

CALIBRATION SUMMARY

SOURCE: Site 9 Sewage Sludge Incineraor

REASON: Initial

DATE : 06-02-1990 TIME: 18:16 - 18:39

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
6	BOILER	ppmSO2	0.0	1.4
6	BOILER	ppmSO2	218.0	206.0
7	BOILER	ppmNOx	0.0	1.1
7	BOILER	ppmNOx	240.0	237.7
8	BOILER	% O2	0.00	0.08
8	BOILER	% O2	12.50	12.42
10	BOILER	% CO2	0.00	0.02
10	BOILER	% CO2	11.01	10.90
1	STACK	ppmTHC	0.0	0.7
1	STACK	ppmTHC	181.2	177.7
2	STACK	ppm CO	0.0	-0.7
2	STACK	ppm CO	1263.0	1256.6
3	STACK	% O2	0.00	0.12
3	STACK	% O2	12.50	12.45

Appendix F

External Audit Report

DRAFT

Review Summary
(Laboratory Analyses)

Technical Systems Review (TSR)
of
Entropy Environmentalists, Inc.
(and Various Subcontract Laboratories)

Conducted at

Entropy Environmentalists, Inc.
Triangle Laboratories, Inc.
Research Triangle Institute
Research Triangle Park, North Carolina

Project Title

Emission Testing of Sewage Sludge Incinerators

QA ID No.: PQ-369
Laboratory Work Plan No.: 1754
EPA Technical PO: Dr. Harry Bostian

July 1990

I. INTRODUCTION

On June 20-22, 1990, Technical Systems Reviews (TSRs) were performed at three laboratories that are providing analytical support for the project entitled "Emission Testing of Sewage Sludge Incinerators," a Category II RREL project. Entropy Environmentalists, Inc./DEECO, Inc., was the prime contractor for this project. Table 1 lists the laboratories reviewed and the analyses for which they were responsible. The samples, which were in various phases of analysis during these reviews, were from Site 9, a multiple-hearth incinerator in Woonsocket, Rhode Island. Field testing at this site was conducted May 28 through June 7, 1990.

TABLE 1. LABORATORIES REVIEWED AND ANALYSES FOR WHICH THEY WERE RESPONSIBLE

Laboratory	Analyses performed
Research Triangle Institute (RTI)	Metals
Triangle Laboratories, Inc.	VOCs, SVOCs, Dioxins
Entropy Environmentalists, Inc.	Hexchrome, Gravimetric

Mr. Thomas Clark of PEI Associates, Cincinnati, Ohio conducted the TSRs for RREL. Ms. Cheryl Davis of DEECO, Inc., was present during most of the reviews. The approved QA Project Plan (dated April 1990) was used as the foundation for the TSRs.

II. RESEARCH TRIANGLE INSTITUTE (RTI)

The RTI Laboratory is responsible for analyzing samples for total metals by use of inductively coupled argon plasma emission spectroscopy (ICAP) and the procedures specified in the draft EPA method "Methodology for the Determination of Trace Metals Emissions in Exhaust Gases From Stationary Combustion Processes."

Dr. Kate Luk, RTI Laboratory Manager, participated in the TSR and provided information regarding laboratory operations. This laboratory is a small research-oriented operation. Samples for this project are received by Dr. Luk and stored in a locked room until analyzed. No formalized sample custody program or records documenting sample custody exists at this facility. In view of the lab manager's personal control of samples, the small number of samples processed, and the small staff, the absence of a formal lab custody program did not present a concern relative to the samples being analyzed for this study.

The samples generated during this study were not being analyzed during the TSR. The lab manager had a copy of the approved QAPjP for this study, and the EPA-approved and standard analytical methods for metals were on file in a looseleaf notebook in the manager's office.

Minor Concern

Reviews of the laboratory data for sample analysis being conducted during the TSR revealed that QA documentation was not in conformance with the level of QC documentation required by the SW-846 methods that will be used to analyze samples generated during this study. The QC procedures were posted at the AA instrument; however, no procedures or SOP documenting QC procedures for the GFAA and ICAP were posted for the analysts.

It is recommended that the laboratory manager provide the analysts with a copy of the SW-846 methods or an SOP detailing the required QC checks for the samples to be analyzed for this study before their analysis is begun.

III. TRIANGLE LABORATORIES, INC.

Triangle Labs is responsible for analyzing samples for volatile organics, semi-volatile organics, and PCDD/PCDF by EPA SW-846 Methods 5040, 8240, 8270 and 8290.

Donald Harvan, Vice President Operations, and Dr. Hani Karam of Triangle Laboratories were present during the TSR. Sample receiving and laboratory

chain-of-custody procedures are acceptable. Sample preparation and analysis procedures were in accordance with those specified in the methods. Calibration data and QC checks were well documented for the samples being analyzed during this study.

Minor Concern

VOST tubes were being stored in the freezer sections of refrigerators prior to analysis. This could result in the fracturing of VOST tubes containing samples collected from a wet source because of the water in the tube freezing.

It is recommended that VOST tubes be stored at 4°C as specified in Method 0030, SW-846, 3d edition.

IV. ENTROPY ENVIRONMENTALISTS, INC.

The Entropy Laboratory is responsible for performing the gravimetric and hexchrome analyses. Gravimetric analyses of the sample train media are performed in the Entropy Laboratory, whereas the hexchrome analysis is performed by Entropy personnel in an EPA laboratory. Mary Ellen Jackson, the Entropy Laboratory Manager, and Cheryl Davis of DEECO, Inc., were present during this TSR.

Gravimetric and hexchrome analyses were being conducted in accordance with procedures specified in the respective methods. Calibration and QA data were appropriately documented for each of these methods.

V. CONCLUSIONS

No concerns were noted that could compromise the quality of the data generated from samples analyzed for this study at the three laboratories visited during this TSR. Insufficient documentation of QC checks was noted at the RTI laboratory; however, this concern was considered minor because analysis of samples for this project had not yet begun. Implementation of the QC check procedures and documentation protocol specified in the methods selected for this study will ensure adequate documentation of data quality for samples analyzed at this facility. In general, data generated from laboratory analyses performed by the laboratories reviewed during these

TSRs should be of adequate quality to meet the study objectives. A rating of satisfactory was assigned to each laboratory visited.

A summary meeting was held at the conclusion of each TSR, during which findings and corrective actions were discussed. Corrective Action Recommendation (CAR) forms were completed and distributed to the responsible parties at these meetings. Copies of the CAR forms are included as Appendix I of this report.

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before comple

1. REPORT NO.	2.	3 PB92-151638
EPA/600/R-92/003i		

4. TITLE AND SUBTITLE	5. REPORT DATE
EMISSIONS OF METALS, CHROMIUM AND NICKEL SPECIES, AND ORGANICS FROM MUNICIPAL WASTEWATER SLUDGE INCINERATORS VOLUME IX: SITE 9 EMISSION TEST REPORT - APPENDICES	March 1992
	6. PERFORMING ORGANIZATION CODE

7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.
William G. DeWees, Robin R. Segall F. Michael Lewis	

9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT NO.
Entropy Environmentalists, Inc. Research Triangle Park North Carolina, 27709	B101
	11. CONTRACT/GRANT NO.
	Contract No. 68-CO-0027 Work Assignment No. 0-5

12. SPONSORING AGENCY NAME AND ADDRESS	13. TYPE OF REPORT AND PERIOD COVERED
Risk Reduction Engineering Laboratory Office of Research and Development U.S. Environmental Protection Agency Cincinnati, OH 45268	Final Report 1989 - 91
	14. SPONSORING AGENCY CODE
	EPA/600/14

15. SUPPLEMENTARY NOTES

EPA Technical Contact: Dr. Harry E. Bostian, (513) 569-7619, FTS: 684-7619

16. ABSTRACT

Site 9 is a secondary plant designed for 15 million gallons per day (MGD) of wastewater flow. The sludge incinerator at Site 9 is a seven (7) hearth, multiple hearth furnace (MHF) built by Nichols Engineering in 1974 controlled by an adjustable throat venturi scrubber with a nominal pressure drop of 20 in. w.c.. After leaving the venturi, the gases pass upward through a three (3) plate tray scrubber with a Chevron mist eliminator. A 10 ft. x 10 ft., upflow, wet electrostatic precipitator, manufacturer by Beltran Associates, Inc., was installed during the first week of testing. The ratio of nickel subsulfide to total nickel in the emission at Site 9 is extremely low, with the sulfidic nickel species being measured at less than detection limit (about 1 to 2 percent of the total nickel). The ratio of hexavalent chromium to total chromium in the emissions at Site 9 was significantly higher that had been anticipated. Site 9 had only two semivolatile organic compounds detected under normal and improved combustion conditions benzyl alcohol and benzoic acid. Several additional compounds were found in the emissions for the normal or improved combustion conditions at Site 9; these compounds were 1,4-dichlorobenzene, 1,2-dichlorobenzene, 2-nitrophenol, 1,2,4-Trichlorobenzene, naphthalene, 2-methylnaphthalene, dibenzofuran, phenanthrene, bis(2-ethylhexyl)phthalate, phenol, 4-methylphenol, and 4-nitrophenol. The volatile organic compounds detected in the Site 9 multiple hearth incinerator emissions were similar to the compounds reported for Sites 1, 2, and 4 (other multiple hearth incinerator tested). Carbon tetrachloride and carbon tetrachloride, reported in the emissions at the other three sites, were not found in the emissions from Site 9.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Wastewater, sludge disposal, incinerators, combustion products combustion products	Emissions chromium compounds nickel compounds total hydrocarbons dioxin/furans organic compounds	

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
RELEASE TO PUBLIC	UNCLASSIFIED	613
	20. SECURITY CLASS *(This page)*	22. PRICE
	UNCLASSIFIED	

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