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THERMAL TREATABILITY STUDY REPORT

AMERICAN CHEMICAL SERVICE (ACS) SITE

SUBMITTED TO:

US EPA REGION V

SUBMITTED BY:

ACS RD/RA
EXECUTIVE COMMITTEE

FOCUS PROJECT No: 119603
JANUARY, 1998

PREPARED BY:

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January 10, 1998

Ms. Sheri Bianchin, RPM
Mail Code SR-J6
U. S. EPA, Region V
77 West Jackson
Chicago, IL 60604-3590

Re: Thermal Treatability Study Report Submittal
American Chemical Services (ACS) NPL Site
Griffith, Indiana

Dear Ms. Bianchin:

The attached report is the second of a two-part submittal reporting on the ex-situ Low Temperature Thermal Treatment treatability studies conducted at the ACS site during the last six months. This report, in conjunction with the Pretreatment/Materials Handling Study (PMHS) report submitted on October 31,1997, provides new information about the site waste materials and indicates that the basis for the required remedy in the Record of Decision (ROD) has changed significantly. Based on the new information, Focus has concluded that ex-situ Low Temperature Thermal Treatment is not an appropriate technology for remediating the site.

I understand a meeting is being organized to allow a more detailed discussion of the findings from these studies with the EPA and State of Indiana.. I look forward to that meeting. If you have any questions regarding this submittal, please direct them to Peter Vagt at (630)691-5020.

Sincerely,

Paul Sadler

Paul Sadler
Senior Project Engineer
Focus Environmental, Inc.

Attachment:
Draft Thermal Treatability Study Report (3 copies)

cc: S. Mrkvika, B&V (2 copies)
Vince Epps, IDEM (2 copies)
Marta Richards, EPA (1 copy)
ACS Technical Committee (1 copy)

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THERMAL TREATABILITY STUDY REPORT

AMERICAN CHEMICAL SERVICE (ACS) SITE

Submitted to:

US EPA REGION V

Submitted by:

ACS RD/RA EXECUTIVE COMMITTEE

January 12, 1998
Focus Project No. 119603

PREPARED BY:

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1.0 EXECUTIVE SUMMARY

Based on new information obtained from the treatability studies conducted for the American Chemical Services (ACS) NPL site, the remedy required in the Record of Decision (ROD) is not an appropriate remedy. Specific technical information supporting this conclusion includes:

- Only 30 volume percent of the contaminated materials required to be managed as waste by the current ROD could be backfilled at the site after LTTT treatment. The remaining 70 volume percent would have to be removed from the site for one reason or another (i.e., drums, debris, and metals contaminated soil).
- Excavation of the contaminated materials would produce significant fugitive emissions that could exceed health risk standards both on-site and offsite.
- Potentially explosive environments could exist in a thermal desorption system due to the significant mass of organics vaporized into the offgas stream during treatment of site soils.
- "Waste" processed in a thermal desorber would produce significant quantities of residuals that the ROD requires to be disposed of offsite. These residuals are a result of a significant organic content in the feed materials. Disposal of these residuals would significantly increase the cost of implementing the remedy.
- Changes in the quantities of contaminated materials required to be disposed of offsite, will significantly increase the cost of implementing the specified remedy.

1.1 BACKGROUND

The ROD for the ACS NPL Site, located in Griffith Indiana, specifies that Buried Waste at the Site is to be remediated by Low Temperature Thermal Treatment (LTTT). "Buried waste" is defined in the ROD as material that has VOC concentrations greater than 10,000 ppm or PCB concentrations greater than 10 ppm. LTTT is a thermal desorption process in which contaminated material is heated sufficiently to desorb contaminants from the matrix, but not heated to the degree that the contaminants are decomposed or incinerated. In an LTTT system, the desorbed contaminants are recovered for further treatment or destruction in an afterburner.

Previous investigations indicated that drums, debris, and municipal landfill debris are intermingled with the "buried waste" and "contaminated soil" at the ACS site. A treatability test program was conducted to better define the characteristics of materials in the Offsite Containment Area and determine the applicability of thermal desorption for the ACS site. The treatability test program was conducted in two separate phases; 1) a Pretreatment/Material Handling Study (PMHS) and 2) a Thermal Treatability Study (TTS).

1.2 PMHS RESULTS

The primary purposes of the PMHS were to determine the extent of the drum disposal region in the Offsite Containment Area, to assess the degree to which debris could be screened from site soils, and to collect samples of "buried waste" for the TTS. The results of the PMHS, detailed in the October 28, 1997 report by Focus Environmental, showed that approximately 44 volume percent of the "buried waste" at the ACS Site was debris and drums which are not amenable to treatment by thermal desorption technologies. The remaining 56 volume percent have to be processed by LTTT. Approximately half of the soils that would be treated by LTTT (approximately 26 volume percent of the total material) is contaminated with metals and would have to be disposed of offsite according to the ROD. This means that a total of 70 volume percent of the contaminated materials at the site will require disposal offsite for one reason or another according to the current ROD

1.3 TTS TEST AND RESULTS

The TTS tested the application of low temperature thermal desorption technologies to the soil portion of the "buried waste". The TTS was executed in three steps. The first step was sample preparation and characterization. The work plan called for two types of samples to be developed from the site materials: one to represent the "typical case" site materials and the other to represent the "worst case" materials.

Two composite soil samples were prepared from the individual samples collected during the PMHS to represent "worst case" and "typical case" waste soils for PCB's. The TTS was conducted on these two samples. A composite sample representing "worst case" VOC or SVOC contamination could not be generated from the samples collected because none of the samples contained VOC's or SVOC's at the highest concentrations previously detected at the site. Analytical results for VOC's in the buried waste samples collected during the RI were 40 times higher than the concentration of VOC's in the samples collected during the PMHS. The two composite soil samples contained detectable concentrations of PCB's, tetrachloroethene, bis(2-ethylhexyl)phthalate, isophorone, and napthalene in excess of the cleanup standards. Several other contaminants of concern (COC's) were not detected, but the analytical detection limits were in excess of the respective cleanup standards. The total organic content of these two samples averaged approximately 8 wt%.

The second step of the TTS was to conduct tray testing on both of the composite samples to document the residual COC concentrations after heating the soil material to four different temperatures (500, 700, 900, and 1,100°F). The results from the tray tests indicate that the cleanup standards can be attained for the prepared samples at soil treatment temperatures of 700°F or higher for all COC's with analytical

detection limits that are less than the cleanup standard. There were several COC's with analytical detection limits in excess of the cleanup standards. Attainment of the cleanup standards could not be demonstrated for these COC's. The tray test results were also used to establish target soil temperatures for the third step of the TTS which was rotary thermal apparatus (RTA) testing.

The primary purpose of RTA testing (the third step) was to characterize the offgas and residuals resulting from heating of the soils at different soil treatment temperatures and using different purge gasses (air and nitrogen). The results from these tests indicate that approximately 65 wt% of the organic carbon in the starting soil partitions to the offgas at a soil temperature of 900°F as opposed to 30 wt% at 700°F. There was no apparent impact on partitioning of organic carbon to the offgas when nitrogen was used as the purge gas instead of air. For soils that contain higher concentrations of VOC's or SVOC's, which have been detected at the site, an even higher percentage of the carbon would partition to the offgas than was measured during the TTS.

Total hydrocarbons (THC) and carbon monoxide (CO) were measured in the offgas at concentrations in excess of 30,000 and 70,000 ppm_v, respectively. The concentration of CO in the offgas was reduced to a maximum of approximately 25,000 ppm_v when nitrogen was used as the purge gas in place of air. Analysis of bag samples indicates that the THC in the offgas consists primarily of light hydrocarbons (i.e., methane, ethane, ethylene, and propylene/propane). Hydrogen was measured in the offgas at a concentration in excess of 140,000 ppm_v for the 900°F test run with an air purge.

1.4 CONCLUSIONS

The results of these studies provide the basis for concluding that ex-situ low temperature thermal desorption is not an appropriate technology to remediate the ACS site. Specific conclusions supporting this statement include:

A) Material handling issues will be significant at the site including:

- Debris and drums which are not amenable to treatment by thermal desorption make up a much greater proportion of the "buried waste" at the site (approximately 44 volume percent) than was previously known. The majority of the debris is municipal debris that cannot be effectively washed per the requirements of the ROD. This debris might have to be transported offsite for disposal at a RCRA TSDF. This would significantly increase the cost of implementing the ROD remedy. Another 26 volume percent of the contaminated materials at the site are contaminated with metals and would require offsite disposal per the current ROD. This means a total of approximately 70 volume percent of the contaminated materials at the site would end up being removed from the site even if LTTT were implemented.

- High concentrations of VOCs exist at the site and treatability tests show that a high percentage of these VOCs will be lost as fugitive emissions during material handling activities, potentially resulting in relatively high exposures to workers and at offsite areas.
- Soils commingled with the drums will have significantly higher organic content than the soils screened in the PMHS and could be problematic due to their sticky nature and high fugitive emissions during screening operations.
- Soils excavated from the region of the upper aquifer could be difficult to handle due to the high water content.

B) Very high organic content (approximately 8 wt%) in the feed soil to a thermal desorber would result in the following problems:

- Development of potentially explosive environments within the thermal desorption process equipment.
- Premature condensation of organics in the emission control system that can cause significant operational problems (plugging, fires, downtime for cleanout).
- Generation of large quantities of treatment residuals (organic liquids, organic sludges, and activated carbon) that require offsite disposal unless a thermal oxidizer can be used as an emission control device.
- Significant emissions of total hydrocarbons (THC) and carbon monoxide (CO) (concentrations of THC and CO were as high as 30,000 and 70,000 ppm_v in the offgas, respectively, during the RTA testing) unless a thermal oxidizer could be used to control the emissions.
- Site soils contain concentrations of PCBs in excess of 50 mg/kg (soil samples collected during the PMHS averaged 80 mg/kg with a maximum of 330 mg/kg). Use of a thermal oxidizer on a thermal desorption system may require a detailed evaluation of alternative treatment technologies to comply with the State of Indiana statutes annotated (13-17-10-2 and 13-17-10-3) and may not be allowed under Indiana law. In addition, if a thermal oxidizer were used on the thermal desorption system, the unit would be required to demonstrate 99.9999 destruction and removal efficiency (DRE) which would be difficult to demonstrate at this site because of low PCB concentrations.
- Thermally processing ACS site soils 'hat contain metals will not provide treatment for those metals, but may increase their mobility (particularly lead) based on the results of the TTS. Thermally processing soils that contain metals will likely increase the quantity of soils requiring stabilization under the current ROD and result in increased project costs.

C) Acid gasses formed during thermal processing from the sulfur and chlorine contained in site soils would pose significant corrosion problems for emission control system equipment.

D) Cleanup standards for some of the ROD defined contaminants cannot be demonstrated using standard analytical techniques due to the analytical detection limits being greater than the cleanup standards. These COC's include CPAH's, 2,4-dinitrotoluene, 2,6-dinitrotoluene, bis(2-chloroethyl)ether, and hexachlorobenzene. This issue must be addressed regardless of the technology applied to the site.

2.0 INTRODUCTION

2.1 OVERVIEW

Thermal treatment is a broad term covering various technologies. The two primary categories of thermal treatment processes include incinerators and thermal desorbers. Incinerators are typically used to process materials with a high organic and/or debris content and completely destroy the COC's or organic portion of the debris while decontaminating the noncombustible portion of the debris. Thermal desorption technology is typically used to treat soils with relatively low organic content (less than 2 wt% organic).

As specified in the Record of Decision (ROD), the EPA requires that thermal desorption be used to remediate waste soils at the American Chemical Service (ACS) Site. As part of the remedial design for the site, a thermal treatability study (TTS) was conducted on site soils collected during the execution of the Pretreatment/Materials Handling Study (PMHS) in July of 1997. The test plan for the TTS was submitted to the EPA by Montgomery Watson as Appendix D to the QAPP and Field Sampling Plan for Pilot/Treatability Testing (June 1997).

2.2 STUDY OBJECTIVES

Specific objectives for the TTS included:

- Determine the VOC reductions during feed preparation operations.
- Determine the concentrations of organic contaminants in the "prepared" treatability test samples.
- Prepare two composite soil samples (a "typical" and a "worst-case" condition) for thermal desorption testing based on analyses of the "prepared" treatability test samples.
- Determine the soil treatment temperature required to meet the cleanup standards.
- Determine the total metals balance in the feed and treated soils.
- Determine the effect of thermal treatment on the leachability of metals in the soil.
- Characterize the off-gas from the thermally treated soil.
- Determine soil geotechnical properties to provide data useful in assessing material handling requirements.
- Determine if dioxin/furans are present in the starting soils, and if so, determine concentration reductions resulting from thermal treatment.
- Determine if dioxin/furans exist in the offgas by analyzing the impinger water.
- Determine approximate partitioning of carbon and chloride to the soil and offgas.
- Determine approximate partitioning of carbon to the various components of the offgas (i.e., carbon monoxide, carbon dioxide, light hydrocarbons and heavy hydrocarbons).

- Conduct water and ash mass balances to determine test closure
- Evaluate (if necessary) the affect of treatment conditions on small pieces of debris (wood, rubber, paper, plastic, etc.).

2.3 PROJECT ORGANIZATION AND RESPONSIBILITY

Focus Environmental managed and directed the TTS under subcontract to Montgomery Watson. Focus subcontracted the actual treatability laboratory work to IT Corporation's Technology Development Laboratory (TDL) located in Knoxville, Tennessee. The TDL was responsible for performing all of the treatabilty tests as defined in the test plan. The contaminant analytical work was subcontracted to IEA Laboratories in Cary, North Carolina. The samples for elemental analyses were sent to Hazen Laboratories in Golden, Colorado. The samples for geotechnical analyses were sent to IT Corporation, also located in Knoxville, Tennessee. Focus prepared this TTS Report, documenting the results of the study.

2.4 CLEANUP STANDARDS

One of the listed study objectives was to determine the soil treatment temperature required to meet the cleanup standards for the site soils. The treatment cleanup standards, as defined in the Record of Decision for the site, are listed in Table 2-1. The excavation cleanup standards are equivalent to the treatment cleanup standards for all contaminants of concern (COC's) except PCB's. The excavation cleanup standard for PCB's is 10 mg/kg as noted in Table 2-1. Table 2-1 categorizes the COCs into carcinogenic and noncarcinogenic compounds and the specific contaminant groups (i.e., volatiles, semivolatiles, pesticides/PCBs, and metals). In addition, Table 2-1 provides a description of the equation for calculating the Cumulative Hazard Index for the detected noncarcinogenic COC's.

Thermal desorption separates organic contaminants from soils by heating the soils and vaporizing the contaminants into an offgas stream. To effectively remove organic contaminants, contaminated soils must be heated to temperatures near the boiling point of the organic COC's. Table 2-2 provides various information regarding the COC's at the site including their respective boiling points. The boiling point data and presence of PCB's indicates that site soils will have to be heated to temperatures in excess of 600 °F to effectively remove the COC's.

To demonstrate compliance with the cleanup standards at the site, analytical methods used to quantify the COC's in the soils must be able to detect the COC's at concentrations less than the required cleanup standard. Table 2-2 presents the analytical detection limit for the carcinogenic COC's which have the most stringent cleanup standards. Table 2-2 shows that several of the carcinogenic COC's have

analytical detection limits that are very close to or much higher than their respective cleanup standard. If matrix interferences are present in the soil samples, the analytical detection limits could be elevated even higher. Specialized analytical methods or minor method modifications may be able to reduce the detection limits for some of these COC's to values less than the cleanup standard. This will not be the case for all COC's, particularly for CPAH's, 2,4-dinitrotoluene, bis(2-chloroethyl)ether, hexachlorobenzene, and 2,6-dinitrotoluene which have cleanup standards that are orders of magnitude less than the analytical detection limits. Communication with an analytical laboratory (Intertech Laboratories in Richardson, TX) revealed that another analytical method for CPAH's (Method 8310) could reduce the analytical detection limit to 0.129 mg/kg which is still 50 times greater than the site cleanup standard for CPAH's. All COC's for which demonstration of the cleanup standard either is or may be a problem due to analytical limitations are shaded and bolded in Table 2-2.

This problem is demonstrated by the analytical results for the CPAHs during this study. CPAHs include benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, dibenzo(a,h)anthracene, and benzo(g,h,i)perylene. The cleanup standard for total CPAHs is 0.0026 mg/kg. The concentrations of these contaminants were summed and reported as CPAHs. If a contaminant was not detected in a sample, one-half of the detection limit was used as the contaminant's concentration in the CPAH summation. For every soil sample analyzed during the study, none of the CPAH contaminants were detected. The cumulative result for total CPAH's using ½ the detection limit is < 1.16 mg/kg. Therefore, compliance with the CPAH cleanup standard listed in the ROD could not be demonstrated. This is true for any of the COC's that have analytical detection limits higher than the cleanup standard.

2.5 WORKPLAN DEVIATIONS/MODIFICATIONS

The following deviations/modifications were made during execution of the workplan:

- The samples for elemental analysis were sent to Hazen Laboratories in Golden, Colorado instead of Galbraith Laboratories. Galbraith could not accept the samples due to the high concentrations of PCBs in the feed soil (i.e., > 50 mg/kg). Hazen has a TSCA materials license and the capabilities and experience to perform the analytical work specified in the workplan. The data from Hazen was consistent with the requirements for Level A data in the workplan.
- Since the PMHS was modified to include analytical testing of soil samples collected for the thermal treatability study, the results of these analyses were used as the "as received" sample analyses. Therefore, the sampling and analysis of the samples as they were received at the thermal treatability test laboratory was eliminated from the TTS. Weight-based averages for contaminant concentrations of the composite samples were compared to analytical results for the air dried composite samples. This modification still

from 13 to 21 percent of the total initial sample weight. This debris consisted mainly of small stones, gravel, roots, and grass. A small amount of glass, paper, plastic, asphalt, and metal was present in some of the field samples. However, all of the material was small enough to be processed by a commercial thermal desorption system. Moisture loss by air drying the field samples averaged approximately 7.2 percent. A summary table of the sample preparation weights (debris, water loss, etc.) is presented in Appendix K (Miscellaneous Data and Calculations).

The approved test plan defined "worst case" soil as soil with PCB, VOC, and SVOC concentrations at the upper bound of the 99% confidence interval concentration around the mean. Analytical results from samples collected during the PMHS showed the following total VOC, SVOC, and PCB concentrations with respect to previous analytical results collected during the RI/FS and the "buried waste" criteria:

	PMHS SAMPLES		RI/FS SAMPLES			"Buried
	Max	Mean	Max	99% CI (a)	Mean	Waste"
VOC's (mg/kg)	8,660	589	522,000	50,868	20,700	> 10,000
SVOC's (mg/kg)	674	61	3,887	2,261	243	NL
PCB's (mg/kg)	330	48	250	66	37	> 10

a) Upper bound of the 99 % confidence interval around the mean for RI/FS samples.

b) NL = Not Limited

These results indicate that the samples were categorized as "buried waste" due to PCB's but not VOC's. Further excavation in the drum disposal area would likely generate soils with concentrations of VOC's and SVOC's greater than what was measured in the PMHS samples. Therefore, a "worst case" soil sample with respect to VOC's and SVOC's was not able to be generated for the TTS. Intermingled soils from other regions of the drum disposal area, that would require processing in the LTTT system, could contain significantly higher concentrations of VOC's and SVOC's than were measured in the samples processed during the TTS.

Two composite feed soil samples were generated by combining and blending portions of the dried and screened field samples collected during the PMHS to represent "worst case" and "typical case" waste soils for PCB's. The TTS was conducted on these two samples. The "worst case" soil for PCB's (SC1) was generated by compositing equal portions of samples SA02-S and SA04-S. The "typical case" soil for PCB's (SC2) was generated by compositing equal portions of all six field samples from the PMHS (D01-S, SP01-S, SP02-S, KP01-S, SA02-S, and SA04-S). The two air dried composite soil samples weighed

approximately 10 kilograms each. Each air dried composite sample was then placed into a 5-gallon bucket, sealed, and placed on a drum roller for 1-hour to ensure sample homogeneity.

The estimated concentrations of key COC's for the two soil composites, listed in Table 3-1, are calculated concentrations based on the individual "as received" analytical results and the weights of each sample included in the composite.

3.2 SAMPLE CHARACTERIZATION

Aliquots from the two composite soil samples were collected and analyzed on a normal turnaround time for VOC, SVOC, PCB, dioxin/furan, total metals, and TCLP metals analyses. Additional aliquots were collected and analyzed for elemental composition (moisture, volatile material, carbon, hydrogen, nitrogen, sulfur, soil pH, and heating value) and geotechnical properties (particle size distribution, Atterberg limits, Proctor density, and soil classification).

The analytical results from the field samples were used to estimate the concentration of COC's in the composite samples prior to air drying and blending. These results were compared to the VOC analytical results for the air dried composite samples to estimate the fugitive emission losses during sample preparation. This comparison is presented in Table 3-2. For all contaminants detected in the initial samples, VOC losses ranged from 67 to > 95 percent during the material handling activities. Therefore, standard full-scale material handling activities, such as excavation, screening, stockpiling, etc., will result in significant fugitive emissions of VOC's.

Analytical results for organic COC's in the air dried composite samples are presented in Table 3-3. The cleanup standards are included on Table 3-3 for comparison. Tetrachloroethene is the only VOC detected in the composite samples at concentrations in excess of the cleanup standard. Bis(2-ethylhexyl)-phthalate, isophorone, and naphthalene (SVOC's) were detected in both composite samples at concentrations in excess of the cleanup standard. Several other COC's were not detected, but the reported detection limits are in excess of the cleanup standard as discussed in Section 2.4.

PCBs were detected in both composite samples at concentrations in excess of the treatment cleanup standard of 2 mg/kg. Toxicity equivalent (TEQ) values for 2,3,7,8-Tetrachloro-dibenzo-para-dioxin (TCDD) were determined to be 0.2 and 1.1 µg/kg for the "worst case" and "typical case" soils, respectively. TEQ calculations are presented in Appendix K (Miscellaneous Data and Calculations).

Analytical results for total and TCLP metals for the composite soil samples are presented in Table 3-4. Lead is present in both composite samples at concentrations in excess of the cleanup standard. Antimony is present in the "typical case" soil at a concentration in excess of the cleanup standard. The "typical case" soil failed the TCLP standard for lead and the TCLP concentration for cadmium was close to exceeding the cleanup standard in the "typical case" sample.

Elemental results for each soil composite are presented in Table 3-5. The moisture content for each sample was approximately 10 percent. Both samples had relatively high organic carbon concentrations ranging from 5.7 to 8.1 weight percent (wt%). Correspondingly, the heating value for each of these two samples was in excess of 1,000 Btu/lb. The volatile material results indicate approximately 9 wt% of the starting soil could be volatilized from the soil during thermal treatment. The volatile material results were determined at soil treatment temperatures of 1,742°F (which is much higher than thermal desorption temperatures), therefore, the actual mass of volatiles that can be liberated from the soil during thermal treatment is less than 9 wt%. Analyses conducted during the PMHS at lower soil temperatures (1,022°F) indicate that approximately 75% of the volatile material liberated from the soil at the higher temperature (1,742°F) would be liberated at the lower temperature.

The geotechnical data for the composite samples are presented in Table 3-6. The soils were classified, according to ASTM D 2487, as "poorly graded sand" (SC1) and "poorly graded sand with silt" (SC2). Atterberg limits were tested for each sample, but both were determined to be non-plastic. The particle size distribution shows each sample to contain at least 90 percent sand. The Proctor density curves show maximum wet densities of 116.6 and 118.5 lb/ft^3 (1.57 to 1.60 tons/yd^3) for SC1 ("worst case" soil) and SC2 ("typical case" soil), respectively.

The primary differences between the "worst" and "typical case" soils are the concentrations of PCB's and total carbon. The "worst case" soil has a PCB concentration of 118 mg/kg compared to a concentration of 82 in the "typical case" soil. The total carbon content in the "worst case" soil is approximately 8.1 wt% compared to 5.7 wt% in the "typical case" soil.

The composite test data provides the baseline soil characterization for comparison with the treated soil analyses from the tray and RTA tests. This comparison is used to determine the effectiveness of the thermal desorption technology.

4.0 THERMAL TREATABILITY STUDY

4.1 GENERAL APPROACH

The thermal treatability study was performed at International Technology Corporation's (IT) Technology Development Laboratory (TDL) located in Knoxville, TN. Treatability testing for this project was conducted using a tiered approach. The first test tier (laboratory-scale tray tests) utilized simple and relatively inexpensive tray tests to define the optimum soil treatment temperature required to meet site cleanup standards. The tray tests required approximately 100 grams of material per test. Information from the tray testing was used for establishing test conditions for the more rigorous Tier 2 tests.

Tier 2 tests consisted of three bench-scale tests using a rotary thermal apparatus (RTA) which allowed processing of a larger quantity of soil at conditions selected based on the results of the tray testing. The RTA tests were used to (1) confirm treatment conditions required to meet soil cleanup standards; (2) gather information to perform a material balance on other parameters of concern (carbon, sulfur, chlorine, etc.); and, (3) gather data on emissions from the soil during thermal treatment. The RTA testing required approximately 1,000 grams of material per test condition.

4.2 TRAY TESTS

4.2.1 Tray Testing Approach

The two composite feed soil matrices were tested using identical protocols and analyzed for the same parameters. Aliquots from each soil matrix were tested at four separate soil temperatures (500, 700, 900, and 1,100°F). The soil treatment temperatures were selected to bracket operating temperatures that are typically used in commercially available thermal desorption systems.

The 500 °F temperature represented a "failure condition" at which thermal desorption was not expected to be successful in meeting the treatment cleanup standards. The 700 through 1,100°F temperatures represented the range of normal thermal desorber soil discharge temperatures. The soil aliquots required approximately 20 minutes heat-up time (ramp time) to reach the target soil temperature. As soon as the soil temperature reached the target temperature, the soil was removed from the oven and allowed to cool. The 20 minute heatup time is representative of a typical residence time in a full-scale thermal desorption system (time from input to the system to exit as treated soil).

4.2.2 Tray Test Equipment Description

The experimental apparatus used for this test program consisted of a Lindberg Model 51848 Muffle Furnace with an electronic temperature controller and a 1,600-watt heater. The oven had a double-shell construction with interior surfaces made of Moldatherm, a moldable aluminum-silicate insulation material. The oven was capable of operating at a temperature of up to 2,012°F and had a relatively fast heat-up rate due to its low mass. The interior space was approximately 3.9-inches wide by 4.3-inches high by 8.3-inches deep. A loose block of Moldatherm (approximately 1/2-inch thick) was placed on the bottom of the oven to provide additional separation between the tray and the hot interior surface of the oven. This minimized the potential for localized hot spots in the soil.

A custom fabricated tray was used to contain the soil sample within the oven. The tray weighed approximately 430 grams, was 3.5-inches wide by 1.3-inches high by 7.6-inches long, and was constructed of Incoloy (i.e., nickel alloy) to resist oxidation during high temperature testing. Figure 4-1 provides the general equipment configuration used to conduct the tray tests.

During the tests, the oven was continuously purged with air which was introduced through a 3/8-inch diameter Incoloy tube connected to the back wall of the oven. The purge gas was directed against the back wall to promote even heating and gas distribution. The purge gas flow rate was measured with a standard rotameter and maintained at approximately 100 cc/min during the test. This flow rate provided adequate purging of the oven, but did not affect the temperature control or heat-up rate of the oven. The purpose of this purge was to minimize the build-up of volatilized organic compounds in the oven. If these organics were not purged, a combustible mixture of gases could have accumulated in the oven.

Two thermocouples were used in the static tray test apparatus to measure temperature. One was a National Institute of Standards and Technology (NIST) traceable, Type K sheathed thermocouple placed approximately 3 centimeters above the test soil at the center of the oven. This thermocouple was used to measure the "Test Temperature" (i.e., oven gas temperature). The second thermocouple, also a NIST traceable, Type K sheathed thermocouple, was used to measure the temperature within the test soil.

Temperatures were recorded using a multipoint recorder and logged from the recorder into a computer data collection program. The 30 recorder channels were sampled every 4.5 seconds. All of these points were sent to the computer data logging program. The data from the computer were transferred to a spreadsheet to generate graphical illustrations of the experimental test temperatures with respect to time.

4.2.3 Tray Test Protocol

The tray test protocol for this study was as follows:

- The oven was baked at its maximum temperature for 1-hour prior to the tray tests. The oven was then turned off and allowed to cool to ambient temperature.
- A representative aliquot (approximately 100 grams) of the feed soil was transferred to the tray using a clean, stainless steel spatula.
- The soil was spread evenly in the tray to achieve a uniform layer in the bottom of the tray, (approximately 1/4-inch depth for a 100-gram aliquot of soil).
- The purge gas flow was turned on and the tray with the soil was placed in the oven at ambient temperature.
- The oven door was closed and the temperature controller was set to the target test temperature and the timer started.
- The temperature and time were monitored and recorded periodically throughout the test period and all pertinent observations were recorded in the logbook.
- When the prescribed soil treatment temperature was reached, the oven heater was shut off, the oven door was opened to remove the sample and the oven was allowed to cool. The cooled treated soil was then packaged, labeled, and submitted for analysis. The trays were washed between test runs.

The treated soils from all four test temperatures were then analyzed for volatiles, semivolatiles, and PCB's. The treated soils from the 500 and 900°F test conditions were analyzed for dioxins and furans.

4.2.4 Tray Test Results

The analytical results for the treated soil samples from the tray tests are presented in Table 4-1 and Table 4-2. Soil and oven temperature profiles vs. time for the tray tests are shown in Figures 4-2 through 4-9. The treated soil from the 500°F tray tests for both soil matrices failed to meet the cleanup standards for bis(2-ethylhexyl)phthalate and PCB's. There were no significant changes in the concentrations of dioxin and furans at the 500°F test condition, however, dioxins and furans were essentially nondetect in the treated soil from the 900°F test conditions for both matrices. TEQ calculations are presented in Appendix K (Miscellaneous Data and Calculations).

The results of the 700°F tray tests indicate that this temperature is sufficient to meet the cleanup standards for all constituents accept those that have analytical detection limits above the cleanup standards. Increasing the treatment temperature beyond 700°F minimizes matrix interferences thereby reducing analytical detection limits, however, results were still inconclusive for the COC's with analytical detection limits above the cleanup standards.

4.3 ROTARY THERMAL APPARATUS (RTA) TESTS

4.3.1 RTA Test Approach

The primary purpose of the RTA tests was to evaluate the effect of thermal treatment at a specified test temperature on a larger mass of soil and collect more analytical data to better evaluate the fate of contaminants. In particular, the RTA tests were used to characterize the offgas from the heated soils. The offgas characterization data will be used in evaluating the capability of potential emission control systems that could be used to capture the contaminants desorbed from the soil.

The three variables that have the most affect on the results of the RTA tests are the soil treatment temperature, ramp time, and the purge gas used (i.e., air or nitrogen). One RTA test was conducted on each soil matrix using an air purge. The "worst case" soil sample was tested at 900°F with a ramp time to the treatment temperature of approximately 23 minutes. The "typical case" sample was tested at 700°F with the same ramp time. This provides a comparison between soils processed at two separate temperatures to allow measurement of potential impact on volatilization of organics. A second RTA test was conducted on the "worst case" soil matrix at the same conditions as the first RTA test (900°F, 23 minute ramp time), however, in this test nitrogen was used as the purge gas instead of air. This allowed collection of data to assess the impact of a reduced oxygen content on the volatilization of organics and composition of the offgas when the soil is heated. The same analyses and offgas monitoring were conducted during each RTA test. The soil treatment temperatures for these tests were established based on the tray test results.

4.3.2 RTA Equipment Description

Figure 4-10 provides a schematic of the RTA test equipment. The RTA was operated in a batch mode. The rotating cylinder portion of the system was 5 inches in diameter by 11.5 inches long and was fabricated of Incoloy to resist oxidation and/or chemical reactions during high temperature tests. The RTA cylinder rotated at 5 revolutions per minute and was externally heated with a 7,000 watt Lindberg furnace. The chain driven tube was suspended on both ends by brass rollers and sealed by graphite packing rings at the inlet and outlet distribution boxes. The RTA cylinder was purged with either air or nitrogen during each test.

The process gas flow rates were established to maintain a slight negative pressure in the RTA cylinder. This ensured that all materials desorbed from the thermally treated soil were directed into the emission control system. The temperature of the soil bed and the temperature of the gas in the RTA cylinder were

monitored with thermocouples and recorded. A sampling system extracted a small gas stream from the RTA cylinder through a water impinger and into an oxygen analyzer.

Figure 4-11 shows a general flow diagram of the RTA system including the off-gas handling and monitoring system. The plan called for the off-gas (purge gas and vaporized contaminants) from the RTA cylinder to pass through a heated filter in order to remove particulates in the off-gas carried over from the RTA cylinder. The filter was a 0.5 micron glass fiber filter. The filtered off-gas then passed through four glass impingers (in series) placed in an ice bath. The first three impingers were partially filled with a total of 400 grams of deionized water. The fourth impinger was empty, to act as a "knockout pot" for the system. The purpose of these impingers was to collect condensables from the offgas so they could be measured and characterized.

Grab samples were taken from the impinger offgas at 5 different soil treatment temperatures throughout the duration of the test. Each sample was collected with a syringe, injected into a Tedlar bag, and then analyzed by gas chromatography for hydrogen, oxygen, nitrogen, carbon monoxide, methane, ethane, acetylene, and propane/propanol. Concentrations of these compounds were determined as a function of soil temperature. The offgas for the "typical case" soil RTA test was sampled at soil treatment temperatures of 300, 400, 500, 600, and 700°F. The offgas for the two "worst case" soil RTA tests (air purge and nitrogen purge) was sampled at soil treatment temperatures of 300, 450, 600, 750 and 900°F. The impinger offgas was split into three separate streams. One stream was analyzed continuously for THC and CO. A second stream (for VOC analysis) passed through two impingers, one containing 400 grams of pure methanol and the second containing 400 grams of deionized water. The off-gas from the methanol and water impingers was passed through two Tenax resin tubes (one primary tube and the second as a backup) to collect VOC's that were not condensed in the set of impingers. The purpose of the methanol and water impingers prior to the Tenax tubes was to reduce the organic loading on the tubes. The methanol from these two impingers was analyzed for volatiles. The third stream (for SVOC and PCB analyses) passed through two XAD resin traps (one primary trap and the second as a backup). The flow rates and/or volumes were measured for each stream during each test. The suction force for gas flow was provided by a dry gas meter/pump. The purge gas flow rates were monitored using gas rotameters.

4.3.3 RTA Test Protocol

The protocol for the RTA tests was as follows:

- The weight of the test soil in the RTA cylinder, water in each impinger, and methanol in the VOC train impinger were recorded prior to test initiation. The impinger that filters the gas sample extracted from the RTA tube for oxygen analysis was filled with deionized water at the beginning of the test and the weight of water was recorded.
- The RTA test equipment was configured as shown in Figure 4-11. The THC and CO monitors were calibrated and connected to the system. The entire system from the water impingers to the dry gas meters was leak checked prior to initiating the test. The heated filter was only used in the first test (RTA2). Because of significant organic condensation in the glassware at the inlet to the heated filter, it was decided to remove the heated filter for subsequent tests and allow the organics to condense in the water impingers.
- The gas flows (purge gas and exhaust) were adjusted to provide a slight negative pressure in the purge gas inlet distribution boxes. The furnace settings were adjusted to ramp as fast as possible to the target soil temperature (approximately 18 - 22 minutes). The furnace was raised to enclose the RTA cylinder and the test was initiated.
- Bag samples were taken of the offgas at the outlet of the water impingers at 5 different temperatures.
- When the planned soil temperature was reached, the furnace was lowered away from the RTA cylinder and a water spray on the outside of the cylinder was used to cool the cylinder and its contents as quickly as possible.
- The RTA cylinder was disassembled, and the treated soil was removed, weighed and the weight recorded. The treated soil was sampled and submitted for the planned analyses.
- The water impinger train was disassembled and the weight of the material remaining in each impinger was measured and recorded. Any organic layer was physically separated from the water layer and weighed. Sample aliquots were collected from the organic layer for VOC and elemental analysis. All glass connections were rinsed with deionized water. The water rinse was collected and combined with the impinger water and weighed. An organic rinse (50:50 acetone and hexane, volume basis) was conducted on the heated filter (if used) and all glassware between the RTA tube and the water impingers. The organic rinse was then combined with the remaining organic layer, weighed and submitted for the SVOC, PCB, and dioxin/furan analyses.
- The methanol impinger was disassembled and the weight of the methanol was measured and recorded. Any discoloration or turbidity was noted. All glass connections were rinsed with pure methanol. The rinse was collected and combined to form one sample. The weight of this sample was measured and recorded. The sample was then submitted for VOC analysis.
- The Tenax resin and the XAD-2 resin tube pairs were removed, the ends were sealed with Teflon tape, and the tubes were packaged in a Ziploc bag and sent to the laboratory for analysis.

This protocol was repeated for all test soil matrices.

4.3.4 RTA Test Results

Operational data and information, including temperatures, test duration, mass of media and offgas volumes associated with the three RTA test runs are summarized in Table 4-3. This data was used to conduct the various calculations summarized in this section. Temperature profiles for the soil, gas phase in the RTA chamber and offgas from the RTA chamber (prior to the water impingers) are presented for the three RTA test runs in Figures 4-12 through 4-14. Figure 4-14 also shows the temperature at the inlet to the heated filter that was used in this test run. Mass balances for the three test runs are included in Appendix K (Miscellaneous Data and Calculations).

Treated Soils

The organic analytical results of the treated soil samples are presented in Table 4-4. Acetone and benzene were the only COC's detected in the treated soil. The treated soil met the cleanup standard for all COC's with the possible exception of COC's with analytical detection limits in excess of the cleanup standard as described in Section 2.4. The results for CPAH's have been shown in Table 4-4 as an example of the high detection limit. PCBs were not detected in any of the treated soil samples.

The elemental analyses associated with the treated soil from the RTA tests is summarized in Table 4-5. This data was used in conjunction with the media mass data in Table 4-3 to conduct mass balances for carbon, volatiles and sulfur. The results of these mass balances are provided in Table 4-6. This data shows that a significant portion (approximately 60 wt%) of the carbon and volatiles are partitioned to the offgas when the soil is heated to 900°F. Significantly lower fractions of the carbon and volatiles (approximately 30 wt%) are partitioned to the offgas at the lower soil treatment temperature of 700 °F.

Table 4-7 presents a summary of the TCLP metal analytical results for the starting and RTA test treated soils. The results indicate that lead exceeds the regulatory standard for leachability in thermally treated soils and that cadmium is very close to exceeding the standards. The data indicates that the leachability of lead may be increased by processing at the higher soil treatment temperature of 900°F. Increased leachability of metals is a common result of thermal treatment.

The results for total metals concentrations indicate changes in extractability or the samples were not homogeneous with respect to metals. The only definite trend was complete removal of small concentrations of mercury.

Condensables

The offgas from the treated soils was passed through a set of water impingers as described in Section 4.3.2. Heavy organics and other condensables or absorbable components in the offgas were captured in the water impinger. Any organic layer present in an impinger was segregated from the water layer, weighed, sampled and analyzed for VOC's and elemental components. The water layer was weighed, sampled and analyzed for VOC's, SVOC's, PCB's, TOC, acidity, chlorides, sulfur, and pH. The glassware associated with the impingers was rinsed with a 50:50 mixture of acetone and hexane by volume. The rinse was added to the remaining organic layer, weighed and submitted to the laboratory for SVOC, PCB's and dioxin/furan analysis. The analytical results for these samples are summarized in Tables 4-8 and 4-9. The mass of each of these matrices was presented in Table 4-3.

Approximately 42 wt% of the starting PCB's were recovered in the treatment residuals for all three RTA test runs. This data implies that a portion of the PCB's decomposed at the measured test conditions. Greater than 99 wt% of the recovered PCB's were in the organic layer. The data shows, with all other factors being equal, a significant increase in the VOC concentrations in the organic layer for the RTA run conducted with a nitrogen purge (RTAN) compared to the run with an air purge (RTA1). The data does not show any significant dioxin/furan formation during processing (i.e., the mass of dioxins/furans in the organic layer is in the same order of magnitude as the mass in the starting soil). The miscellaneous water analyses shown on Table 4-9 show a high acidity and TOC in the water layer. The high acidity is likely due to adsorption of hydrogen chloride and sulfur dioxide from the offgas which also accounts for the sulfur and chloride content in the water layer.

Offgas Results

The offgas from the water impinger was split into three streams. One stream passed through a methanol impinger followed by a water impinger prior to passing through a Tenax/Tenax-charcoal tube pair. The methanol impinger and Tenax tube pair were analyzed for VOC's. A second stream was passed through an XAD resin tube pair for SVOC analysis. The third stream was analyzed for THC and CO. Bag samples were collected at the outlet of the water impinger and analyzed for various gaseous components.

Volatiles

Analytical data for VOC's in the methanol impinger are summarized in Table 4-10. These results indicate that significant VOC's remain in the offgas even after passing through a water impinger at 32°F. The primary VOC's found in the methanol impinger were acetone, chloromethane, toluene, and xylene. Analytical data from the Tenax tube pairs is included in Appendix F (RTA Test Analytical Data).

Semivolatiles/PCB's

The results from analysis of the XAD resin tubes are also included in Appendix F. These results indicate that very little SVOC's made it past the cooled water impingers. The only SVOC's detected in the offgas from the impingers were napthalene and bis(2-ethylhexyl)phthlate. Both of these COC's were detected in the offgas (i.e., less than 50 ppm_v for napthalene and 0.2 ppm_v for bis(2-ethylhexyl)phthalate).

THC and CO (CEMS Monitoring)

Figures 4-15 through 4-17 provide a graphical representation of the THC and CO concentrations relative to the soil treatment temperature. The sampling location was downstream of the water impinger. These results show the CO and THC concentrations increasing rapidly when the soil treatment temperature exceeds 350°F. The data also shows a significant decrease in the concentration of CO in the nitrogen purge run (RTAN, Figure 4-16) compared to the air purge runs. This was expected due to a decreased availability of oxygen for oxidation of organics in the soil. The THC results appear to be relatively unaffected by the purge gas used.

Light Gasses (Bag Sample Results)

Analytical results from the bag samples taken downstream of the water impingers are summarized in Tables 4-11 through 4-13. These results show that the majority of the THC concentrations measured with the CEMS system are a result of light hydrocarbons (methane, ethane, propylene/propane, and ethylene). The results from the bag samples also show a very high concentration of hydrogen in the offgas.

Emission Factors

Emission factors, for the purpose of this report, are defined as the mass of a specific parameter partitioned to the offgas during thermal treatment relative to the total carbon content of the starting soil (i.e., lb of "X" per lb of starting carbon). The offgas sampling and analysis data from the thermal treatability testing was used to estimate emission factors for specific parameters. Tables summarizing the calculations are included in Appendix K. Table 4-14 summarizes these emission factors. These factors include mass from the impinger water, organic phase, and offgas samples as appropriate. These factors can be useful for projecting the performance of a full-scale thermal treatment system.

5.0 DISCUSSION OF RESULTS

5.1 FUGITIVE EMISSIONS

The two major sources of fugitive emissions from the implementation of ex-situ processing at the site are excavation and material handling. Excavation and handling of the drums would generate the most emissions of VOC's. Excavation and handling of VOC contaminated soils will also generate significant VOC emissions. "Fugitive emission" losses from soil handling operations were estimated by comparing the estimated weighted average contaminant concentrations of the composite samples to the VOC analytical results for the air dried composite samples. This comparison was presented in Table 3-2. The results showed that more than 65 percent of the mass of detected VOC compounds were lost during the sample preparation steps. This reflects the volatility of these compounds and indicates that significant losses are likely during full-scale material handling/soil preparation activities.

Standard soil preparation activities such as excavation, screening and stockpiling, etc. will result in some volatilization of the VOC contaminants. Screening of VOC contaminated soils to remove debris will increase the air to soil contact thereby increasing fugitive emissions of VOC's. However, once the soil has been screened and stockpiled, VOC's will primarily be emitted from the soil at the surface of the stockpile. The VOC contaminated soil deep within the stockpile will lose a lower percentage of VOC's. VOC's will be emitted each time the soil is moved, however, none of the full-scale activities will provide the same duration of air to soil contact that the soil experienced during the TTS.

5.2 ATTAINMENT OF CLEANUP STANDARDS

The TTS demonstrated that thermal desorption is capable of removing organic COC's from the soil at temperatures of 700°F or above to meet the site cleanup standards for PCB's and other COC's detected in the site soils in excess of the cleanup standards. This could not be demonstrated for five of the carcinogenic COC's including:

- CPAH's
- 2,4-dinitrotoluene
- 2,6-dinitrotoluene
- Bis(2-chloroethyl)ether
- Hexachlorobenzene.

These five COC's have analytical detection limits using standard analytical methods that are orders of magnitude greater than the site cleanup standards. Even though these COC's were not detected in the

treated soils, the actual concentration of these COC's could be greater than the site cleanup standard. This issue would have to be resolved prior to any remedial action being conducted at the site.

5.3 IMPACT OF ORGANIC CONTENT

The organic content of soils is an important parameter for consideration when the soils are to be processed through a thermal treatment system, particularly a thermal desorption system. As was mentioned in the overview (Section 2.1), thermal desorption technology is typically used for soils with relatively low organic contents (i.e., less than 2 wt% organic carbon). Since the soils from the ACS site have significantly higher organic content (average of 5.1 wt% from Table 3-4 of the PMHS Report), the impact of the organic content of the soils must be considered if thermal desorption technology is applied to treat site soils. This section provides a discussion of the various process design issues that must be considered when processing soils with high organic content (i.e., greater than 2 wt% organic carbon).

5.3.1 Types of Processes

There are various commercially available processes that are categorized as "thermal desorbers". However, these processes vary significantly in their design and mechanisms for heating the soil and controlling emissions from the process. Thermal desorption is defined as "a process that uses either direct or indirect heat exchange to heat organic contaminants to a temperature high enough to volatilize and separate them from a contaminated solid medium.....Volatiles in the offgas may be burned in an afterburner, collected on activated carbon, or recovered in condensation equipment" (EPA/540/S-94/501, February 1994). The following descriptions provide a more detailed discussion of the different types of desorption processes.

Primary Heating Mechanism

The primary heating mechanism for thermal desorbers is of two types: (1) directly heated, and (2) indirectly heated. Directly heated systems utilize an auxiliary-fuel fired burner to produce a hot gas which is contacted with the soil to heat the soil and desorb contaminants. The heat transfer from the hot gas to the soil is very efficient in this type of system due to direct contact and intimate mixing of the hot gas with the soil. The volatilized contaminants along with the hot gas produced by the burner are exhausted to the emission control system for further treatment.

In indirectly heated systems, heat is transferred from a source (hot liquid or gas) through a metal shell to heat the soil. Combustion products from the burner are not mixed with the volatilized contaminants, therefore, the volume of gas requiring further treatment is very low. The heat transfer is not as efficient in

an indirectly heated system, therefore, directly heated systems are generally capable of higher soil throughputs than indirectly heated systems.

Emission Control Systems

The emission control system for thermal desorption processes may be either a "destructive-type" or a "recovery-type". "Destructive-type" systems use a thermal oxidizer (afterburner) to destroy organic contaminants in conjunction with one or more of the following:

- Cyclone for particulate removal
- Baghouse for additional particulate removal
- Quench chamber for cooling the offgas with a direct water spray
- Scrubber (venturi or packed bed) for final quenching and acid gas removal

Since "destructive-type" systems oxidize the organic contaminants, there are no residual streams requiring offsite disposal.

"Recovery-type" systems typically use wet scrubbers, condensers, and granular activated carbon to recover organics from the offgas stream. The process residuals from a "recovery-type" system include organic liquid condensate, organic sludge, and spent activated carbon. Residual streams from "recovery-type" systems are typically shipped offsite for further treatment at a commercial treatment, storage, and disposal facility.

The data from the TTS indicates a significant quantity of organics volatilize from the ACS soils during heating and partitions to the emission control system. If a "recovery type" emission control system is used at the site, large quantities of organic residuals and spent activated carbon would be generated. If a "destructive type" emission control system is utilized, the quantity of treatment residuals would be reduced or eliminated relative to the quantity of treatment residuals that would be generated from a system with a "recovery-type" emission control system. There would be some additional cost associated with burning fuel in a system with a "destructive-type" emission control system. However, the cost of the additional fuel would be minimal compared to the cost of managing the quantity of treatment residuals that would be generated from a "recovery-type" emission control system.

5.3.2 Condensation in Emission Control System

If soils contain heavy organics (i.e., organics with boiling points in excess of 500°F), the heavy organics may be volatilized from the soil in the primary heating chamber only to condense immediately downstream

of the primary chamber as the offgas temperature decreases. This can be of particular concern if the process component downstream of the primary heating chamber is a baghouse. Blinding of the bags and baghouse fires are potential problems in these situations. Significant condensation of organics was observed in the glassware leading to the water impingers in the ACS treatability study. This data indicates that premature condensation of organics would occur in the emission control system if an afterburner is not installed immediately downstream of the thermal desorber.

5.3.3 Process Residuals

The TTS results indicate that the mass of residuals generated from processing the ACS soil through a thermal desorber with a "recovery-type" emission control system could be as much as 9 wt% of the starting soil mass. These residuals include organic liquid condensate and spent aqueous and vapor phase activated carbon that would have to be transported offsite for incineration which would be very expensive.

Using the data from the TTS and the minimum soil mass requiring thermal treatment from the PMHS report, Table 5-1 provides an estimate of the potential quantities of process residuals that would result from processing ACS soils using a thermal desorber with a "recovery-type" emission control system. These process residual masses are significant and must be considered when estimating the full impact of implementing thermal desorption technology at the site. Table 5-1 also shows estimated mass balances for processing soil from the ACS Site in other types of thermal desorption systems.

5.3.4 CO and THC Emission

CO and THC will be generated in the primary heating chamber of a thermal desorber. The magnitude of CO and THC generation is dependent on the amount of carbon and oxygen present and the temperature in the primary chamber. The TTS for the ACS Site demonstrated that several thousands of ppm_v CO and THC will be generated during processing of the ACS soils. Thermal desorbers with "recovery-type" emission control systems have no control efficiency for CO generated in the primary heating chamber and limited control efficiency for THC. The THC generated in the system may be either light hydrocarbons (i.e., methane through C6) or heavy hydrocarbons (greater than C6). The emission control system will be relatively effective for the heavier hydrocarbons but have a very low control efficiency for the light hydrocarbons. The only way to effectively control the CO and light THC is by combustion in an afterburner. Based on the TTS results and best engineering judgment, Table 5-1 provides estimates of the CO and THC emissions from different types of thermal desorption systems processing ACS soils.

5.3.5 Acid Gas Emission

Elemental analysis of the soil samples collected during the PMHS indicated consistent concentrations of sulfur and chlorine of approximately, 1,100 and 1,600 mg/kg, respectively. Thermal processing of the soils would generate acid gasses (SO_2 and HCl) from these components that must be managed in the emission control system. Evidence of these acid gasses was measured in the acidity, sulfide and chloride content of the impinger water from the TTS. Scrubbers would be required in the emission control system of a thermal desorber to manage these acid gasses and equipment corrosion with associated operational downtime would be a significant problem.

5.3.6 Explosive Environments

Volatilization of organics into a gas stream can develop potentially explosive environments. The TTS for the ACS Site demonstrated that significant quantities of organic vapors will be liberated from the contaminated soil during thermal processing. Therefore, the design features of any thermal process proposed to be used for processing the contaminated soils at the ACS Site must be thoroughly evaluated to minimize the potential for developing an explosive environment.

6.0 SUMMARY OF FINDINGS

A) More than 65 percent of the VOCs were lost during the TTS sample preparation activities. This indicates that volatiles will be lost as fugitive emissions during the full-scale material handling activities at the site. The laboratory material handling (air drying, blending, and compositing) was more aggressive than full-scale material handling operations, but extended time periods for excavation and higher concentrations of VOC's in the materials being excavated will result in significant emissions.

B) Both composite soil samples tested during the TTS contained lead at concentrations in excess of the cleanup standard. The TCLP result for lead in the untreated "typical case" soil and in all treated soil samples exceeded the TCLP standard. Thermal treatment of site soils to a temperature of 900°F apparently increased the leachability of lead compared to the starting soil. An increase in lead leachability was not observed at a soil treatment temperature of 700°F.

C) The soil samples from the site were determined to be a "poorly graded sand" or "poorly graded sand with silt". These type of soils are relatively easy to handle as long as the water content and organic content are low. Soils commingled with the drums will have significantly higher organic content than the soils screened in the PMHS and could be problematic (sticky nature and high fugitive emissions) during screening operations. Also, soils excavated from the region of the upper aquifer could be difficult to handle due to the high water content.

D) A treatment temperature of 500°F failed to achieve the cleanup standards for the site for both sample matrices.

E) Soil samples treated at temperatures of 700°F or greater achieved the site cleanup standards with the exception of COC's that could not be demonstrated as meeting the cleanup goal due to analytical detection limits that were in excess of the site cleanup standards. These COC's include CPAH's, 2,4-dinitrotoluene, 2,6-dinitrotoluene, bis(2-chloroethyl)ether, and hexachlorobenzene.

F) Approximately 70 wt% of the starting carbon partitioned to the treated soil at a soil treatment temperature of 700°F. Approximately 30 wt% of the starting carbon partitioned to the treated soil at a soil treatment temperature of 900°F. The majority of the carbon that partitioned overhead was captured in the organic condensate. The rest partitioned to the water and the offgas as CO and THC.

G) A significant mass of organics partitioned to the offgas when the contaminated waste soil was heated. Heavy organics condensed in the glassware of the RTA test device immediately downstream of the primary heating chamber which could also happen in a full-scale system potentially causing plugging and fires in the emission control system.

H) Approximately 42 wt% of the starting PCB's were detected in the treatment residuals (for all three RTA test runs). Greater than 99 wt% of the recovered PCB's were in the organic condensate.

I) Dioxins and furans were detected in the starting soils at low concentrations (approximately 0.7 µg/kg as 2,3,7,8-TCDD toxicity equivalents). Treatment of the soils at temperatures of 700°F or higher reduced the concentration of dioxins and furans by approximately 99 percent. Analytical results from the treatment residuals did not indicate any formation of dioxins and furans.

J) Based on bag sample results, the THC readings in the offgas consisted primarily of light hydrocarbons (i.e., methane, ethane, ethylene, and propylene/propane)

K) The maximum concentrations of CO in the offgas during the RTA tests ranged from 20,000 ppm_v for the nitrogen purge test to 70,000 ppm_v for the air purge tests. The maximum concentration of THC in the offgas (as propane) was approximately 15,000 ppm_v for the 700°F RTA test run and 25,000 ppm_v for the two RTA test runs at 900°F. There was no apparent impact of purge gas on concentrations of THC in the offgas.

TABLES

Table 2-1. Treatment Cleanup Standards

CARCINOGENIC COMPOUNDS		NONCARCINOGENIC COMPOUNDS	
Contaminant	**Cleanup Goal (mg/kg)**	**Contaminant**	**Cleanup Goal (mg/kg)**
Volatiles		**Volatiles**	
Tetrachloroethene	1.1	Acetone	2,400
Trichloroethene	5.3	2-Butanone	620
Styrene	1.7	Chlorobenzene	150
Benzene	1.0	Chloroethane	2,700
1,1-Dichloroethene	0.098	1,2-Dichloroethene (cis)	250
Carbon Tetrachloride	0.38	Ethylbenzene	1,300
Chloroform	9.5	4-Methyl-2-pentanone	630
1,2-Dichloroethane	0.64	Toluene	5,000
Methylene Chloride	6.2	1,1,1-Trichloroethane	2,300
1,2-Dichloropropane	0.42	Xylenes (mixed)	26,000
1,1,2-Trichloroethane	0.51		
1,1,2,2-Tetrachloroethane	0.28	**Semivolatiles**	
Vinyl Chloride	0.031	Naphthalene	82
		Di-n-butylphthalate	2,300
Semivolatiles		1,2,4-Trichlorobenzene	16
CPAHs	0.0026		
Cyclic Ketones	7.3	**Pesticides/PCBs**	
bis(2-Ethylhexyl)phthalate	1.1	Endosulfan I	0.63
Isophorone	7.2		
Pentachlorophenol	0.43	**Metals (a)**	
2,4-Dinitrotoluene	0.044	Antimony	15
bis(2-Chloroethyl)ether	0.027	Barium	2,600
Hexachlorobutadiene	0.36	Cadmium	51
Hexachlorobenzene	0.018	Chromium (VI)	1,400
n-Nitrosodiphenylamine	12.0		
2,6-Dinitrotoluene	0.044	**Miscellaneous Groups**	
1,4-Dichlorobenzene	2.4	Nitrogenated Benzenes	6.2
		n-Chain Alkanes	760
Pesticides/PCBs		Branched Alkanes	770
4,4'-DDD	0.12	Methyl Propyl Benzenes	490
4,4'-DDT	0.088	Halogenated Alkanes	2,300
Aldrin	0.002	Dimethyl Ethyl Benzenes	1,300
gamma-BHC (Lindane)	0.046	Non-Cyclic Acids	1,000
alpha-BHC	0.0047	Methylated Naphthalenes	85
beta-BHC	0.016	Oxygenated Benzenes	1,200
4,4'-DDE	0.16	Diethyl Benzenes	1,300
Heptachlor Epoxide	0.0033	Propenyl Benzenes	320
PCBs (a)	2	Ethyl Methyl Benzenes	4,900
		Cumulative Hazard Index (CHI)	< 1.0 (b)
		Lead (c)	500

Notes :

a) The excavation cleanup goal for PCB's is 10 mg/kg.

b) CHI applies to detected non-carcinogenic COC's only and in effect is calculated as follows:

$$CHI = (C1/CG1 + C2/CG2 + C3/CG3 + Ci/CGi)$$

where

CHI = Cumulative Hazard Index

C_i = Concentration of the "ith" detected COC in the soil

CG_i = Cleanup Standard representing a Hazard Index = 1 for the "ith" COC

c) The ROD states that "isolated pockets of heavy metal contaminated soils greater than 500 mg/kg lead in both the On-site and Off-site areas will be excavated, treated by LTTT to remove VOC's and SVOC's, possibly immobilized to remove the hazardous characteristic for metals and sent off-site for disposal." It is assumed that this statement holds for soils contaminated with metals other than lead.

Table 2-2. Organic Contaminant of Concern Information - ACS Site

Contaminant	CAS Number	Boiling Point (°F)	Analytical Method	Detection Limit (mg/kg)	Cleanup Standard (mg/kg)
CARCINOGENIC					
CPAHs	Varied	~ 600 - 900	8270	**2.6**	0.0026
alpha-BHC	319-84-6	550	8081A	**0.008**	0.0047
Heptachlor Epoxide	1024-57-3	mp. 315	8081A	**0.008**	0.0033
Tetrachloroethene	127-18-4	250	8260	0.005	1.1
bis(2-Ethylhexyl)phthalate	117-81-7	723	8270	0.33	1.1
Aldrin	309-00-2	mp. 219	8081A	**0.008**	0.002
Trichloroethene	79-01-6	188	8260	0.005	5.3
Isophorone	78-59-1	419	8270	0.33	7.2
Styrene	100-42-5	295	8260	0.005	1.7
Pentachlorophenol	87-86-5	590	8270	**1.6**	0.43
Benzene	71-43-2	176	8260	0.005	1.0
4,4'-DDD	72-54-8	mp. 232	8081A	0.003	0.120
2,4-Dinitrotoluene	121-14-2	572	8270	**0.33**	0.044
1,1-Dichloroethene	75-35-4	89	8260	0.005	0.098
Carbon Tetrachloride	56-23-5	170	8260	0.005	0.38
bis(2-Chloroethyl)ether			8270	**0.33**	0.027
4,4'-DDT	50-29-3	500	8081A	0.003	0.088
Chloroform	67-66-3	142	8260	0.005	9.5
Hexachlorobutadiene	87-68-3	415	8260	0.005	0.36
1,2-Dichloroethane	107-06-2	182	8260	0.005	0.64
Methylene Chloride	75-09-2	104	8260	0.01	6.2
1,2-Dichloropropane	78-87-5	206	8260	0.005	0.42
Hexachlorobenzene	118-74-1	617	8270	**0.33**	0.018
gamma-BHC (Lindane)	110-82-7	178	8081A	0.002	0.046
1,1,2-Trichloroethane	79-00-5	237	8260	0.005	0.51
n-Nitrosodiphenylamine	86-30-6	mp. 152	8270	0.33	12
1,1,2,2-Tetrachloroethane	79-34-5	295	8260	0.005	0.28
Vinyl Chloride	75-01-4	57	8260	0.01	0.031
beta-BHC	319-85-7	mp. 597	8081A	0.002	0.016
2,6-Dinitrotoluene	606-20-2	mp. 151	8270	**0.33**	0.044
4,4'-DDE	72-55-9	mp 194	8081A	0.003	0.16
1,4-Dichlorobenzene	106-46-7	345	8260	0.33	2.4
PCB's (a)	Varied	~ 644 - 707	8081A	0.72	2.0

a) The excavation standard for PCB's is 10 mg/kg. The treatment standard is 2 mg/kg

b) Shaded values indicate the detection limit is either very close to or in excess of the cleanup standard. This could mean that compliance with the cleanup goal may not be able to be demonstrated

c) Detection limits are from SW846 methodologies. Detection limits for multicomponent mixtures (CPAH's and PCB's) are summations of the detection limits for the individual components.

Table 2-2. Organic Contaminant of Concern Information - ACS Site

Contaminant	CAS Number	Boiling Point (°F)	Analytical Method	Detection Limit (mg/kg)	Cleanup Standard (mg/kg)
NONCARCINOGENIC					
Toluene	108-88-3	231	8260	NL	5,000
Ethylbenzene	100-41-4	277	8260	NL	1,300
Naphthalene	91-20-3	424	8270	NL	82
1,1,1-Trichloroethane	71-55-6	165	8260	NL	2,300
4-Methyl-2-pentanone	108-10-1	242	8260	NL	630
Endosulfan I	959-98-8	mp. 228	8081A	NL	0.63
1,2-Dichloroethene (cis)	156-59-2	141	8260	NL	250
2-Butanone	78-93-3	175	8260	NL	620
Acetone	67-64-1	133	8260	NL	2,400
Chlorobenzene	108-90-7	269	8260	NL	150
Xylenes (mixed)	1330-20-7	281	8260	NL	26,000
Di-n-butylphthalate	84-74-2	644	8270	NL	2,300
1,2,4-Trichlorobenzene	120-82-1	415	8260	NL	16
Chloroethane	75-00-3	54	8260	NL	2,700

a) NL - Not Listed. Detection limits have only been listed for the carcinogenic contaminants of concern because of their lower cleanup standards.

Table 3-1. Soil Sample Compositing Summary

Constituent	Measured Concentration (mg/kg) (a)						Calculated Concentration		Cleanup Standard
							Worst Case Sample (b)	Typical Sample (c)	
Sample Number	D01-S	SP01-S	SP02-S	KP01-S	SA02-S	SA04-S	SC1	SC2	(mg/kg)
Benzene						45	23	8	1.0
Tetrachloroethene	4	220	290		170	880	525	261	1.1
Trichloroethene					160	350	255	85	5.3
bis(2-Ethylhexyl)phthalate	120	230		130	240		120	120	1.1
Isophorone	67	190			210		105	78	7.2
Naphthalene	51	74			140		70	44	82
PCBs	28	68	73	127	125	330	228	125	2.0
Total Carbon (wt%)	4.3	4.5	6.2	3.8	8.8	5.3	7.1	5.5	NL
Sulfur (mg/kg)	980	880	1,100	2,100	910	720	815	1,115	NL
Chlorine (mg/kg)	350	1,100	4,800	36	2,900	1,700	2,300	1,814	NL
Higher Heating Value (Btu/lb)	698	844	2,105	408	1,666	952	1,309	1,112	NL
Volatiles (@1,022 °F) (wt%)	10.6	5.1	15.5	7.7	12.0	5.7	8.8	9.4	NL

Notes:

a) Only contaminants of concern detected in excess of the cleanup standards are reported. See Tables 3-2 and 3-3 for a complete summary of results. All data is from the PMHS report.

b) Treatability sample SC1. This estimate includes equal quantities of soil from samples SA02 and SA04.

c) Treatability sample SC2. This estimate includes equal quantities of soil from samples D01, SP01, SP02, KP01, SA02, and SA04.

Table 3-2. Summary of Volatile Losses During Sample Preparation

Analyte	Worst Case Soil (SC1) (a) Composite (mg/kg)	Worst Case Soil (SC1) (b) Air Dried Composite (mg/kg)	Worst Case Soil (SC1) (c) Loss on Drying (wt%)	Typical Case Soil (SC2) (a) Composite (mg/kg)	Typical Case Soil (SC2) (b) Air Dried Composite (mg/kg)	Typical Case Soil (SC2) (c) Loss on Drying (wt%)	Cleanup Standard (mg/kg)
Acetone	600	< 140	> 77	200	< 140	> 30	2,400
Benzene	23	< 14	> 38	8	< 14	NA	1
2-Butanone	345	33	90	155	< 28	> 82	620
Cis-1,2-Dichloroethene	< 40	< 14	NA	< 30	< 14	NA	250
Ethylbenzene	490	150	69	429	140	67	1,300
4-Methyl-2-Pentanone	235	50	79	233	60	74	630
Tetrachloroethene	525	28	95	261	24	91	1.1
Toluene	1,100	200	82	758	160	79	5,000
1,1,1-Trichloroethane	< 40	< 14	NA	< 30	< 14	NA	2,300
Trichloroethene	255	< 14	> 95	85	< 14	> 84	5.3
Xylene (Total)	2,600	870	67	2,680	920	66	26,000

Notes:

a) The values reported are weighted average concentrations based on analytical results from the soil samples that were blended together to make the composite sample.

b) Sample was air dried in a hood.

c) Weight percent of detected volatiles lost during the sample preparation step.

d) NA - Not Applicable

Table 3-3. Starting Soil Organic Analytical Data

Analyte	Units	Worst Case Soil (SC1) Air Dried Composite	Typical Case Soil (SC2) Air Dried Composite	Cleanup Standard
Volatile Organics (Method 8260A)				
Acetone	mg/kg	< 140	< 140	2,400
Benzene	mg/kg	**< 14**	**< 14**	1
2-Butanone	mg/kg	33	< 28	620
Ethylbenzene	mg/kg	150	140	1,300
4-Methyl-2-Pentanone	mg/kg	50	60	630
Tetrachloroethene	mg/kg	**28**	**24**	1.1
Toluene	mg/kg	200	160	5,000
Trichloroethene	mg/kg	**< 14**	**< 14**	5.3
Xylene (Total)	mg/kg	870	920	26,000
Semivolatile Organics (Method 8270B)				
bis(2-Ethylhexyl)phthalate	mg/kg	**270**	**410**	1.1
Di-n-butylphthalate	mg/kg	190	230	2,300
Isophorone	mg/kg	**270**	**380**	7.2
Naphthalene	mg/kg	**180**	**200**	82
CPAH's (a) (b)	mg/kg	**< 193**	**< 196**	0.0026
2,4-Dinitrotoluene (b)	mg/kg	**< 28**	**< 28**	0.044
bis(2-Chloroethyl)ether (b)	mg/kg	**< 28**	**< 28**	0.027
Hexachlorobenzene (b)	mg/kg	**< 28**	**< 28**	0.018
2,6-Dinitrotoluene (b)	mg/kg	**< 28**	**< 28**	0.044
PCB's (Method 8081)				
PCB's (c)	mg/kg	**118**	**82**	2
Dioxin/Furans (Method 8290)				
Total Dioxin/Furans	µg/kg	46.5	88 9	(d)
TCDD TEQ (e)	µg/kg	0.2	1.1	(d)

Notes:

a) CPAH's include benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, dibenzo(a,h)anthracene, and benzo(g,h,i)perylene.
b) Non-detect values above the cleanup standard are reported as one-half of the detection limits.
c) The cleanup standard listed for PCB's is the treatment standard. The excavation standard is 10 mg/kg.
d) Not Applicable
e) TCDD TEQ stands for toxic equivalents of 2,3,7,8-TCDD.
f) Shaded and bolded values are in excess of the applicable standard.

Table 3-4. Starting Soil Metals Analytical Data

Analyte	Air Dried Soil Composites (a) Worst Case SC1	Air Dried Soil Composites (a) Typical Case SC2	Cleanup or Regulatory Standard
Total Metals (mg/kg)			
Aluminum	5,590	4,510	
Antimony	< 6.7	**41**	15
Arsenic	4.8	3.9	
Barium	297	955	2,600
Cadmium	16	40	51
Calcium	14,300	14,600	
Chromium	140	532	1,400
Cobalt	10	20	
Copper	1,440	635	
Iron	11,600	13,000	
Lead	**682**	**2,920**	500
Magnesium	5,950	6,400	
Manganese	189	288	
Mercury	2.2	1.8	
Nickel	14	27	
Potassium	1,010	< 564	
Selenium	1.2	2.7	
Silver	1.7	13	
Sodium	< 556	< 564	
Vanadium	11	8.7	
Zinc	476	1,390	
TCLP Metals (mg/l)			
Arsenic	< 0.5	< 0.5	5.0
Barium	< 10.0	< 10.0	100
Cadmium	0.33	0.76	1.0
Chromium	< 0.5	< 0.5	5.0
Lead	1.25	**14.8**	5.0
Mercury	< 0.02	< 0.02	0.2
Selenium	< 0.1	< 0.1	1.0
Silver	< 0.5	< 0.5	5.0

Notes:

a) Shaded and bolded values are in excess of the applicable standard.

Table 3-5. Starting Soil Elemental Analytical Data

Sample Number	Units	Air Dried Soil Composites (a)	
		SC1 (b)	SC2
"As-Received" (wet) Basis			
Moisture (c)	wt%	9.08	11.6
Total Carbon	wt%	8.12	5.73
Hydrogen	wt%	0.30	(d)
Nitrogen	wt%	0.25	0.18
Sulfur	wt%	0.12	0.13
Ash (1,382 °F, Air)	wt%	82.16	79.91
Oxygen (by difference) (e)	wt%	0 (f)	2.76
Volatiles (1,382 °F, Nitrogen)	wt%	7.74	8.84
Heating Value	Btu/lb	1,281	1,055
Dry Basis			
Total Carbon	wt%	8.94	6.48
Hydrogen	wt%	0.33	(d)
Nitrogen	wt%	0.28	0.20
Sulfur	wt%	0.14	0.15
Ash (932 °F, Air)	wt%	90.37	90.40
Oxygen (by difference) (e)	wt%	0 (f)	2.77
Volatiles (1,742 °F, Nitrogen)	wt%	8.51	10.00
Heating Value	Btu/lb	1,409	1,194

Notes:

a) All results are in units of weight percent unless otherwise noted.

b) Results are an average of a sample and its duplicate.

c) Based on weight loss at 221°F under a nitrogen atmosphere.

d) The concentration of hydrogen has to be corrected for the hydrogen in the sample moisture, therefore minor nonhomogeneity in the moisture content of the sample can result in estimated concentrations of hydrogen less than zero.

e) Oxygen is calculated by subtracting total carbon, hydrogen, nitrogen, sulfur, and ash from 100. Nondetects are assumed equal to zero.

f) Sometimes the calculated oxygen can be less than zero due to sample nonhomogeneity.

Table 3-6. Starting Soil Geotechnical Data

Sample Number	Soil Classification	Particle Size Distribution (wt %) (a)				(b) Atterberg Limits	Proctor Density Data (c)		
		Gravel	Sand	Silt	Clay		Optimum Moisture (wt%)	Wet Density (lb/ft³)	Wet Density (ton/yd³)
SC1	Poorly Graded Sand	0.7	94.5	3.0	1.8	NP	10.6	116.6	1.57
SC2	Poorly Graded Sand with Silt	0.5	90.0	7.5	2.0	NP	14.0	118.5	1.60

Notes:

a) Particle size classifications are as follows:

Gravel is greater than 4.75 mm (U. S. Sieve No. 4);
Sand is less than 4.75 mm but greater than 0.075 mm (U. S. Sieve No. 4-200);
Silt is less than 0.075 mm but greater than 0.002 mm
Clay is less than 0.002 mm.

b) NP = non-plastic

c) All Proctor Density and Optimum Moisture Content Data was reported by the laboratory on a dry basis. The data was converted to a wet basis for this report. Equations used to convert to a wet basis are as follows:

"Wet Basis Moisture" = "Dry Basis Moisture"/(1+ "Dry Basis Moisture"/100)

"Wet Density" = "Dry Density"/(1 - "Wet Basis Moisture"/100)

Table 4-1. Tray Test Organic Results - Worst Case Soils (SC1)

Analyte	Starting Soil Air Dried Composite (mg/kg)	Tray Test Treated Soil Concentration (mg/kg)				Cleanup Standard (mg/kg)
Soil Temperature (°F)	NA	500	700	900	1,100	NA
Volatile Organics (Method 8260A)						
Acetone	< 140	0.560	< 0.100	< 0.120	< 0.050	2,400
Benzene	< 14	< 0.010	< 0.010	< 0.012	< 0.005	1
2-Butanone	33	0.034	< 0.020	< 0.025	< 0.010	620
Cis-1,2-Dichloroethene	< 14	< 0.010	< 0.010	< 0.012	< 0.005	250
Ethylbenzene	150	< 0.010	< 0.010	< 0.012	< 0.005	1,300
4-Methyl-2-Pentanone	50	< 0.020	< 0.020	< 0.025	< 0.010	630
Tetrachloroethene	**28**	< 0.010	< 0.010	< 0.012	< 0.005	1.1
Toluene	200	< 0.010	< 0.010	< 0.012	< 0.005	5,000
1,1,1-Trichloroethane	< 14	< 0.010	< 0.010	< 0.012	< 0.005	2,300
Trichloroethene	< 14	< 0.010	< 0.010	< 0.012	< 0.005	5.3
Xylene (Total)	870	< 0.010	< 0.010	< 0.012	< 0.005	26,000
Semivolatile Organics (Method 8270B)						
bis(2-Ethylhexyl)phthalate	**270**	**230**	< 3.3	< 0.66	< 0.33	1.1
Di-n-butylphthalate	190	100	< 3.3	< 0.66	< 0.33	2,300
Isophorone	**270**	< 66	< 3.3	< 0.66	< 0.33	7.2
Naphthalene	**180**	< 66	< 3.3	< 0.66	< 0.33	82
CPAHs (a) (b)	**< 193**	**< 33**	**< 11.6**	**< 2.31**	**< 1.16**	0.0026
2,4-Dinitrotoluene (b)	**< 28**	**< 33**	**< 1.7**	**< 0.33**	**< 0.17**	0.044
bis(2-Chloroethyl)ether (b)	**< 28**	**< 33**	**< 1.7**	**< 0.33**	**< 0.17**	0.027
Hexachlorobenzene (b)	**< 28**	**< 33**	**< 1.7**	**< 0.33**	**< 0.17**	0.018
2,6-Dinitrotoluene (b)	**< 28**	**< 33**	**< 1.7**	**< 0.33**	**< 0.17**	0.044
PCB's (Method 8081)						
PCB's	**118**	**54**	< 0.16	< 0.16	< 0.16	2
Dioxin/Furans (Method 8290)						
Total Dioxin/Furans (µg/kg)	46.5	44.5	NM	0.071	NM	NA
TCDD TEQ (c) (µg/kg)	0.2	0.2	NM	0.0001	NM	NA

Notes:

a) CPAH's include benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, and benzo(g,h,i)perylene. Results are reported at half of the summation of the detection limits.

b) Non-detect values above the cleanup standard are reported as one-half of the detection limits.

c) TCDD TEQ stands for toxic equivalents of 2,3,7,8-TCDD.

d) NM - Not Measured. NA - Not Applicable

e) Shaded and bolded values indicate the result exceeds the cleanup standard.

Table 4-2. Tray Test Organic Results - Typical Case Soils (SC2)

Analyte	Starting Soil Air Dried Composite (mg/kg)	Tray Test Treated Soil Concentration (mg/kg)					Cleanup Standard (mg/kg)
Soil Temperature (°F)	NA	500	700	900	1,100		NA
Volatile Organics (Method 8260A)							
Acetone	< 140	0.052	< 0.050	< 0.050	< 0.050		2,400
Benzene	< 14	< 0.005	< 0.005	0.020	< 0.005		1
2-Butanone	28	0.010	< 0.010	< 0.010	< 0.010		620
Cis-1,2-Dichloroethene	< 14	< 0.005	< 0.005	< 0.005	< 0.005		250
Ethylbenzene	140	< 0.005	< 0.005	< 0.005	< 0.005		1,300
4-Methyl-2-Pentanone	60	< 0.010	< 0.010	< 0.010	< 0.010		630
Tetrachloroethene	**24**	< 0.005	< 0.005	< 0.005	< 0.005		1.1
Toluene	160	< 0.005	< 0.005	< 0.005	< 0.005		5,000
1,1,1-Trichloroethane	< 14	< 0.005	< 0.005	< 0.005	< 0.005		2,300
Trichloroethene	< 14	< 0.005	< 0.005	< 0.005	< 0.005		5.3
Xylene (Total)	920	< 0.005	< 0.005	< 0.005	< 0.005		26,000
Semivolatile Organics (Method 8270B)							
bis(2-Ethylhexyl)phthalate	**410**	**410**	< 3.3	< 0.34	< 0.33		1.1
Di-n-butylphthalate	230	130	< 3.3	< 0.34	< 0.33		2,300
Isophorone	**380**	< 66	< 3.3	< 0.34	< 0.33		7.2
Naphthalene	**200**	< 66	< 3.3	< 0.34	< 0.33		82
CPAHs (a) (b)	**< 196**	**< 231**	**< 11.6**	**< 1.19**	**< 1.16**		0.0026
2,4-Dinitrotoluene (b)	**< 28**	**< 33**	**< 1.7**	**< 0.17**	**< 0.17**		0.044
bis(2-Chloroethyl)ether (b)	**< 28**	**< 33**	**< 1.7**	**< 0.17**	**< 0.17**		0.027
Hexachlorobenzene (b)	**< 28**	**< 33**	**< 1.7**	**< 0.17**	**< 0.17**		0.018
2,6-Dinitrotoluene (b)	**< 28**	**< 33**	**< 1.7**	**< 0.17**	**< 0.17**		0.044
PCB's (Method 8081)							
PCB's	**82**	**43**	< 0.16	< 0.16	< 0.16		2
Dioxin/Furans (Method 8290)							
Total Dioxin/Furans (µg/kg)	88.9	114.7	NM	< 0.036	NM		NA
TCDD TEQ (c) (µg/kg)	1.1	0.8	NM	0.0000	NM		NA

Notes:

a) CPAH's include benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, and benzo(g,h,i)perylene. Results are reported at half of the summation of the detection limits.

b) Non-detect values above the cleanup standard are reported as one-half of the detection limits.

c) TCDD TEQ stands for toxic equivalents of 2,3,7,8-TCDD

d) NM - Not Measured, NA - Not Applicable

e) Shaded and bolded values indicate the result exceeds the cleanup standard

Table 4-3. Miscellaneous RTA Test Data

Parameter	Units	RTA Test Data		
RTA Test Number		RTA1	RTAN	RTA2
Soil Temperature	°F	900	900	700
Purge Gas		Air	Nitrogen	Air
Test Durations				
- Total Test	min	34	34	34
- Up to Target Temperature	min	22	23	23
Mass Data				
Starting Soil	g	1,027.2	1,023.7	982.2
Treated Soil	g	847.4	849.9	835.4
Ending Impinger Water	g	684.6	721.4	701.0
Organic Layer	g	85.1	39.4	NM
Organic Layer and Rinse	g	521.7	460.3	582.2
Methanol Impinger (a)	g	687.8	686.6	683.8
Flow and Volume Data				
VOC Train Sample Volume (ft^3)	ft^3	0.45	0.38	0.61
SVOC Train Sample Volume (ft^3)	ft^3	0.46	0.70	0.88
CEMS Flow Rate (ft^3 / min)	ft^3 / min	0.07	0.07	0.07
Offgas Volumes				
- Total Test	ft^3	3.29	3.52	3.87
- Up to Target Temperature	ft^3	2.10	2.38	2.62

Notes:

a) The methanol impinger was placed in front of the Tenax tube to capture volatiles and minimize loading on the Tenax resin.

Table 4-4. RTA Test Results - Soil Organic Analytical Data

Analyte	Units	Worst Case Soils (SC1) Starting Soil Air Dried Composite	Worst Case Soils (SC1) RTA Test Treated Soil Concentration		Typical Case Soils (SC2) Starting Soil Air Dried Composite	Typical Case Soils (SC2) RTA test Treated Soil Concentration
RTA Test Number		NA	RTA1	RTAN	NA	RTA2
Soil Temperature	°F	NA	900	900	NA	700
Purge Gas		NA	Air	Nitrogen	NA	Air
Volatile Organics (Method 8260A)						
Acetone	mg/kg	< 140	0.066	< 0.050	< 140	0.068
Benzene	mg/kg	< 14	0.005	< 0.005	< 14	< 0.005
2-Butanone	mg/kg	33	< 0.010	< 0.010	28	< 0.010
Cis-1,2-Dichloroethene	mg/kg	< 14	< 0.005	< 0.005	< 14	< 0.005
Ethylbenzene	mg/kg	150	< 0.005	< 0.005	140	< 0.005
4-Methyl-2-Pentanone	mg/kg	50	< 0.010	< 0.010	60	< 0.010
Tetrachloroethene	mg/kg	**28**	< 0.005	< 0.005	**24**	< 0.005
Toluene	mg/kg	200	< 0.005	< 0.005	160	< 0.005
1,1,1-Trichloroethane	mg/kg	< 14	< 0.005	< 0.005	< 14	< 0.005
Trichloroethene	mg/kg	< 14	< 0.005	< 0.005	< 14	< 0.005
Xylene (Total)	mg/kg	870	< 0.005	< 0.005	920	< 0.005
Semivolatile Organics (Method 8270B)						
bis(2-Ethylhexyl)phthalate	mg/kg	**270**	< 0.67	< 0.33	**410**	< 6.7
Di-n-butylphthalate	mg/kg	190	< 0.67	< 0.33	230	< 6.7
Isophorone	mg/kg	**270**	< 0.67	< 0.33	**380**	< 6.7
Naphthalene	mg/kg	**180**	< 0.67	< 0.33	**200**	< 6.7
CPAHs (a)	mg/kg	**< 193**	**< 2.35**	**< 1.15**	**< 196**	**< 23.5**
PCB's (Method 8081)						
PCB's	mg/kg	**118**	< **0.16**	< **0.16**	**82**	< 0.16
Dioxin/Furans (Method 8290)						
Total Dioxin/Furans	µg/kg	46.5	0.47	0.28	88.9	1.7
TCDD TEQ (b)	µg/kg	0.2	0.003	0.002	1.1	0.04

Notes:

a) CPAH's include benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, dibenzo(a,h)anthracene, and benzo(g,h,i)perylene. Results are reported at half of the summation of the detection limits

b) TCDD TEQ stands for toxic equivalents of 2,3,7,8-TCDD

c) Shaded and bolded values indicate the result exceeds the cleanup standard.

Table 4-5. RTA Test Results - Soil Elemental Analytical Data

Parameter	Units	Worst Case Soil (a)			Typical Case (a)	
		Starting Soil	Treated Soil		Starting Soil	Treated Soil
Sample Number		SC1 (b)	RTA1	RTAN	SC2	RTA2
Soil Treatment Temperature (°F)	°F	NA	900	900	NA	700
Purge Gas		NA	Air	Nitrogen	NA	Air
"As-Received" (wet) Basis						
Moisture (221°F, Nitrogen)	wt%	9.08	0.92	1.53	11.6	1.95
Total Carbon	wt%	8.12	3.37	3.02	5.73	4.88
Hydrogen	wt%	0.30	0.40	0.16	0 (c)	0.24
Nitrogen	wt%	0.25	0.16	0.12	0.18	0.17
Sulfur	mg/kg	1,227	1,486	1,182	1,326	1,373
Ash (1,382 °F, Air)	wt%	82.16	94.54	94.28	79.91	90.71
Oxygen (by difference) (d)	wt%	0 (e)	1.17	1.17	2.76	2.46
Volatiles (1,382 °F, Nitrogen)	wt%	7.74	4.23	3.54	8.84	6.45
Heating Value	Btu/lb	1,281	383	201	1,055	530
"Dried and Ground" Basis						
Total Carbon	wt%	8.94	3.40	3.07	6.48	4.98
Hydrogen	wt%	0.33	0.40	0.16	0 (c)	0.24
Nitrogen	wt%	0.28	0.16	0.12	0.20	0.17
Sulfur	mg/kg	1,350	1,500	1,200	1,500	1,400
Ash (932 °F, Air)	wt%	90.37	95.42	95.74	90.40	92.51
Oxygen (by difference) (d)	wt%	0 (e)	0.47	0.79	2.77	1.96
Volatiles (1,742 °F, Nitrogen)	wt%	8.51	4.27	3.59	10.00	6.58
Heating Value	Btu/lb	1,409	387	204	1,194	541

Notes:

a) All results are in units of weight percent unless otherwise noted.

b) Results are an average of duplicate results.

c) The concentration of hydrogen has to be corrected for the hydrogen in the sample moisture, therefore minor nonhomogeneity in the moisture content of the sample can result in estimated concentrations of hydrogen less than zero.

d) Oxygen is calculated by subtracting total carbon, hydrogen, nitrogen, sulfur, and ash from 100. Nondetects are assumed equal to zero

e) Sometimes the calculated oxygen can be less than zero due to sample nonhomogeneity.

Table 4-6. Component Partitioning to Offgas

Parameter	RTA Test Run		
	RTA1	RTAN	RTA2
Soil Temperature (°F)	900	900	700
Purge Gas	Air	Nitrogen	Air
Partitioning Factors (% of starting component mass)			
Volatiles Overhead	54.9	62	37.9
Sulfur to Overhead	(a)	20.3	4.7
Carbon			
- to Treated Soil	34.2	30.8	72.6
- to Water Layer	13.0	13.4	3.6
- to Organic Layer	59.1	30.4	(b)
- to Offgas (c)	3.3	2.7	3.5
Carbon Recovery (d)	109.5	77.4	(e)

Notes:

a) Results indicated nonhomogeneous sample.

b) Carbon in the organic layer could not be measured because the majority of the organics were condensed in the glassware associated with the heated filter.

c) Carbon in offgas as CO and THC.

d) The carbon recovery does not include a component for carbon dioxide.

e) Could not be calculated because the carbon content of the organic layer was not measured.

Table 4-7. Summary of Metals Leachability Data

Metal	TCLP Leachate Concentrations (mg/l)					
	Worst Case Soil			Typical Case Soil		Regulatory Standard
	Starting Soil	Treated Soil		Starting Soil	Treated Soil	
Sample Name	SC1	RTA1	RTAN	SC2	RTA2	NA
Soil Temperature (°F)	NA	900	900	NA	700	NA
Purge Gas	NA	Air	Nitrogen	NA	Air	NA
Cadmium	0.3	0.2	0.15	0.76	0.82	1.0
Lead	1.3	**9.6**	**8.4**	**14.8**	**12.0**	5.0
Arsenic	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	5.0
Barium	< 10	< 10	< 10	< 10	< 10	100.0
Chromium	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	5.0
Mercury	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.2
Selenium	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	1.0
Silver	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	5.0

Notes:
a) Shaded and bolded results indicate the value is in excess of the regulatory standard.

Table 4-8. RTA Test Results - Impinger Media Concentrations

Analyte	Units	Worst Case Soil				Typical Case Soil	
		Water Layer	Organic Layer	Water Layer	Organic Layer	Water Layer	Organic Layer
RTA Test Number		RTA1		RTAN		RTA2	
Soil Temperature	°F	900		900		700	
Purge Gas		Air		Nitrogen		Air	
Volatile Organics (Method 8260A)							
Acetone	mg/l	3,800	2,700	4,500		260	NS
Benzene	mg/l		140		3,600		NS
1,2-Dichlorobenzene	mg/l		140		3,300		NS
Ethylbenzene	mg/l		160		3,900		NS
Isopropylbenzene	mg/l				660		NS
Methyl Methacrylate	mg/l				840	79	NS
N-Propylbenzene	mg/l				1,100		NS
Styrene	mg/l		220		5,800		NS
Toluene	mg/l		240		15,000	16	NS
1,2,4-Trichlorobenzene	mg/l				580		NS
1,2,4-Trimethylbenzene	mg/l		280		6,900		NS
1,3,5-Trimethylbenzene	mg/l				1,800		NS
Xylene (Total)	mg/l		450				NS
TIC's (a)	mg/l		1,990		43,000	62	NS
Semivolatile Organics (Method 8270B)							
bis(2-Ethylhexyl)phthalate	mg/l		170		230		100
Di-n-butylphthalate	mg/l		150		200		
Dimethylphthalate	mg/l				110		
Isophorone	mg/l	140	200	180	230	340	100
2-Methylphenol	mg/l				100		
4-Methylphenol	mg/l	150	100	160	140	89	
Naphthalene	mg/l		160		180		120
Phenol	mg/l	600	170	580	220	360	
TIC's (a)	mg/l	1,438	5,140	1,246	4,780	574	1,992
PCB's (Method 8081)							
PCB's	mg/l	0.13	94	0.19	110	0.24	59
Dioxin/Furans (Method 8290)							
Total Dioxin/Furans	µg/kg	NA	142.9	NA	96.9	NA	128.2
TCDD TEQ (b)	µg/kg	NA	1.57	NA	1.35	NA	2.13

Notes:
a) TIC's - Tentatively Identified Compounds
b) TCDD TEQ stands for toxic equivalents of 2,3,7,8-TCDD.
c) Blank cells indicate the analytical result was nondetect.
d) NA - Not Analyzed, NS - Not Sampled

Table 4-9. Miscellaneous Analytical Results for Condensables

Parameter/Analyte	Water Layer		
RTA Test Run	RTA1	RTAN	RTA2
Starting Soil Matrix	Worst Case	Worst Case	Typical Case
Purge Gas	Air	Nitrogen	Air
Soil Treatment Temperature (°F)	900	900	700
Water Layer			
Acidity (a) (mg/l)	1,540	1,030	954
pH	4.6	4.8	3.7
TOC (mg/l)	15,800	15,500	2,880
Total Sulfur (as sulfate) (mg/l)	52	25	22
Total Chloride (mg/l)	83	83	123
Organic Layer			
Carbon (wt%)	58.0	64.2	NS
Sulfur (wt%)	0.13	0.17	NS
Nitrogen (wt%)	0.65	0.79	NS

Notes:
a) Acidity measured as calcium carbonate to a pH of 8.3.
b) NS - Not Sampled

Table 4-10. RTA Test Methanol Impinger Analytical Data

Parameter/Analyte	Concentration (mg/l)		
RTA Test Run	RTA1	RTAN	RTA2
Starting Soil Matrix	Worst Case	Worst Case	Typical Case
Purge Gas	Air	Nitrogen	Air
Soil Treatment Temperature	900 °F	900 °F	700 °F
Volatile Organics (Method 8260A)			
Acetone	250	550	430
Benzene	97	84	74
Chloroethane	66	73	75
Chloromethane	120	140	130
Ethylbenzene	40	28	61
Methylene Chloride			46
Methyl Methacrylate			79
Toluene	160	84	270
1,2,4-Trimethylbenzene	26		52
1,3,5-Trimethylbenzene			16
Xylene (Total)	190	130	350

Notes:

a) Only analytes reported are those detected in one or more samples. Empty cells indicate the analyte was not detected in the sample.

Table 4-11. Offgas Bag Sample Data for RTA1

Parameter	Units	Soil Temperature (°F)				
		300	450	600	750	900
Methane	ppmv	0	0	3,309	30,193	45,561
Peak1 (a)	ppmv	1,317	117,185	147,469	218,570	136,935
Ethylene	ppmv	0	165	2,667	6,927	7,030
Ethane	ppmv	0	29	164	2,025	5,786
Acetylene	ppmv	0	0	14	45	33
Propylene/Propane	ppmv	0	351	4,411	15,575	23,776
CO	ppmv	33	5,177	31,371	48,765	38,722
Hydrogen	ppmv	43	11,485	62,594	137,391	> 143,564

(a) This peak was a combination of at least methane and CO, possibly CO2 also.

Table 4-12. Offgas Bag Sample Data for RTAN

Parameter	Units	Soil Temperature (°F)				
		300	450	600	750	900
Methane	ppmv	0	0	1,085	18,080	30,555
Peak1	ppmv	8,295	39,501	126,402	183,019	91,510
Ethylene	ppmv	0	12	517	2,688	2,812
Ethane	ppmv	0	0	58	1,350	5,333
Acetylene	ppmv	0	0	0	22	2
Propylene/Propane	ppmv	0	0	1,585	8,959	17,574
CO	ppmv	497	3,727	7,325	18,119	12,217
Hydrogen	ppmv	488	3,158	44,505	> 71,782	> 71,782

(a) This peak was a combination of at least methane and CO, possibly CO2 also.

Table 4-13. Offgas Bag Sample Data for RTA2

Parameter	Units	Soil Temperature (°F)				
		300	400	500	600	700
Methane	ppmv	0	0	398	2,350	14,446
Peak1	ppmv	1,172	54,379	111,260	122,847	172,486
Ethylene	ppmv	0	13	445	1,933	3,825
Ethane	ppmv	0	13	38	100	530
Acetylene	ppmv	0	0	0	22	45
Propylene/Propane	ppmv	0	0	0	2,826	5,996
CO	ppmv	0	4,970	11,803	31,371	45,866
Hydrogen	ppmv	0	4,450	19,668	59,866	87,574

(a) This peak was a combination of at least methane and CO, possibly CO2 also.

Table 4-14. Summary of Treatability Study Emission Factors

Parameter	Emission Factors (a) (lb / lb total carbon)			
	RTA1	RTAN	RTA2	Average
TEST CONDITIONS				
Test Soil	Worst	Worst	Typical	NA
Starting Carbon Content (wt%)	8.13	8.13	5.73	NA
Target Soil Temperature (°F)	900	900	700	NA
Purge Gas	Air	Nitrogen	Air	NA
MISCELLANEOUS				
Condensable Carbon (Organic Layer)	0.591	0.304	NM	0.448
Condensable Carbon (Water Layer)	0.130	0.134	0.036	0.100
Carbon Monoxide (CO) (b, c)	0.03	0.01	0.03	0.023
Total Hydrocarbons (THC) (b, c)	0.025	0.025	0.026	0.025
Total VOC's Downstream of Impingers (d)	0.098	0.146	0.168	0.137
PCB's	0.00091	0.00084	0.00051	0.00075
LIGHT GASES (e)				
Propylene/Propane	0.01120	0.00937	0.00166	0.00741
Methane	0.00786	0.00646	0.00119	0.00517
Ethylene	0.00286	0.00137	0.00077	0.00167
Ethane	0.00143	0.00157	0.00008	0.00103
Hydrogen	0.00426	0.00294	0.00214	0.00311
VOLATILES				
VOC TICs (f)	0.0366	0.3690	0.0240	0.1432
Toluene	0.0124	0.1230	0.0270	0.0541
Acetone	0.0529	0.0920	0.0460	0.0636
Xylenes	0.0149	0.0970	0.0340	0.0486
1,2,4-Trimethylbenzene	0.0023	0.0530	0.0051	0.0201
Ethylbenzene	0.0032	0.0330	0.0060	0.0141
Benzene	0.0075	0.0356	0.0072	0.0168
Chloromethane	0.0091	0.0135	0.0127	0.0118
Chloroethane	0.0051	0.0073	0.0076	0.0067
SEMIVOLATILES				
SVOC TICs (f)	0.0528	0.047	0.032	0.0439
Phenol	0.0066	0.0067	0.0045	0.0059
Isophorone	0.0031	0.0033	0.0055	0.0040
4-methyl phenol	0.0022	0.0022	0.0011	0.0018

Notes:

a) Mass of specific constituent imparted to offgas during heating of contaminated soil relative to the mass of carbon in the starting soil. Tables presenting the data used to calculate the emission factors can be found in Appendix K (Miscellaneous Data and Calculations)

b) Measured downstream of the water impingers.

c) Includes emissions measured up to the target soil treatment temperature.

d) Total VOC's Downstream of Impingers includes VOC TIC's, Acetone, Benzene, Xylene and Toluene. In effect, this is the mass of material that does not condense at 40°F that could be adsorbed on vapor phase activated carbon.

e) Calculated from bag sample measurements.

f) Tentatively Identified Compounds.

Table 5-1. Carbon Balance Estimate for Full-Scale Processes

Type of Thermal Desorber	Indirectly Heated		Directly Heated	
Emission Control Device	**Recovery**	**Destructive**	**Recovery**	**Destructive**
Soil Quantity (tons)			125,813	
Total Carbon Concentration (wt%)			5.1	
Total Carbon in Feed (lb) (a)	12,832,926	12,832,926	12,832,926	12,832,926
% of Carbon Transferred to APC System	65.0	65.0	65.1	65.1
Exiting with Treated Soil (lb)	4,495,974	4,494,399	4,482,524	4,480,435
ASSUMPTIONS				
- CO Generation Factor (lb CO / lb feed carbon) (b)	0.010	0.010	0.030	0.030
- Carbon Ratio of CO2 to CO (lb C / lb C)	4.710	4.710	17.000	17.000
- Light THC Generation (lb THC / lb feed carbon) (b)	0.025	0.025	0.025	0.025
- Heavy THC Generation (lb THC / lb feed carbon) (b)(c)	0.150	0.150	0.199	0.199
- Condensable Carbon (lb C / lb feed carbon) (b)	0.482	0.482	0.236	0.236
- Condensed Organic in Aqueous Layer (wt%) (b)	18	NA	18	NA
- Light THC Capture Efficiency on Carbon (wt%)	90	NA	90	NA
- Heavy THC Capture Efficiency on Carbon (wt%)	95	NA	95	NA
- CO Destruction in Afterburner (wt%)	NA	99.9	NA	99.9
- THC Destruction in Afterburner (wt%)	NA	99.9	NA	99.9
- Carbon Loading (lb organic C / lb Activated C)				
* On Aqueous Phase Carbon	0.10	NA	0.10	NA
* Light THC on Vapor Phase Carbon	0.01	NA	0.01	NA
* Heavy THC on Vapor Phase Carbon	0.15	NA	0.15	NA
- % Carbon in "Organic" Layer (b)	65	NA	65	NA
RESULTS				
Exiting from System				
- Exiting with Organic Residuals (lb)	5,072,086	NA	2,483,428	NA
- Adsorbed on Aqueous Phase Carbon (lb)	1,113,385	NA	545,143	NA
- Light THC Adsorbed on Vapor Phase Carbon (lb)	236,243	NA	236,243	NA
- Heavy THC Adsorbed on Vapor Phase Carbon (lb)	1,496,203	NA	1,984,962	NA
- Emitted in CO (lb)	54,998	55	164,995	165
- Emitted in Light THC (lb)	26,249	262	26,249	262
- Emitted in Heavy THC (lb)	78,748	1,575	104,472	2,089
- Emitted in CO2 (lb)	259,042	8,336,635	2,804,911	8,349,974
Residuals				
- Aqueous Phase Carbon (tons)	5,567	NA	2,726	NA
- Vapor Phase Carbon for Light THC (tons)	11,812	NA	11,812	NA
- Vapor Phase Carbon for Heavy THC (tons)	4,987	NA	6,617	NA
- Organic Layer (tons)	3,902	NA	1,910	NA
STACK CALCULATIONS				
Emission Factors (lb / lb soil treated)				
- CO	0.00051	0.0000005	0.00153	0.0000015
- THC	0.00051	0.0000089	0.00063	0.0000114
Soil Feed Rate (tons/hr)	15	15	15	15
Stack Emissions (lb/hr)				
- CO	15.30	0.02	45.90	0.05
- THC	15.30	0.27	19.05	0.34
Stack Flow Rate (dscfm)	200	3,000	9,000	12,500
Stack Concentration (ppmv)				
- CO	16,539	1.1	1,103	0.8
- THC	10,525	12.3	291	3.8

Notes:

a) All mass quantities are "as carbon" unless otherwise indicated

b) For the directly heated system, approximately 30% of the mass of organics vaporized during the treatability testing is assumed to be oxidized in the primary heating chamber of a full scale system

c) Since the full scale directly heated system only cools the offgas to 180°F, approximately 30% of the organic condensed at 40°F during the treatability study is assumed to remain in the vapor state and require adsorption on vapor phase carbon

d) All mass quantities exclude carbon associated with fuel inputs

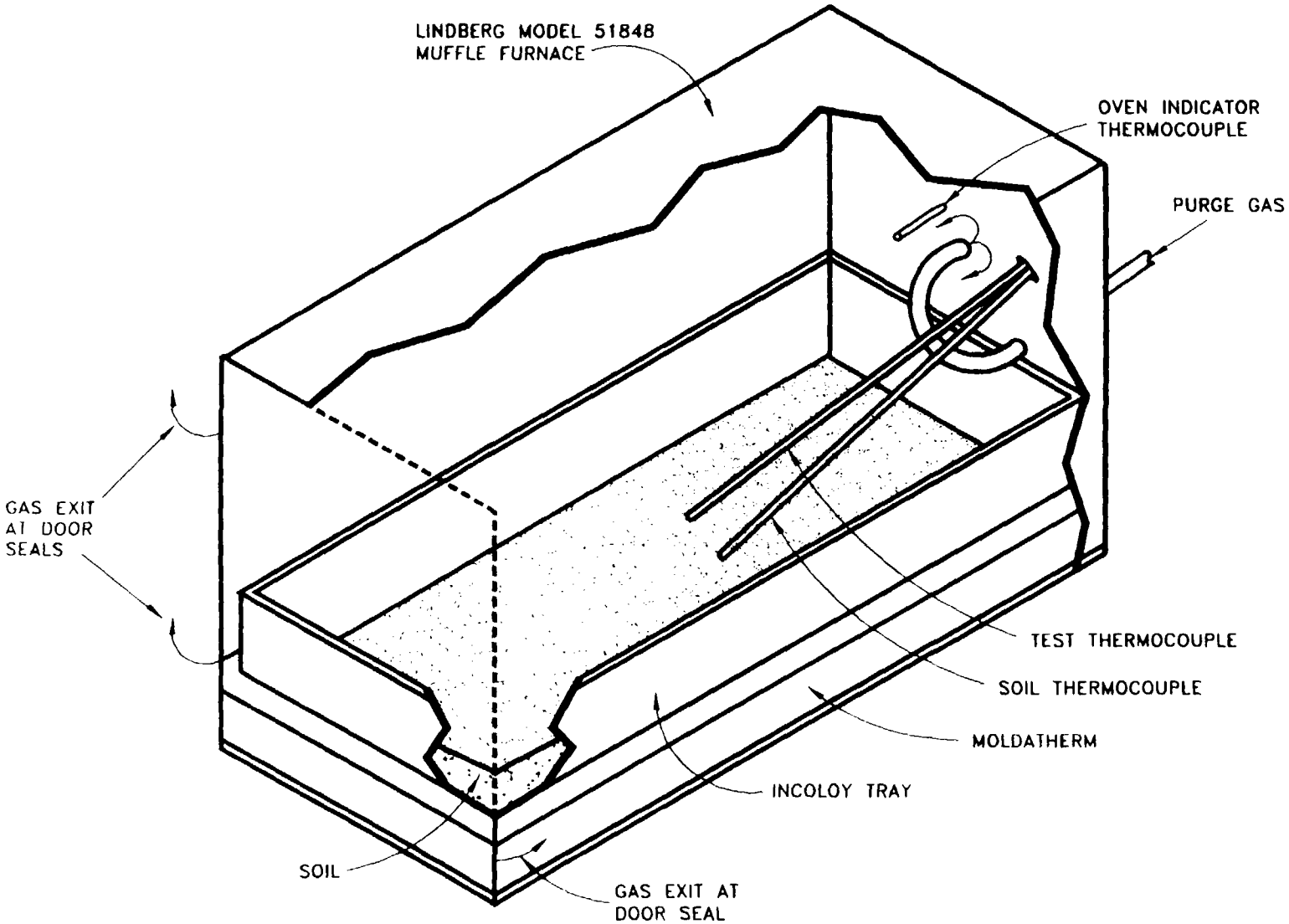


Figure 4-1. Tray Test - General Configuration

11/12/97	ACS-TRAY	119406

Figure 4-2. Tray Test Temperature Profile : TT1-500

Worst Case Soil, 500°F

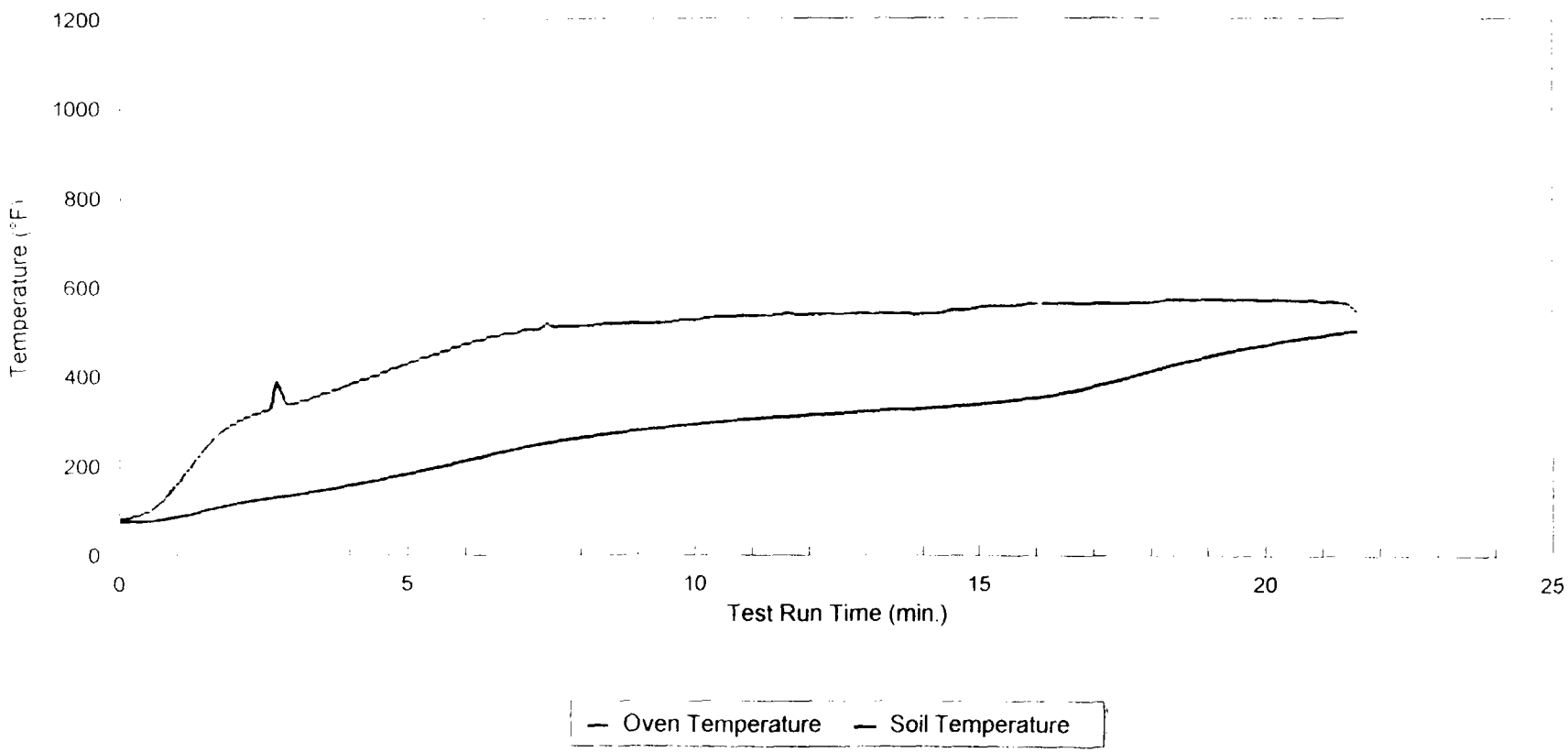


Figure 4-3. Tray Test Temperature Profile : TT1-700

Worst Case Soil, 700°F

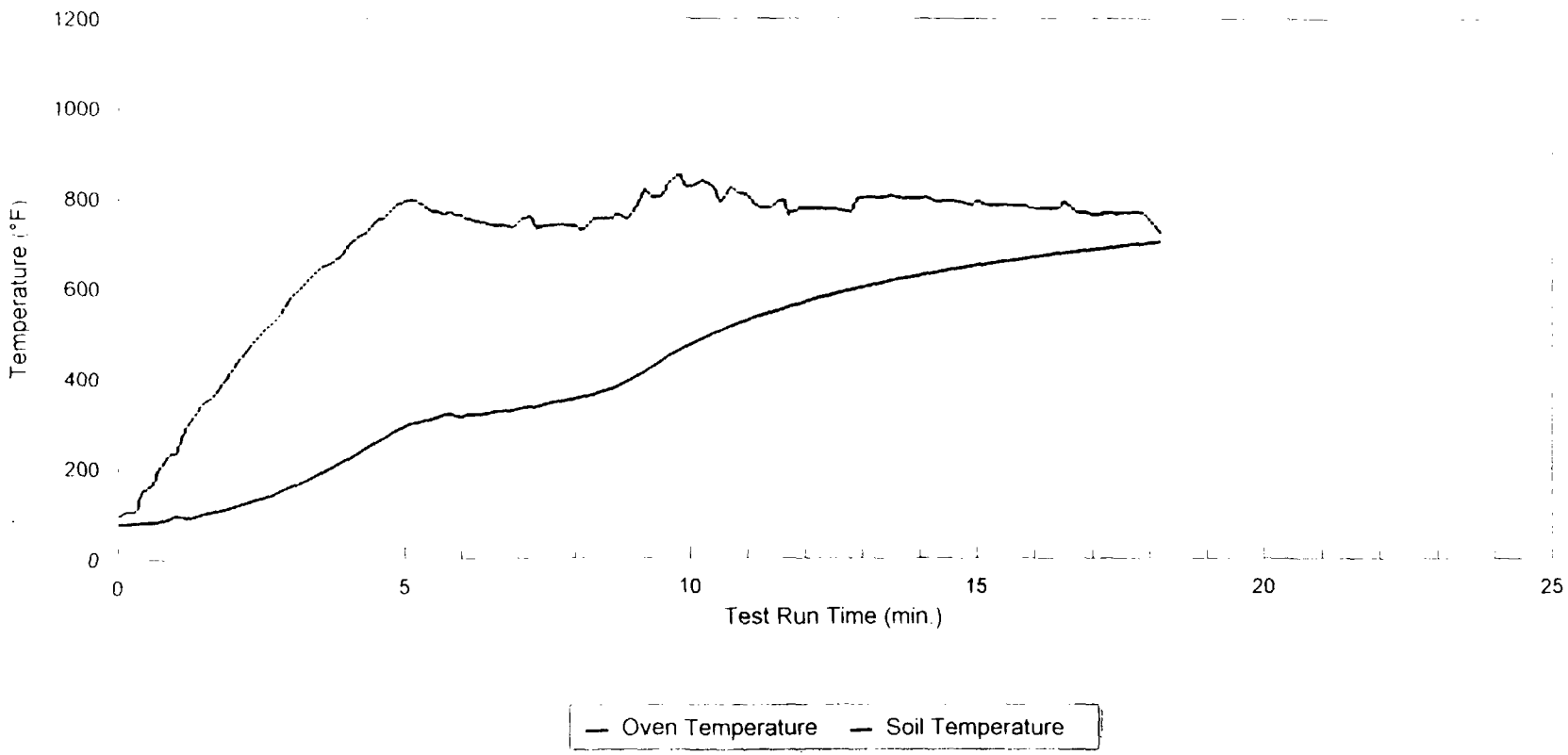


Figure 4-4. Tray Test Temperature Profile : TT1-900

Worst Case Soil, 900°F

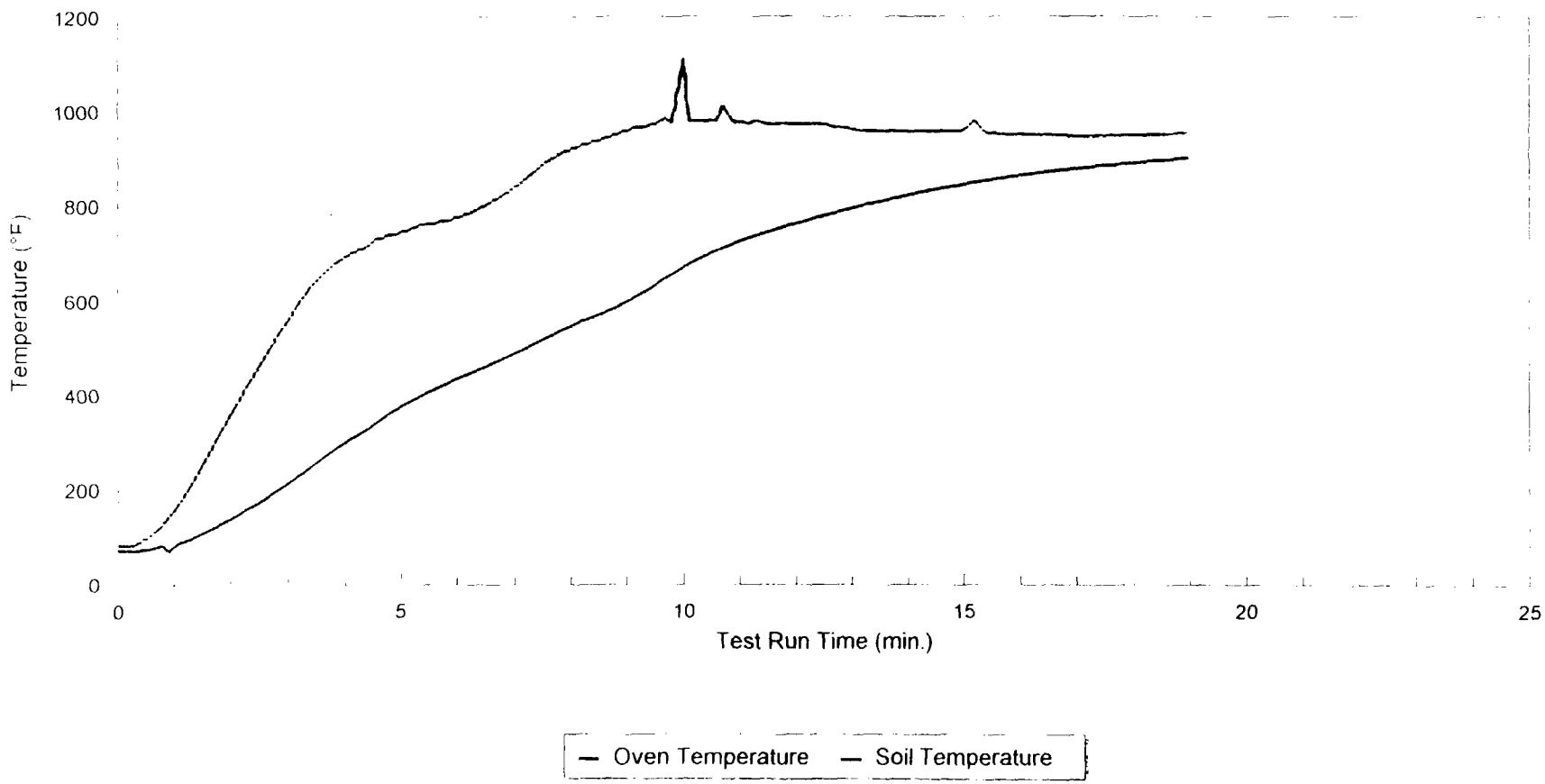


Figure 4-5. Tray Test Temperature Profile : TT1-1100

Worst Case Soil, 1,100°F

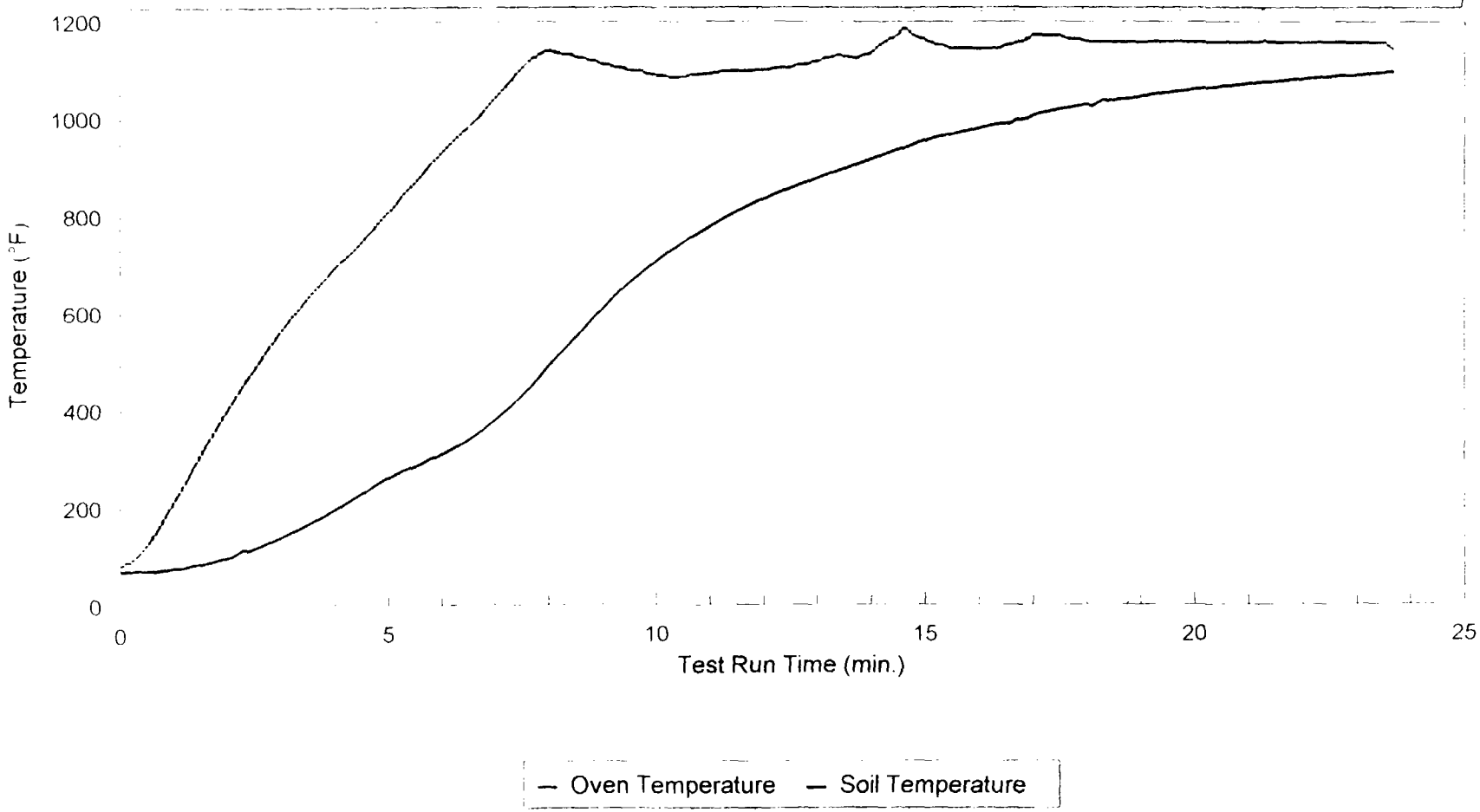


Figure 4-6. Tray Test Temperature Profile : TT2-500

Typical Case Soil, 500°F

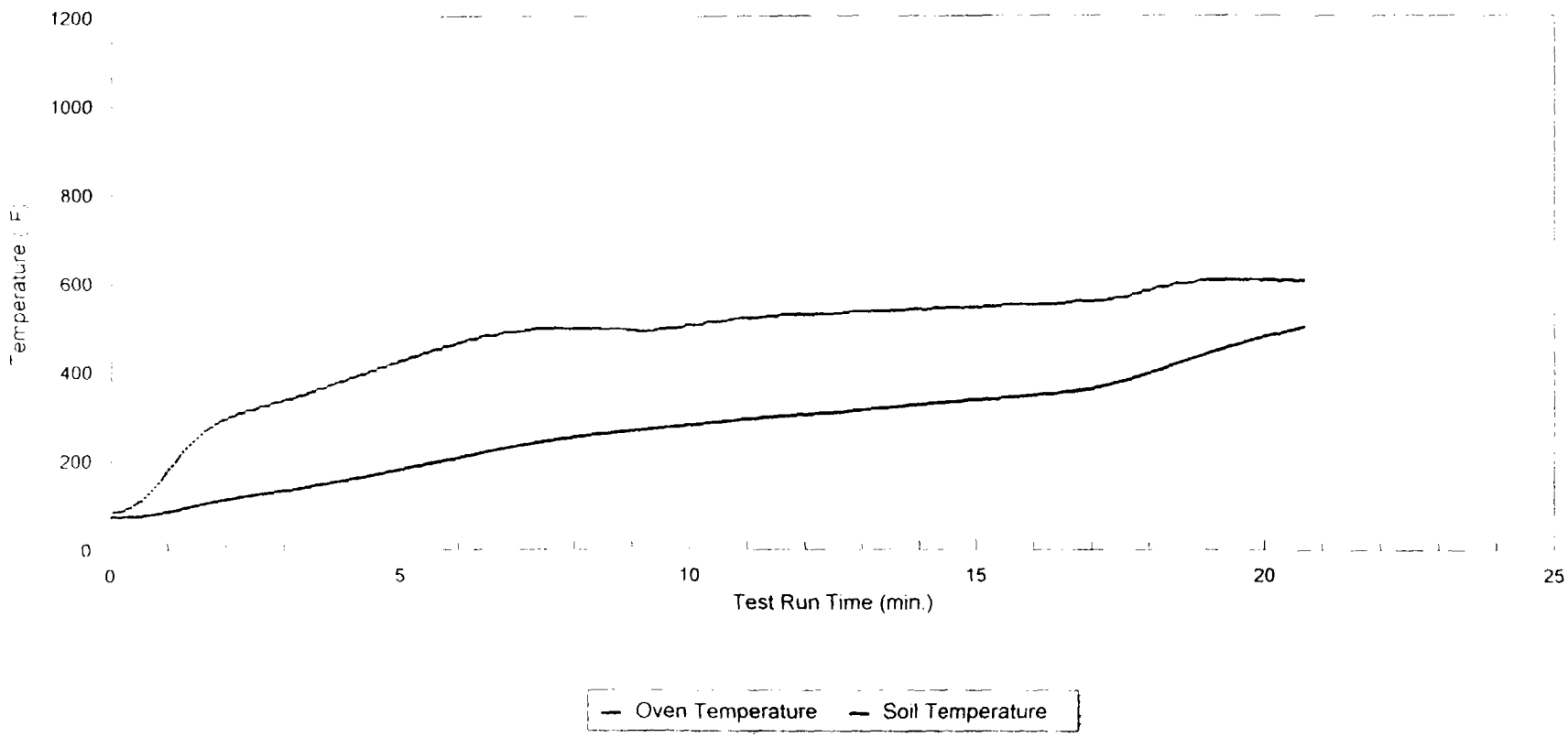


Figure 4-7. Tray Test Temperature Profile : TT2-700

Typical Case Soil, 700°F

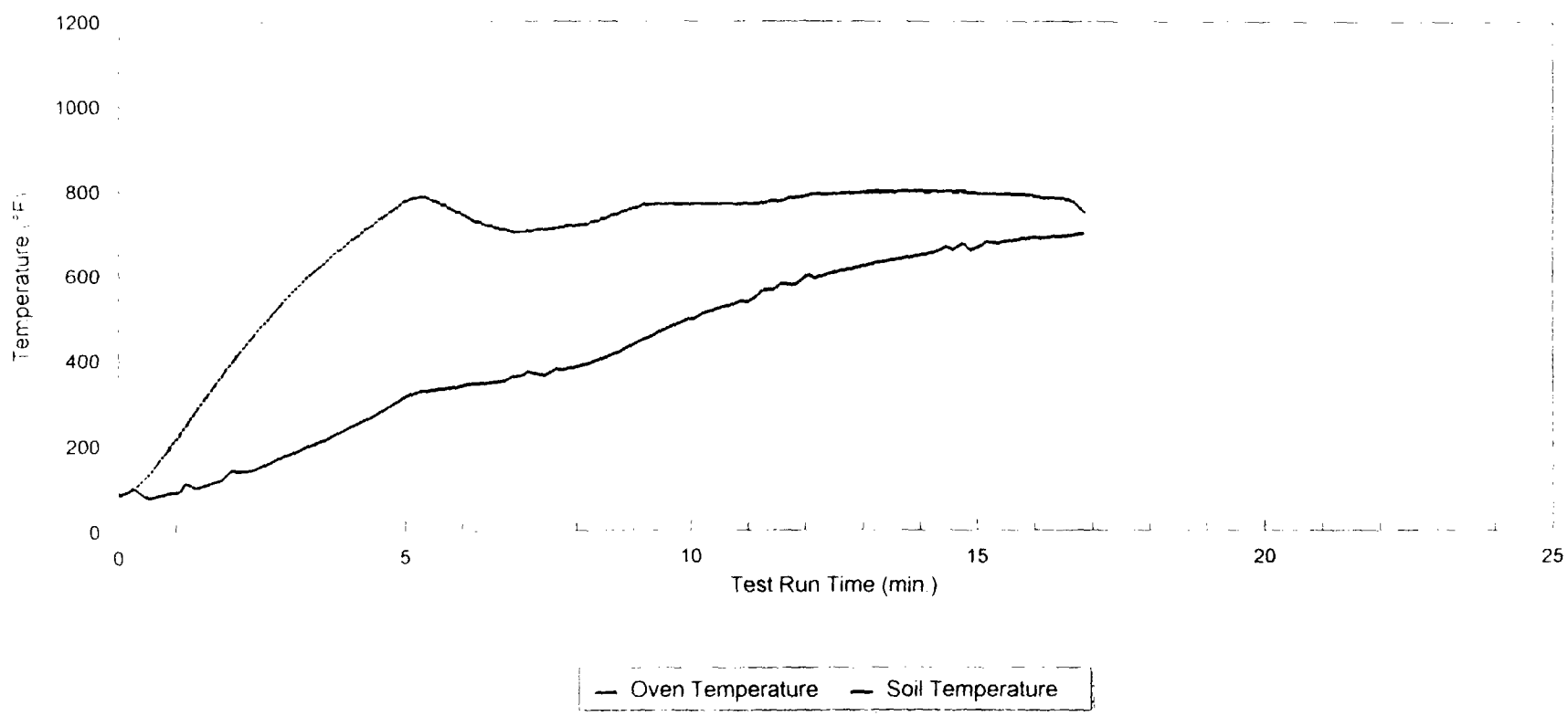


Figure 4-8. Tray Test Temperature Profile : TT2-900

Typical Case Soil, 900°F

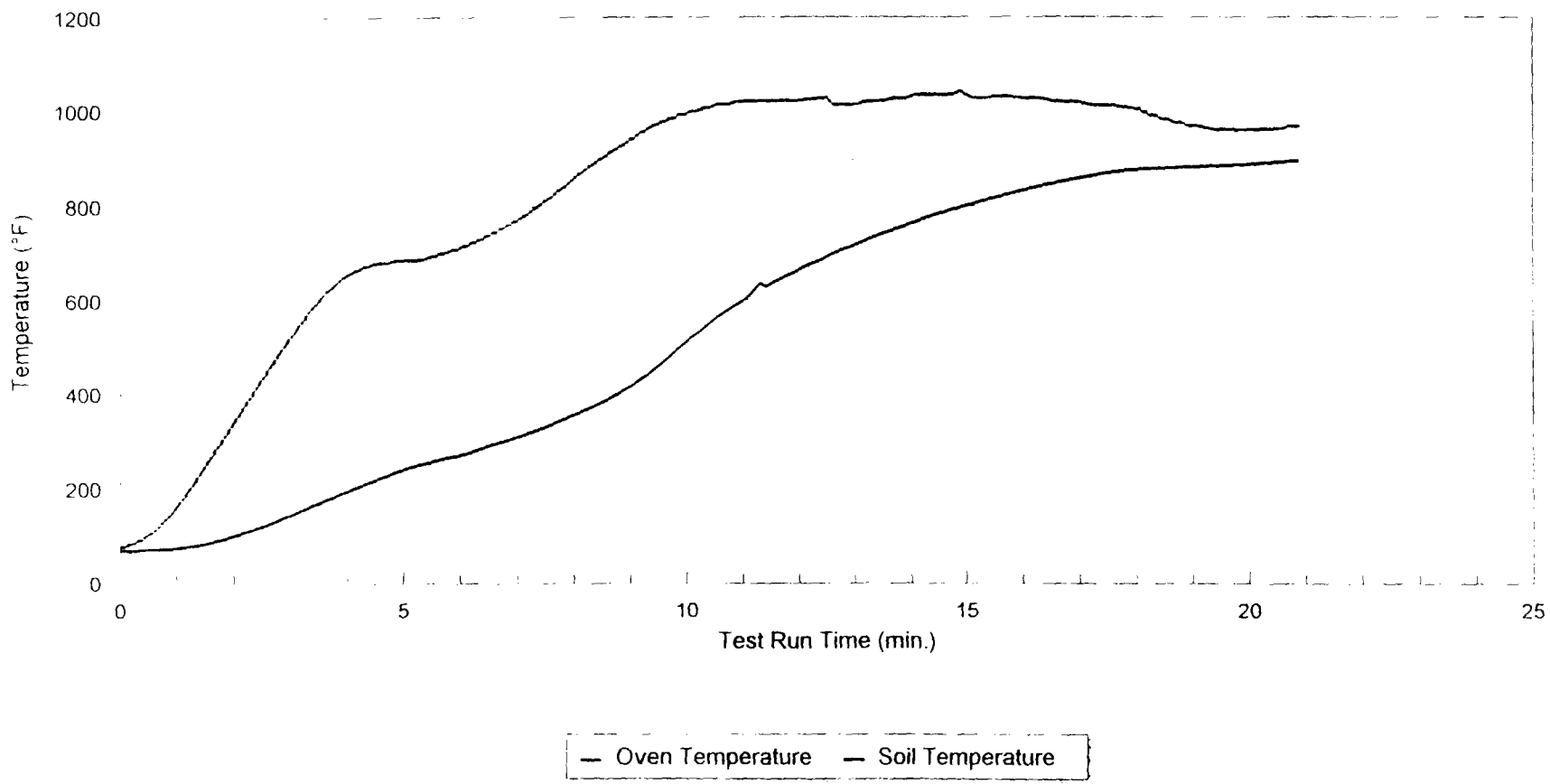
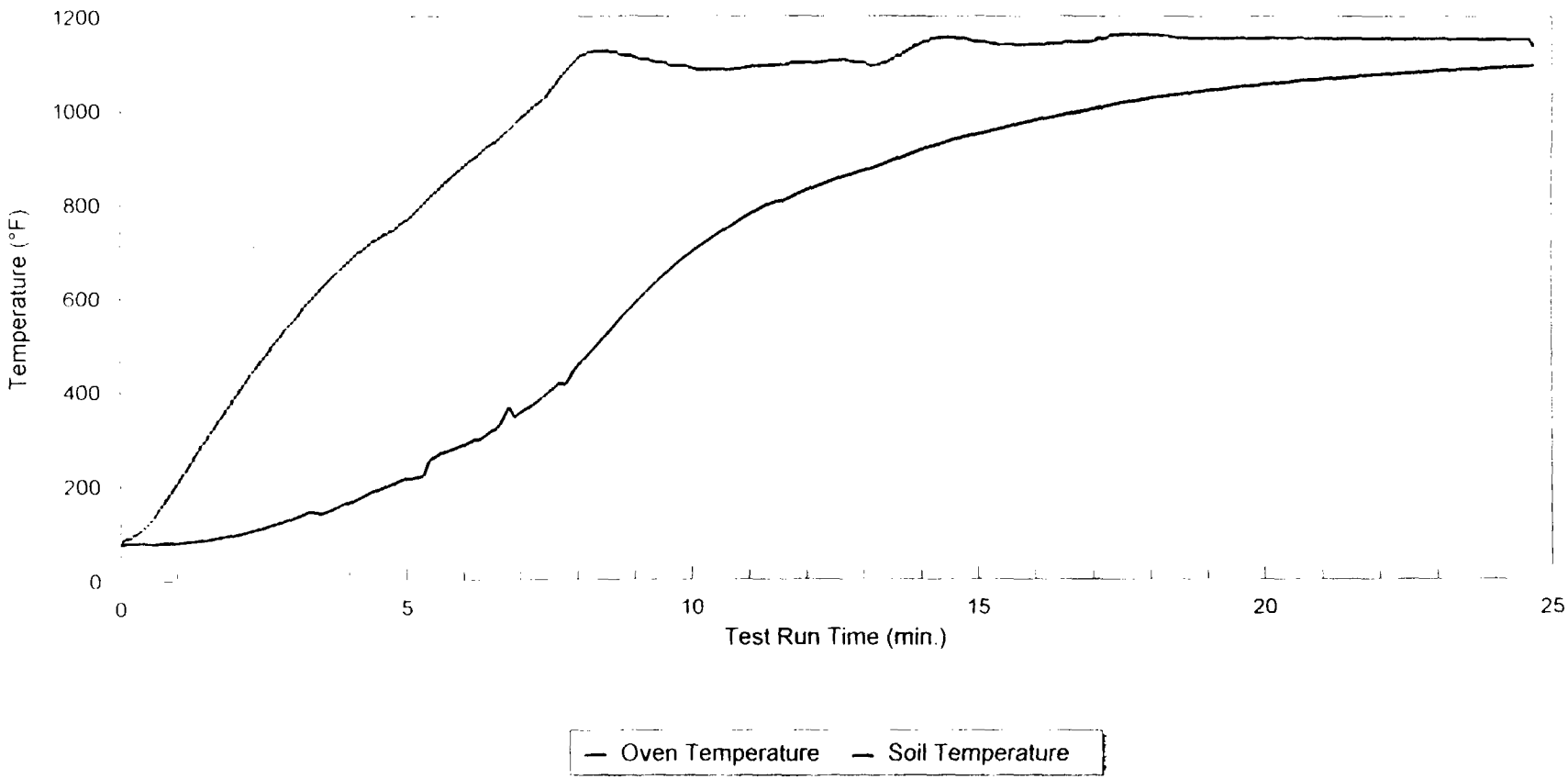


Figure 4-9. Tray Test Temperature Profile : TT2-1100

Typical Case Soil, 1,100°F



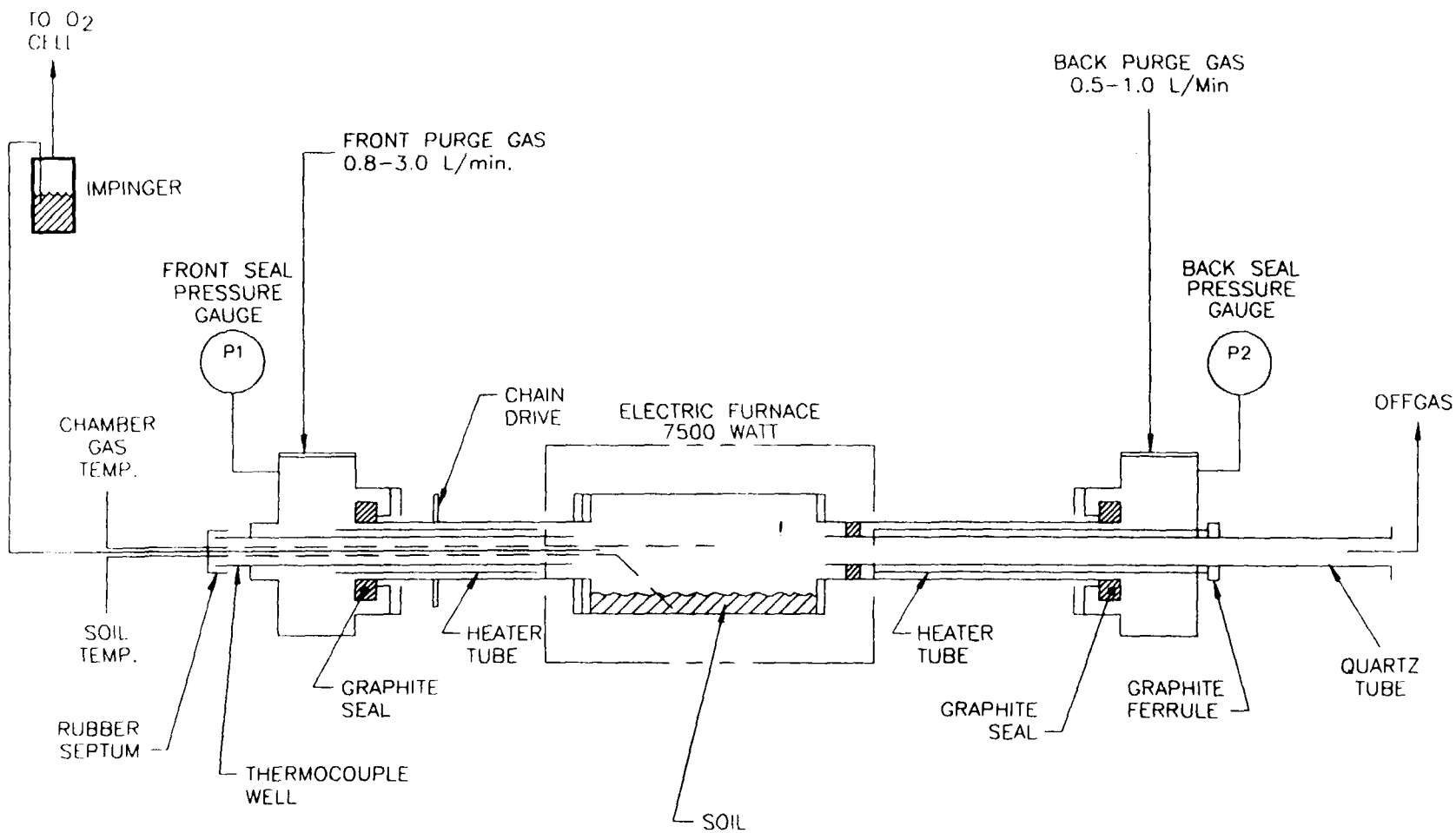


Figure 4–10. Schematic of RTA Test Equipment

11/12/97	ACS-RTA	119406

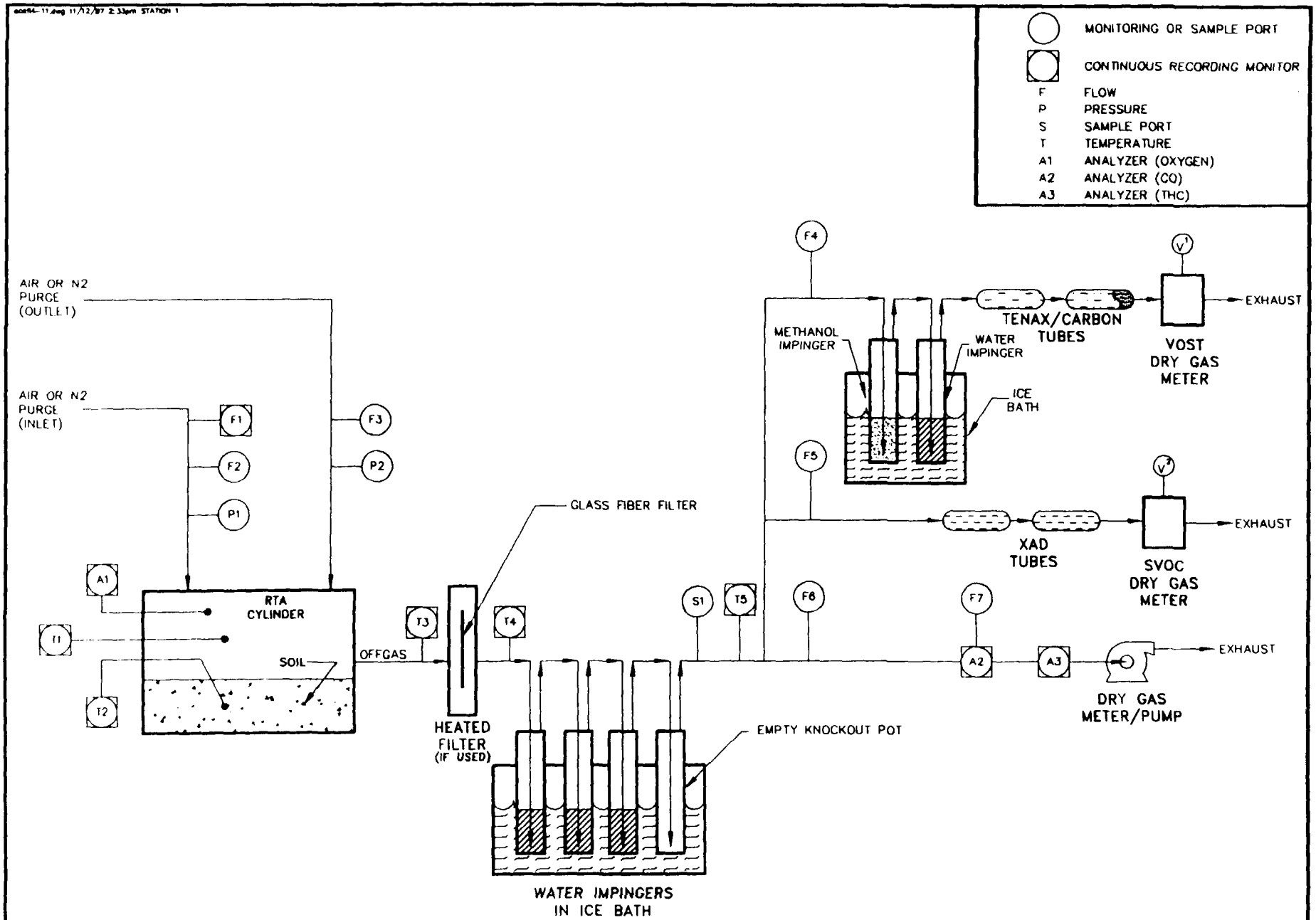


Figure 4-11. General Flow and Monitoring Diagram for RTA Testing

11/12/97	ACSF4-11	119406

Figure 4-12. RTA Temperature Profile : RTA1

Worst Case Soil, Air Purge, 900°F

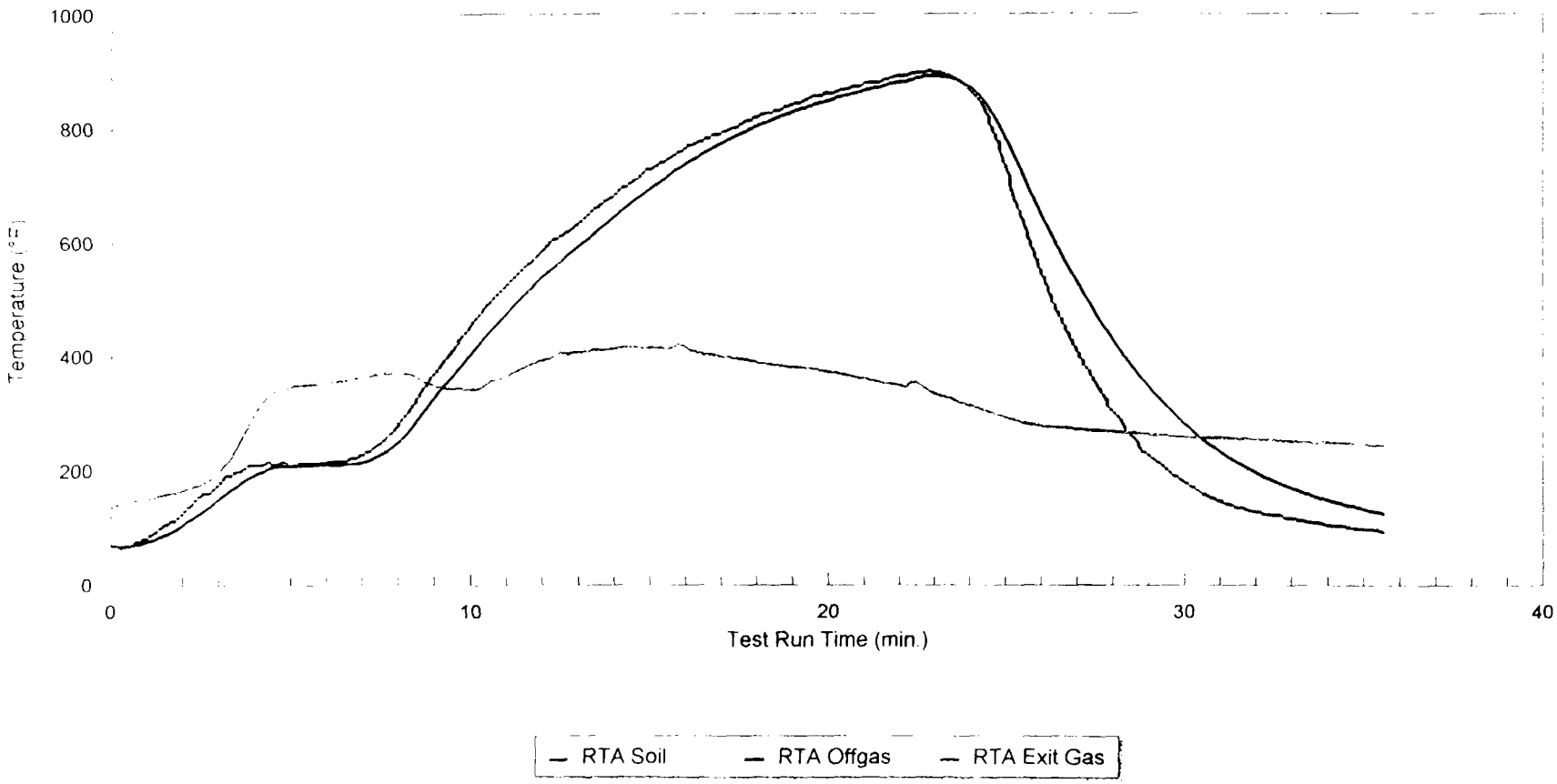


Figure 4-13. RTA Temperature Profile : RTAN

Worst Case Soil, Nitrogen Purge, 900°F

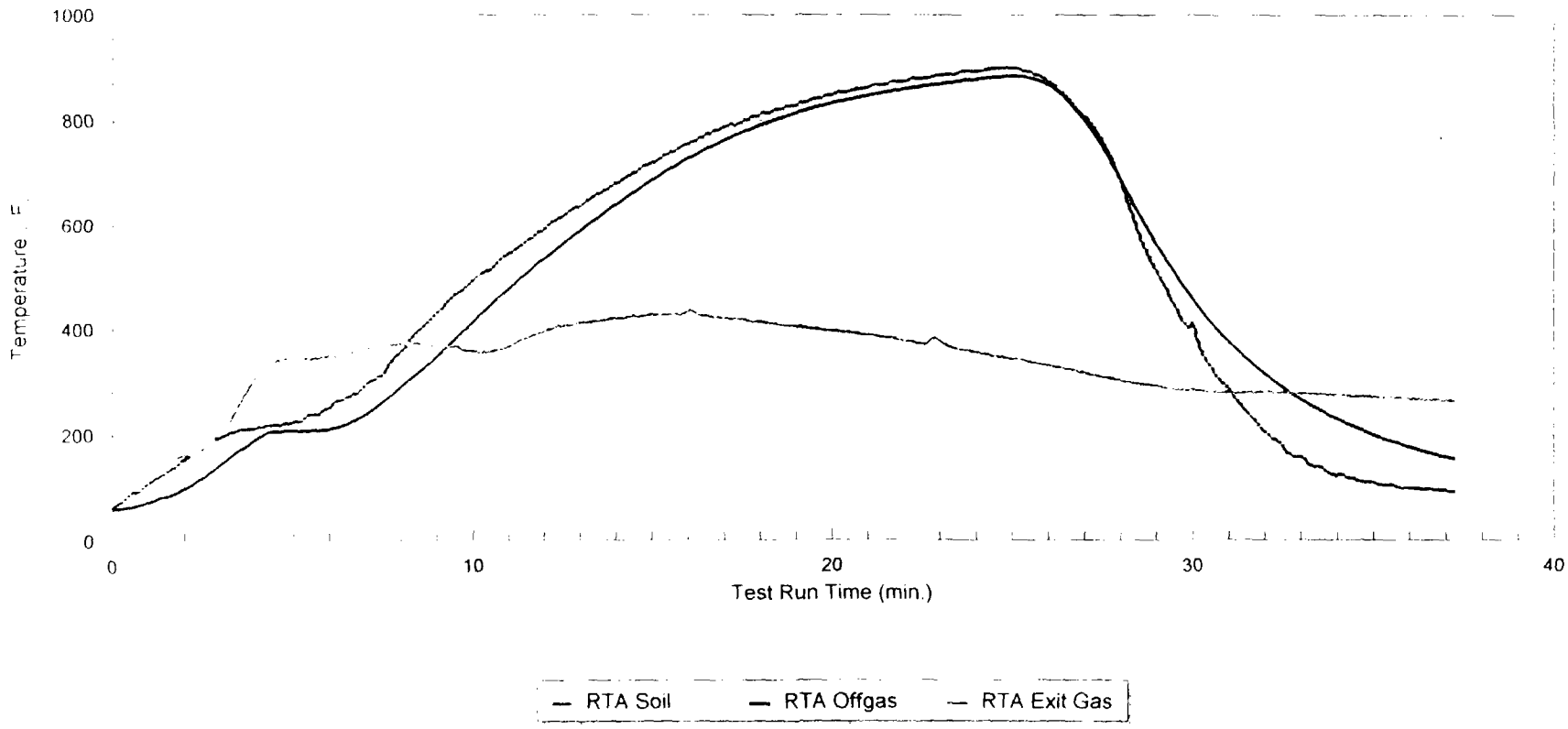


Figure 4-14. RTA Temperature Profile : RTA2

Typical Case Soil, Air Purge, 700°F

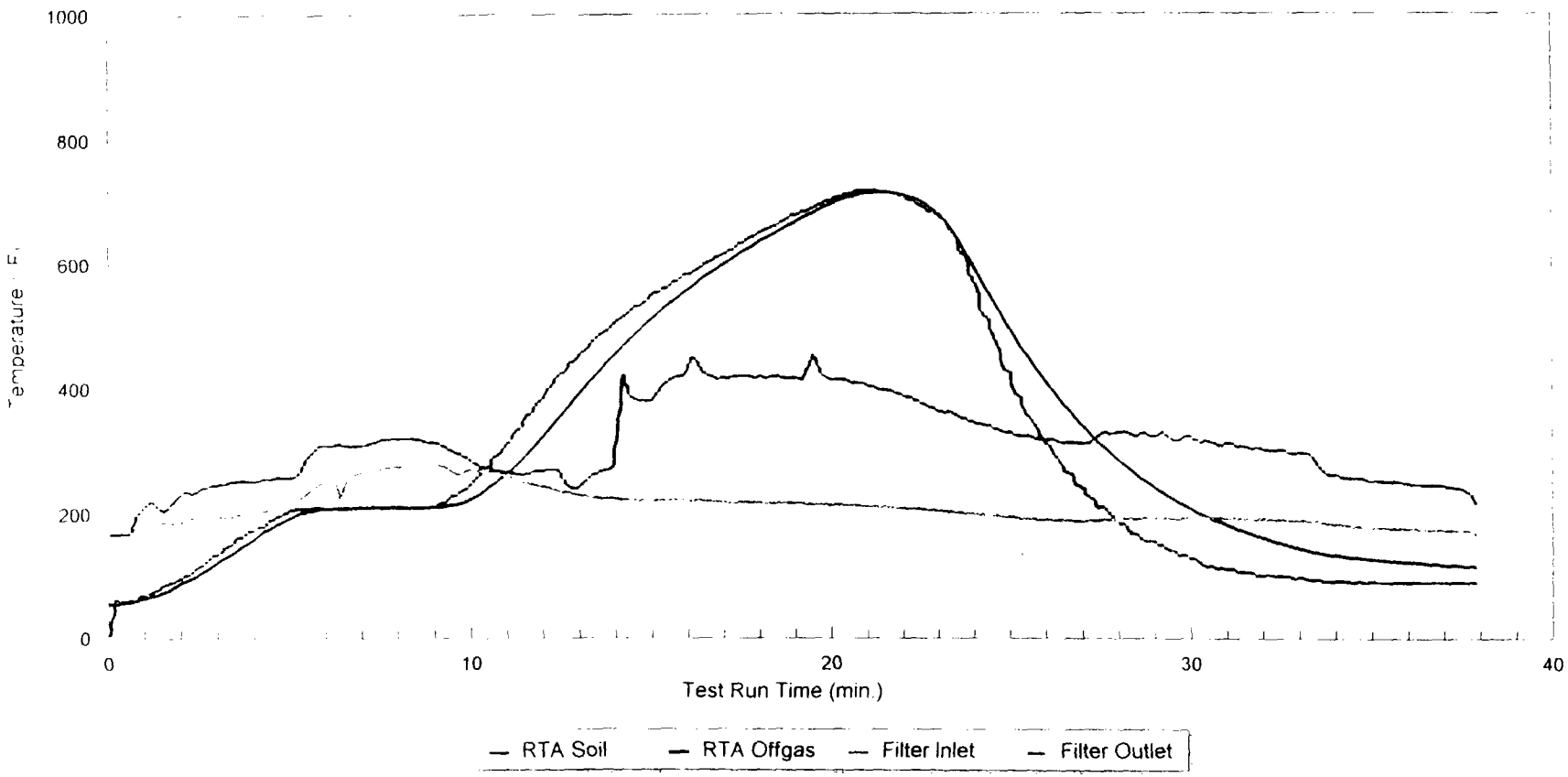


Figure 4-15. RTA Offgas Profile : RTA1

Worst Case Soil, Air Purge, 900°F

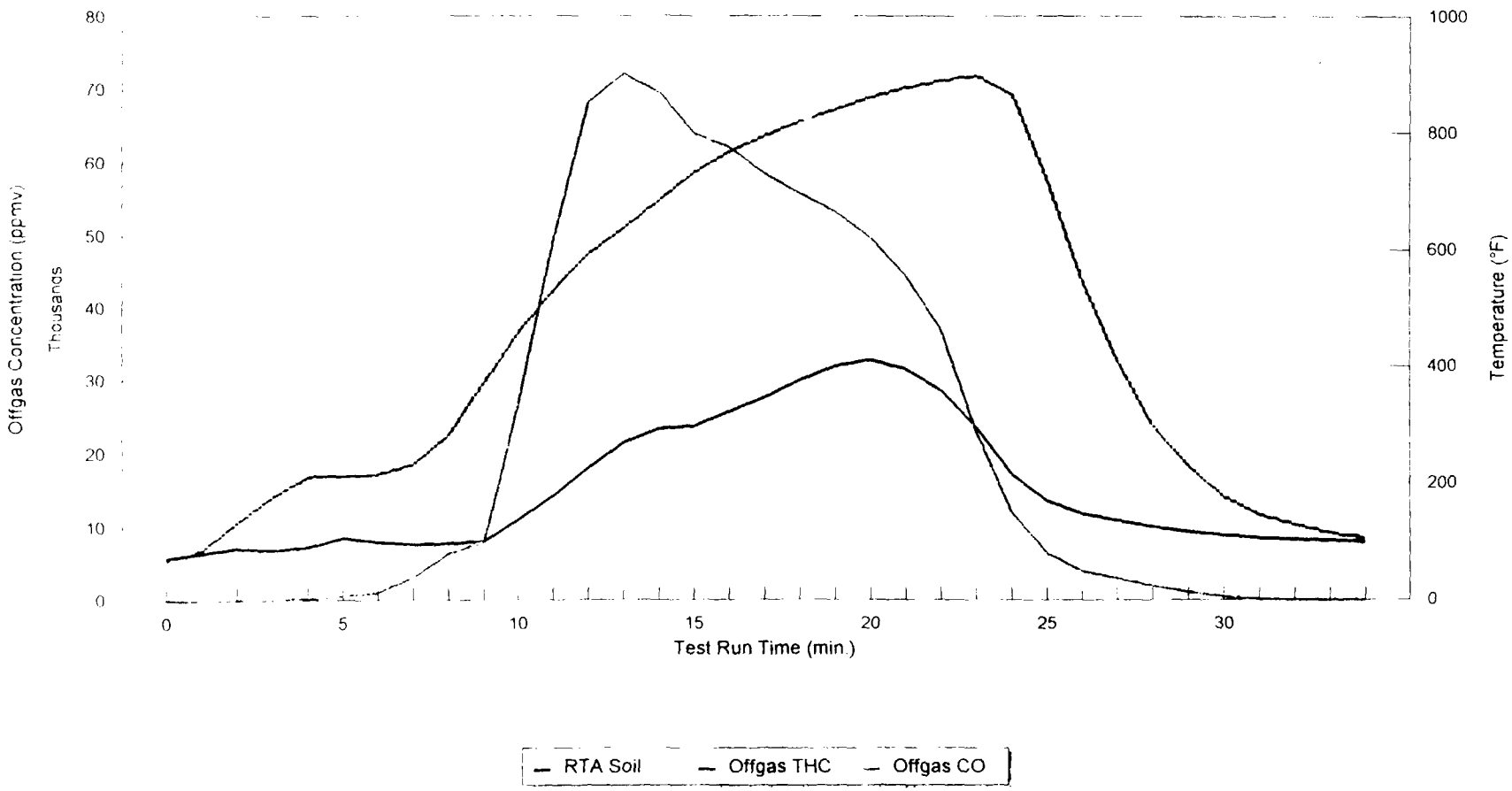


Figure 4-16. RTA Offgas Profile : RTAN

Worst Case Soil, Nitrogen Purge, 900°F

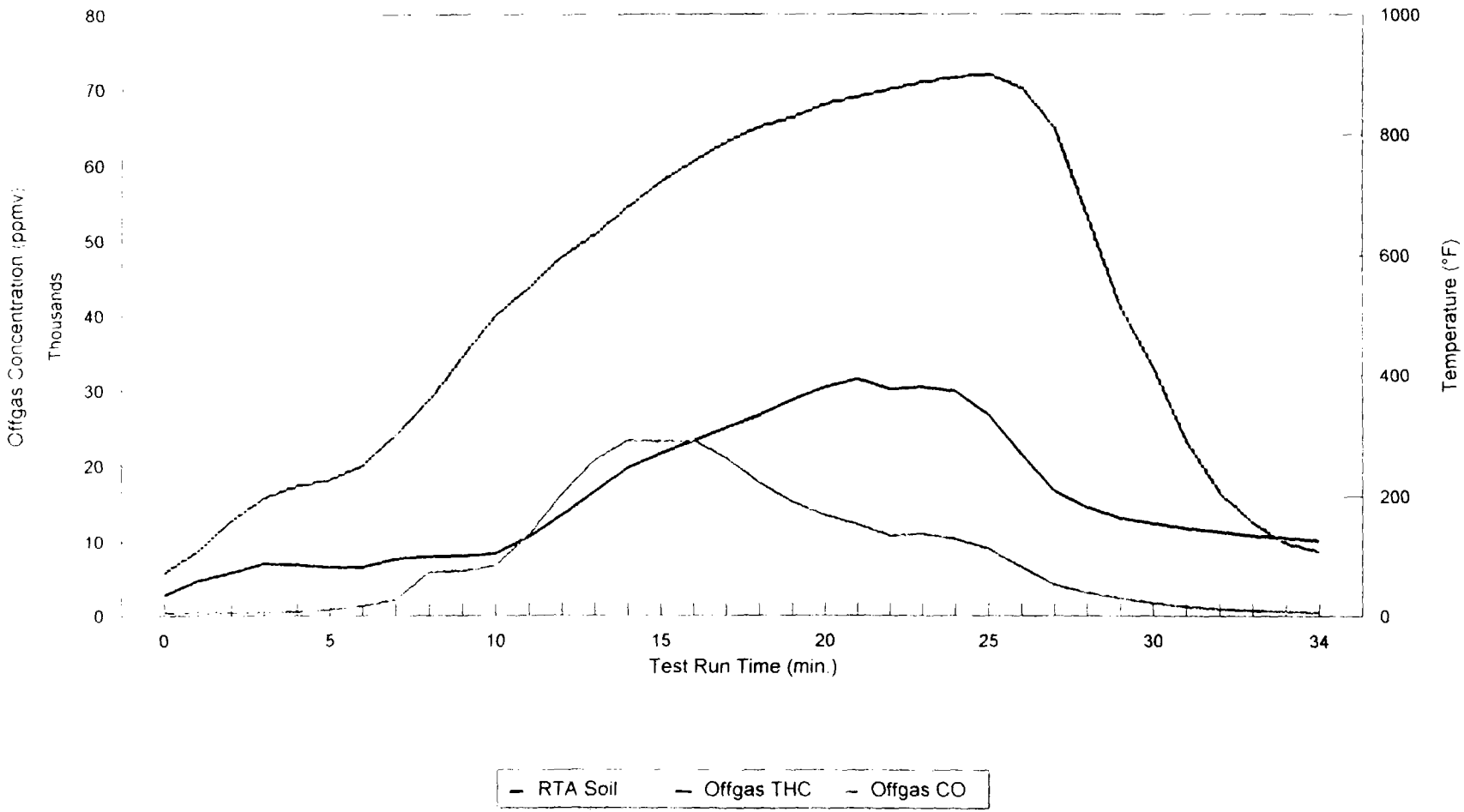
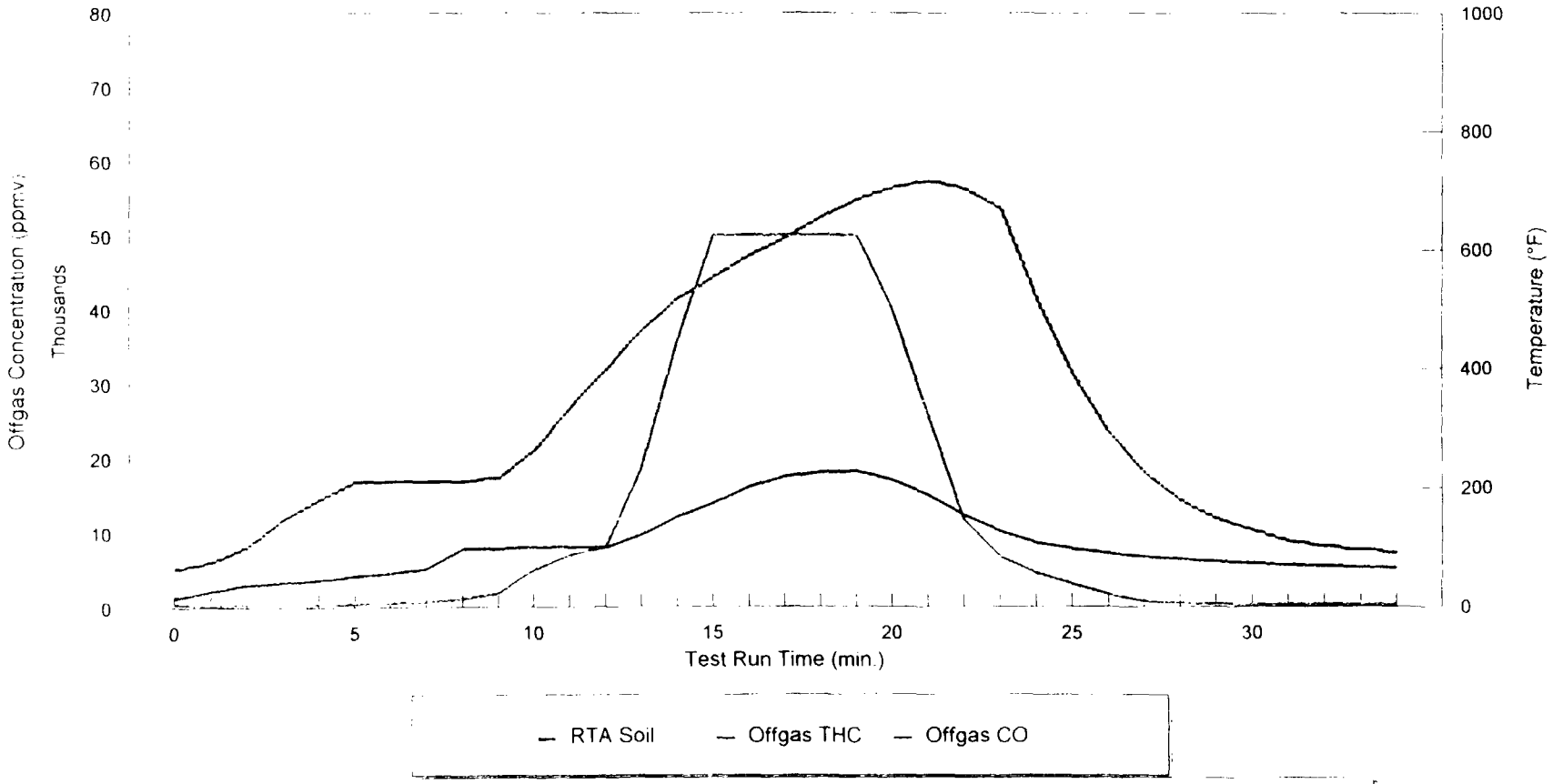


Figure 4-17. RTA Offgas Profile : RTA2

Typical Case Soil, Air Purge, 700°F



Note CO meter was set to read 0 - 5% Subsequent tests were measured at 0 - 10%

PHOTOGRAPHS

P-1 Pictures taken during the execution of the RTA tests are presented in the 'Photographs' section of this report. Each picture is identified by a label in the lower right corner of the photograph (P-1, P-2, etc.). The following section provides a description of each photograph.

P-2 This picture shows the rotating cylinder portion of the RTA system, loaded with the feed soil, as it is being assembled for a test. A graphite packing ring is visible on the right end of the cylinder. System purge gas is introduced through the tubing located at the top of the stainless steel box, to the right of the unit. The soil and offgas thermocouples are located on the right side of this box. Each thermocouple extends approximately 3 feet into the soil test chamber

P-3 The Lindberg furnace is closing around the RTA test cylinder in this photograph. The furnace is preheated to a temperature of approximately 1,000°F and then it is raised to enclose the RTA test cylinder. When the furnace closes, the RTA test begins. The soil is then indirectly heated to the target temperature. The offgas exits to the left of the cylinder, through a 3-foot long quartz tube inside the Incoloy tube.

P-4 This photograph shows the RTA technician taking an offgas grab sample for analysis. A 1-liter syringe was used to pull a sample of the RTA offgas when the soil treatment temperature reaches values chosen prior to the test. The offgas in the syringe was forced into a Tedlar bag, the bag was labeled, and then analyzed following the RTA test. The sampling point was after the chilled impingers

P-5 This device is one of the dry gas meters/pumps used to draw a portion of the offgas through the sampling media (i.e., Tenax or XAD resins) The dry gas meters/pumps measured the flow rates and/or volumes for the streams during each test. The offgas was routed through two Tenax resin tubes (for VOCs) and two XAD resin traps (for SVOCs and PCBs). The Tenax resin/resin charcoal tube pair is visible at the top of the lab stand. The two XAD resin traps are lower just to the right of the lab stand

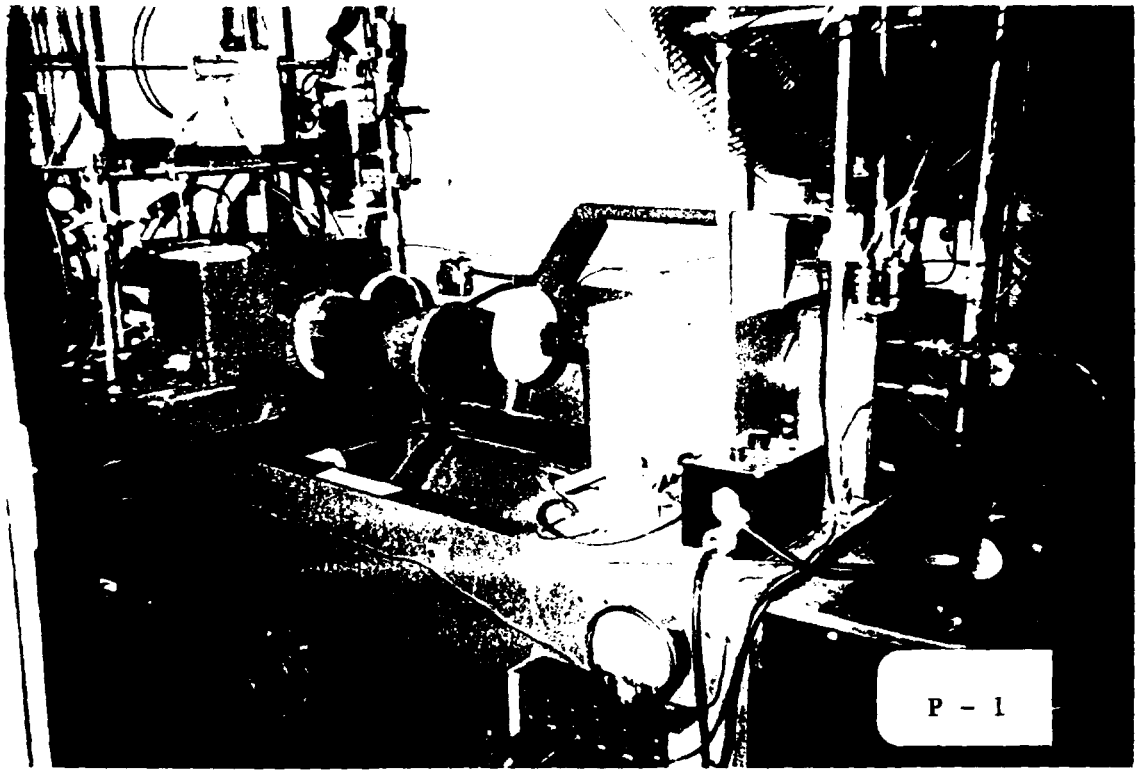
P-6 These analyzers monitored the offgas stream continuously during the RTA tests. The monitor on the left measured the THC concentration and the smaller unit on the right measured the concentration of CO The data values for both THC and CO were continuously logged into the computer shown on top of the THC monitor

PHOTOGRAPHS

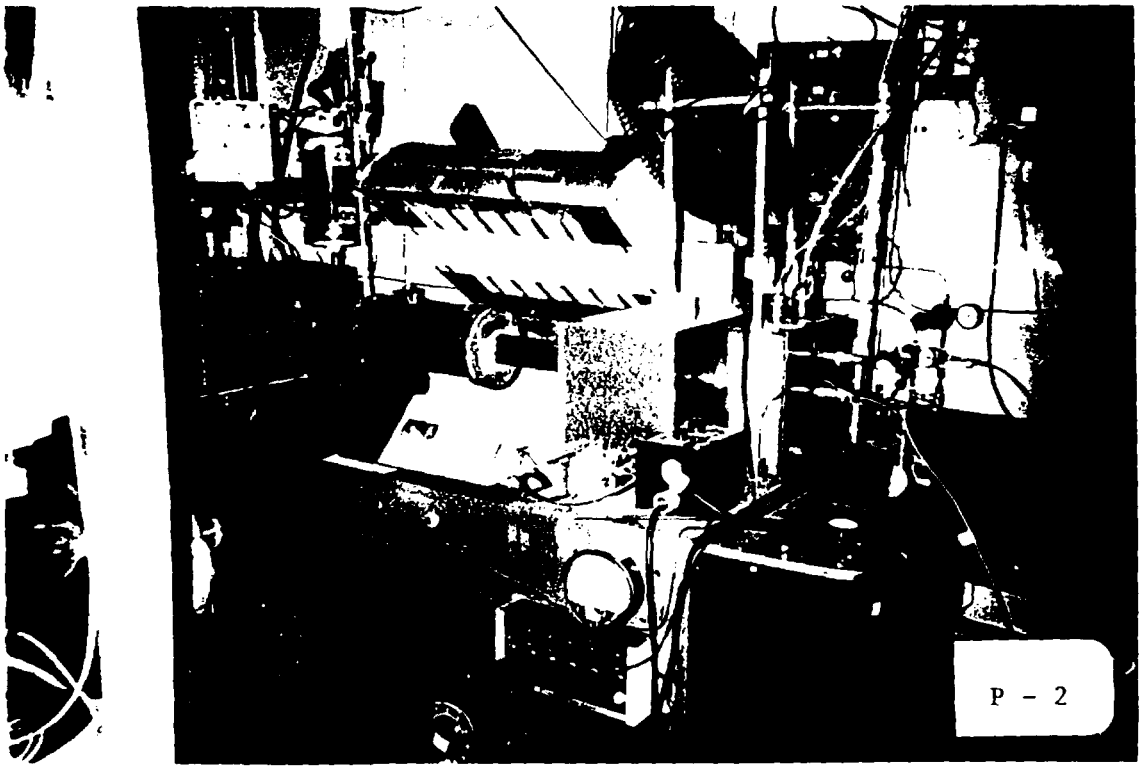
P-7 In this picture, the RTA technician is removing the thermally treated soil from the RTA test cylinder The soil was cooled to less than 100°F, transferred from the test cylinder to a tared weighing dish, weighed, and then divided into aliquots for various analyses.

P-8 This photograph shows the first impinger of the offgas stream. The heated filter was not used for this RTA test. Although only a brownish-black liquid is visible in this picture, after approximately 2 hours two distinct layers formed. An approximate 3/4-inch organic layer on top was separated from the water layer. Each layer was collected separately and weighed.

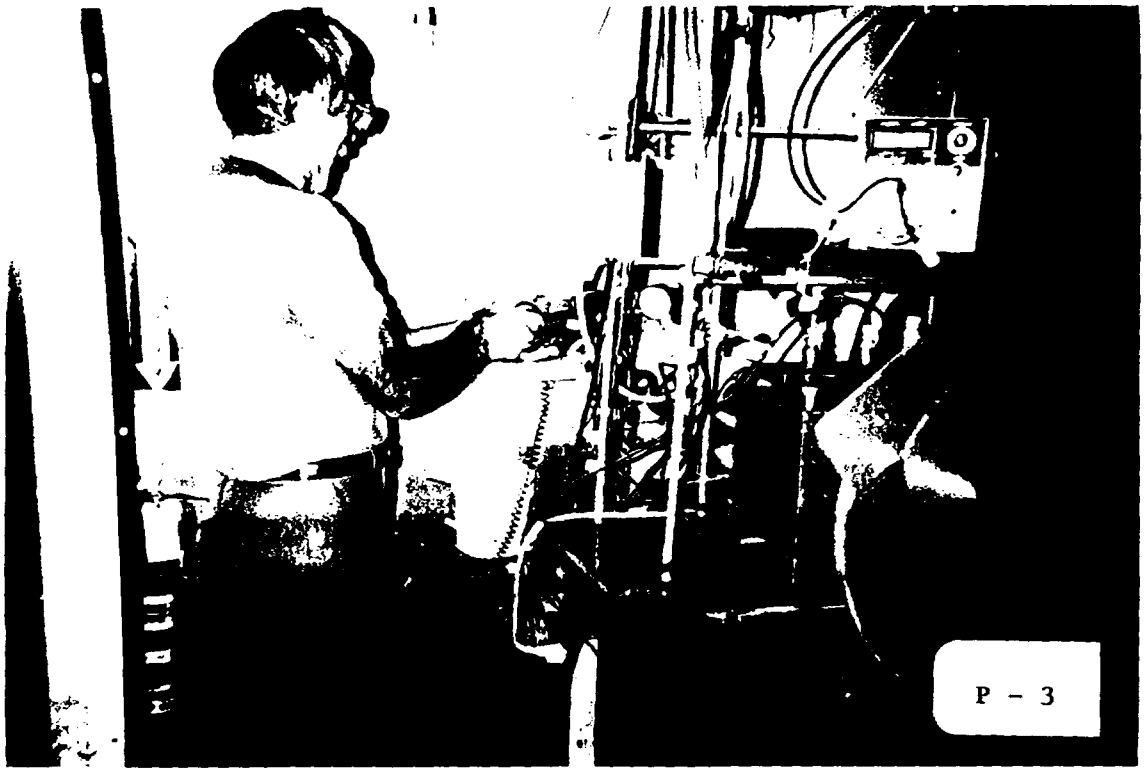
P-9 This photograph shows the second impinger of the offgas stream. As with photograph P-7, the heated filter was not used for this RTA test. A small organic layer is present above the water layer. All organic layers for a test were combined for sample analysis as were all water samples. Each layer was analyzed separately.



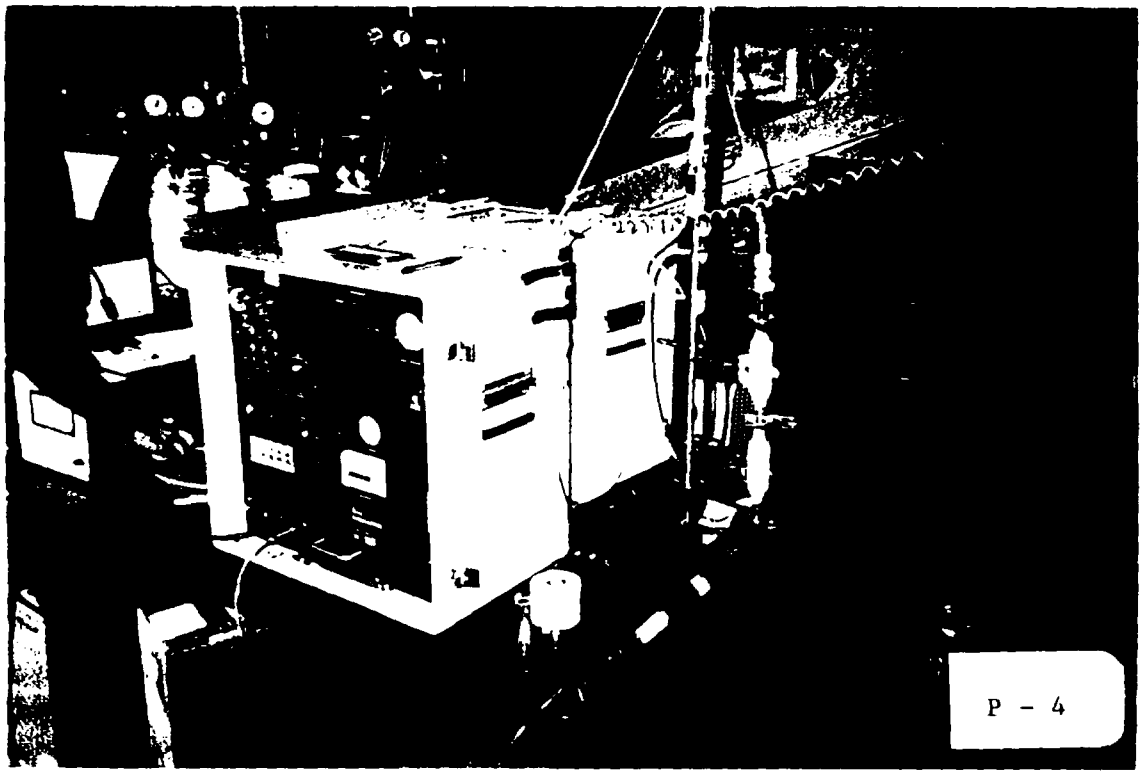
P - 1



P - 2

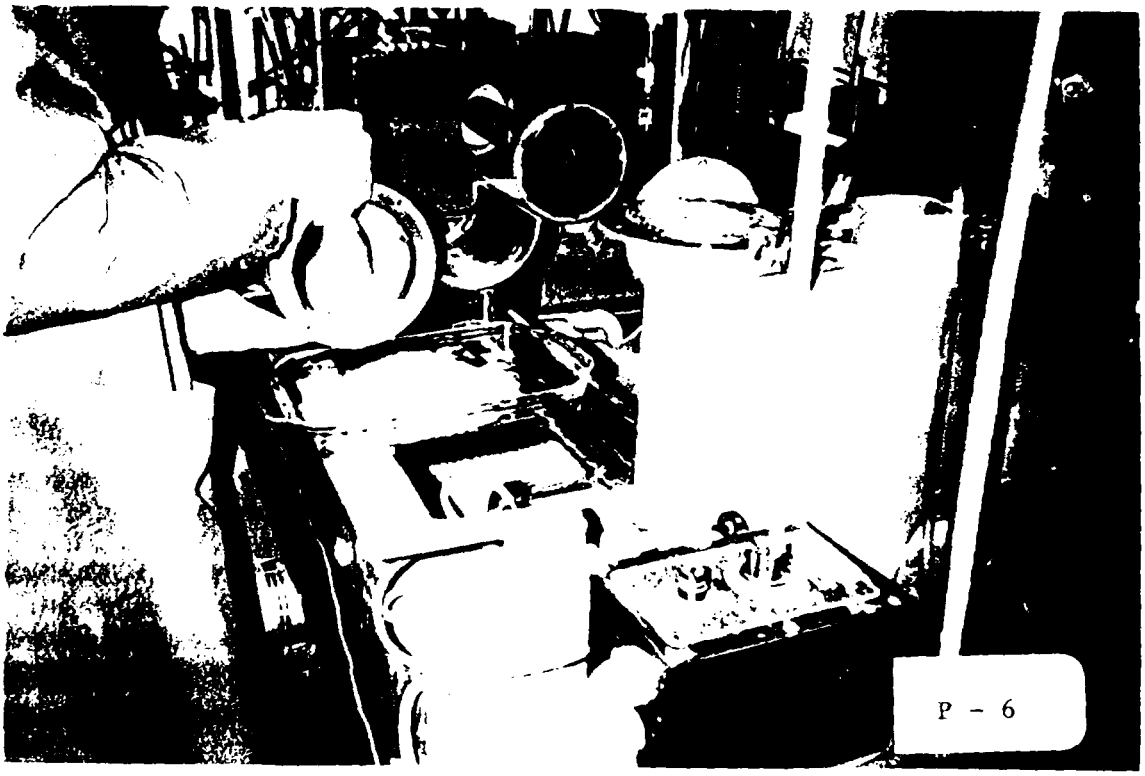


P - 3



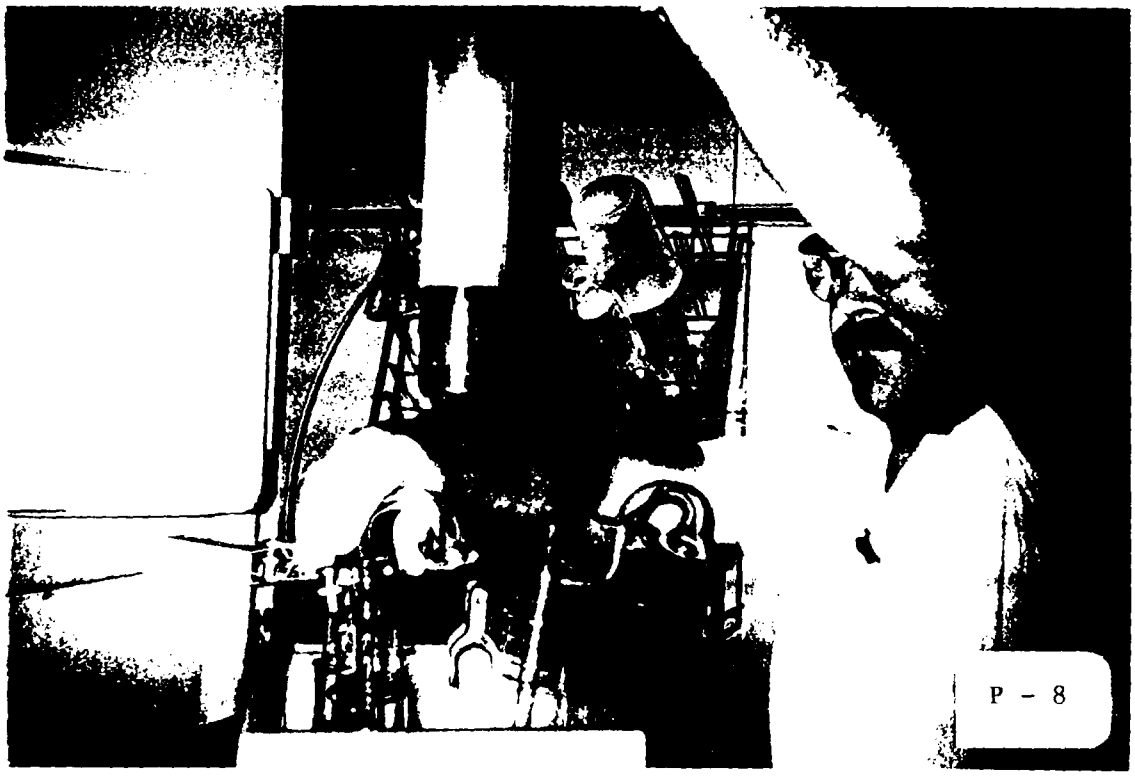
P - 4

P - 5



P - 6

P - 7


P - 8

APPENDIX A

Appendix A

Treatability Test Logbook

Project Name FUELS 100

Project Number

1153:004

Analytical Requirements for Feed composites . Table D4.3
- TO IEA labs.

- Triplicate samples for VOC's on composite SC1 - Single SC2
- Triplicate sample for SVOC on composite SC1 - Single SC2
- Duplicate samples for PCB on composite SC1 Single SC2
- Single sample for Dioxins/furan on SC1 - Single SC2
- Duplicate sample for Total metals for SC1 - single SC2
- Single sample for TCLP metals on SC1 - single on SC2

- Samples to Galbraith

  - for Ultimate & Proximate analyses - Duplicate for SC1 - Single SC
  - for Leachable chlorides Single sample for SC1 & SC2
  - for Ash Fusibility Single sample for SC1 & SC2
  - for soil pH - Single sample for SC1 & SC2
  - Heating Value Duplicate for SC1 - Single for SC2

- For GEO testing - IT-GEO

  - Single bulk sample for defined testing for SC1 & SC2

Sample ID #	Description
= 1153-04-1	Composite SC1 for GEO testing
# 1153-04-2	Composite SC2 for GEO testing
RFA# 472913	
#1153-04-3	Composite SC1 for Galbraith - all analyses
-4	Composite SC1 for Galbraith - Ultimate - Proximate & BT
#1153-04-5	Composite SC2 for Galbraith - all analyses
RFA # 472912	

next page for analytical parameters continued

Samples from RFA# 472912 returned from Galbraith on 9/3/97
no analyses performed - lab unable to handle samples with PCB > 50 ppm

- resubmitted to on RFA# 472915

Entries by

Date 8/28/97

Project Name Fours ACS

Project Number 772686

1153:005

SAMPLE ID#	DESCRIPTION
#1153-005 - 1	40ml VIAL SOIL SC1 for VOC
#1153-005 - 2	DUPLICATE SAMPLE SC1-D
#1153-005 - 3	SPIKE DUPLICATE SAMPLE SC1-M.
#1153-005 - 4	8oz jars SOIL SC1 for SVOC
-5	DUPLICATE SAMPLE SC1-D
-6	SPIKE DUPLICATE SC1-M.
-7	8oz jar SOIL SC1 for PCB's
-8	DUPLICATE SC1-D PCB
-9	8oz SOIL SC1 for DIOXINS/FURANS
-10	8oz jar SOIL SC1 for TOTAL METALS
-11	DUPLICATE SAMPLE SC1-D
-12	8oz SOIL SC1 for TCLP METALS
#1153-005 -13	SOIL SC2 VOC. 40ml VIAL
-14	SOIL SC2 8oz jar SVOC
-15	SOIL SC2 8oz jar PCB
-16	SOIL SC2 8oz jar DIOXINS/FURANS
-17	SOIL SC2 - TOTAL METALS 8oz
-18	SOIL SC2 - TCLP METALS 8oz

RFA# 472911 2 pages
shipped.

New Thermocouple for tray test furnace.
calibrated 8/29/97.

ID# 03509 - center) for furnace #1 (A) — reads ~1° low @ 300.
03511 - sample. — reads -1.5 @ 100, -2° low @ 300, -3.5° low @ 700

ID # 03510 - center for furnace # 2 (B) — - off <1° @ all pts.
03512 - sample — reads - 1.6° low @ 100, - 1.7 @ 300, - 2.6 @ 700

Entries by [signature] Date 9/3/97

Project Name FOCUS TLB

Project Number 772686

1153:006

Tray Test #1
Target temp = 1100°F (593°C)
Time @ temp (soil) = 0 min
air purge ~ 100 cc/min

Computer File
FARSC211
oven #1
unheated soil pt = 610°C

Feed Sample ID
SC-2
Typical Soil Composite.

tare wt of tray 451.27
+ untreated soil 561.94 (depth ~8 mm average)
picture ✓
net 110.67 g.

+ treated = 539.08 g. net = 87.81
picture ✓
Loss = 20.66%

Time	Pt #16 (oven)	Pt #17 (soil)	Comments
1 min	106	27	- sample contains some debris (rocks)
min	197	35	
5 min	413	102	
7 min	526	175	- smoke coming from oven.
10 min	575	378	- still smoking slightly.
11 min	587	412	
min	593	444	- slight smoke.
min	623.	494	
16 min	615	524	set pt to 617°
18 min	627	551	
20 min		568	
22 min	622	580	
min		588	
24:40		590	

AC 1/3

stop test. too
surface of soil appears uniform
- subsurface may be charred

FR ← charred spot

Residue Sample ID #1153-006-1R. (TT2-1100)

- subsurface charred. below ~ 3-4 mm

Entries by [signature]

Date 9/3/92

Project Name Focus ACS

Project Number 772686

1153:007

Tray Test #2
target temp = 900°F (482°C)
time @ temp = 0 min (soil)
Ar purge ~ 100 cc/min

Computer file
FACSC209
oven #2
initial set pt = 495°C

Feed Sample ID
SC-2
Typical soil composit

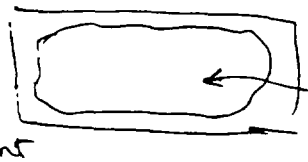
tare wt of tray = 448.09
+ untreated soil = 561.11 (~ 8 mm deep)
picture ✓
net = 113.02

+ treated = 539.86
picture ✓

net: 91.77
loss = 18.8%

Time	Pt #18 (oven)	Pt #19 (soil)	Comments
1 min	65	24	
2 min	161	37	
5 min	362	111	
7 min	410	154	
9 min	499	209	oven smoking
11 min	549	314	still smoking
13 min	547	381	– smoking lightly
14 min	553	404	– still smoking lightly
16 min	555	443	set pt to 490°C
17 min		457	set pt to 480°C
18 min	542	468	
19 min		472	set pt to 485
20 min		475	set pt to 490°C
21 min		480	
for 9/9			

start test t=0



front

– almost all of centerline of soil surface charred.

Residue ID# 1153-007-1R
– subsurface greyish color.

Project Name Focus 1153

Project Number 772686

1153:008

Tray Test #3
Target temp = 700°F (371°C)
time @ temp = 0 min (soil)
on purge.

Computer File
FACSC207
initial set pt = 390°C
oven #1 (oven 4)

Feed Sample ID
SC2
Typical soil Composite

tare wt of tray = 451.21
+untreated 563.39
picture ✓ net = 112.18

+treated = 545.20
picture ✓

net = 93.99
Loss = 16.22%

Time	Pt #16 (oven)	Pt #17 (soil)	Comments
min	98	32	
3min	296	88	
5min	406	155	
7min	374	184	set pt to 405 - oven smoking
9min	407	220	set pt to 395 @ 10 min
10min		263	- still smoking
12min		304	
15min	423	353	set pt to 385°C
16min		363	still smoking
16:50		370	stop test - t=0

- sample removed - entire surface charred - smoked when removed from oven.

Residue ID# 1153-008-1R
subsurface is grayish to tan color. lighter than surface.
- some puffed charballs present.

Entries by [signature]

Date 9/3/97

Project Name Focus AES

Project Number M2686

1153:009

Tray Test # 4
target temp = 500°F (260°C)
time @ temp = 0 min (soil)
air purge ~ 100 cc/min

Computer File
FAESC205.
initial set pt = 275°C
oven #2 (main B)

Feed Sample: 17
SC-2
Typical Soil Composite

tare wt of tray = 448.04
untreated = 562.68
picture ✓ net = 114.64 g

untreated = 547.13 net = 99.09
picture ✓
loss = 13.56%

Time	Pt #18 (oven)	Pt #19 (soil)	Comment
1 min	72	29	
2 min	144	45	
5 min	220	84	
7 min	254	106	- oven smoking slightly
9 min	256	129	- smoke heavier set pt to 285°C
10 min	263	136	
12 min	275	149	
14 min		164	
16 min	286	174	set pt to 300 @ 17m
17 m		183	
18 min		200	Set pt back to 285
19 min		221	Still smoking moderately
20 min		244	
20:50		260	stop test two
		heavy smoke when oven opened.	- surface not charred - slightly discolored. - remove tray - cover + let cool.

surface has a sort of dark brown glaze - start of charring possibly
subsurface ~~and~~ brown color not charred
- slight odor of charring

Residue ID# 1153-009-1R

Entries by [signature] Date 9/3/97

Project Name Focusing

Project Number 772686

1153:010

Tray Test #5
target temp = 1100°F (593°C)
time @ temp (soil) = 0 min
air purge ~ 100 cc/min

Computer File
FARS C111
initial soil pt = 610°C
oven #1 (oven A)

Feed Sample ID
SC1
Worst Case Composite

tare of tray = 951.21
+untreated 567.72
picture ✓
net = 116.51 g

+treated = 545.67
picture ✓

net = 94.96
loss = 18.93%

Time	Pt #15 (oven)	Pt #17 (soil)	Comments
1 min	99	25.	
2 min	205	37	
5 min	451	136	oven smoking strongly
7 min	~~192~~ 561	~~5~~ 193	still smoking strongly.
9 min	600	319	- smoke slightly less.
12 min	594	448	- still smoking
14 min		496	- smoking lightly.
16 min		528	soil pt to 620°C
17 min		541	
18 min		553	
20 min		571	
22 min		583	
23 min		586	
23:40		590	stop test t=0

- surface a uniform brown
- subsurface charred.

Residue ID# 1153-010-1R.

Entries by [signature]

Date 9/3/97

Project Name FOCUS ACS

Project Number 772686

1153:011

Tray Test #6
target temp = 900°F (482°C)
time @ temp (soil) = 0 min
air purge ~ 100 cc/min

Computer File
FACSC109
initial setpt = 485°C
oven #2 (oven B)

Feed Sample ID
SC 1
Worst Case Composite

tare wt of tray = 448.00
untreated = 564.82
picture ✓ net = 116.82

+ treated = 544.16
picture ✓

net = 96.16
loss = 17.69%

Time	Pt #16 (oven)	Pt #19 (soil)	Comment
1 min	70	31	
3 min	368	149	- oven smoking moderately
5 min	397	194	- smoking more strongly
7 min	456	263	
9 min	516	313	setpt 485 @ 10 min
11 min	524	385	still smoking
12 min		403.	still smoking
14 min		440	
16 min	511	461	
17 min		469	
18 min		475.	
19 m		482	stop Test two

some glowing embers, - light smoke when door opened

entire surface charred - also some puffed textbelt.
- subsurface more grey to sandy brown color

Residue ID # 1153-011-1R

Entries by

Date 9/3/92

Project Name FOCUS ACS

Project Number 77268

1153:012

Tray Test #7
target temp = 700°F (371°C)
time @ temp (soil) = 0 min
air purge ~100 cc/min

Computer File
FACSC107
control set pt = 390°C
oven #1 (oven A)

Feed Sample ID
SC1
Worst Case Composite

tare wt of tray = 451.17
untreated 563.64
picture ✓ net = 112.67

treated = 546.67
picture ✓

net = 95.70
loss = 15.06%

Time	Pt #16 (oven)	Pt #17 (soil)	Comments
min	111	32	
2 min	207	44	
5 min	420	141	oven smoking moderately
7 min	390	164	set pt to 405 - still smoking
9 min	400	200	still smoking
10 min		245	set pt to 390 @ 10 min
min	414	293	
14 min		328	
15 min		342	
16 min		370	stop test time

remove tray & cover to cool.

Sample still smoking when door opened and for several second after - entire surface appears charred
subsurface not as black -
more gray & sand brown.

Residue ID# 1153-012-1R

9/2/02

Project Name Focus-ACS

Project Number 77268

1153:013

Tray Test #8	Computer File	Feed Sample ID
~~target temp~~ - 500°F (260°C)	FACSC105	SC1
time @ temp (soak) 30 min	switches set pt - 275°C	Worst Case Composite
air purge ~ 100 cc/min	oven #2 (oven B)	

tare wt of tray = 447.95 + treated = 551.49 net - 103.44
+ untreated = 565.11
picture ✓ net = 117.16
picture ✓

Time	Pt # 18 (oven)	Pt # 19 (soil)	Comments
1 min	81	32	
2 min	148	47	
7 min	261	116	- oven smoking slightly
9 min		137	set pt to 280° - smoke a little heavier
10 min		145.	
12 min	282	156	
14 min		164	set pt 285.
16 min	295.	178	still smoking - not heavily
17 min		190	set pt to 290
18 min		211	set pt to 280
19 min		229	smoke a little heavier
20 min		243	
21 min	297	254	
21:30		260	stop test t=0 - remove tray & cover

- surface has brown glaze - burnt odor
- start of puffing after ball.

Residue ID# 1153-013-1R

Date 6/3/97

Project Name FOCUS/ACS.

Project Number

1153:014

Sample aliquot cross reference

Sample Source	ID	wt (mg)
Test #1 - SC2 - 1100F	6V, 6S, 6P	6.08, 31.7, 30.7 g
#2 900F	7V, 7S, 7P, 7T	5.01, 29.0, 28.9, 28.8 g
#3 700F	8V, 8S, 8P	7.0, 32.5, 32.4
#4 500F	9V, 9S, 9P, 9T	5.7, 30.4, 31.2, 31.0
#5 - SC1 - 1100F	10V, 10S, 10P,	6.0, 31.4, 32.5
#6 900F	11V, 11S, 11P, 11T	5.1, 30.3, 29.9, 30.6
#7 700F	12V, 12S, 12P	6.4, 31.3, 32.1
#8 500F	13V, 13S, 13P, 13T	5.6, 30.06, 30.15, 31.14

_V = sample for VOC
_S = sample for ~~PCB~~ AC.01/12 SVOC
_P = sample for PCB
_T = sample for Dioxins/Furans

Entries by C. Gro

Date 11/13/92

Project Name FOCUS ACS

Project Number

1153:043

RTA Test # 1
target temp = 700°F
time @ temp (soil) = 0 min
air purge inlet ~1 l/min
outlet purge ~ 0.5 l/min
- pull vacuum to maintain -ve (slight

Computer file
~~FACSR700~~ to 10/8
FACSC2
preheat to 600°C

Feed Soil SC2
typical composite

Pt #1 - soil
2 gel
3 oven
4 htr
5 filter out
7 -
6 - htr
8 - filter in
12 - impinger out
condensate @ impinger inlet 30 O_2

tare of bowl = 127.17
+ untreated soil = 1109.41

Time	Pt #1	O_2
0	16	-
2 min	31	
5 min	98	
8 min	100	
9 min	102	
20 min	373	
24 1/2 min		
35 min		

— stop test
shut off ext heater
- stop cooling - shut off purge gas

tare of clean tray = 1045.42
+ treated soil = 1870.80 net = 835.38

treated soil ID # 1153-043-1R

inlet to filter + quartz tube + filter & hose 5 blank
washed = hexane/acetone retained separate sum air in between
from impinger rinses (water) - then hexane/acetone 2-3 blank sum
air sum before
facs1out

gasbag analysis
file ID facs300f actual with
700°F sple 5 sum
other sums OIC 300f sple
named facs1out
facs400f, facs500f, facs600f
- 700, 600 & 500 taken @ med sens
file name facs7m (5 sum)
facs6m (3 sums)
facs5m (3 sum)

Project Name FOCUS-ACS

Project Number

1153:044

Computer File
FACSC11
preheat to 700°F

Sample ID
composite SC1

KTA Test #2
target temp = 900°F
time @ temp = 0 min (soil
air purge inlet & outlet 1.0 & 0.5 ∧
slight vacuum

tare of tray = 127.02 after = 127.08
+untreated = 1154.26

Time	Soil Temp	O_2 (when in range)	Comments
0	21°		
[illegible]	78 °C		
4 min	99		
7 min	110		
15 min	385		set pt to 475 @ ~14 min
20 min	460		
[illegible] min	468		

tare of clean tray = 1045.42
+clean soil = 1892.80

treated soil ID
#1153-044-1R

gas sample taken
@ ~150
232
315
400
475 °C

Date 10/8/97

Project Name Focus ACS

Project Number

1153:045

RTA Test 3
target temp = 900°F
time @ temp . 0 min
N_2 purge

Computer File
FACSC12
preheat to 700°C

Sample 10
Composite SC 1

pt# 5 = outlet gas

tare of tray = 127.04 after . 127.14
+ untreated soil : 1150.78

Time	Soil Temp	O_2	Comments
0	24°C	11%	
2 min	70	11%	
3½ min	99°	11.7%	
14½ min	370		setpt to 480°C
23½ min	477		
24½ min	482		t=0 stop test.

tare of clean tray . 1045.0
1894.94

Residue ID# 1153-045-1R

gas sample taken @ 150°C
2
315
400
480

Project Name: LUCAS / ITCS

Project Number:

1153:046

Sample Source	# jars/vials	IT #	LAB	Analysis
~~Test 3 (RTAN)~~ AC 10/9	3	#1153-046-1	IEA	VOC ✓
~~soil 45-1R~~ AC/10/9	3	#1153-046-2	IEA	SVOC ✓
TEST 2 (RTA-1)	2	#1153-046-3	IEA	PCB ✓
soil 44-1R	1	#1153-046-4	IEA	DIOXINS ✓
	1	#1153-046-5	IEA	TOTAL METALS ✓
	1	#1153-046-6	IEA	TCLP METALS
	2	#1153-046-7	HAZEN	ULT/PROX ✓
	1	#1153-046-8	HAZEN	LEACHBL CL ✓
				SOIL pH
TEST 3 (RTAN) ~~(RTA-1)~~	1	#1153-046-9	IEA	VOC ✓
soil 45-1R	1	#1153-046-10	↓	SVOC ✓
	1	-11	↓	PCB ✓
	1	-12	↓	DIOXIN
	1	-13	↓	TOTAL METALS
	1	-14	↓	TCLP METALS
	1	-15	HAZEN	ULT/PROX ✓
	1	-16	↓	LEACH CL/SOIL pH ✓
TEST 1 (RTA-2)	1	#1153-046-17	IEA	VOC ✓
Soil 43-1R	1	18	↓	SVOC ✓
	1	19	↓	PCB ✓
	1	20	↓	DIOXIN ✓
	1	21	↓	TOTAL METAL ✓
	1	22	↓	TCLP METALS
	1	23	HAZEN	ULT/PROX ✓
	1	24		LEAC CL/SOIL pH ✓

Entries by: [signature] Date: 10/10/97

Project Name FOCUS ACS

Project Number

1153:047

Sample Source	WT		LAB	ANALYSIS
Run #1 - Water		#1153-047-1	IEA	VOC ✓
RTA-2		#1153-047-2	IEA	SVOC/PCB
RUN #1 RINSE HEX/ACETONE		#1153-047-3	IEA	SVOC/PCB ✓ DIOXINS
Run #1 Water		#1153-047-4	HAZEN	Acidity/TOC pH, Cl⁻, S
Run #2 Water RTA-1		#1153-047-5.	IEA	VOC ✓
		#1153-047-6	IEA	SVOC/PCB ✓
		#1153-047-7	HAZEN	Acidity/pH Cl⁻/S/TOC
Run #2 Organic ph		#1153-047-8	HAZEN	BTU/ULTIM.
Run #2 Organic		#1153-047-9	IEA	VOC ✓
Run #2 Rinse Acetone/HEXANE		#1153-047-10	IEA	SVOC/PCB/DIOXIN FURAN
Run #3 Water RTAN		#1153-047-11 ~~#1147 0~~ 1015	IEA	VOC ✓
		#1153-047-12	IEA	SVOC/PCB
		-13	HAZEN	pH, ~~[illegible]~~ Solids TOC, Acidity
Run #3 Organic		-14	IEA	VOC ✓
		-15	HAZEN	HEAT content, ULTIMATE
Run #3 Rinses		-16	IEA	SVOC/PCB/DIOXIN FURAN

Entries by

10/10/92

APPENDIX B

Appendix B

Temperature Profile Data

Tray Test Temperature Profile : TT1-500
Worst Case Soil, 500°F

9/3/97

Run Time	Cummulative Time (min.)	Soil Temperature (°F)	Oven Temperature (°F)
16:17:51	0.00	85.82	77.72
16:18:03	0.20	87.44	78.08
16:18:09	0.30	90.14	78.26
16:18:21	0.50	100.40	79.34
16:18:27	0.60	108.68	80.24
16:18:39	0.80	132.26	83.12
16:18:45	0.90	146.66	84.92
16:18:57	1.10	178.88	89.96
16:19:03	1.20	197.60	92.84
16:19:15	1.40	230.36	99.50
16:19:21	1.50	245.84	102.92
16:19:33	1.70	271.94	109.22
16:19:39	1.80	282.74	112.28
16:19:51	2.00	299.12	117.68
16:19:57	2.10	305.42	119.48
16:20:09	2.30	315.50	123.98
16:20:15	2.40	320.54	126.68
16:20:27	2.60	327.56	130.28
16:20:33	2.70	391.46	131.54
16:20:45	2.90	336.74	134.96
16:20:51	3.00	340.52	137.30
16:21:03	3.20	348.08	141.26
16:21:09	3.30	351.68	142.88
16:21:21	3.50	360.86	147.74
16:21:27	3.60	365.54	149.90
16:21:39	3.80	374.36	154.22
16:21:45	3.90	378.86	156.74
16:21:57	4.10	389.12	161.24
16:22:09	4.30	397.94	166.10
16:22:15	4.40	402.44	167.90
16:22:27	4.60	411.44	172.94
16:22:33	4.70	416.48	175.64
16:22:45	4.90	425.30	180.68
16:22:51	5.00	430.52	183.20
16:23:03	5.20	438.08	188.60
16:23:09	5.30	442.76	191.48
16:23:21	5.50	451.40	197.24
16:23:27	5.60	455.72	199.94
16:23:39	5.80	464.18	205.88
16:23:45	5.90	468.14	209.30
16:23:57	6.10	476.42	215.78
16:24:03	6.20	479.66	218.30
16:24:15	6.40	487.04	224.06

Tray Test Temperature Profile : TT1-500
Worst Case Soil, 500°F

9/3/97

Run Time	Cummulative Time (min.)	Soil Temperature (°F)	Oven Temperature (°F)
16:24:21	6.50	489.92	227.30
16:24:33	6.70	495.50	232.70
16:24:39	6.80	497.84	235.76
16:24:51	7.00	502.88	241.34
16:24:57	7.10	504.68	243.68
16:25:09	7.30	507.56	248.72
16:25:15	7.40	518.90	250.52
16:25:27	7.60	511.52	255.02
16:25:33	7.70	512.06	256.82
16:25:45	7.90	513.50	260.78
16:25:51	8.00	515.12	263.12
16:26:03	8.20	516.02	266.72
16:26:09	8.30	516.38	268.16
16:26:21	8.50	517.28	271.76
16:26:27	8.60	518.36	273.74
16:26:39	8.80	518.72	276.08
16:26:45	8.90	518.72	277.34
16:26:57	9.10	519.62	280.04
16:27:03	9.20	520.34	281.48
16:27:15	9.40	521.60	284.00
16:27:21	9.50	522.32	285.26
16:27:33	9.70	524.12	287.78
16:27:39	9.80	525.56	289.04
16:27:51	10.00	528.26	291.74
16:27:57	10.10	529.88	293.54
16:28:09	10.30	532.40	295.88
16:28:15	10.40	533.30	297.14
16:28:27	10.60	535.28	299.66
16:28:33	10.70	536.54	301.10
16:28:45	10.90	537.62	303.26
16:28:51	11.00	537.98	303.80
16:29:03	11.20	538.52	305.96
16:29:09	11.30	539.06	307.40
16:29:21	11.50	539.42	309.02
16:29:27	11.60	540.32	309.56
16:29:39	11.80	539.42	311.72
16:29:45	11.90	539.78	312.80
16:29:57	12.10	539.96	314.42
16:30:03	12.20	539.78	315.50
16:30:15	12.40	539.60	316.94
16:30:21	12.50	539.60	317.48
16:30:33	12.70	539.78	319.10
16:30:39	12.80	540.32	320.18

Tray Test Temperature Profile : TT1-500
Worst Case Soil, 500°F

9/3/97

Run Time	Cummulative Time (min.)	Soil Temperature (°F)	Oven Temperature (°F)
16:30:51	13.00	540.32	321.98
16:30:57	13.10	539.78	322.16
16:31:09	13.30	540.14	323.60
16:31:15	13.40	541.04	324.86
16:31:27	13.60	539.60	326.66
16:31:33	13.70	541.40	326.84
16:31:45	13.90	538.16	327.38
16:31:51	14.00	539.78	328.28
16:32:03	14.20	540.68	329.90
16:32:09	14.30	543.56	330.98
16:32:21	14.50	548.06	333.32
16:32:27	14.60	549.32	334.40
16:32:39	14.80	552.38	335.84
16:32:45	14.90	553.82	337.10
16:32:57	15.10	556.70	339.62
16:33:03	15.20	557.60	340.34
16:33:15	15.40	559.76	343.58
16:33:27	15.60	561.02	346.64
16:33:33	15.70	561.74	348.44
16:33:45	15.90	562.46	351.86
16:33:51	16.00	562.28	352.94
16:34:03	16.20	563.18	357.26
16:34:09	16.30	563.36	359.42
16:34:21	16.50	563.72	364.28
16:34:27	16.60	563.18	365.90
16:34:39	16.80	563.54	371.48
16:34:45	16.90	564.80	375.44
16:34:57	17.10	564.80	381.20
16:35:03	17.20	564.44	384.44
16:35:15	17.40	563.54	390.56
16:35:21	17.50	564.08	394.16
16:35:33	17.70	564.80	401.36
16:35:39	17.80	565.52	405.50
16:35:51	18.00	567.68	412.88
16:35:57	18.10	568.58	416.30
16:36:09	18.30	570.20	422.96
16:36:15	18.40	570.74	426.20
16:36:27	18.60	572.54	433.04
16:36:33	18.70	572.72	435.56
16:36:45	18.90	573.44	441.86
16:36:51	19.00	573.80	445.10
16:37:03	19.20	573.98	451.58
16:37:09	19.30	573.08	453.74

Tray Test Temperature Profile : TT1-500

Worst Case Soil, 500°F

9/3/97

Run Time	Cummulative Time (min.)	Soil Temperature (°F)	Oven Temperature (°F)
16:37:21	19.50	572.90	458.78
16:37:27	19.60	572.90	461.48
16:37:39	19.80	572.18	466.34
16:37:45	19.90	571.28	468.14
16:37:57	20.10	570.74	473.00
16:38:03	20.20	570.74	475.52
16:38:15	20.40	570.92	480.56
16:38:21	20.50	570.38	482.90
16:38:33	20.70	569.84	486.86
16:38:39	20.80	569.30	488.48
16:38:51	21.00	568.22	491.90
16:38:57	21.10	568.04	494.42
16:39:09	21.30	566.96	497.66
16:39:15	21.40	566.24	499.46
16:39:27	21.60	545.36	502.34

Tray Test Temperature Profile : TT1-700

Worst Case Soil, 700°F

9/3/97

Run Time	Cummulative Time (min.)	Soil Temperature (°F)	Oven Temperature (°F)
15:33:21	0.00	92.84	78.62
15:33:27	0.10	103.64	78.98
15:33:39	0.30	104.36	79.52
15:33:45	0.40	150.80	81.50
15:33:57	0.60	163.58	81.68
15:34:03	0.70	196.70	82.94
15:34:15	0.90	233.06	90.86
15:34:21	1.00	232.52	97.16
15:34:33	1.20	297.32	91.76
15:34:39	1.30	314.24	94.10
15:34:51	1.50	350.42	100.58
15:34:57	1.60	354.56	102.56
15:35:09	1.80	386.06	108.68
15:35:15	1.90	405.14	111.92
15:35:27	2.10	441.32	119.30
15:35:33	2.20	456.80	123.08
15:35:45	2.40	487.58	131.36
15:35:51	2.50	503.60	134.42
15:36:03	2.70	528.98	143.06
15:36:09	2.80	540.50	150.44
15:36:21	3.00	580.46	160.52
15:36:27	3.10	590.00	165.74
15:36:39	3.30	617.00	175.28
15:36:45	3.40	631.04	181.94
15:36:57	3.60	652.82	195.08
15:37:03	3.70	656.06	201.38
15:37:15	3.90	673.52	215.06
15:37:21	4.00	697.46	222.08
15:37:33	4.20	717.98	236.66
15:37:39	4.30	719.96	243.68
15:37:51	4.50	753.26	258.62
15:37:57	4.60	754.34	265.64
15:38:09	4.80	776.66	280.40
15:38:15	4.90	789.26	287.24
15:38:27	5.10	797.90	299.48
15:38:33	5.20	794.66	300.20
15:38:45	5.40	776.66	306.86
15:38:51	5.50	771.26	310.28
15:39:03	5.70	765.14	318.38
15:39:09	5.80	767.30	319.28
15:39:21	6.00	759.74	313.70
15:39:27	6.10	752.00	318.38
15:39:39	6.30	747.32	318.56

Tray Test Temperature Profile : TT1-700
Worst Case Soil, 700°F

9/3/97

Run Time	Cummulative Time (min.)	Soil Temperature (°F)	Oven Temperature (°F)
15:39:45	6.40	744.08	320.72
15:39:57	6.60	739.22	325.58
15:40:03	6.70	739.40	325.94
15:40:15	6.90	734.72	328.82
15:40:21	7.00	748.40	331.34
15:40:33	7.20	761.00	336.02
15:40:39	7.30	733.28	335.48
15:40:51	7.50	738.50	342.68
15:41:03	7.70	741.92	347.18
15:41:09	7.80	741.92	349.52
15:41:21	8.00	737.24	354.56
15:41:27	8.10	724.46	357.08
15:41:39	8.30	755.24	362.30
15:41:45	8.40	755.96	366.80
15:41:57	8.60	752.72	374.36
15:42:03	8.70	767.66	379.76
15:42:15	8.90	752.00	392.54
15:42:21	9.00	770.72	399.20
15:42:33	9.20	821.12	414.14
15:42:39	9.30	803.12	422.06
15:42:51	9.50	803.66	437.72
15:42:57	9.60	833.36	448.34
15:43:09	9.80	851.72	460.22
15:43:15	9.90	825.62	467.78
15:43:27	10.10	831.38	482.00
15:43:33	10.20	839.66	486.86
15:43:45	10.40	824.90	498.56
15:43:51	10.50	787.28	504.32
15:44:03	10.70	825.98	514.58
15:44:09	10.80	813.20	519.44
15:44:21	11.00	806.90	528.62
15:44:27	11.10	784.40	535.46
15:44:39	11.30	777.92	541.76
15:44:45	11.40	781.70	546.08
15:44:57	11.60	799.16	553.64
15:45:03	11.70	762.26	557.42
15:45:15	11.90	778.28	564.08
15:45:21	12.00	778.46	568.58
15:45:33	12.20	777.20	576.86
15:45:39	12.30	777.20	579.92
15:45:51	12.50	774.50	586.58
15:45:57	12.60	774.14	589.82
15:46:09	12.80	770.36	595.76

Tray Test Temperature Profile : TT1-700
Worst Case Soil, 700°F

9/3/97

Run Time	Cummulative Time (min.)	Soil Temperature (°F)	Oven Temperature (°F)
15:46:15	12.90	799.52	598.28
15:46:27	13.10	801.14	604.40
15:46:33	13.20	800.24	607.46
15:46:45	13.40	803.66	612.68
15:46:51	13.50	806.00	615.56
15:47:03	13.70	799.34	620.78
15:47:09	13.80	800.78	623.12
15:47:21	14.00	800.42	628.34
15:47:27	14.10	804.02	631.22
15:47:39	14.30	793.76	635.36
15:47:45	14.40	795.56	637.52
15:47:57	14.60	796.46	642.20
15:48:03	14.70	790.70	644.54
15:48:15	14.90	786.02	648.68
15:48:21	15.00	792.14	650.66
15:48:33	15.20	786.38	654.62
15:48:39	15.30	785.30	656.60
15:48:51	15.50	786.20	660.38
15:48:57	15.60	785.12	661.82
15:49:09	15.80	783.14	665.42
15:49:15	15.90	779.72	667.58
15:49:27	16.10	778.64	671.18
15:49:33	16.20	777.74	672.62
15:49:45	16.40	776.30	676.22
15:49:51	16.50	794.66	677.48
15:50:03	16.70	770.90	681.08
15:50:09	16.80	769.64	682.88
15:50:21	17.00	764.96	685.58
15:50:27	17.10	764.96	687.02
15:50:39	17.30	767.84	690.08
15:50:45	17.40	765.32	692.06
15:50:57	17.60	766.40	694.94
15:51:03	17.70	768.56	696.20
15:51:15	17.90	766.94	698.36
15:51:21	18.00	751.82	699.98
15:51:33	18.20	718.52	702.32

Tray Test Temperature Profile : TT1-900

Worst Case Soil, 900°F

9/3/97

Run Time	Cummulative Time (min.)	Soil Temperature (°F)	Oven Temperature (°F)
14:29:10	0.00	84.20	73.94
14:29:22	0.20	85.46	73.76
14:29:28	0.30	87.80	73.94
14:29:40	0.50	98.60	76.10
14:29:46	0.60	107.06	78.08
14:29:58	0.80	129.20	85.28
14:30:04	0.90	142.88	70.88
14:30:16	1.10	174.02	90.68
14:30:22	1.20	192.56	94.64
14:30:34	1.40	231.80	104.18
14:30:40	1.50	252.50	109.58
14:30:52	1.70	295.34	121.46
14:30:58	1.80	316.76	128.12
14:31:10	2.00	358.34	140.36
14:31:16	2.10	379.04	146.48
14:31:28	2.30	420.80	160.88
14:31:34	2.40	441.68	167.72
14:31:46	2.60	482.90	183.02
14:31:52	2.70	502.52	190.94
14:32:04	2.90	541.40	206.42
14:32:10	3.00	560.12	214.70
14:32:22	3.20	596.30	230.90
14:32:28	3.30	613.76	239.36
14:32:40	3.50	644.90	257.18
14:32:46	3.60	657.68	266.72
14:32:58	3.80	678.92	284.90
14:33:04	3.90	687.56	293.36
14:33:16	4.10	701.60	308.12
14:33:22	4.20	707.00	314.42
14:33:34	4.40	715.64	328.46
14:33:40	4.50	728.78	336.56
14:33:52	4.70	736.52	353.66
14:33:58	4.80	740.48	361.04
14:34:10	5.00	745.34	375.44
14:34:16	5.10	747.86	382.10
14:34:28	5.30	759.02	394.88
14:34:34	5.40	761.36	401.36
14:34:46	5.60	764.60	411.98
14:34:52	5.70	767.66	417.92
14:35:04	5.90	773.06	428.90
14:35:10	6.00	776.48	434.12
14:35:22	6.20	785.30	444.74
14:35:28	6.30	789.80	449.96

Tray Test Temperature Profile : TT1-900

Worst Case Soil, 900°F

9/3/97

Run Time	Cummulative Time (min.)	Soil Temperature (°F)	Oven Temperature (°F)
14:35:40	6.50	802.04	460.04
14:35:46	6.60	809.78	466.88
14:35:58	6.80	824.00	476.96
14:36:04	6.90	831.02	482.36
14:36:16	7.10	847.76	493.34
14:36:22	7.20	856.94	499.46
14:36:34	7.40	876.74	510.98
14:36:46	7.60	896.00	523.40
14:36:52	7.70	901.76	528.98
14:37:04	7.90	914.18	540.14
14:37:10	8.00	918.14	545.36
14:37:22	8.20	927.14	556.16
14:37:28	8.30	930.74	561.20
14:37:40	8.50	938.66	570.92
14:37:46	8.60	942.26	575.24
14:37:58	8.80	950.72	585.14
14:38:04	8.90	955.04	591.26
14:38:16	9.10	962.42	603.14
14:38:22	9.20	965.30	609.98
14:38:34	9.40	969.98	624.92
14:38:40	9.50	971.78	633.20
14:38:52	9.70	985.28	648.32
14:38:58	9.80	973.76	655.34
14:39:10	10.00	1111.28	670.10
14:39:16	10.10	979.34	677.48
14:39:28	10.30	979.16	689.72
14:39:34	10.40	978.98	695.84
14:39:46	10.60	977.18	705.74
14:39:52	10.70	1012.10	710.24
14:40:04	10.90	975.20	719.78
14:40:10	11.00	975.92	725.18
14:40:22	11.20	975.20	733.28
14:40:28	11.30	977.90	737.06
14:40:40	11.50	973.40	744.44
14:40:46	11.60	973.94	748.40
14:40:58	11.80	975.38	755.60
14:41:04	11.90	973.76	758.66
14:41:16	12.10	973.04	765.32
14:41:22	12.20	973.58	768.92
14:41:34	12.40	972.86	775.58
14:41:40	12.50	970.70	779.00
14:41:52	12.70	967.46	785.30
14:41:58	12.80	966.56	788.54

Tray Test Temperature Profile : TT1-900
Worst Case Soil, 900°F

9/3/97

Run Time	Cummulative Time (min.)	Soil Temperature (°F)	Oven Temperature (°F)
14:42:10	13.00	962.06	793.94
14:42:16	13.10	960.80	797.18
14:42:28	13.30	958.28	803.30
14:42:34	13.40	958.46	805.64
14:42:46	13.60	955.76	811.40
14:42:52	13.70	955.94	814.46
14:43:04	13.90	955.94	819.50
14:43:10	14.00	955.76	821.48
14:43:22	14.20	955.94	826.88
14:43:28	14.30	956.12	829.76
14:43:40	14.50	956.66	834.44
14:43:46	14.60	956.30	836.24
14:43:58	14.80	955.58	840.56
14:44:04	14.90	955.94	842.90
14:44:16	15.10	965.30	847.04
14:44:22	15.20	980.24	849.02
14:44:34	15.40	954.14	852.98
14:44:40	15.50	953.42	855.14
14:44:52	15.70	951.98	858.38
14:44:58	15.80	951.08	860.18
14:45:10	16.00	951.98	863.42
14:45:16	16.10	949.28	864.50
14:45:28	16.30	948.92	868.10
14:45:34	16.40	948.20	869.90
14:45:46	16.60	947.48	872.24
14:45:58	16.80	946.76	874.94
14:46:04	16.90	946.58	875.84
14:46:16	17.10	945.68	878.54
14:46:22	17.20	946.40	880.34
14:46:34	17.40	946.40	882.68
14:46:40	17.50	946.58	883.76
14:46:52	17.70	947.48	885.74
14:46:58	17.80	948.02	887.72
14:47:10	18.00	948.38	889.52
14:47:16	18.10	948.56	890.42
14:47:28	18.30	950.72	892.94
14:47:34	18.40	950.54	894.02
14:47:46	18.60	951.80	896.18
14:47:52	18.70	951.98	897.44
14:48:04	18.90	953.24	899.78
14:48:10	19.00	953.24	900.14

Tray Test Temperature Profile : TT1-1100
Worst Case Soil, 1,100°F

9/3/97

Run Time	Cummulative Time (min.)	Soil Temperature (°F)	Oven Temperature (°F)
13:59:28	-0.00	85.10	71.24
13:59:40	0.20	92.30	71.78
13:59:46	0.30	100.58	74.12
13:59:58	0.50	124.88	72.86
14:00:04	0.60	139.82	72.68
14:00:16	0.80	173.84	75.02
14:00:22	0.90	192.56	75.92
14:00:34	1.10	230.90	78.26
14:00:40	1.20	250.52	79.88
14:00:52	1.40	289.94	84.20
14:00:58	1.50	308.66	86.00
14:01:10	1.70	346.64	90.50
14:01:16	1.80	365.00	92.66
14:01:28	2.00	401.36	98.60
14:01:34	2.10	419.00	101.66
14:01:46	2.30	453.38	113.54
14:01:52	2.40	470.30	112.82
14:02:04	2.60	501.98	121.28
14:02:10	2.70	517.82	125.78
14:02:22	2.90	549.32	134.78
14:02:28	3.00	563.90	139.82
14:02:40	3.20	592.16	149.90
14:02:46	3.30	605.66	155.48
14:02:58	3.50	632.30	166.64
14:03:04	3.60	644.90	171.86
14:03:16	3.80	669.20	183.56
14:03:28	4.00	692.06	195.80
14:03:34	4.10	703.04	201.74
14:03:46	4.30	723.56	215.78
14:03:52	4.40	734.18	221.90
14:04:04	4.60	757.94	234.86
14:04:10	4.70	769.82	242.42
14:04:22	4.90	795.38	255.02
14:04:28	5.00	805.64	260.78
14:04:40	5.20	832.64	271.94
14:04:46	5.30	845.24	276.80
14:04:58	5.50	869.00	285.08
14:05:04	5.60	881.60	289.40
14:05:16	5.80	905.54	301.10
14:05:22	5.90	917.24	304.70
14:05:34	6.10	939.56	314.42
14:05:40	6.20	950.54	320.18
14:05:52	6.40	972.50	333.14

Tray Test Temperature Profile : TT1-1100
Worst Case Soil, 1,100°F

9/3/97

Run Time	Cummulative Time (min.)	Soil Temperature (°F)	Oven Temperature (°F)
14:05:58	6.50	982.40	339.44
14:06:10	6.70	1004.54	354.56
14:06:16	6.80	1017.14	362.84
14:06:28	7.00	1042.52	380.30
14:06:34	7.10	1054.40	388.94
14:06:46	7.30	1078.16	408.74
14:06:52	7.40	1090.76	419.00
14:07:04	7.60	1113.62	440.60
14:07:10	7.70	1123.70	451.94
14:07:22	7.90	1135.94	477.86
14:07:28	8.00	1137.56	490.82
14:07:40	8.20	1134.86	514.58
14:07:46	8.30	1132.34	526.28
14:07:58	8.50	1127.48	549.50
14:08:04	8.60	1124.78	561.38
14:08:16	8.80	1119.20	585.50
14:08:22	8.90	1116.32	596.48
14:08:34	9.10	1110.02	619.70
14:08:40	9.20	1107.50	630.86
14:08:52	9.40	1102.46	651.92
14:08:58	9.50	1100.12	662.18
14:09:10	9.70	1093.52	678.92
14:09:16	9.80	1093.82	688.28
14:09:28	10.00	1087.70	705.56
14:09:34	10.10	1087.52	714.20
14:09:46	10.30	1085.72	729.32
14:09:52	10.40	1085.72	736.34
14:10:04	10.60	1086.98	750.92
14:10:10	10.70	1088.42	757.40
14:10:22	10.90	1091.48	770.72
14:10:28	11.00	1092.56	777.02
14:10:40	11.20	1094.72	790.16
14:10:46	11.30	1095.98	796.46
14:10:58	11.50	1097.24	808.16
14:11:04	11.60	1098.32	813.92
14:11:16	11.80	1099.04	823.82
14:11:22	11.90	1099.76	828.86
14:11:34	12.10	1101.20	838.40
14:11:40	12.20	1102.10	843.26
14:11:52	12.40	1105.34	852.44
14:11:58	12.50	1106.06	856.58
14:12:10	12.70	1109.30	864.68
14:12:16	12.80	1111.82	868.64

Tray Test Temperature Profile : TT1-1100

Worst Case Soil, 1,100°F

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Run Time	Cummulative Time (min.)	Soil Temperature (°F)	Oven Temperature (°F)
14:12:28	13.00	1118.12	876.74
14:12:34	13.10	1121.36	880.70
14:12:46	13.30	1127.66	888.80
14:12:52	13.40	1129.46	892.94
14:13:04	13.60	1126.76	900.14
14:13:10	13.70	1123.88	904.10
14:13:22	13.90	1131.98	912.02
14:13:28	14.00	1134.50	915.26
14:13:40	14.20	1153.40	923.54
14:13:46	14.30	1160.60	928.22
14:13:58	14.50	1170.68	936.32
14:14:04	14.60	1188.14	939.38
14:14:16	14.80	1169.60	947.30
14:14:22	14.90	1166.72	951.62
14:14:34	15.10	1157.90	957.92
14:14:40	15.20	1153.94	961.52
14:14:52	15.40	1147.82	965.12
14:14:58	15.50	1145.66	967.82
14:15:10	15.70	1144.22	972.86
14:15:16	15.80	1143.32	974.84
14:15:28	16.00	1142.96	979.70
14:15:34	16.10	1143.32	982.40
14:15:46	16.30	1144.04	987.26
14:15:52	16.40	1146.02	989.78
14:16:04	16.60	1153.58	990.14
14:16:10	16.70	1155.38	997.34
14:16:22	16.90	1163.48	1000.22
14:16:28	17.00	1173.56	1005.80
14:16:40	17.20	1170.32	1012.82
14:16:52	17.40	1169.96	1017.14
14:16:58	17.50	1169.42	1019.12
14:17:10	17.70	1165.28	1023.44
14:17:16	17.80	1163.48	1025.24
14:17:28	18.00	1160.06	1028.66
14:17:34	18.10	1158.08	1026.32
14:17:46	18.30	1156.64	1038.38
14:17:52	18.40	1156.10	1036.04
14:18:04	18.60	1158.44	1039.64
14:18:10	18.70	1157.36	1040.36
14:18:22	18.90	1156.82	1042.70
14:18:28	19.00	1157.18	1044.86
14:18:40	19.20	1158.26	1048.82
14:18:46	19.30	1158.80	1050.44

Tray Test Temperature Profile : TT1-1100

Worst Case Soil, 1,100°F

9/3/97

Run Time	Cummulative Time (min.)	Soil Temperature (°F)	Oven Temperature (°F)
14:18:58	19.50	1159.52	1053.68
14:19:04	19.60	1160.06	1054.58
14:19:16	19.80	1159.34	1057.10
14:19:22	19.90	1158.80	1058.90
14:19:34	20.10	1158.08	1061.60
14:19:40	20.20	1157.36	1062.50
14:19:52	20.40	1157.36	1064.48
14:19:58	20.50	1157.36	1066.10
14:20:10	20.70	1156.82	1068.26
14:20:16	20.80	1156.46	1069.34
14:20:28	21.00	1156.82	1071.86
14:20:34	21.10	1156.82	1072.94
14:20:46	21.30	1160.78	1074.92
14:20:52	21.40	1156.10	1075.46
14:21:04	21.60	1156.64	1077.80
14:21:10	21.70	1158.08	1078.52
14:21:22	21.90	1157.18	1080.50
14:21:28	22.00	1157.00	1081.76
14:21:40	22.20	1157.00	1083.74
14:21:46	22.30	1156.82	1084.28
14:21:58	22.50	1156.82	1086.08
14:22:04	22.60	1157.18	1087.34
14:22:16	22.80	1157.36	1088.78
14:22:22	22.90	1155.92	1088.96
14:22:34	23.10	1155.92	1090.40
14:22:40	23.20	1156.46	1091.84
14:22:52	23.40	1155.38	1093.82
14:22:58	23.50	1155.56	1094.36
14:23:10	23.70	1142.42	1095.98

Tray Test Temperature Profile : TT2-500
Typical Case Soil, 500°F

9/3/97

Run Time	Cummulative Time (min.)	Soil Temperature (°F)	Oven Temperature (°F)
12:22:47	0.00	86.00	76.46
12:22:53	0.10	88.16	76.82
12:23:05	0.30	95.72	77.72
12:23:11	0.40	102.38	77.90
12:23:23	0.60	121.28	80.06
12:23:29	0.70	133.88	81.86
12:23:41	0.90	162.86	85.82
12:23:47	1.00	179.24	88.16
12:23:59	1.20	211.82	93.92
12:24:05	1.30	227.66	96.98
12:24:17	1.50	254.48	102.74
12:24:23	1.60	265.82	105.62
12:24:35	1.80	284.18	111.20
12:24:41	1.90	291.56	113.54
12:24:53	2.10	303.08	118.22
12:24:59	2.20	307.76	120.20
12:25:11	2.40	316.04	124.16
12:25:17	2.50	319.28	125.78
12:25:29	2.70	326.66	129.56
12:25:35	2.80	330.62	131.72
12:25:47	3.00	337.82	135.14
12:25:53	3.10	340.88	136.40
12:26:05	3.30	349.16	140.72
12:26:11	3.40	353.84	143.24
12:26:23	3.60	362.84	148.28
12:26:29	3.70	367.16	150.08
12:26:41	3.90	376.34	154.94
12:26:47	4.00	380.66	156.74
12:26:59	4.20	389.84	161.60
12:27:05	4.30	393.80	163.76
12:27:17	4.50	402.62	168.44
12:27:23	4.60	408.02	171.50
12:27:35	4.80	416.48	176.36
12:27:41	4.90	420.80	178.88
12:27:53	5.10	429.08	183.56
12:27:59	5.20	433.22	186.26
12:28:11	5.40	441.50	191.12
12:28:17	5.50	445.64	194.36
12:28:29	5.70	453.74	199.58
12:28:35	5.80	457.34	201.74
12:28:47	6.00	464.72	207.14
12:28:53	6.10	468.50	210.20
12:29:05	6.30	475.16	215.42

Tray Test Temperature Profile : TT2-500
Typical Case Soil, 500°F

9/3/97

Run Time	Cummulative Time (min.)	Soil Temperature (°F)	Oven Temperature (°F)
12:29:11	6.40	477.68	217.58
12:29:23	6.60	482.72	222.98
12:29:29	6.70	485.60	225.86
12:29:41	6.90	489.38	230.72
12:29:47	7.00	490.82	233.06
12:29:59	7.20	493.70	237.92
12:30:05	7.30	494.78	239.90
12:30:17	7.50	495.32	243.14
12:30:23	7.60	495.86	245.30
12:30:35	7.80	496.40	248.72
12:30:41	7.90	496.40	250.52
12:30:53	8.10	495.50	253.76
12:30:59	8.20	495.50	255.74
12:31:11	8.40	494.78	258.98
12:31:17	8.50	494.42	260.42
12:31:29	8.70	493.70	262.76
12:31:35	8.80	493.88	264.56
12:31:47	9.00	493.16	266.90
12:31:53	9.10	492.26	267.44
12:32:05	9.30	492.44	269.78
12:32:11	9.40	493.34	271.40
12:32:23	9.60	496.22	274.10
12:32:29	9.70	497.66	275.54
12:32:41	9.90	501.80	278.42
12:32:47	10.00	503.78	279.68
12:32:59	10.20	507.74	282.92
12:33:05	10.30	509.72	284.18
12:33:17	10.50	513.14	287.06
12:33:23	10.60	515.12	288.14
12:33:35	10.80	517.64	290.66
12:33:41	10.90	519.26	292.10
12:33:53	11.10	521.42	294.26
12:33:59	11.20	522.14	294.80
12:34:11	11.40	523.94	296.78
12:34:17	11.50	525.20	298.04
12:34:29	11.70	526.82	300.02
12:34:41	11.90	527.90	301.64
12:34:47	12.00	528.26	302.18
12:34:59	12.20	529.34	304.16
12:35:05	12.30	529.88	305.06
12:35:17	12.50	530.60	306.68
12:35:23	12.60	530.96	307.76
12:35:35	12.80	532.58	310.46

Tray Test Temperature Profile : TT2-500

Typical Case Soil, 500°F

9/3/97

Run Time	Cummulative Time (min.)	Soil Temperature (°F)	Oven Temperature (°F)
12:35:41	12.90	532.94	311.72
12:35:53	13.10	534.74	314.42
12:35:59	13.20	535.64	316.04
12:36:11	13.40	536.90	318.38
12:36:17	13.50	537.08	319.28
12:36:29	13.70	538.34	321.62
12:36:35	13.80	539.42	323.60
12:36:47	14.00	539.78	325.58
12:36:53	14.10	539.60	326.12
12:37:05	14.30	540.86	328.28
12:37:11	14.40	541.76	329.90
12:37:23	14.60	543.38	332.06
12:37:29	14.70	543.74	332.60
12:37:41	14.90	544.82	334.58
12:37:47	15.00	545.54	335.48
12:37:59	15.20	546.62	337.64
12:38:05	15.30	546.80	338.36
12:38:17	15.50	548.24	340.70
12:38:23	15.60	549.14	341.78
12:38:35	15.80	550.04	343.76
12:38:41	15.90	550.76	345.20
12:38:53	16.10	551.48	347.18
12:38:59	16.20	552.02	348.08
12:39:11	16.40	553.10	350.78
12:39:17	16.50	554.00	352.40
12:39:29	16.70	555.80	355.64
12:39:35	16.80	556.34	357.08
12:39:47	17.00	557.42	361.04
12:39:53	17.10	558.86	364.46
12:40:05	17.30	561.74	370.22
12:40:11	17.40	563.54	373.10
12:40:23	17.60	568.22	379.76
12:40:29	17.70	571.82	383.72
12:40:41	17.90	578.84	392.00
12:40:47	18.00	582.44	396.32
12:40:59	18.20	589.10	405.32
12:41:05	18.30	591.62	409.64
12:41:17	18.50	596.12	418.46
12:41:23	18.60	597.56	422.24
12:41:35	18.80	601.16	431.06
12:41:41	18.90	602.42	435.38
12:41:53	19.10	604.58	444.02
12:41:59	19.20	605.66	448.34

Tray Test Temperature Profile : TT2-500

Typical Case Soil, 500°F

9/3/97

Run Time	Cummulative Time (min.)	Soil Temperature (°F)	Oven Temperature (°F)
12:42:11	19.40	606.38	456.44
12:42:17	19.50	606.20	459.50
12:42:29	19.70	606.38	466.88
12:42:35	19.80	606.74	471.20
12:42:47	20.00	606.38	478.04
12:42:53	20.10	605.84	480.92
12:43:05	20.30	605.48	487.22
12:43:11	20.40	605.66	491.00
12:43:23	20.60	605.48	497.48
12:43:29	20.70	604.58	500.00

Tray Test Temperature Profile : TT2-700

Typical Case Soil, 700°F

9/3/97

Run Time	Cummulative Time (min.)	Soil Temperature (°F)	Oven Temperature (°F)
11:46:38	0.00	88.16	88.34
11:46:48	0.17	94.46	94.46
11:46:54	0.27	102.38	103.82
11:47:06	0.47	125.42	81.68
11:47:12	0.57	139.82	80.78
11:47:24	0.77	172.76	86.54
11:47:30	0.87	190.40	90.68
11:47:42	1.07	227.84	93.38
11:47:48	1.17	246.74	114.08
11:48:00	1.37	285.08	103.28
11:48:06	1.47	303.80	105.98
11:48:18	1.67	340.52	115.52
11:48:24	1.77	358.88	118.22
11:48:36	1.97	394.70	142.52
11:48:42	2.07	411.80	141.44
11:48:54	2.27	445.82	141.26
11:49:00	2.37	461.66	146.30
11:49:12	2.57	493.34	156.38
11:49:18	2.67	508.28	161.96
11:49:30	2.87	538.16	177.26
11:49:36	2.97	552.38	179.42
11:49:48	3.17	579.56	190.58
11:49:54	3.27	592.88	197.06
11:50:06	3.47	617.90	208.22
11:50:12	3.57	629.60	213.08
11:50:24	3.77	653.00	225.50
11:50:30	3.87	663.62	232.16
11:50:42	4.07	684.68	245.84
11:50:48	4.17	694.94	251.78
11:51:00	4.37	714.74	264.38
11:51:06	4.47	724.28	270.86
11:51:18	4.67	743.90	285.98
11:51:24	4.77	753.44	294.80
11:51:36	4.97	772.88	312.08
11:51:42	5.07	780.26	317.66
11:51:54	5.27	787.10	326.84
11:52:00	5.37	785.84	327.74
11:52:12	5.57	774.14	330.80
11:52:18	5.67	768.20	333.68
11:52:30	5.87	753.26	336.38
11:52:36	5.97	746.96	338.90
11:52:48	6.17	732.20	344.30
11:52:54	6.27	726.26	345.02

Tray Test Temperature Profile : TT2-700

Typical Case Soil, 700°F

9/3/97

Run Time	Cummulative Time (min.)	Soil Temperature (°F)	Oven Temperature (°F)
11:53:06	6.47	718.70	346.82
11:53:12	6.57	712.94	347.90
11:53:24	6.77	707.18	352.22
11:53:30	6.87	705.38	361.22
11:53:42	7.07	705.56	364.64
11:53:48	7.17	705.92	372.74
11:54:00	7.37	707.00	364.82
11:54:06	7.47	706.64	365.72
11:54:18	7.67	714.20	379.76
11:54:24	7.77	715.10	377.78
11:54:36	7.97	716.72	383.18
11:54:48	8.17	720.50	390.20
11:54:54	8.27	724.82	394.52
11:55:06	8.47	733.46	403.88
11:55:12	8.57	738.86	409.10
11:55:24	8.77	747.86	419.90
11:55:30	8.87	752.90	428.36
11:55:42	9.07	761.54	441.14
11:55:48	9.17	765.14	448.16
11:56:00	9.37	768.56	459.14
11:56:06	9.47	770.00	467.42
11:56:18	9.67	769.28	480.38
11:56:24	9.77	768.56	484.70
11:56:36	9.97	768.56	495.86
11:56:42	10.07	769.28	497.30
11:56:54	10.27	768.02	512.24
11:57:00	10.37	768.74	515.12
11:57:12	10.57	768.92	524.84
11:57:18	10.67	768.92	525.74
11:57:30	10.87	768.74	538.34
11:57:36	10.97	770.00	535.28
11:57:48	11.17	770.36	549.68
11:57:54	11.27	771.26	565.34
11:58:06	11.47	774.50	565.34
11:58:12	11.57	776.84	579.20
11:58:24	11.77	781.70	576.68
11:58:30	11.87	783.86	579.74
11:58:42	12.07	788.00	599.90
11:58:48	12.17	789.44	591.98
11:59:00	12.37	792.14	600.08
11:59:06	12.47	793.22	605.12
11:59:18	12.67	794.84	610.88
11:59:24	12.77	794.84	613.04

Tray Test Temperature Profile : TT2-700
Typical Case Soil, 700°F

9/3/97

Run Time	Cummulative Time (min.)	Soil Temperature (°F)	Oven Temperature (°F)
11:59:36	12.97	795.56	619.52
11:59:42	13.07	795.92	622.22
11:59:54	13.27	796.28	629.78
12:00:00	13.37	796.46	630.86
12:00:12	13.57	796.64	636.98
12:00:18	13.67	796.82	638.60
12:00:30	13.87	796.82	643.64
12:00:36	13.97	796.82	644.90
12:00:48	14.17	796.46	651.20
12:00:54	14.27	797.00	653.36
12:01:06	14.47	796.82	667.76
12:01:12	14.57	796.10	660.38
12:01:24	14.77	795.74	675.14
12:01:30	14.87	795.38	658.76
12:01:42	15.07	794.48	669.38
12:01:48	15.17	794.12	679.64
12:02:00	15.37	793.40	676.76
12:02:06	15.47	793.04	678.92
12:02:18	15.67	791.24	682.88
12:02:24	15.77	790.16	685.94
12:02:36	15.97	787.64	688.82
12:02:42	16.07	786.20	688.10
12:02:54	16.27	782.96	690.26
12:03:00	16.37	781.52	692.24
12:03:12	16.57	778.82	693.32
12:03:18	16.67	776.84	696.56
12:03:30	16.87	746.78	699.44

Tray Test Temperature Profile : TT2-900

Typical Case Soil, 900°F

9/3/97

Run Time	Cummulative Time (min.)	Soil Temperature (°F)	Oven Temperature (°F)
10:37:26	0.00	80.42	71.78
10:37:32	0.10	82.58	72.14
10:37:44	0.30	89.78	72.32
10:37:50	0.40	96.08	72.86
10:38:02	0.60	113.36	74.12
10:38:08	0.70	124.16	74.48
10:38:20	0.90	149.36	75.92
10:38:26	1.00	163.76	77.00
10:38:38	1.20	195.80	80.24
10:38:44	1.30	212.54	81.32
10:38:56	1.50	248.72	85.82
10:39:02	1.60	267.44	88.70
10:39:14	1.80	303.98	94.82
10:39:20	1.90	322.70	98.60
10:39:32	2.10	359.96	106.16
10:39:38	2.20	379.04	110.66
10:39:50	2.40	415.76	118.58
10:39:56	2.50	433.76	122.54
10:40:08	2.70	469.94	131.54
10:40:14	2.80	488.12	136.76
10:40:26	3.00	523.40	147.20
10:40:32	3.10	540.14	151.70
10:40:44	3.30	572.72	162.32
10:40:50	3.40	587.84	167.00
10:41:02	3.60	614.84	176.90
10:41:08	3.70	626.54	181.76
10:41:20	3.90	646.16	191.48
10:41:26	4.00	653.90	195.98
10:41:38	4.20	666.32	205.16
10:41:44	4.30	671.18	209.84
10:41:56	4.50	678.20	219.02
10:42:02	4.60	680.36	223.16
10:42:14	4.80	682.52	232.16
10:42:20	4.90	683.78	237.20
10:42:32	5.10	684.86	245.84
10:42:38	5.20	685.58	248.90
10:42:50	5.40	689.90	255.20
10:42:56	5.50	693.32	258.44
10:43:08	5.70	700.88	264.20
10:43:14	5.80	704.12	266.36
10:43:26	6.00	711.68	271.76
10:43:32	6.10	716.18	275.00
10:43:44	6.30	725.90	282.20

Tray Test Temperature Profile : TT2-900

Typical Case Soil, 900°F

9/3/97

Run Time	Cummulative Time (min.)	Soil Temperature (°F)	Oven Temperature (°F)
10:43:50	6.40	731.84	286.70
10:44:02	6.60	744.26	295.52
10:44:08	6.70	751.64	299.48
10:44:20	6.90	763.70	306.32
10:44:26	7.00	770.36	310.10
10:44:38	7.20	784.94	318.38
10:44:50	7.40	801.86	327.20
10:44:56	7.50	810.32	331.70
10:45:08	7.70	828.14	341.24
10:45:14	7.80	837.86	346.64
10:45:26	8.00	857.30	357.08
10:45:32	8.10	866.48	361.58
10:45:44	8.30	884.12	371.84
10:45:50	8.40	892.22	377.06
10:46:02	8.60	908.06	388.58
10:46:08	8.70	915.80	395.60
10:46:20	8.90	930.56	409.28
10:46:26	9.00	938.66	416.84
10:46:38	9.20	954.32	433.22
10:46:44	9.30	962.06	441.50
10:46:56	9.50	973.94	460.58
10:47:02	9.60	979.16	470.12
10:47:14	9.80	988.34	491.18
10:47:20	9.90	992.30	501.62
10:47:32	10.10	999.32	521.60
10:47:38	10.20	1002.02	530.60
10:47:50	10.40	1009.04	549.68
10:47:56	10.50	1012.46	560.84
10:48:08	10.70	1016.06	576.86
10:48:14	10.80	1018.04	584.42
10:48:26	11.00	1020.02	598.82
10:48:32	11.10	1021.10	606.74
10:48:44	11.30	1021.46	635.90
10:48:50	11.40	1021.82	628.16
10:49:02	11.60	1022.54	640.94
10:49:08	11.70	1023.44	647.60
10:49:20	11.90	1023.80	658.76
10:49:26	12.00	1023.62	665.24
10:49:38	12.20	1025.42	676.40
10:49:44	12.30	1025.60	681.08
10:49:56	12.50	1030.46	692.42
10:50:02	12.60	1016.42	698.36
10:50:14	12.80	1012.82	708.44

Tray Test Temperature Profile : TT2-900
Typical Case Soil, 900°F

9/3/97

Run Time	Cummulative Time (min.)	Soil Temperature (°F)	Oven Temperature (°F)
10:50:20	12.90	1014.44	713.12
10:50:32	13.10	1018.40	723.20
10:50:38	13.20	1020.92	728.60
10:50:50	13.40	1023.44	737.96
10:50:56	13.50	1023.80	742.28
10:51:08	13.70	1026.86	750.74
10:51:14	13.80	1028.12	754.88
10:51:26	14.00	1031.90	763.70
10:51:32	14.10	1033.88	767.84
10:51:44	14.30	1036.22	776.12
10:51:50	14.40	1036.40	779.54
10:52:02	14.60	1033.70	786.92
10:52:08	14.70	1033.88	790.52
10:52:20	14.90	1043.06	797.90
10:52:26	15.00	1033.52	801.14
10:52:38	15.20	1029.38	807.44
10:52:44	15.30	1030.28	811.04
10:52:56	15.50	1031.54	817.34
10:53:02	15.60	1031.72	820.40
10:53:14	15.80	1031.36	826.52
10:53:20	15.90	1031.00	830.12
10:53:32	16.10	1028.66	835.88
10:53:38	16.20	1026.68	838.22
10:53:50	16.40	1025.06	844.34
10:53:56	16.50	1024.16	846.86
10:54:08	16.70	1022.18	852.08
10:54:14	16.80	1021.10	854.42
10:54:26	17.00	1018.04	858.56
10:54:32	17.10	1016.96	860.90
10:54:44	17.30	1014.26	865.04
10:54:50	17.40	1013.36	867.56
10:55:02	17.60	1011.38	871.88
10:55:08	17.70	1010.12	872.78
10:55:20	17.90	1008.14	875.48
10:55:26	18.00	1007.60	877.10
10:55:38	18.20	996.98	878.72
10:55:44	18.30	991.94	878.90
10:55:56	18.50	983.84	879.80
10:56:02	18.60	980.96	880.70
10:56:14	18.80	975.02	881.78
10:56:20	18.90	972.32	882.32
10:56:32	19.10	968.00	882.86
10:56:38	19.20	966.38	883.76

Tray Test Temperature Profile : TT2-900

Typical Case Soil, 900°F

9/3/97

Run Time	Cummulative Time (min.)	Soil Temperature (°F)	Oven Temperature (°F)
10:56:50	19.40	962.96	884.48
10:56:56	19.50	961.52	884.84
10:57:08	19.70	959.54	885.92
10:57:14	19.80	959.18	886.28
10:57:26	20.00	959.54	887.72
10:57:38	20.20	960.80	889.16
10:57:44	20.30	961.70	890.06
10:57:56	20.50	963.68	891.50
10:58:02	20.60	964.76	892.04
10:58:14	20.80	967.64	894.20
10:58:20	20.90	969.08	895.46

Tray Test Temperature Profile : TT2-1100
Typical Case Soil, 1,100°F

9/3/97

Run Time	Cummulative Time (min.)	Soil Temperature (°F)	Oven Temperature (°F)
10:04:52	0.00	85.82	78.62
10:05:04	0.20	92.30	78.98
10:05:10	0.30	99.68	78.98
10:05:22	0.50	122.72	78.80
10:05:28	0.60	137.30	78.44
10:05:40	0.80	170.06	79.34
10:05:46	0.90	187.52	79.52
10:05:58	1.10	223.52	81.32
10:06:04	1.20	242.24	82.22
10:06:16	1.40	279.86	84.92
10:06:22	1.50	298.22	86.36
10:06:34	1.70	333.68	89.96
10:06:40	1.80	351.50	92.30
10:06:52	2.00	386.78	96.08
10:06:58	2.10	403.88	98.96
10:07:10	2.30	437.72	104.18
10:07:16	2.40	453.92	107.06
10:07:28	2.60	486.32	114.80
10:07:34	2.70	501.98	118.22
10:07:46	2.90	532.94	126.14
10:07:52	3.00	547.88	129.92
10:08:04	3.20	577.04	138.92
10:08:10	3.30	591.62	143.96
10:08:22	3.50	618.44	141.26
10:08:28	3.60	631.76	144.68
10:08:40	3.80	655.70	154.76
10:08:46	3.90	666.68	159.98
10:08:58	4.10	688.28	168.80
10:09:04	4.20	698.18	173.66
10:09:16	4.40	717.62	185.72
10:09:22	4.50	726.08	190.22
10:09:34	4.70	740.12	200.66
10:09:40	4.80	747.14	205.88
10:09:52	5.00	766.04	215.24
10:09:58	5.10	775.94	215.60
10:10:10	5.30	798.98	219.74
10:10:16	5.40	810.50	252.86
10:10:28	5.60	834.44	268.52
10:10:34	5.70	845.96	270.86
10:10:46	5.90	867.56	280.22
10:10:52	6.00	877.82	285.44
10:11:04	6.20	897.26	296.24
10:11:10	6.30	906.98	297.14

Tray Test Temperature Profile : TT2-1100
Typical Case Soil, 1,100°F

9/3/97

Run Time	Cummulative Time (min.)	Soil Temperature (°F)	Oven Temperature (°F)
10:11:22	6.50	926.96	314.06
10:11:28	6.60	937.04	320.72
10:11:40	6.80	957.56	365.54
10:11:46	6.90	969.44	342.68
10:11:58	7.10	991.40	361.04
10:12:04	7.20	1002.56	367.16
10:12:16	7.40	1022.18	385.34
10:12:22	7.50	1035.32	396.86
10:12:34	7.70	1067.54	417.56
10:12:40	7.80	1083.74	413.24
10:12:52	8.00	1110.56	453.92
10:12:58	8.10	1118.66	464.72
10:13:10	8.30	1124.96	489.74
10:13:16	8.40	1125.32	503.78
10:13:28	8.60	1123.52	532.22
10:13:40	8.80	1119.20	559.04
10:13:46	8.90	1116.50	571.28
10:13:58	9.10	1110.56	599.00
10:14:04	9.20	1108.22	609.98
10:14:16	9.40	1102.46	633.56
10:14:22	9.50	1100.30	645.26
10:14:34	9.70	1095.08	666.50
10:14:40	9.80	1093.28	676.94
10:14:52	10.00	1089.14	695.12
10:14:58	10.10	1087.16	704.84
10:15:10	10.30	1085.36	721.76
10:15:16	10.40	1085.00	729.86
10:15:28	10.60	1085.72	744.98
10:15:34	10.70	1087.16	753.26
10:15:46	10.90	1089.50	767.84
10:15:52	11.00	1090.94	774.50
10:16:04	11.20	1092.74	787.28
10:16:10	11.30	1094.18	795.02
10:16:22	11.50	1096.16	802.76
10:16:28	11.60	1096.70	804.92
10:16:40	11.80	1097.96	815.72
10:16:46	11.90	1098.86	821.12
10:16:58	12.10	1099.94	831.56
10:17:04	12.20	1100.12	835.70
10:17:16	12.40	1104.26	845.06
10:17:22	12.50	1104.80	849.74
10:17:34	12.70	1106.06	857.48
10:17:40	12.80	1103.54	861.08

Tray Test Temperature Profile : TT2-1100
Typical Case Soil, 1,100°F

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Run Time	Cummulative Time (min.)	Soil Temperature (°F)	Oven Temperature (°F)
10:17:52	13.00	1100.66	868.64
10:17:58	13.10	1095.98	872.06
10:18:10	13.30	1096.70	880.88
10:18:16	13.40	1100.84	885.20
10:18:28	13.60	1113.44	894.56
10:18:34	13.70	1121.36	898.52
10:18:46	13.90	1135.76	907.34
10:18:52	14.00	1142.06	912.38
10:19:04	14.20	1150.52	921.20
10:19:10	14.30	1154.30	924.98
10:19:22	14.50	1155.38	932.72
10:19:28	14.60	1154.48	936.68
10:19:40	14.80	1150.52	943.16
10:19:46	14.90	1148.00	945.86
10:19:58	15.10	1143.86	950.18
10:20:04	15.20	1142.60	954.50
10:20:16	15.40	1140.80	960.08
10:20:22	15.50	1140.26	962.78
10:20:34	15.70	1139.54	968.18
10:20:40	15.80	1139.90	971.24
10:20:52	16.00	1140.62	976.64
10:20:58	16.10	1140.80	979.16
10:21:10	16.30	1141.70	984.02
10:21:16	16.40	1142.06	986.72
10:21:28	16.60	1142.78	991.76
10:21:34	16.70	1142.96	994.10
10:21:46	16.90	1144.76	998.96
10:21:52	17.00	1147.28	1000.94
10:22:04	17.20	1152.86	1006.16
10:22:10	17.30	1156.28	1009.40
10:22:22	17.50	1160.24	1014.44
10:22:28	17.60	1161.14	1016.24
10:22:40	17.80	1161.86	1021.10
10:22:46	17.90	1161.50	1023.08
10:22:58	18.10	1159.88	1026.86
10:23:04	18.20	1158.08	1028.30
10:23:16	18.40	1155.74	1031.72
10:23:22	18.50	1154.66	1032.98
10:23:34	18.70	1153.22	1035.86
10:23:40	18.80	1152.50	1037.66
10:23:52	19.00	1152.14	1040.54
10:23:58	19.10	1152.14	1041.80
10:24:10	19.30	1153.04	1044.68

Tray Test Temperature Profile : TT2-1100
Typical Case Soil, 1,100°F

9/3/97

Run Time	Cummulative Time (min.)	Soil Temperature (°F)	Oven Temperature (°F)
10:24:16	19.40	1153.04	1046.30
10:24:28	19.60	1153.40	1049.00
10:24:34	19.70	1153.40	1050.08
10:24:46	19.90	1154.12	1052.78
10:24:52	20.00	1154.12	1054.22
10:25:04	20.20	1154.30	1056.92
10:25:10	20.30	1154.30	1057.82
10:25:22	20.50	1154.12	1060.16
10:25:28	20.60	1154.48	1061.78
10:25:40	20.80	1154.12	1064.84
10:25:46	20.90	1153.22	1064.48
10:25:58	21.10	1152.86	1066.10
10:26:10	21.30	1152.32	1068.26
10:26:16	21.40	1152.14	1068.98
10:26:28	21.60	1152.50	1071.14
10:26:34	21.70	1152.50	1072.58
10:26:46	21.90	1152.32	1074.02
10:26:52	22.00	1151.96	1074.74
10:27:04	22.20	1152.14	1076.54
10:27:10	22.30	1152.14	1077.62
10:27:22	22.50	1151.96	1079.06
10:27:28	22.60	1152.14	1079.60
10:27:40	22.80	1152.14	1081.58
10:27:46	22.90	1152.14	1082.66
10:27:58	23.10	1152.14	1084.46
10:28:04	23.20	1151.42	1084.64
10:28:16	23.40	1151.42	1086.08
10:28:22	23.50	1151.60	1086.80
10:28:34	23.70	1150.88	1087.70
10:28:40	23.80	1150.88	1088.78
10:28:52	24.00	1151.96	1090.22
10:28:58	24.10	1151.24	1090.40
10:29:10	24.30	1151.42	1092.20
10:29:16	24.40	1151.42	1092.74
10:29:28	24.60	1151.06	1093.64
10:29:34	24.70	1131.44	1094.72

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RTA Temperature Profile : RTA1

Worst Case Soil. Air Purge, 900°F

Run Time	Cummulative Time (min.)	RTA Soil (°F)	RTA Offgas (°F)	RTA Surface (°F)	RTA Exit Gas (°F)	Impinger Exit Gas (°F)
15:12:52	0.00	68.36	69.98	1183.10	133.16	73.04
15:12:58	0.10	67.28	68.72	1183.46	140.54	72.68
15:13:10	0.30	68.00	68.54	1187.78	143.42	72.50
15:13:16	0.40	69.62	68.90	1188.50	145.40	72.32
15:13:28	0.60	73.22	70.34	1191.20	148.10	72.50
15:13:34	0.70	76.28	71.78	1189.94	149.00	72.32
15:13:46	0.90	81.68	74.84	1190.12	151.70	72.32
15:13:52	1.00	85.64	77.00	1192.82	152.60	72.32
15:14:04	1.20	93.02	80.96	1193.00	154.94	71.96
15:14:10	1.30	95.72	83.66	1190.12	155.84	71.60
15:14:22	1.50	106.52	88.88	1191.92	158.36	71.78
15:14:28	1.60	109.76	91.22	1194.26	159.80	71.96
15:14:40	1.80	115.88	98.24	1194.62	162.68	71.78
15:14:46	1.90	123.98	102.74	1193.18	164.48	71.78
15:14:58	2.10	132.26	111.20	1194.98	168.08	71.60
15:15:10	2.30	144.32	119.30	1195.52	172.76	71.60
15:15:16	2.40	152.96	123.62	1195.88	174.92	71.60
15:15:28	2.60	162.68	131.36	1196.78	180.32	71.24
15:15:34	2.70	160.88	136.40	1196.96	183.92	71.24
15:15:46	2.90	172.40	146.30	1196.24	193.28	70.88
15:15:52	3.00	176.36	151.70	1198.58	199.76	71.24
15:16:04	3.20	194.36	161.24	1198.76	213.62	70.70
15:16:10	3.30	190.94	166.28	1198.58	222.26	70.70
15:16:22	3.50	200.84	173.84	1198.94	242.60	70.70
15:16:28	3.60	199.76	178.70	1200.92	254.48	70.34
15:16:40	3.80	209.12	186.62	1201.46	278.96	70.16
15:16:46	3.90	209.84	190.58	1201.28	292.10	70.34
15:16:58	4.10	210.20	196.52	1201.64	312.80	70.16
15:17:04	4.20	212.00	198.32	1204.34	320.18	69.62
15:17:16	4.40	214.70	204.08	1204.52	332.78	69.62
15:17:22	4.50	211.64	205.34	1203.44	336.92	69.80
15:17:34	4.70	214.16	208.04	1205.06	342.68	70.16
15:17:40	4.80	214.70	208.22	1205.96	344.30	69.62
15:17:52	5.00	212.54	208.76	1207.04	346.82	69.80
15:17:58	5.10	212.36	208.22	1206.50	348.08	69.44
15:18:10	5.30	212.72	208.94	1207.22	349.52	69.62
15:18:16	5.40	213.08	209.48	1208.66	350.06	69.44
15:18:28	5.60	213.26	209.84	1210.46	350.60	69.44
15:18:34	5.70	213.44	210.20	1210.28	351.50	69.44
15:18:46	5.90	214.16	210.38	1211.00	353.12	69.44
15:18:52	6.00	214.52	210.20	1212.44	354.20	69.62
15:19:04	6.20	215.24	210.56	1213.52	356.00	69.44
15:19:10	6.30	216.32	210.74	1212.98	356.36	69.26
15:19:22	6.50	217.58	210.92	1213.88	358.34	69.44
15:19:28	6.60	219.20	211.28	1216.22	359.24	69.80
15:19:40	6.80	222.80	212.18	1216.94	361.94	70.16
15:19:46	6.90	225.14	212.72	1216.04	363.02	69.62
15:19:58	7.10	231.44	215.60	1217.12	365.54	69.44
15:20:04	7.20	235.04	218.30	1218.92	366.62	69.80
15:20:16	7.40	244.04	224.24	1219.46	368.24	69.80

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RTA Temperature Profile : RTA1

Worst Case Soil. Air Purge, 900°F

Run Time	Cummulative Time (min.)	RTA Soil (°F)	RTA Offgas (°F)	RTA Surface (°F)	RTA Exit Gas (°F)	Impinger Exit Gas (°F)
15:20:22	7.50	248.18	227.48	1218.74	369.14	69.26
15:20:34	7.70	260.06	235.22	1220.00	370.40	69.44
15:20:40	7.80	266.54	239.72	1222.16	371.12	69.80
15:20:52	8.00	281.12	249.98	1223.06	371.12	69.80
15:20:58	8.10	288.68	254.30	1222.34	370.76	69.62
15:21:10	8.30	304.88	268.52	1223.42	368.78	69.62
15:21:16	8.40	315.50	278.96	1225.04	366.98	69.98
15:21:28	8.60	335.84	294.98	1225.94	359.60	69.80
15:21:34	8.70	344.48	303.44	1225.40	356.18	69.80
15:21:46	8.90	362.84	320.36	1226.30	351.14	69.44
15:21:52	9.00	370.40	328.46	1227.56	348.26	69.44
15:22:04	9.20	385.52	344.48	1229.18	345.56	69.62
15:22:16	9.40	404.78	358.70	1230.26	344.66	69.62
15:22:22	9.50	411.26	366.44	1230.44	344.48	69.80
15:22:34	9.70	431.60	381.20	1231.52	343.22	69.62
15:22:40	9.80	437.72	389.66	1232.24	341.96	69.26
15:22:52	10.00	456.08	404.60	1233.68	341.78	69.44
15:22:58	10.10	465.62	412.70	1234.04	341.96	69.44
15:23:10	10.30	478.94	427.46	1235.48	343.58	69.62
15:23:16	10.40	487.40	434.66	1236.20	351.14	69.26
15:23:28	10.60	497.66	448.52	1237.64	358.34	69.26
15:23:34	10.70	507.56	456.08	1238.00	357.98	69.80
15:23:46	10.90	518.90	469.76	1239.44	362.66	69.80
15:23:52	11.00	527.36	476.06	1239.98	366.26	69.26
15:24:04	11.20	535.10	489.02	1241.24	371.66	69.26
15:24:10	11.30	545.54	496.22	1241.60	374.54	69.26
15:24:22	11.50	559.22	509.00	1243.04	381.02	69.26
15:24:28	11.60	562.28	515.12	1244.48	384.62	69.26
15:24:40	11.80	573.08	527.90	1246.28	388.94	69.26
15:24:46	11.90	580.10	534.02	1246.64	391.46	69.44
15:24:58	12.10	591.08	545.54	1247.72	394.88	69.26
15:25:04	12.20	602.42	550.94	1249.34	396.50	69.26
15:25:16	12.40	608.00	562.10	1250.96	405.32	69.26
15:25:22	12.50	611.96	567.68	1250.96	406.94	69.08
15:25:34	12.70	618.98	577.94	1252.40	404.78	68.90
15:25:40	12.80	623.12	582.98	1254.02	405.86	69.26
15:25:52	13.00	635.36	593.78	1255.64	407.84	69.62
15:25:58	13.10	638.78	598.28	1255.64	407.66	68.72
15:26:10	13.30	651.20	608.54	1257.44	409.46	68.90
15:26:16	13.40	657.32	614.12	1258.34	411.08	69.26
15:26:28	13.60	665.78	624.56	1259.96	410.90	69.26
15:26:34	13.70	671.18	629.42	1260.32	411.26	68.90
15:26:46	13.90	678.92	639.86	1257.80	413.42	69.08
15:26:52	14.00	683.24	645.62	1255.64	414.32	69.26
15:27:04	14.20	695.48	656.24	1250.78	414.86	69.44
15:27:10	14.30	697.64	661.10	1248.44	415.40	69.26
15:27:22	14.50	706.64	670.82	1242.68	416.12	69.26
15:27:28	14.60	709.88	675.86	1238.72	415.94	69.26
15:27:40	14.80	721.58	684.50	1233.14	415.04	68.90
15:27:46	14.90	725.72	688.82	1231.70	415.22	68.90

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RTA Temperature Profile : RTA1

Worst Case Soil. Air Purge, 900°F

Run Time	Cummulative Time (min.)	RTA Soil (°F)	RTA Offgas (°F)	RTA Surface (°F)	RTA Exit Gas (°F)	Impinger Exit Gas (°F)
15:27:58	15.10	730.22	698.36	1226.66	414.86	69.08
15:28:04	15.20	735.80	702.68	1222.52	415.22	68.72
15:28:16	15.40	742.82	711.32	1217.48	414.32	68.72
15:28:22	15.50	745.88	716.00	1216.76	413.60	69.26
15:28:34	15.70	753.08	725.00	1212.26	415.58	69.26
15:28:40	15.80	756.68	728.60	1208.66	421.70	69.08
15:28:52	16.00	766.04	737.06	1204.16	415.94	69.08
15:28:58	16.10	770.00	741.38	1203.08	411.44	69.26
15:29:10	16.30	773.42	747.86	1198.22	407.84	68.72
15:29:22	16.50	778.82	755.78	1194.26	404.42	69.08
15:29:28	16.60	782.06	759.38	1191.38	403.52	68.90
15:29:40	16.80	787.28	766.40	1187.42	401.72	68.90
15:29:46	16.90	789.44	770.18	1186.34	400.46	69.26
15:29:58	17.10	793.76	776.30	1182.02	398.12	68.72
15:30:04	17.20	796.82	779.00	1179.86	397.76	68.72
15:30:16	17.40	800.42	785.30	1176.44	395.96	68.90
15:30:22	17.50	804.74	788.36	1174.82	394.70	68.90
15:30:34	17.70	812.12	793.94	1171.58	393.08	69.08
15:30:40	17.80	814.10	797.18	1169.78	392.36	69.26
15:30:52	18.00	818.42	802.76	1166.54	389.48	69.26
15:30:58	18.10	821.84	805.28	1164.56	387.86	68.90
15:31:10	18.30	826.88	810.50	1161.32	385.34	68.90
15:31:16	18.40	826.88	813.56	1159.88	385.16	69.44
15:31:28	18.60	831.38	818.42	1156.64	383.36	69.26
15:31:34	18.70	832.10	819.86	1154.66	381.74	68.36
15:31:46	18.90	838.40	824.36	1151.78	380.48	68.72
15:31:52	19.00	840.02	827.24	1150.16	380.30	69.08
15:32:04	19.20	843.44	832.10	1147.64	379.22	69.44
15:32:10	19.30	847.04	833.54	1146.20	378.50	69.08
15:32:22	19.50	852.80	837.68	1143.50	377.24	69.26
15:32:28	19.60	854.78	840.02	1141.70	375.98	69.26
15:32:40	19.80	856.22	843.62	1138.28	373.64	69.08
15:32:46	19.90	859.82	845.24	1137.56	373.28	68.90
15:32:58	20.10	860.54	849.38	1135.04	371.30	69.26
15:33:04	20.20	863.60	851.90	1133.96	370.22	69.80
15:33:16	20.40	865.40	855.14	1131.26	367.52	69.62
15:33:22	20.50	869.00	856.76	1130.72	366.80	69.98
15:33:34	20.70	871.70	860.00	1127.84	363.92	69.80
15:33:40	20.80	871.52	861.62	1126.04	362.30	69.44
15:33:52	21.00	876.56	864.68	1123.52	360.14	69.44
15:33:58	21.10	877.28	866.48	1122.62	359.06	69.62
15:34:10	21.30	881.06	869.54	1120.10	356.54	69.62
15:34:16	21.40	880.34	870.62	1118.30	355.10	69.26
15:34:28	21.60	884.48	873.86	1116.50	352.94	69.62
15:34:34	21.70	887.72	876.20	1116.14	352.22	70.34
15:34:46	21.90	889.34	878.90	1113.80	349.52	70.34
15:34:52	22.00	889.52	879.62	1112.36	348.08	69.98
15:35:04	22.20	892.04	881.60	1109.84	345.38	69.44
15:35:10	22.30	894.56	883.58	1108.76	354.20	69.98
15:35:22	22.50	895.82	887.00	1106.60	354.02	70.16

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RTA Temperature Profile : RTA1

Worst Case Soil. Air Purge, 900°F

Run Time	Cummulative Time (min.)	RTA Soil (°F)	RTA Offgas (°F)	RTA Surface (°F)	RTA Exit Gas (°F)	Impinger Exit Gas (°F)
15:35:28	22.60	897.44	887.72	1086.26	347.90	69.98
15:35:40	22.80	899.78	890.60	1054.04	340.70	70.70
15:35:46	22.90	900.14	890.96	1074.56	337.28	70.52
15:35:58	23.10	897.62	890.60	1082.12	332.06	70.34
15:36:10	23.30	894.38	889.34	1084.82	327.92	70.34
15:36:16	23.40	892.22	888.44	1085.36	326.48	70.70
15:36:28	23.60	887.90	885.56	1085.18	322.34	70.70
15:36:34	23.70	884.84	882.50	1084.46	319.28	70.16
15:36:46	23.90	872.60	875.30	1083.56	315.32	69.98
15:36:52	24.00	865.76	871.34	1083.56	313.70	70.70
15:37:04	24.20	852.80	860.36	1082.30	309.74	71.06
15:37:10	24.30	847.40	853.16	1080.86	307.04	70.34
15:37:22	24.50	821.66	838.40	1079.24	302.90	70.34
15:37:28	24.60	802.76	829.40	1078.52	301.10	70.34
15:37:40	24.80	775.94	807.44	1076.90	296.60	70.52
15:37:46	24.90	748.94	795.02	1075.46	293.90	70.16
15:37:58	25.10	717.80	770.18	1074.56	290.30	70.52
15:38:04	25.20	681.44	757.04	1073.48	288.68	70.70
15:38:16	25.40	651.38	729.86	1071.86	285.08	71.24
15:38:22	25.50	636.98	715.28	1070.78	282.74	70.88
15:38:34	25.70	596.66	688.28	1068.44	280.76	70.70
15:38:40	25.80	581.00	675.14	1067.72	280.04	70.70
15:38:52	26.00	544.82	647.96	1065.38	277.52	70.52
15:38:58	26.10	532.94	635.54	1065.38	276.80	71.24
15:39:10	26.30	498.74	610.88	1063.40	275.18	71.24
15:39:16	26.40	482.18	598.64	1061.96	274.28	70.70
15:39:28	26.60	460.58	573.80	1060.52	274.10	70.88
15:39:34	26.70	446.18	561.92	1060.70	274.28	71.24
15:39:46	26.90	419.36	539.78	1058.00	273.20	71.24
15:39:52	27.00	409.10	528.80	1056.38	272.30	70.88
15:40:04	27.20	382.28	506.84	1054.76	270.86	70.52
15:40:10	27.30	376.52	497.12	1053.86	270.32	70.70
15:40:22	27.50	354.02	476.06	1051.70	269.42	70.88
15:40:28	27.60	344.84	466.34	1051.88	269.78	71.42
15:40:40	27.80	325.76	447.26	1050.26	268.88	71.42
15:40:46	27.90	306.68	437.72	1048.64	268.16	71.06
15:40:58	28.10	297.14	419.54	1047.38	267.44	71.24
15:41:04	28.20	289.76	410.72	1046.84	267.26	71.78
15:41:16	28.40	267.62	393.08	1044.32	266.18	71.78
15:41:22	28.50	261.86	384.62	1043.42	265.64	71.24
15:41:34	28.70	249.62	368.78	1041.80	264.92	71.42
15:41:40	28.80	233.96	361.04	1041.44	264.56	71.78
15:41:52	29.00	228.74	345.92	1039.82	263.48	71.78
15:41:58	29.10	224.42	338.54	1038.38	262.58	71.24
15:42:10	29.30	213.26	325.40	1036.94	262.04	71.42
15:42:16	29.40	208.22	318.92	1036.40	261.68	71.78
15:42:28	29.60	198.50	305.96	1034.96	260.78	71.96
15:42:34	29.70	192.92	299.66	1033.16	260.42	71.42
15:42:46	29.90	185.36	287.24	1031.54	259.34	71.42
15:42:58	30.10	176.90	276.62	1030.10	258.98	71.60

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RTA Temperature Profile : RTA1

Worst Case Soil. Air Purge, 900°F

Run Time	Cummulative Time (min.)	RTA Soil (°F)	RTA Offgas (°F)	RTA Surface (°F)	RTA Exit Gas (°F)	Impinger Exit Gas (°F)
15:43:04	30.20	172.94	271.40	1029.38	258.26	71.96
15:43:16	30.40	166.28	260.78	1027.76	257.90	72.14
15:43:22	30.50	160.52	255.20	1027.22	257.72	71.96
15:43:34	30.70	155.84	245.84	1025.42	257.36	71.96
15:43:40	30.80	153.86	241.88	1024.70	256.82	71.96
15:43:52	31.00	145.94	233.24	1023.08	256.46	71.96
15:43:58	31.10	145.40	228.92	1022.54	256.82	72.32
15:44:10	31.30	140.54	221.18	1020.92	256.28	72.50
15:44:16	31.40	138.20	217.40	1019.48	255.56	72.14
15:44:28	31.60	136.22	210.02	1018.04	254.84	72.14
15:44:34	31.70	133.88	206.42	1017.68	254.84	72.32
15:44:46	31.90	131.18	200.12	1016.06	254.48	72.50
15:44:52	32.00	129.56	196.88	1014.98	253.94	72.14
15:45:04	32.20	125.78	190.58	1012.64	253.04	71.78
15:45:10	32.30	125.42	187.88	1011.92	252.86	72.14
15:45:22	32.50	122.72	182.12	1011.02	252.32	72.50
15:45:28	32.60	122.54	179.78	1010.48	251.96	72.32
15:45:40	32.80	119.84	174.56	1008.86	251.60	72.50
15:45:46	32.90	118.04	172.22	1008.32	251.06	72.50
15:45:58	33.10	114.98	167.36	1006.88	249.98	72.32
15:46:04	33.20	113.36	165.02	1005.80	249.62	72.32
15:46:16	33.40	113.54	160.52	1004.36	249.44	72.50
15:46:22	33.50	111.74	159.08	1003.64	248.90	72.68
15:46:34	33.70	110.30	154.76	1001.84	248.72	72.32
15:46:40	33.80	108.86	152.78	1001.66	249.08	72.50
15:46:52	34.00	105.98	149.18	1000.04	248.54	72.68
15:46:58	34.10	105.62	147.38	998.96	248.00	72.32
15:47:10	34.30	104.72	144.50	997.70	247.64	72.68
15:47:16	34.40	103.82	142.70	996.80	247.64	72.86
15:47:28	34.60	101.84	139.10	995.54	246.92	72.68
15:47:34	34.70	101.12	138.20	994.82	246.56	72.68
15:47:46	34.90	99.50	134.96	993.02	246.02	72.68
15:47:52	35.00	98.24	133.34	993.02	246.20	73.04
15:48:04	35.20	96.80	130.28	991.04	244.76	72.68
15:48:10	35.30	96.62	129.20	990.32	244.04	72.68
15:48:22	35.50	95.36	126.32	988.88	243.50	72.68
15:48:28	35.60	94.10	125.42	988.34	243.14	72.86

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RTA Temperature Profile : RTAN

Worst Case Soil. Nitrogen Purge, 900°F

Run Time	Cummulative Time (min.)	RTA Soil (°F)	RTA Offgas (°F)	RTA Surface (°F)	RTA Exit Gas (°F)	Impinger Exit Gas (°F)
9:58:53	0.00	72.68	61.52	1183.46	137.48	65.84
9:58:59	0.10	66.92	61.52	1183.64	138.74	65.84
9:59:11	0.30	76.82	62.24	1185.08	140.36	65.84
9:59:17	0.40	83.66	63.14	1185.98	140.36	65.66
9:59:29	0.60	94.46	65.48	1185.08	141.26	65.48
9:59:35	0.70	91.76	66.92	1185.44	142.88	65.66
9:59:47	0.90	104.36	70.70	1184.90	145.22	65.66
9:59:53	1.00	108.68	73.40	1185.80	145.94	65.66
10:00:05	1.20	119.84	78.26	1185.80	149.00	65.30
10:00:11	1.30	122.36	81.50	1184.54	150.26	65.30
10:00:23	1.50	128.84	84.20	1185.62	153.86	64.94
10:00:29	1.60	136.76	86.90	1185.80	155.84	64.58
10:00:41	1.80	143.24	91.58	1186.34	159.44	64.40
10:00:47	1.90	149.90	94.82	1186.16	160.88	64.22
10:00:59	2.10	159.62	103.10	1185.62	165.74	64.04
10:01:05	2.20	164.66	106.34	1185.98	168.08	63.86
10:01:17	2.40	176.54	116.42	1186.70	174.56	63.32
10:01:23	2.50	174.56	118.94	1186.34	177.80	63.14
10:01:35	2.70	186.44	131.18	1186.16	187.70	62.60
10:01:41	2.80	194.18	134.24	1188.68	193.82	62.60
10:01:53	3.00	197.06	146.30	1187.96	206.24	62.60
10:01:59	3.10	200.84	151.52	1188.50	213.08	62.42
10:02:11	3.30	206.24	161.60	1188.68	231.08	62.06
10:02:17	3.40	208.94	166.64	1189.76	245.12	62.42
10:02:29	3.60	212.18	176.36	1190.30	270.50	61.70
10:02:35	3.70	211.64	179.78	1190.66	282.56	61.52
10:02:47	3.90	213.62	189.68	1190.30	304.16	61.16
10:02:53	4.00	216.50	194.00	1191.74	312.98	61.34
10:03:05	4.20	217.94	202.10	1191.92	326.66	60.98
10:03:11	4.30	217.58	206.24	1191.20	331.70	60.44
10:03:23	4.50	221.36	208.22	1191.92	339.80	60.26
10:03:29	4.60	221.72	208.40	1193.54	343.04	60.44
10:03:41	4.80	224.24	208.94	1194.08	347.00	60.44
10:03:47	4.90	223.70	209.12	1193.54	347.90	59.90
10:03:59	5.10	226.94	208.94	1194.26	347.90	59.72
10:04:11	5.30	230.00	208.94	1195.34	347.00	59.72
10:04:17	5.40	237.56	209.48	1196.42	346.28	60.08
10:04:29	5.60	240.44	209.84	1197.14	346.64	60.08
10:04:35	5.70	241.16	209.84	1196.42	347.90	60.08
10:04:47	5.90	250.34	211.10	1197.50	350.60	60.44
10:04:53	6.00	249.80	212.00	1197.68	350.78	60.08
10:05:05	6.20	265.46	215.24	1199.30	351.86	60.62
10:05:11	6.30	267.44	217.04	1198.04	353.12	60.80
10:05:23	6.50	271.76	221.90	1199.48	356.00	61.34
10:05:29	6.60	275.90	224.60	1200.38	357.08	61.34
10:05:41	6.80	280.76	230.90	1200.92	360.32	61.70
10:05:47	6.90	285.98	234.50	1201.46	361.94	62.06
10:05:59	7.10	300.92	243.14	1202.18	365.54	62.24
10:06:05	7.20	304.70	248.00	1202.72	366.80	62.24
10:06:17	7.40	312.08	258.26	1204.34	369.50	62.78

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RTA Temperature Profile : RTAN

Worst Case Soil. Nitrogen Purge, 900°F

Run Time	Cummulative Time (min.)	RTA Soil (°F)	RTA Offgas (°F)	RTA Surface (°F)	RTA Exit Gas (°F)	Impinger Exit Gas (°F)
10:06:23	7.50	315.14	263.48	1202.54	369.68	62.42
10:06:35	7.70	338.36	274.10	1203.62	371.30	62.60
10:06:41	7.80	347.18	279.50	1205.06	372.38	62.42
10:06:53	8.00	358.34	290.84	1205.78	373.28	62.78
10:06:59	8.10	365.90	296.60	1205.42	374.00	63.14
10:07:11	8.30	384.80	307.94	1206.32	374.72	62.60
10:07:17	8.40	394.52	313.16	1207.58	374.72	62.42
10:07:29	8.60	403.70	323.60	1208.48	372.38	62.42
10:07:35	8.70	410.72	329.18	1208.12	371.84	62.60
10:07:47	8.90	424.04	341.60	1208.84	369.68	62.78
10:07:53	9.00	431.24	347.90	1210.28	368.96	62.96
10:08:05	9.20	442.04	361.58	1211.54	366.26	63.14
10:08:11	9.30	455.36	368.60	1211.18	366.26	63.14
10:08:23	9.50	466.34	381.56	1211.90	369.50	63.14
10:08:29	9.60	470.66	388.22	1213.70	366.80	63.68
10:08:41	9.80	481.10	401.36	1214.78	359.60	63.86
10:08:47	9.90	488.84	408.02	1214.06	360.32	63.68
10:08:59	10.10	499.64	420.98	1215.32	358.16	63.50
10:09:05	10.20	506.66	427.46	1217.12	356.54	64.04
10:09:17	10.40	513.68	440.42	1218.20	357.26	64.22
10:09:23	10.50	513.86	447.08	1218.02	359.60	64.58
10:09:35	10.70	531.32	459.68	1219.28	362.12	64.40
10:09:41	10.80	536.72	466.16	1220.90	363.56	64.94
10:09:53	11.00	546.26	478.22	1221.80	368.42	64.58
10:09:59	11.10	550.22	483.98	1221.44	372.38	64.40
10:10:11	11.30	558.32	496.04	1222.88	379.04	64.40
10:10:23	11.50	570.02	507.92	1224.32	385.52	64.58
10:10:29	11.60	574.16	514.04	1225.94	386.96	65.12
10:10:41	11.80	583.88	525.20	1227.38	391.64	64.94
10:10:47	11.90	587.84	530.78	1227.38	394.70	65.30
10:10:59	12.10	598.28	541.22	1228.28	400.10	64.94
10:11:05	12.20	605.12	546.62	1229.36	401.36	64.58
10:11:17	12.40	613.22	557.24	1230.80	407.30	64.76
10:11:23	12.50	615.56	562.82	1230.98	406.76	65.30
10:11:35	12.70	626.72	573.80	1232.60	409.10	65.66
10:11:41	12.80	631.04	578.48	1233.68	409.64	65.30
10:11:53	13.00	634.82	589.10	1235.12	413.06	65.48
10:11:59	13.10	642.56	594.68	1235.84	414.86	65.84
10:12:11	13.30	651.02	604.94	1237.10	414.14	66.02
10:12:17	13.40	656.78	609.62	1238.00	415.40	65.66
10:12:29	13.60	662.54	619.34	1239.44	417.56	65.66
10:12:35	13.70	665.96	624.56	1239.62	418.46	65.84
10:12:47	13.90	675.50	634.64	1241.06	420.98	66.02
10:12:53	14.00	679.82	638.96	1242.32	422.06	65.66
10:13:05	14.20	687.56	648.68	1243.94	422.24	65.84
10:13:11	14.30	692.06	654.08	1243.94	423.86	66.20
10:13:23	14.50	699.44	663.08	1245.56	426.38	66.02
10:13:29	14.60	703.58	667.58	1246.82	425.84	65.84
10:13:41	14.80	715.10	676.76	1248.08	426.56	65.84
10:13:47	14.90	716.90	681.26	1246.82	427.64	65.84

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RTA Temperature Profile : RTAN

Worst Case Soil. Nitrogen Purge, 900°F

Run Time	Cummulative Time (min.)	RTA Soil (°F)	RTA Offgas (°F)	RTA Surface (°F)	RTA Exit Gas (°F)	Impinger Exit Gas (°F)
10:13:59	15.10	722.12	690.62	1243.76	428.72	66.02
10:14:05	15.20	726.62	694.94	1241.96	428.90	66.38
10:14:17	15.40	735.80	703.76	1236.56	429.26	66.38
10:14:23	15.50	737.78	707.90	1232.96	429.62	66.02
10:14:35	15.70	745.88	716.36	1227.20	429.62	66.20
10:14:41	15.80	749.84	720.50	1224.86	429.08	66.74
10:14:53	16.00	755.42	727.70	1218.74	433.04	66.20
10:14:59	16.10	758.12	730.76	1215.32	437.90	65.66
10:15:11	16.30	764.96	738.14	1210.10	429.08	66.02
10:15:17	16.40	768.20	742.10	1207.58	427.64	66.20
10:15:29	16.60	775.04	749.30	1202.72	425.30	66.74
10:15:35	16.70	778.64	752.36	1200.02	424.40	66.38
10:15:47	16.90	783.86	759.02	1194.98	422.96	66.38
10:15:53	17.00	787.46	762.26	1192.82	422.24	66.74
10:16:05	17.20	793.76	768.56	1187.96	420.80	66.74
10:16:11	17.30	789.44	771.80	1186.16	421.34	66.74
10:16:23	17.50	797.54	777.20	1181.48	419.90	66.74
10:16:29	17.60	800.24	780.26	1179.50	418.10	66.56
10:16:41	17.80	806.18	785.12	1175.00	415.58	66.74
10:16:47	17.90	806.72	788.18	1173.20	415.22	67.10
10:16:59	18.10	813.02	793.40	1169.06	413.78	67.28
10:17:11	18.30	814.82	798.08	1164.92	412.16	66.92
10:17:17	18.40	818.42	800.24	1162.76	411.26	67.10
10:17:29	18.60	821.84	804.56	1158.62	409.10	66.74
10:17:35	18.70	824.90	807.08	1156.82	408.74	66.92
10:17:47	18.90	827.96	811.40	1153.04	407.30	66.92
10:17:53	19.00	828.50	813.20	1150.88	406.22	66.74
10:18:05	19.20	833.36	817.34	1147.46	404.42	66.74
10:18:11	19.30	835.34	819.32	1145.66	403.16	66.74
10:18:23	19.50	839.66	823.10	1142.24	401.36	66.92
10:18:29	19.60	841.10	824.90	1140.62	400.46	66.92
10:18:41	19.80	844.52	828.50	1137.20	398.84	67.10
10:18:47	19.90	847.04	830.12	1135.22	397.76	66.92
10:18:59	20.10	850.82	833.72	1132.34	396.68	67.10
10:19:05	20.20	851.18	835.34	1130.90	396.32	67.64
10:19:17	20.40	854.42	838.58	1127.66	394.88	67.82
10:19:23	20.50	856.40	839.66	1125.68	393.98	67.10
10:19:35	20.70	858.38	842.36	1122.44	392.18	66.92
10:19:41	20.80	860.00	844.16	1121.00	391.64	67.28
10:19:53	21.00	862.34	846.68	1117.94	389.48	67.10
10:19:59	21.10	863.78	847.76	1115.96	388.76	66.74
10:20:11	21.30	866.30	850.46	1113.44	387.32	67.10
10:20:17	21.40	868.28	852.26	1111.82	386.42	67.28
10:20:29	21.60	870.26	854.78	1109.12	384.62	67.64
10:20:35	21.70	872.06	855.86	1108.22	383.90	67.64
10:20:47	21.90	874.22	858.02	1105.16	381.20	67.64
10:20:53	22.00	874.76	859.46	1103.54	379.58	67.64
10:21:05	22.20	877.10	861.62	1100.84	377.06	67.64
10:21:11	22.30	879.08	862.34	1099.58	375.98	67.46
10:21:23	22.50	880.16	864.50	1097.06	373.64	67.64

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RTA Temperature Profile : RTAN

Worst Case Soil. Nitrogen Purge, 900°F

Run Time	Cummulative Time (min.)	RTA Soil (°F)	RTA Offgas (°F)	RTA Surface (°F)	RTA Exit Gas (°F)	Impinger Exit Gas (°F)
10:21:29	22.60	881.06	865.58	1095.08	372.20	67.64
10:21:41	22.80	883.76	867.74	1092.74	382.28	67.64
10:21:47	22.90	884.84	868.64	1091.84	385.16	67.82
10:21:59	23.10	886.46	870.80	1089.32	372.56	67.82
10:22:05	23.20	887.54	871.70	1087.34	369.32	67.64
10:22:17	23.40	888.98	873.50	1084.82	365.00	67.64
10:22:23	23.50	890.24	874.58	1084.28	363.38	68.00
10:22:35	23.70	892.22	876.38	1082.12	360.68	68.36
10:22:41	23.80	892.58	876.74	1080.14	359.06	68.00
10:22:53	24.00	894.02	878.36	1077.80	356.54	67.82
10:23:05	24.20	895.82	879.80	1075.46	354.20	68.00
10:23:11	24.30	896.54	881.06	1074.74	353.12	68.36
10:23:23	24.50	898.34	882.50	1072.22	350.42	68.36
10:23:29	24.60	898.52	882.50	1070.78	349.16	68.00
10:23:41	24.80	899.96	883.94	1052.96	347.18	68.00
10:23:47	24.90	901.04	884.84	1030.46	345.74	68.18
10:23:59	25.10	899.42	884.84	993.56	343.58	68.18
10:24:05	25.20	897.62	884.30	1022.90	343.22	68.36
10:24:17	25.40	893.84	882.50	1032.98	341.06	68.36
10:24:23	25.50	892.40	880.88	1035.14	339.26	68.54
10:24:35	25.70	887.72	877.10	1036.40	336.38	68.18
10:24:41	25.80	885.02	874.94	1036.58	335.84	68.36
10:24:53	26.00	876.20	869.36	1036.40	333.14	68.72
10:24:59	26.10	872.60	865.40	1035.32	331.16	68.54
10:25:11	26.30	856.58	853.70	1033.88	328.28	68.72
10:25:17	26.40	855.14	846.86	1033.88	327.56	68.90
10:25:29	26.60	840.02	832.64	1032.26	324.68	69.26
10:25:35	26.70	829.76	825.08	1031.18	322.70	68.90
10:25:47	26.90	815.18	808.88	1029.20	319.28	68.90
10:25:53	27.00	809.78	800.24	1028.12	318.38	69.08
10:26:05	27.20	791.96	781.52	1026.14	315.50	69.08
10:26:11	27.30	781.88	770.72	1024.88	313.16	68.72
10:26:23	27.50	759.74	749.48	1022.90	310.10	68.90
10:26:29	27.60	748.04	738.14	1022.18	309.38	69.26
10:26:41	27.80	722.66	714.20	1020.20	306.68	69.26
10:26:47	27.90	702.14	701.60	1018.40	304.88	69.26
10:26:59	28.10	665.60	674.96	1016.60	301.82	68.72
10:27:05	28.20	642.92	661.46	1015.34	300.74	68.90
10:27:17	28.40	607.46	635.00	1013.36	298.58	69.08
10:27:23	28.50	584.42	623.12	1012.46	297.14	69.26
10:27:35	28.70	552.02	599.18	1010.84	295.34	69.44
10:27:41	28.80	537.26	587.48	1009.04	294.98	69.44
10:27:53	29.00	512.24	563.72	1007.06	293.72	69.08
10:27:59	29.10	501.08	553.28	1006.16	292.46	69.44
10:28:11	29.30	477.32	532.04	1003.82	290.12	69.26
10:28:17	29.40	459.14	521.60	1002.74	289.58	69.26
10:28:29	29.60	434.84	499.64	1000.76	287.78	69.08
10:28:35	29.70	419.36	488.84	999.86	286.88	69.26
10:28:47	29.90	401.72	469.04	997.34	285.44	69.44
10:28:53	30.00	412.52	459.50	996.62	285.44	69.26

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RTA Temperature Profile : RTAN

Worst Case Soil. Nitrogen Purge, 900°F

Run Time	Cummulative Time (min.)	RTA Soil (°F)	RTA Offgas (°F)	RTA Surface (°F)	RTA Exit Gas (°F)	Impinger Exit Gas (°F)
10:29:05	30.20	366.80	440.42	994.82	284.54	69.26
10:29:11	30.30	351.14	431.78	994.10	283.28	69.44
10:29:23	30.50	328.64	414.86	991.40	282.02	69.26
10:29:29	30.60	319.10	406.94	990.68	281.66	69.26
10:29:41	30.80	299.66	391.64	988.70	281.12	69.26
10:29:53	31.00	289.94	377.42	986.72	281.12	69.44
10:29:59	31.10	277.34	371.12	985.82	280.58	69.44
10:30:11	31.30	258.80	357.62	983.30	280.04	69.26
10:30:17	31.40	252.86	351.50	982.76	280.22	69.44
10:30:29	31.60	237.20	339.62	981.32	280.94	69.62
10:30:35	31.70	231.26	333.68	980.06	280.04	69.26
10:30:47	31.90	210.74	322.16	978.26	280.58	69.26
10:30:53	32.00	205.70	316.22	977.00	281.12	69.26
10:31:05	32.20	194.18	305.78	975.56	281.12	69.44
10:31:11	32.30	189.86	300.74	974.30	280.22	69.26
10:31:23	32.50	181.40	290.84	972.68	280.04	69.44
10:31:29	32.60	167.36	286.16	971.78	280.04	69.62
10:31:41	32.80	160.52	276.98	970.16	279.32	69.62
10:31:47	32.90	158.36	272.48	968.72	279.14	69.44
10:31:59	33.10	156.56	263.66	967.28	278.06	69.26
10:32:05	33.20	144.14	259.70	966.02	277.88	69.44
10:32:17	33.40	140.18	251.78	964.04	277.16	69.26
10:32:23	33.50	141.26	248.00	963.32	276.80	69.26
10:32:35	33.70	131.36	240.80	961.52	275.90	69.26
10:32:41	33.80	128.12	237.20	960.62	275.72	69.26
10:32:53	34.00	121.82	230.36	958.28	274.82	69.08
10:32:59	34.10	124.16	226.76	957.74	274.46	69.26
10:33:11	34.30	120.20	220.64	955.76	273.92	69.26
10:33:17	34.40	117.68	217.58	954.50	273.56	69.08
10:33:29	34.60	113.72	211.64	952.52	273.02	69.26
10:33:35	34.70	110.12	208.94	952.34	273.02	69.26
10:33:47	34.90	109.04	203.36	950.72	272.84	69.44
10:33:53	35.00	108.86	200.30	949.64	271.94	69.26
10:34:05	35.20	105.62	195.26	947.84	271.40	69.26
10:34:11	35.30	105.26	192.74	947.30	271.58	69.44
10:34:23	35.50	105.08	187.88	945.50	270.68	69.26
10:34:29	35.60	102.02	185.72	944.78	270.14	69.26

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RTA Temperature Profile : RTA2

Typical Case Soil, Air Purge, 700°F

Run Time	Cummulative Time (min.)	RTA Soil (°F)	RTA Offgas (°F)	RTA Surface (°F)	Filter Inlet (°F)	Filter Outlet (°F)	Impinger Exit Gas (°F)
10:16:49	0.00	64.94	55.94	1030.82	175.46	167.36	62.78
10:17:01	0.20	60.08	55.94	1041.80	175.28	167.54	62.60
10:17:07	0.30	60.26	56.48	1044.50	175.10	167.72	62.42
10:17:19	0.50	62.78	58.46	1049.90	175.28	168.08	62.60
10:17:25	0.60	64.58	59.36	1052.24	175.28	170.60	62.60
10:17:37	0.80	69.26	61.70	1054.40	178.52	201.56	62.42
10:17:43	0.90	70.88	63.14	1057.46	184.28	206.78	61.88
10:17:55	1.10	76.10	66.56	1058.54	190.22	218.66	60.44
10:18:01	1.20	79.34	68.18	1058.72	189.68	221.00	60.08
10:18:13	1.40	86.90	71.60	1062.32	188.42	207.86	59.72
10:18:19	1.50	88.52	73.76	1063.76	187.16	204.26	59.72
10:18:31	1.70	93.02	79.34	1064.48	186.80	214.34	59.72
10:18:37	1.80	95.72	82.76	1066.64	187.16	220.64	59.72
10:18:49	2.00	102.20	89.06	1068.08	188.42	232.16	59.54
10:18:55	2.10	105.80	91.76	1070.06	189.50	236.30	59.18
10:19:07	2.30	114.98	97.34	1070.42	195.08	233.24	57.92
10:19:13	2.40	117.68	100.22	1073.12	196.16	236.12	57.56
10:19:25	2.60	126.32	107.78	1073.84	196.52	242.24	57.20
10:19:31	2.70	135.68	111.02	1074.02	196.88	243.86	57.20
10:19:43	2.90	138.02	119.30	1077.62	197.06	246.02	57.02
10:19:55	3.10	148.28	126.86	1078.70	197.24	248.36	57.02
10:20:01	3.20	151.70	130.28	1079.96	197.06	249.62	56.48
10:20:13	3.40	163.58	137.48	1081.94	198.32	251.60	56.30
10:20:19	3.50	164.48	141.62	1083.02	199.40	252.14	56.30
10:20:31	3.70	173.66	150.26	1085.00	201.38	253.04	56.30
10:20:37	3.80	175.28	152.96	1085.90	201.92	253.22	56.12
10:20:49	4.00	180.86	161.24	1087.70	203.72	254.12	55.94
10:20:55	4.10	182.30	165.38	1088.42	204.44	255.02	55.94
10:21:07	4.30	191.12	174.38	1090.04	206.42	256.28	55.94
10:21:13	4.40	195.26	176.54	1092.20	207.32	255.92	55.76
10:21:25	4.60	198.68	183.74	1093.64	209.30	257.00	55.76
10:21:31	4.70	203.72	186.08	1093.46	210.02	258.26	55.58
10:21:43	4.90	207.68	192.02	1094.54	212.36	259.16	55.58
10:21:49	5.00	209.84	195.26	1096.70	215.06	258.62	55.76
10:22:01	5.20	210.74	200.12	1099.04	222.08	260.96	55.94
10:22:07	5.30	210.74	202.28	1098.86	226.04	270.32	55.94
10:22:19	5.50	210.74	205.34	1101.02	234.86	291.38	56.30
10:22:25	5.60	211.10	205.34	1103.18	239.36	298.40	56.48
10:22:37	5.80	210.92	208.58	1104.26	247.28	305.96	56.66
10:22:43	5.90	210.92	208.76	1104.26	250.34	311.36	56.48
10:22:55	6.10	211.46	209.30	1105.70	255.38	310.64	56.66
10:23:01	6.20	211.64	209.30	1107.68	257.54	310.82	57.02
10:23:13	6.40	211.82	209.30	1109.12	224.96	312.26	57.02
10:23:19	6.50	212.00	209.12	1109.84	246.02	310.46	57.02
10:23:31	6.70	211.46	209.66	1110.56	260.60	309.56	57.02
10:23:37	6.80	211.82	209.66	1111.82	263.30	309.02	57.20
10:23:49	7.00	211.82	210.38	1112.54	266.90	310.46	57.38
10:23:55	7.10	211.46	210.38	1112.72	268.34	311.72	57.38
10:24:07	7.30	211.82	210.74	1113.08	270.86	313.70	57.74
10:24:13	7.40	211.64	210.38	1113.26	272.48	316.22	57.92
10:24:25	7.60	211.64	210.74	1113.26	274.28	319.64	57.92
10:24:31	7.70	211.46	210.56	1114.16	275.18	320.72	57.74
10:24:43	7.90	211.46	210.38	1114.70	276.08	321.44	57.92
10:24:49	8.00	211.46	210.56	1114.52	276.26	321.26	57.92
10:25:01	8.20	211.82	210.74	1113.80	276.80	322.16	58.10
10:25:07	8.30	212.00	210.74	1114.70	277.70	321.80	58.28
10:25:19	8.50	212.00	210.74	1115.06	278.42	320.00	58.28
10:25:25	8.60	212.54	210.74	1114.52	278.24	318.20	58.28
10:25:37	8.80	214.88	211.10	1114.34	278.96	316.76	58.28

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RTA Temperature Profile : RTA2

Typical Case Soil, Air Purge, 700°F

Run Time	Cummulative Time (min.)	RTA Soil (°F)	RTA Offgas (°F)	RTA Surface (°F)	Filter Inlet (°F)	Filter Outlet (°F)	Impinger Exit Gas (°F)
10:25:49	9.00	216.32	211.82	1114.34	278.60	313.52	58.28
10:25:55	9.10	219.38	212.18	1115.78	278.78	313.52	58.64
10:26:07	9.30	227.12	213.62	1115.96	276.98	307.40	58.64
10:26:13	9.40	230.54	214.16	1114.52	271.94	303.26	58.28
10:26:25	9.60	237.74	215.96	1114.70	264.20	297.50	58.28
10:26:31	9.70	240.80	217.22	1116.14	266.00	296.42	58.28
10:26:43	9.90	249.80	221.18	1115.78	270.50	289.94	58.10
10:26:49	10.00	259.70	223.52	1114.34	270.68	284.00	57.56
10:27:01	10.20	268.34	230.18	1114.52	270.32	277.34	57.38
10:27:07	10.30	275.72	234.32	1115.42	269.96	276.80	57.56
10:27:19	10.50	291.74	243.32	1115.78	268.34	273.20	57.74
10:27:25	10.60	295.70	247.10	1115.06	266.90	270.50	57.38
10:27:37	10.80	308.12	256.10	1115.06	263.84	267.98	57.38
10:27:43	10.90	318.92	259.70	1116.14	262.22	267.26	57.38
10:27:55	11.10	332.78	269.96	1115.96	258.26	265.46	57.38
10:28:01	11.20	339.44	275.36	1115.78	256.46	265.64	57.56
10:28:13	11.40	356.54	286.34	1116.14	252.68	262.76	57.74
10:28:19	11.50	362.12	292.28	1116.86	251.06	264.56	57.92
10:28:31	11.70	375.98	304.70	1117.04	248.18	266.36	58.10
10:28:37	11.80	384.62	310.82	1116.68	246.38	267.62	58.10
10:28:49	12.00	397.94	323.60	1117.04	243.86	269.60	58.28
10:28:55	12.10	410.72	330.98	1117.04	242.42	270.68	58.10
10:29:07	12.30	421.52	344.84	1116.86	239.54	272.12	58.10
10:29:13	12.40	427.46	351.68	1117.40	238.28	272.12	58.28
10:29:25	12.60	441.86	365.90	1117.58	234.86	246.38	58.64
10:29:31	12.70	444.92	372.74	1117.40	234.14	243.50	58.46
10:29:43	12.90	456.80	386.42	1117.76	231.44	238.28	58.64
10:29:49	13.00	462.74	393.80	1118.30	230.72	245.84	59.18
10:30:01	13.20	473.36	406.94	1117.94	228.02	254.66	58.64
10:30:07	13.30	483.98	413.24	1117.22	227.30	259.88	58.64
10:30:19	13.50	489.38	425.84	1117.58	226.22	265.46	58.64
10:30:25	13.60	494.06	432.14	1118.12	225.50	267.98	59.00
10:30:37	13.80	504.50	444.92	1118.66	225.14	271.94	59.18
10:30:43	13.90	510.26	450.68	1118.30	225.14	272.48	59.18
10:30:55	14.10	516.56	462.74	1118.30	224.06	361.58	59.00
10:31:01	14.20	522.14	467.96	1118.84	223.34	422.42	58.82
10:31:13	14.40	532.04	479.48	1118.48	222.26	386.24	58.64
10:31:19	14.50	534.20	485.06	1118.12	222.44	384.26	59.00
10:31:31	14.70	542.30	496.22	1118.12	222.08	381.74	59.00
10:31:43	14.90	552.74	506.84	1118.30	222.08	380.30	59.36
10:31:49	15.00	553.82	511.88	1118.48	221.54	380.48	58.82
10:32:01	15.20	559.58	521.78	1118.66	222.08	396.86	58.82
10:32:07	15.30	563.72	527.00	1118.30	222.62	405.50	59.00
10:32:19	15.50	571.82	536.54	1118.48	223.16	413.78	59.18
10:32:25	15.60	574.88	540.50	1119.02	223.16	417.38	58.64
10:32:37	15.80	582.44	549.50	1119.20	222.98	420.62	58.28
10:32:43	15.90	585.32	553.82	1118.12	222.44	419.90	58.46
10:32:55	16.10	591.08	562.46	1118.30	221.00	450.14	58.46
10:33:01	16.20	593.42	567.32	1119.56	221.18	448.52	58.46
10:33:13	16.40	601.52	575.78	1119.56	221.18	426.38	58.46
10:33:19	16.50	604.04	579.92	1119.38	220.82	423.32	58.82
10:33:31	16.70	611.24	587.66	1119.38	220.46	419.54	58.82
10:33:37	16.80	614.30	591.44	1119.92	220.28	416.66	58.64
10:33:49	17.00	620.06	598.64	1120.10	219.38	417.56	58.46
10:33:55	17.10	623.48	602.42	1119.56	218.48	416.84	58.46
10:34:07	17.30	632.12	609.98	1119.02	218.30	419.00	58.46
10:34:13	17.40	633.74	614.12	1118.30	218.84	417.92	58.82
10:34:25	17.60	641.12	621.32	1114.88	218.66	419.00	58.82
10:34:31	17.70	644.36	624.56	1112.36	217.94	418.46	58.28

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RTA Temperature Profile : RTA2

Typical Case Soil, Air Purge, 700°F

Run Time	Cummulative Time (min.)	RTA Soil (°F)	RTA Offgas (°F)	RTA Surface (°F)	Filter Inlet (°F)	Filter Outlet (°F)	Impinger Exit Gas (°F)
10:34:43	17.90	650.84	631.40	1108.04	217.76	417.02	58.28
10:34:49	18.00	654.44	635.36	1105.88	218.12	417.74	58.64
10:35:01	18.20	658.22	641.66	1101.02	217.58	417.56	58.28
10:35:07	18.30	661.64	644.36	1098.86	217.04	417.92	57.74
10:35:19	18.50	667.40	651.02	1094.72	217.04	419.00	58.10
10:35:25	18.60	671.36	654.26	1091.84	217.22	417.38	58.28
10:35:37	18.80	678.20	660.74	1087.70	217.22	416.66	58.46
10:35:43	18.90	679.64	663.44	1086.08	217.22	417.56	58.28
10:35:55	19.10	684.32	669.56	1082.12	217.22	416.66	58.28
10:36:01	19.20	686.48	672.62	1079.06	216.50	414.50	58.10
10:36:13	19.40	691.34	678.56	1074.92	215.60	438.62	58.10
10:36:19	19.50	693.68	681.26	1073.84	215.78	454.64	58.28
10:36:31	19.70	698.36	687.56	1070.42	215.42	423.86	58.28
10:36:37	19.80	701.42	690.44	1067.72	215.06	418.82	58.28
10:36:49	20.00	705.20	695.48	1063.94	214.52	415.22	58.28
10:36:55	20.10	708.44	698.18	1063.22	214.88	415.22	58.64
10:37:07	20.30	712.22	702.68	1023.98	214.34	413.42	58.46
10:37:19	20.50	714.38	707.00	980.42	214.16	411.80	58.64
10:37:25	20.60	715.82	708.44	1015.52	213.26	409.10	58.28
10:37:37	20.80	716.54	710.96	1028.84	212.72	406.40	58.10
10:37:43	20.90	717.08	712.04	1031.36	212.72	406.94	58.28
10:37:55	21.10	716.54	713.48	1033.70	212.00	403.88	58.28
10:38:01	21.20	716.00	713.66	1033.52	211.28	401.00	58.10
10:38:13	21.40	714.74	714.20	1033.88	210.92	397.94	58.28
10:38:19	21.50	713.48	714.38	1033.52	210.92	397.58	58.64
10:38:31	21.70	710.78	713.12	1031.90	210.02	395.60	58.28
10:38:37	21.80	707.90	711.50	1030.64	209.48	392.36	57.92
10:38:49	22.00	704.30	709.34	1029.38	209.12	388.22	58.28
10:38:55	22.10	700.88	707.72	1027.40	208.58	386.96	58.10
10:39:07	22.30	693.14	704.48	1026.14	208.40	382.28	58.64
10:39:13	22.40	692.06	702.86	1025.24	208.22	379.04	58.82
10:39:25	22.60	684.68	697.46	1022.90	207.68	374.72	59.18
10:39:31	22.70	682.52	693.32	1020.74	206.42	372.02	58.28
10:39:43	22.90	675.50	685.22	1018.22	205.52	366.98	58.46
10:39:49	23.00	670.46	680.90	1017.32	204.98	363.38	58.82
10:40:01	23.20	656.42	668.84	1014.98	204.08	360.50	58.82
10:40:07	23.30	645.98	661.10	1013.36	203.90	363.38	58.64
10:40:19	23.50	617.54	643.46	1011.02	202.46	356.54	58.46
10:40:25	23.60	611.42	634.10	1010.12	202.28	354.38	59.00
10:40:37	23.80	579.92	615.20	1007.78	201.56	350.78	59.18
10:40:43	23.90	560.84	604.58	1005.98	200.84	348.08	58.82
10:40:55	24.10	519.98	583.70	1004.18	199.94	343.04	59.00
10:41:01	24.20	512.24	572.72	1002.56	199.40	343.76	59.00
10:41:13	24.40	487.04	552.92	999.68	198.50	341.60	59.36
10:41:19	24.50	462.74	542.84	998.60	198.14	337.64	59.18
10:41:31	24.70	433.40	523.22	996.08	197.06	333.14	59.00
10:41:37	24.80	426.02	513.32	994.64	196.16	332.06	59.36
10:41:49	25.00	393.26	494.06	992.30	195.26	329.36	59.36
10:41:55	25.10	386.60	485.24	991.58	194.72	326.84	59.36
10:42:07	25.30	361.76	467.06	988.52	193.46	325.04	59.18
10:42:13	25.40	351.14	458.78	987.08	193.10	324.32	59.00
10:42:25	25.60	330.44	441.86	984.74	192.38	322.34	59.18
10:42:37	25.80	317.48	425.84	982.40	191.48	319.64	59.00
10:42:43	25.90	308.66	417.74	981.32	191.48	319.10	59.18
10:42:55	26.10	294.08	402.44	979.52	190.94	317.66	59.18
10:43:01	26.20	283.28	395.42	977.72	190.40	317.30	59.18
10:43:13	26.40	265.46	381.02	976.28	190.22	315.50	59.36
10:43:19	26.50	265.28	373.82	975.38	190.22	314.78	59.54
10:43:31	26.70	245.12	359.96	973.22	189.50	313.52	59.36

10/8/97

RTA Temperature Profile : RTA2

Typical Case Soil, Air Purge, 700°F

Run Time	Cummulative Time (min.)	RTA Soil (°F)	RTA Offgas (°F)	RTA Surface (°F)	Filter Inlet (°F)	Filter Outlet (°F)	Impinger Exit Gas (°F)
10:43:37	26.80	242.96	352.94	971.78	188.96	312.98	59.00
10:43:49	27.00	227.66	339.98	969.62	188.78	312.08	59.00
10:43:55	27.10	225.86	334.04	968.54	188.60	311.00	59.18
10:44:07	27.30	209.48	322.70	967.28	189.50	316.58	59.72
10:44:13	27.40	211.82	316.58	965.84	189.86	323.96	59.54
10:44:25	27.60	202.28	305.96	964.22	191.12	330.44	59.72
10:44:31	27.70	195.98	300.56	962.78	190.94	328.10	59.18
10:44:43	27.90	186.80	290.30	960.26	191.48	327.74	58.82
10:44:49	28.00	180.14	285.08	959.54	192.20	331.70	59.00
10:45:01	28.20	170.42	275.72	957.74	192.56	331.52	58.82
10:45:07	28.30	169.88	271.58	956.48	192.56	327.74	58.64
10:45:19	28.50	160.88	262.40	954.50	192.92	325.76	58.64
10:45:25	28.60	156.74	258.08	953.42	193.10	328.46	58.82
10:45:37	28.80	159.44	249.98	951.26	193.28	327.56	58.82
10:45:43	28.90	152.06	246.02	950.18	192.74	323.42	58.46
10:45:55	29.10	149.54	238.28	948.38	193.28	326.30	58.46
10:46:01	29.20	142.52	234.14	947.30	193.64	330.44	58.28
10:46:13	29.40	142.88	226.76	945.14	193.28	322.34	58.28
10:46:19	29.50	131.18	223.70	943.88	193.10	316.40	58.28
10:46:31	29.70	136.04	217.58	942.26	192.92	316.94	58.46
10:46:37	29.80	129.02	214.34	941.18	193.28	322.16	58.64
10:46:49	30.00	129.74	208.22	939.56	193.82	323.42	58.82
10:46:55	30.10	119.30	205.16	938.48	193.82	318.92	58.82
10:47:07	30.30	114.62	199.40	936.32	193.28	314.60	58.28
10:47:13	30.40	115.88	196.70	935.06	193.28	316.76	58.28
10:47:25	30.60	113.54	191.48	933.08	193.28	314.96	58.46
10:47:31	30.70	113.54	189.50	932.54	193.28	310.64	58.46
10:47:43	30.90	110.66	184.64	930.92	193.28	309.38	58.64
10:47:49	31.00	111.38	182.30	929.48	193.28	312.44	58.46
10:48:01	31.20	107.60	178.16	927.86	193.28	310.82	58.64
10:48:07	31.30	106.88	175.82	926.96	192.92	307.58	58.64
10:48:19	31.50	105.26	171.32	924.98	192.38	305.96	58.64
10:48:31	31.70	102.20	167.54	923.36	192.20	303.98	58.64
10:48:37	31.80	100.76	165.38	922.10	192.20	305.06	58.46
10:48:49	32.00	103.10	161.96	920.30	191.84	303.80	58.64
10:48:55	32.10	102.02	159.98	919.40	191.30	301.10	58.64
10:49:07	32.30	100.94	156.56	917.60	190.94	300.02	58.82
10:49:13	32.40	98.96	154.76	917.06	190.58	301.46	58.64
10:49:25	32.60	99.14	151.52	914.90	190.40	300.56	58.82
10:49:31	32.70	97.16	149.72	913.82	189.68	297.68	58.46
10:49:43	32.90	98.06	146.66	912.20	189.50	296.96	58.46
10:49:49	33.00	96.80	144.86	911.12	189.50	297.86	58.46
10:50:01	33.20	94.10	142.16	909.86	189.50	297.32	58.82
10:50:07	33.30	93.92	140.72	908.60	188.78	295.34	58.46
10:50:19	33.50	92.30	138.20	906.98	187.70	280.04	58.82
10:50:25	33.60	92.30	137.30	906.26	186.62	269.96	59.18
10:50:37	33.80	91.94	135.50	904.10	184.46	262.58	59.36
10:50:43	33.90	91.94	134.60	903.02	183.56	261.14	59.18
10:50:55	34.10	91.76	133.34	901.40	182.84	259.34	59.54
10:51:01	34.20	91.58	132.44	900.50	181.94	258.44	59.72
10:51:13	34.40	91.22	130.82	898.52	180.86	256.82	59.72
10:51:19	34.50	91.40	130.46	898.16	180.68	256.46	59.72
10:51:31	34.70	91.22	129.38	896.54	179.96	255.20	59.90
10:51:37	34.80	91.40	128.84	894.74	179.78	254.48	60.26
10:51:49	35.00	91.22	127.58	894.38	179.06	253.40	60.44
10:51:55	35.10	91.22	126.86	893.12	178.88	253.22	60.62
10:52:07	35.30	91.22	125.78	890.96	178.16	251.78	60.62
10:52:13	35.40	90.86	125.42	890.42	177.26	251.06	60.44
10:52:25	35.60	90.86	124.16	888.08	176.90	249.98	60.62

10/8/97

RTA Temperature Profile : RTA2

Typical Case Soil, Air Purge, 700°F

Run Time	Cummulative Time (min.)	RTA Soil (°F)	RTA Offgas (°F)	RTA Surface (°F)	Filter Inlet (°F)	Filter Outlet (°F)	Impinger Exit Gas (°F)
10:52:31	35.70	91.04	123.98	887.36	176.90	249.44	60.80
10:52:43	35.90	91.22	123.26	886.82	176.90	248.72	61.34
10:52:49	36.00	91.22	122.90	885.92	176.54	248.54	61.34
10:53:01	36.20	91.22	122.00	883.58	176.00	247.10	61.16
10:53:07	36.30	91.04	121.46	883.22	175.64	246.74	61.52
10:53:19	36.50	91.22	120.74	880.52	175.46	245.84	61.70
10:53:25	36.60	91.22	120.38	880.52	175.10	245.30	61.52
10:53:37	36.80	90.86	119.30	878.18	174.56	243.86	61.34
10:53:43	36.90	90.86	118.94	877.64	174.38	243.68	61.52
10:53:55	37.10	90.86	118.22	876.20	174.02	242.78	61.52
10:54:07	37.30	91.22	117.86	874.76	173.84	241.88	62.06
10:54:13	37.40	91.22	117.50	873.32	173.30	241.34	61.88
10:54:25	37.60	91.22	116.78	872.06	172.94	236.12	62.06
10:54:31	37.70	91.04	116.42	871.70	172.22	231.62	62.06
10:54:43	37.90	91.22	115.88	869.00	166.28	213.08	62.24

10/8/97

RTA Temperature Profile : RTA1

Worst Case Soil. Air Purge, 900°F

Run Time	Cummulative Time (min.)	RTA Soil (°F)	THC in RTA Offgas (ppmv)	CO in RTA Offgas (ppmv)
15:12	0	68.4	5,757.4	0.0
15:13	1	85.6	6,383.8	0.0
15:14	2	132.3	7,077.5	5.0
15:15	3	176.4	6,875.2	105.7
15:16	4	210.2	7,270.2	276.7
15:17	5	212.5	8,532.3	548.4
15:18	6	214.5	7,973.7	1,021.4
15:19	7	231.4	7,665.3	3,144.7
15:20	8	281.1	7,742.4	6,405.2
15:21	9	370.4	8,079.7	7,995.1
15:22	10	456.1	10,941.5	26,561.6
15:23	11	527.4	14,207.6	49,072.8
15:24	12	591.1	18,055.8	68,152.4
15:25	13	635.4	21,435.1	72,067.0
15:26	14	683.2	23,375.4	69,521.0
15:27	15	730.2	23,666.4	63,825.3
15:28	16	766.0	25,639.0	61,973.7
15:29	17	793.8	27,627.8	58,330.8
15:30	18	818.4	29,972.3	55,654.0
15:31	19	840.0	31,896.4	53,098.0
15:32	20	860.5	32,785.7	49,515.5
15:33	21	876.6	31,524.5	44,242.5
15:34	22	889.5	28,581.8	36,866.2
15:35	23	897.6	23,520.9	22,908.7
15:36	24	865.8	17,198.8	11,939.9
15:37	25	717.8	13,577.0	6,445.4
15:38	26	544.8	11,846.9	3,990.0
15:39	27	409.1	10,925.3	2,993.8
15:40	28	297.1	10,068.3	1,937.1
15:41	29	228.7	9,373.1	1,061.7
15:42	30	176.9	8,855.7	397.5
15:43	31	145.9	8,499.9	85.5
15:44	32	129.6	8,282.0	0.0
15:45	33	115.0	8,137.5	0.0
15:46	34	106.0	7,992.9	0.0

RTA Temperature Profile : RTAN

10/9/97

Worst Case Soil. Nitrogen Purge, 900°F

Run Time	Cummulative Time (min.)	RTA Soil (°F)	THC in RTA Offgas (ppmv)	CO in RTA Offgas (ppmv)
09:58	0	72.7	2,770.3	494.7
09:59	1	108.7	4,663.0	484.7
10:00	2	159.6	5,826.1	504.7
10:01	3	197.1	7,021.0	534.7
10:02	4	216.5	6,851.8	594.7
10:03	5	226.9	6,524.0	844.5
10:04	6	249.8	6,513.4	1,374.2
10:05	7	300.9	7,592.0	2,123.8
10:06	8	358.3	7,930.3	5,881.6
10:07	9	431.2	7,983.2	6,071.5
10:08	10	499.6	8,363.9	6,781.1
10:09	11	546.3	10,564.1	10,928.8
10:10	12	598.3	13,491.6	16,255.7
10:11	13	634.8	16,578.9	20,773.2
10:12	14	679.8	19,630.6	23,301.7
10:13	15	722.1	21,564.6	23,191.8
10:14	16	755.4	23,267.9	23,321.7
10:15	17	787.5	24,918.0	20,983.0
10:16	18	813.0	26,603.6	17,714.9
10:17	19	828.5	28,608.5	15,206.3
10:18	20	850.8	30,347.3	13,477.3
10:19	21	862.3	31,429.6	12,238.0
10:20	22	874.8	30,098.9	10,758.9
10:21	23	886.5	30,329.5	10,978.7
10:22	24	894.0	29,815.0	10,349.1
10:23	25	899.4	26,674.5	8,969.9
10:24	26	876.2	21,422.7	6,551.3
10:25	27	809.8	16,649.8	4,182.6
10:26	28	665.6	14,503.0	3,153.2
10:27	29	512.2	13,083.5	2,363.7
10:28	30	412.5	12,356.1	1,774.0
10:29	31	289.9	11,770.6	1,274.3
10:30	32	205.7	11,273.8	954.5
10:31	33	156.6	10,777.0	764.6
10:32	33	121.8	10,457.6	634.6
10:33	34	108.9	10,102.8	554.7

RTA Temperature Profile : RTA2

10/8/97

Typical Case Soil. Air Purge, 700°F

Run Time	Cummulative Time (min.)	RTA Soil (°F)	THC in RTA Offgas (ppmv)	CO in RTA Offgas (a) (ppmv)
10:16	0	64.9	1,274.9	380.7
10:17	1	76.1	2,168.4	370.6
10:18	2	102.2	3,031.8	380.7
10:19	3	148.3	3,393.2	390.7
10:20	4	180.9	3,644.1	430.7
10:21	5	209.8	4,206.3	470.8
10:22	6	211.5	4,587.8	561.0
10:23	7	211.8	5,150.0	751.3
10:24	8	211.5	7,850.4	1,091.9
10:25	9	216.3	7,820.3	1,873.2
10:26	10	259.7	8,071.3	4,998.5
10:27	11	332.8	8,111.4	7,042.0
10:28	12	397.9	8,081.3	8,063.8
10:29	13	462.7	9,624.0	18,641.9
10:30	14	516.6	12,117.2	35,671.0
10:31	15	553.8	13,919.6	50,000.0
10:32	16	591.1	16,109.5	50,000.0
10:33	17	620.1	17,524.5	50,000.0
10:34	18	654.4	18,063.5	50,000.0
10:35	19	684.3	18,215.1	50,000.0
10:36	20	705.2	17,120.2	40,188.7
10:37	21	716.5	15,031.4	25,774.1
10:38	22	704.3	12,420.4	11,720.0
10:39	23	670.5	10,213.6	6,771.6
10:40	24	520.0	8,647.0	4,637.9
10:41	25	393.3	7,820.3	3,155.4
10:42	26	294.1	7,207.9	1,702.9
10:43	27	227.7	6,816.4	791.4
10:44	28	180.1	6,505.2	530.9
10:45	29	149.5	6,204.0	420.7
10:46	30	129.7	5,923.0	370.6
10:47	31	111.4	5,651.9	340.6
10:48	32	103.1	5,501.3	330.6
10:49	33	96.8	5,390.9	330.6
10:50	34	91.8	5,240.3	320.5

(a) The CO monitor was set at a 0 - 5% range. This range was set to 0 - 10% for subsequent tests.

Appendix C

Analytical Chain of Custodies

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

Reference Document No. 472911
Page 1 of 2

Project Name/No. [1] FOCUS-ACS / 772686.01000000
Sample Team Members [2] A. Gore
Profit Center No. [3] 6585001
Project Manager [4] E. SHEALY
Purchase Order No. [6]
Required Report Date [11]

Samples Shipment Date [7] 8/28/97
Lab Destination [8] IEA LABS
Lab Contact [9] Jason Jordan
Project Contact/Phone [12] ALE GROEN / 690-3211
Carrier/Waybill No. [13] FED EX

Bill to: [5] FOCUS ENVIRONMENTAL

Report to: [10] KEN SADLER
FOCUS ENVIRONMENTAL
9050 EXECUTIVE PARK SUITE A202
KNOXVILLE TN 37923

White: To accompany samples
Yellow: Field copy

ONE CONTAINER PER LINE

Sample Number [14]	Sample Description/Type [15]	Date/Time Collected [16]	Container Type [17]	Sample Volume [18]	Pre-servative [19]	Requested Testing Program [20]	Condition on Receipt [21]	Disposal Record No. [22]
#1153-005-1	WORST CASE SC1	8/27/97	VOA VIAL	40g	4°C	VOC'S	Sample	
#1153-005-2	↓	↓	↓	↓	↓	METHOD 8260A	FOR LAB USE ONLY	
#1153-005-3	↓					↓	matrix spike XX	
#1153-005-13	TYPICAL SC2	↓	↓	↓	↓	↓		
#1153-005-4	WORST CASE SC1	8/27/97	8oz jar	90-100g	4°C	SVOC'S	Sample	
#1153-005-5	↓	↓	↓	↓	↓	METHOD 8270B	FOR LAB USE ONLY	
#1153-005-6	↓					↓	matrix spike XX	
#1153-005-14	TYPICAL SC2	↓	↓	↓	↓	↓		

Special Instructions: [23]

Possible Hazard Identification: [24]
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☒

Sample Disposal: [25]
Return to Client ☐ Disposal by Lab ☒ Archive _____ (mos.)

Turnaround Time Required: [26]
Normal ☒ Rush ☐

QC Level: [27]
I. ☐ II. ☐ III. ☐ Project Specific (specify) "PER FOCUS REQUIREMENTS"

1. Relinquished by [28] (Signature/Affiliation) IT-TDL	Date: 8/28/97 Time: 4:00 pm	1. Received by [28] (Signature/Affiliation)	Date: 8/29/97 Time: 1000
2. Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation)	Date: Time:
3. Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation)	Date: Time:

Comments: [29] SOILS HAVE STRONG ODOR, LOW LEVELS OF PCA'S, SOLVENTS

IEA #2436-002

*See back of form for special instructions.

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD (cont.)*

Reference Document No.[30] 472911
Page 2 of 2

Project Name FOCUS ACS

Project No. T72686-01000000

Samples Shipment Date 8/26/97

ONE CONTAINER PER LINE

Sample[14] Number	Sample[15] Description/Type	Date/Time[16] Collected	Container[17] Type	Sample[18] Volume	Pre-[19] servative	Requested Testing[20] Program	Condition on[21] Receipt	Disposal[22] Record No.
#1153-005-7	WORST CASE SC1	8/27/97	8oz GLASS	90-100g	4°C	PCB'S	Sample	
#1153-005-8	"	↓		↓	↓	↓ METHOD 8081	Duplicate	
#1153-005-15	TYPICAL SC2	↓		↓	↓	↓		
#1153-005-9	WORST CASE SC1	8/27/97	8oz GLASS	90-100g	4°C	DIOXINS/FURANS	} Sub to Triangle Labs	
#1153-005-16	TYPICAL SC2	↓	↓	↓	↓	↓ METHOD 8290		
#1153-005-10	WORST CASE SC1	8/27/97	8oz GLASS	90-100g	4°C	TOTAL METALS	Sample	
#1153-005-11	"	↓	↓	↓	↓	↓ METHODS 6010/7000	Duplicate	
#1153-005-17	TYPICAL SC2	↓	↓	↓	↓	↓		
#1153-005-12	WORST CASE SC1	8/27/97	8oz GLASS	90-100g	4°C	TCLP METALS		
#1153-005-18	TYPICAL SC2	↓	↓	↓	↓	↓ METHODS 1311/6010/7000		
						IEA#8436-002		
						8/29/97 1000 4°C		

White: To accompany samples
Yellow: Field copy

*See back of form for special instructions.

IN... .ATIONAL TECHNOLOGY CORPORATION

A ALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

Reference Document No. 472912
Page 1 of 1

Project Name/No. [1] FOCUS-ACS / 772686.0100000
Sample Team Members [2] H Green
Profit Center No. [3] 6585001
Project Manager [4] S. SHEALY
Purchase Order No. [6]
Required Report Date [11]

Samples Shipment Date [7] 8/28/97
Lab Destination [8] GALBRAITH
Lab Contact [9]
Project Contact/Phone [12] ARE GREEN / 690 3211
Carrier/Waybill No. [13]

Bill to: [5] FOCUS ENVIRONMENTAL

Report to: [10] KEN SADLER
FOCUS ENVIRONMENTAL
9050 EXECUTIVE PARK SUITE A202
KNOXVILLE TN 37923

ONE CONTAINER PER LINE

Sample Number [14]	Sample Description/Type [15]	Date/Time Collected [16]	Container Type [17]	Sample Volume [18]	Pre-servative [19]	Requested Testing Program [20]	Condition on Receipt [21]	Disposal Record No. [22]
#1153-04-3	WORST CASE SC1	8/27/97	GLASS	100'g	—	ULTIMATE/PROXIMATE		
1153-04-4	WORST CASE SC1	↓	↓	↓	—	HEATING VALUE		
#1153-04-5	TYPICAL SC2	↓	↓	↓	↓	LEACHABLE CHLORIDE		
						ASH FUSABILITY		
						SOIL pH		
						AS PER REQUEST SHEETS		

Special Instructions: [23]

Possible Hazard Identification: [24]
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☒

Sample Disposal: [25]
Return to Client ☒ Disposal by Lab ☐ Archive (mos.)

Turnaround Time Required: [26]
Normal ☒ Rush ☐

QC Level: [27]
I ☒ II ☐ III ☐ Project Specific (specify): PER FOCUS REQUIREMENTS

1. Relinquished by [28] (Signature/Affiliation) [signature] IT-TDL	Date: 8/28/97 Time: 1407	1. Received by [28] (Signature/Affiliation) [signature]
2. Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation)
3. Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation)

Comments: [29] SOIL HAS SOLVENT ODOR, MAY CONTAIN LOW LEVELS OF PCB

White: To accompany samples
Yellow: Field copy
*See back of form for special instructions

MCA 3 15 91

NOLOGY
ORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Reference Document 47291
Page 1 of 2

Project Name/No. [1] FOCUS-ACS / 772686
Sample Team Members [2] A Shoen
Profit Center No. [3] 658500 /
Project Manager [4] S SHEALY
Purchase Order No. [6]
Required Report Date [11] NORMAL TURNAROUND

Samples Shipment Date [7] JEA 9/5/97
Lab Destination [8] JEA LABS
Lab Contact [9] JASON JORDON 800-444-9919
Project Contact/Phone [12] ARIE CROEN / KEN SADLER
Carrier/Waybill No. [13]

Bill to: [5] FOCUS ENVIRONMENTAL
Report to: [10] FOCUS ENVIRONMENTAL
KEN SADLER
9050 EXECUTIVE PARK SUITE A202
KNOXVILLE TN 37923

ONE CONTAINER PER LINE

Sample Number [14]	Sample Description/Type [15]	Date/Time Collected [16]	Container Type [17]	Sample Volume [18]	Preservative [19]	Requested Testing Program [20]	Condition on Receipt [21]	Disposal Record No. [22]
6V	TREATED SOIL	9/5/97	VIAL	5-7g	4°C	VOLATILE ORGANICS		
7V						METHOD 8260M	FOR LAB USE ONLY	
8V								
9V						SEE NOTE BELOW!		
10V							FOR LAB USE ONLY	
11V								
12V								
13V								

Special Instructions: [23]

Possible Hazard Identification: [24]
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☒

Sample Disposal: [25]
Return to Client ☐ Disposal by Lab ☒ Archive ___ (mos.)

Turnaround Time Required: [26]
Normal ☒ Rush ☐

QC Level: [27]
I. ☐ II. ☐ III. ☐ Project Specific (specify): LEVEL C DATA

1. Relinquished by [28] (Signature/Affiliation) [signature] / ITTA	Date: 9/5/97 Time: 15:40	1. Received by [28] (Signature/Affiliation) [signature] / AEN 4°C	Date: 9/6/97 Time: 1020
2. Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation)	Date: Time:
3. Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation)	Date: Time:

Comments: [29] * SAMPLES MAY ACT LIKE CHARCOAL SO SAKES MAY NOT BE RECOVERED!!!
JEA # 2436-003

MCA 3/15/91

2

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD (cont.)*

Reference Document No.[30] 472916

Page 2 of 2

Project Name FOCUS - ACS

Project No. 772666.0100000

Samples Shipment Date 9/5/97

ONE CONTAINER PER LINE

Sample[14] Number	Sample[15] Description/Type	Date/Time[16] Collected	Container[17] Type	Sample[18] Volume	Pre-[19] servative	Requested Testing[20] Program	Condition on[21] Receipt	Disposal[22] Record No.
6S	TREATED SOIL	9/5/97	VIAL	30g	4°C	SVOC METHOD		
7S						8270B		
8S								
9S								
10S								
11S								
12S								
13S								
6P						PCB METHOD 8081		
7P								
8P								
9P								
10P								
11P								
12P								
13P								
7T						TOTAL DIOXINS & FURANS		
9T						METHOD 8290		
11T								
13T								

White: To accompany samples

Yellow: Field copy

*See back of form for special instructions.

MCA 3/15/91

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

Reference Document No. 47001
Page 1 of 1

Project Name/No. [1] FOCUS-ACS / 772666.0100200
Sample Team Members [2] A Glover
Profit Center No. [3] 658500 1
Project Manager [4] S SHEALY
Purchase Order No. [6]
Required Report Date [11]

Samples Shipment Date [7] 8/28/97
Lab Destination [8] IT-ETDC
Lab Contact [9] RALPH COLE
Project Contact/Phone [12] ARLIE CROSS
Carrier/Waybill No. [13]

Bill to: [5]

Report to: [10] LEN SADLER
FOCUS ENVIRONMENTAL
9050 EXECUTIVE PARK SUITE A 202
KNOXVILLE TN 37923

ONE CONTAINER PER LINE

Sample Number [14]	Sample Description/Type [15]	Date/Time Collected [16]	Container Type [17]	Sample Volume [18]	Pre-servative [19]	Requested Testing Program [20]	Condition on Receipt [21]	Disposal Record No. [22]
#1153-004-1	WORST CASE SOIL	8/27/97		12 kg	—	ASTM D422, D4318	ETDC 7243	
#1153-004-2	TYPICAL SOIL	8/27/97		12 kg	—	D698, D2487	ETDC 7244	

Special Instructions: [23]

Possible Hazard Identification: [24]
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐

Sample Disposal: [25]
Return to Client ☐ Disposal by Lab ☒ Archive (mos.)

Turnaround Time Required: [26]
Normal ☒ Rush ☐

QC Level: [27]
I. ☐ II. ☐ III. ☐ Project Specific (specify):

1. Relinquished by [28] (Signature/Affiliation) IT-TDL	Date: 8/28/97 Time:	1. Received by [28] (Signature/Affiliation) IT/ETDC	Date: 8-29-97 Time: 0800
2. Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation)	Date: Time:
3. Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation)	Date: Time:

Comments: [29]

White: To accompany samples
Yellow: Field copy
*See back of form for special instructions.

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

Reference Document No. 4
Page 1 of 3

Project Name/No. [1] FOCUS-ACS/772666 01000000
Samples Shipment Date [7] 10-10-97
Bill to: [5] FOCUS ENVIRONMENTAL

Sample Team Members [2] A Gloe / K Ferguson
Lab Destination [8] IEA

Profit Center No. [3] 6585001
Lab Contact [9] JASON JORDAN

Project Manager [4] S. SHEALY
Project Contact/Phone [12]
Report to: [10] KEN SADLER FOCUS ENVIRONMENTAL

Purchase Order No. [6] —
Carrier/Waybill No. [13] Fedex 7715673422 1

Required Report Date [11]

ONE CONTAINER PER LINE

Sample Number [14]	Sample Description/Type [15]	Date/Time Collected [16]	Container Type [17]	Sample Volume [18]	Pre-servative [19]	Requested Testing Program [20]	Condition on Receipt [21]	Disposal Record No. [22]
#1153-046-1	TREATED SOIL	10/9/97	VIAL	40 ml	4°C	VOC'S		
#1153-046-9	↓	↓	↓	1x40 ml	↓	↓		
#1153-046-17	↓	↓	↓	↓	↓	↓		
#1153-047-1	IMPINGER AQUEOUS PHASE	↓	↓	↓	↓	↓		
#1153-047-5	↓	↓	↓	↓	↓	↓		
#1153-047-11	↓	↓	↓	↓	↓	↓		
#1153-047-9	ORGANIC PHASE FROM IMPINGERS	↓	↓	5 ml	↓	↓		
#1153-047-14	↓	↓	↓	↓	↓	↓		

COPY

Special Instructions: [23]

Possible Hazard Identification: [24]
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☒

Sample Disposal: [25]
Return to Client ☐ Disposal by Lab ☒ Archive (mos.)

Turnaround Time Required: [26]
Normal ☒ Rush ☐

QC Level: [27]
I. ☐ II. ☐ III. ☐ Project Specific (specify): LEVEL B DATA REQ'D

1. Relinquished by [28] (Signature/Affiliation) [signature] IT TAC	Date: 10/9/97 Time: 1800	1. Received by [28] (Signature/Affiliation)	Date: Time:
2. Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation)	Date: Time:
3. Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation)	Date: Time:

Comments: [29] SAMPLES 47-3, 47-10, 47-16 are 50/50 HEXANE/ACETONE RINSES.
SAMPLES 47-9 & 47-14. ORGANIC PHASE CONDENSATE FROM IMPINGERS

*See back of form for special instructions

Yellow Field copy

To accompany samples

MCA 3-15-91

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD (cont.)*

Reference Document No.[30] _____

Project Name FOCUS A-CC

Project No. 772686.01000000

Samples Shipment Date 10-10-97

ONE CONTAINER PER LINE

Sample[14] Number	Sample[15] Description/Type	Date/Time[16] Collected	Container[17] Type	Sample[18] Volume	Pre-[19] servative	Requested Testing[20] Program	Condition on[21] Receipt	Disposal[22] Record No.
#1153-046-2	TREATED SOIL	10/9/97	VIAL	3x40g	4°C	SVOC		
#1153-046-10	↓	↓		1x40g	↓	↓		
#1153-046-18	↓	↓		↓	↓	↓		
#1153-047-2	IMPINGER WATER	↓	1l BOTTLE	500ml	↓	SVOC/PCB		
#1153-047-6	↓	↓	↓	↓	↓	↓		
#1153-047-12	↓	↓	↓	↓	↓	↓		
#1153-047-3	SOLVENT RINSE + ORGANIC PHASE	↓	1l BOTTLE	600ml	↓	SVOC/PCB/DIOXIN FURANS	3	
#1153-047-10	↓	↓	↓	↓	↓	↓		
#1153-047-16	↓	↓	↓	↓	↓	↓		
#1153-046-3	TREATED SOIL	↓	VIAL	2x40g	↓	PCB		
#1153-046-11	↓	↓	↓	1x40g	↓	↓		
#1153-046-19	↓	↓	↓	↓	↓	↓		
#1153-046-4	↓	↓	↓	1x40g	↓	DIOXINS/FURANS		
#1153-046-12	↓	↓	↓	↓	↓	↓		
#1153-046-20	↓	↓	↓	↓	↓	↓		
#1153-046-5	TREATED SOIL	↓	↓	1x25g	↓	TOTAL METALS		
#1153-046-13	↓	↓	↓	↓	↓	↓		
#1153-046-21	↓	↓	↓	↓	↓	↓		
#1153-046-6	↓	↓	↓	↓	↓	TCLP METALS		
#1153-046-14	↓	↓	↓	↓	↓	↓		

White - To accompany samples
Yellow - Field copy
*See back of form for special instructions.

MCA 3-15-91

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD (cont.)*

Reference Document No.[30] 472

Page 3 of 3

Project Name FOCUS-ACS

Project No. 772686.01000000

Samples Shipment Date 10-10-97

ONE CONTAINER PER LINE

Sample[14] Number	Sample[15] Description/Type	Date/Time[16] Collected	Container[17] Type	Sample[18] Volume	Pre-[19] servative	Requested Testing[20] Program	Condition on[21] Receipt	Disposal[22] Record No.
#1153-046 22	TREATED SOIL	10/9/97	VIAL	1x25g	4°C	TCLP METALS		
RTA 1 Run # 2	TENAX MACS	10/8/97	GLASS	2 tubes		VOCS		
RTAN Run # 3	↓	10/9/97	↓	↓		↓		
RTA 2 Run #1	↓	10/8/97	↓	↓		↓		
RTA 1 Run # 2	XAD TRAP	10/8/97	GLASS	2-tubes		SVOC/PCB		
RTAN Run #3	↓	10/9/97	↓	↓		↓		
RTA 2 Run # 1	↓	10/8/97	↓	↓		↓		
RTA 1 Run # 2	MeOH trap	10/8/97	GLASS	2x25ml		VOC		
RTAN Run #3	↓	10/9/97	↓	↓		↓		
RTA2 Run # 1	↓	10/8/97	↓	↓		↓		

Attach to accompany samples

Yellow: Field copy

*See back of form for special instructions.

MCA 3/15/91

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

2nd Delivery ?

Reference Document No. 4724.
Page 1 of 2

Project Name/No. [1] FOCUS-ACS / 772686.01000000
Samples Shipment Date [7]
Bill to: [5] FOCUS ENVIRONMENTAL

Sample Team Members [2] Ken Ferguson, A Gore
Lab Destination [8] HAZEN

Profit Center No. [3] 6585001
Lab Contact [9]

Project Manager [4] S SHEALY
Project Contact/Phone [12] ALIE GREEN/KEN SADLER
Report to: [10] KEN SADLER
FOCUS ENVIRONMENTAL
9050 EXECUTIVE PARK SUITE A202
KNOXVILLE TN 37923

Purchase Order No. [6]
Carrier/Waybill No. [13]

Required Report Date [11]

ONE CONTAINER PER LINE

Sample Number [14]	Sample Description/Type [15]	Date/Time Collected [16]	Container Type [17]	Sample Volume [18]	Pre-servative [19]	Requested Testing Program [20]	Condition on Receipt [21]	Disposal Record No. [22]
1153-046-7	TREATED SOIL	10/9/97	VIAL	2x 30g		ULTIMATE/PROXIMATE		
1153-046-23				1x30g				
1153-046-15				1x30g		LEACHABLE CHLORIDE SOIL pH		
1153-046-8				1x30g				
1153-046-16								
153-046-24								
153-047-4	IMPINGER WATER	10/9/97	VIAL	40g		TOC, pH TOTAL O/S ACIDITY.		
1153-047-7								

COPY

Special Instructions: [23]

Possible Hazard Identification: [24]
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☒

Sample Disposal: [25]
Return to Client ☐ Disposal by Lab ☒ Archive (mos.)

Turnaround Time Required: [26]
Normal ☒ Rush ☐

QC Level: [27]
I. ☐ II. ☐ III. ☐ Project Specific (specify): LEVEL A DATA REQUIREMENT

Relinquished by [28] (Signature/Affiliation) A Gore IT-TAC	Date: 10/9/97 Time: 1800	1. Received by [28] (Signature/Affiliation)	Date: Time:
Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation)	Date: Time:
Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation)	Date: Time:

Comments: [29] SAMPLES 47-8 & 47-15 HAVE SIGNIFICANT ODOR. WATER MAY ALSO HAVE STRONG BURNT WOOD ODOR

White: To accompany samples
Yellow: Field copy
*See back of form for special instructions.

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD (cont.)*

Reference Document No.[30] 472922

Page 2 of 2

Project Name FOCUS - ACS

Project No. 772686.01000000

Samples Shipment Date

ONE CONTAINER PER LINE

Sample[14] Number	Sample[15] Description/Type	Date/Time[16] Collected	Container[17] Type	Sample[18] Volume	Pre-[19] servative	Requested Testing[20] Program	Condition on[21] Receipt	Disposal[22] Record No.
#1153-047-13	IMPINGER WATER	10/9/97	VIAL	40g	-	TOC, pH, TOTAL Cl TOTAL S/ACIDITY		
#1153-047-8	ORGANIC PHASE CONDENSATE	↓	↓	25 g		HEAT CONTENT ULTIMATE		
#1153-047-15	↓	↓	↓	↓		↓		

Yellow: Field copy To accompany samples

*See back of form for special instructions.

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD (cont.)*

Reference Document No.[30] 472922

Page 2 of 2

Project Name FOCUS - ACS

Project No. 772686.01000000

Samples Shipment Date

ONE CONTAINER PER LINE

Sample[14] Number	Sample[15] Description/Type	Date/Time[16] Collected	Container[17] Type	Sample[18] Volume	Pre-[19] servative	Requested Testing[20] Program	Condition on[21] Receipt	Disposal[22] Record No.
*1153-047-13	IMPINGER WATER	10/9/97	VIAL	40g	-	TOC, pH, TOTAL Cl TOTAL S/ACIDITY		
*1153-047-8	ORGANIC PHASE CONDENSATE	↓	↓	25 g		HEAT CONTENT ULTIMATE		
*1153-047-15	↓	↓	↓	↓		↓		

DOE

White To accompany samples Yellow Field copy

*See back of form for special instructions.

'PENDIX D

Appendix D

Starting Soil Analytical Data

Appendix F

RTA Test Analytical Data

TREATED SOIL ANALYTICAL DATA

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

TREATED SOIL 900°F, Air (RTAI) WORST CASE SOIL

IEA Project Number: 2436-004
IEA Sample Number: 971022801
Client Name: Focus Environmental, Inc.
Client Project: 772686.01000000 FOCUS-ACS
Sample Identification: #1153-046-1
Matrix: (soil/water) SOIL
% Moisture: not dec. 0

Date Received: 10/13/97
Date Sampled: 10/09/97
Date Analyzed: 10/21/97
Lab File ID: 1021914.D
Analyst: DIXON
Dilution Factor: 1.0

CAS NO.	COMPOUND	QUANT LIMIT: ug/kg	RESULT: ug/kg	Q
67-64-1	Acetone	50	66	
107-13-1	Acrylonitrile	5	5	U
107-05-1	Allyl Chloride	5	5	U
71-43-2	Benzene	5	5	
108-86-1	Bromobenzene	5	5	U
74-97-5	Bromochloromethane	5	5	U
75-27-4	Bromodichloromethane	5	5	U
75-25-2	Bromoform	5	5	U
74-83-9	Bromomethane	10	10	U
78-93-3	2-Butanone	10	10	U
104-51-8	N-Butylbenzene	5	5	U
135-98-8	Sec-Butylbenzene	5	5	U
98-06-6	Tert-Butylbenzene	5	5	U
75-15-0	Carbon Disulfide	5	5	U
56-23-5	Carbon Tetrachloride	5	5	U
108-90-7	Chlorobenzene	5	5	U
124-48-1	Chlorodibromomethane	5	5	U
75-00-3	Chloroethane	10	10	U
110-75-8	2-Chloroethyl Vinyl Ether	10	10	U
67-66-3	Chloroform	5	5	U
74-87-3	Chloromethane	10	10	U
95-49-8	2-Chlorotoluene	5	5	U
106-43-4	4-Chlorotoluene	5	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	5	U
106-93-4	1,2-Dibromoethane	5	5	U
74-95-3	Dibromomethane	5	5	U
95-50-1	1,2-Dichlorobenzene	5	5	U
541-73-1	1,3-Dichlorobenzene	5	5	U
106-46-7	1,4-Dichlorobenzene	5	5	U
75-71-8	Dichlorodifluoromethane	10	10	U
75-34-3	1,1-Dichloroethane	5	5	U
107-06-2	1,2-Dichloroethane	5	5	U
75-35-4	1,1-Dichloroethene	5	5	U
156-59-2	Cis-1,2-Dichloroethene	5	5	U

Treated Soil 900°F, Air (RTAI) Worst Case Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

IEA Project Number: 2436-004
IEA Sample Number: 971022801
Client Name: Focus Environmental, Inc.
Client Project: 772686.01000000 FOCUS-ACS
Sample Identification: #1153-046-1
Matrix: (soil/water) SOIL
% Moisture: not dec. 0

Date Received: 10/13/97
Date Sampled: 10/09/97
Date Analyzed: 10/21/97
Lab File ID: 1021914.D
Analyst: DIXON
Dilution Factor: 1.0

CAS NO.	COMPOUND	QUANT LIMIT: ug/kg	RESULT: ug/kg	Q
156-60-5	Trans-1,2-Dichloroethene	5	5	U
78-87-5	1,2-Dichloropropane	5	5	U
142-28-9	1,3-Dichloropropane	5	5	U
594-20-7	2,2-Dichloropropane	5	5	U
563-58-6	1,1-Dichloropropene	5	5	U
10061-01-5	Cis-1,3-Dichloropropene	5	5	U
10061-02-6	Trans-1,3-Dichloropropene	5	5	U
110-57-6	Cis-1,4-Dichloro-2-Butene	5	5	U
110-57-6	Trans-1,4-Dichloro-2-Butene	5	5	U
100-41-4	Ethylbenzene	5	5	U
97-63-2	Ethyl Methacrylate	5	5	U
87-68-3	Hexachlorobutadiene	5	5	U
591-78-6	2-Hexanone	10	10	U
74-88-4	Iodomethane	5	5	U
98-82-8	Isopropylbenzene	5	5	U
99-87-6	P-Isopropyltoluene	5	5	U
126-98-7	Methacrylonitrile	5	5	U
75-09-2	Methylene Chloride	10	10	U
80-62-6	Methyl Methacrylate	5	5	U
108-10-1	4-Methyl-2-Pentanone	10	10	U
1634-04-4	Methyl-tert-Butyl ether	5	5	U
91-20-3	Naphthalene	5	5	U
76-01-7	Pentachloroethane	5	5	U
103-65-1	N-Propylbenzene	5	5	U
100-42-5	Styrene	5	5	U
630-20-6	1,1,1,2-Tetrachloroethane	5	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	5	U
127-18-4	Tetrachloroethene	5	5	U
108-88-3	Toluene	5	5	U
87-61-6	1,2,3-Trichlorobenzene	5	5	U
120-82-1	1,2,4-Trichlorobenzene	5	5	U
71-55-6	1,1,1-Trichloroethane	5	5	U
79-00-5	1,1,2-Trichloroethane	5	5	U
79-01-6	Trichloroethene	5	5	U

Treated Soil
900°F, Air
(RTAI)
Worst Case Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

IEA Project Number: 2436-004
IEA Sample Number: 971022801
Client Name: Focus Environmental, Inc.
Client Project: 772686.01000000 FOCUS-ACS
Sample Identification: #1153-046-1
Matrix: (soil/water) SOIL
% Moisture: not dec. 0

Date Received: 10/13/97
Date Sampled: 10/09/97
Date Analyzed: 10/21/97
Lab File ID: 1021914.D
Analyst: DIXON
Dilution Factor: 1.0

CAS NO.	COMPOUND	QUANT LIMIT: ug/kg	RESULT: ug/kg	Q
75-69-4	Trichlorofluoromethane	5	5	U
96-18-4	1,2,3-Trichloropropane	5	5	U
95-63-6	1,2,4-Trimethylbenzene	5	5	U
108-67-8	1,3,5-Trimethylbenzene	5	5	U
108-05-4	Vinyl Acetate	10	10	U
75-01-4	Vinyl Chloride	10	10	U
1330-20-7	Xylene (Total)	5	5	U

1E

CLIENT SAMPLE NO.

SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

#1153-046-1 Treated Soil 900°F, AIR

Lab Name: IEA-NC Method: 8260

Lab Code: IEA Case No.: 2436-004 SDG No.: 10228

Matrix: (soil/water) SOIL Lab Sample ID: 971022801

Sample wt/vol: 5 (g/mL) g Lab File ID: 1021914.D

Level: (low/med) LOW Date Received: 10/13/97

% Moisture: not dec. 0 Date Analyzed: 10/21/97

GC Column: DB-624 ID: .53(mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs Found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

Treated Soil
900°F, N_2
(RTAN)
WORST CASE
Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

IEA Project Number: 2436-004 | Date Received: 10/13/97

IEA Sample Number: 971022802 | Date Sampled: 10/09/97

Client Name: Focus Environmental, Inc. | Date Analyzed: 10/22/97

Client Project: 772686.01000000 FOCUS-ACS | Lab File ID: 1022711.D

Sample Identification: #1153-046-9 | Analyst: DIXON

Matrix: (soil/water) SOIL | Dilution Factor: 1.0

% Moisture: not dec. 1

CAS NO.	COMPOUND	QUANT LIMIT: ug/kg	RESULT: ug/kg	Q
67-64-1	Acetone	50	50	U
107-13-1	Acrylonitrile	5	5	U
107-05-1	Allyl Chloride	5	5	U
71-43-2	Benzene	5	5	U
108-86-1	Bromobenzene	5	5	U
74-97-5	Bromochloromethane	5	5	U
75-27-4	Bromodichloromethane	5	5	U
75-25-2	Bromoform	5	5	U
74-83-9	Bromomethane	10	10	U
78-93-3	2-Butanone	10	10	U
104-51-8	N-Butylbenzene	5	5	U
135-98-8	Sec-Butylbenzene	5	5	U
98-06-6	Tert-Butylbenzene	5	5	U
75-15-0	Carbon Disulfide	5	5	U
56-23-5	Carbon Tetrachloride	5	5	U
108-90-7	Chlorobenzene	5	5	U
124-48-1	Chlorodibromomethane	5	5	U
75-00-3	Chloroethane	10	10	U
110-75-8	2-Chloroethyl Vinyl Ether	10	10	U
67-66-3	Chloroform	5	5	U
74-87-3	Chloromethane	10	10	U
95-49-8	2-Chlorotoluene	5	5	U
106-43-4	4-Chlorotoluene	5	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	5	U
106-93-4	1,2-Dibromoethane	5	5	U
74-95-3	Dibromomethane	5	5	U
95-50-1	1,2-Dichlorobenzene	5	5	U
541-73-1	1,3-Dichlorobenzene	5	5	U
106-46-7	1,4-Dichlorobenzene	5	5	U
75-71-8	Dichlorodifluoromethane	10	10	U
75-34-3	1,1-Dichloroethane	5	5	U
107-06-2	1,2-Dichloroethane	5	5	U
75-35-4	1,1-Dichloroethene	5	5	U
156-59-2	Cis-1,2-Dichloroethene	5	5	U

Treated Soil
900F, N_2
(RTAN)
WORST CASE
SOIL

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

IEA Project Number: 2436-004
IEA Sample Number: 971022802
Client Name: Focus Environmental, Inc.
Client Project: 772686.01000000 FOCUS-ACS
Sample Identification: #1153-046-9
Matrix: (soil/water) SOIL
% Moisture: not dec. 1

Date Received: 10/13/97
Date Sampled: 10/09/97
Date Analyzed: 10/22/97
Lab File ID: 1022711.D
Analyst: DIXON
Dilution Factor: 1.0

CAS NO.	COMPOUND	QUANT LIMIT: ug/kg	RESULT: ug/kg	Q
156-60-5	Trans-1,2-Dichloroethene	5	5	U
78-87-5	1,2-Dichloropropane	5	5	U
142-28-9	1,3-Dichloropropane	5	5	U
594-20-7	2,2-Dichloropropane	5	5	U
563-58-6	1,1-Dichloropropene	5	5	U
10061-01-5	Cis-1,3-Dichloropropene	5	5	U
10061-02-6	Trans-1,3-Dichloropropene	5	5	U
110-57-6	Cis-1,4-Dichloro-2-Butene	5	5	U
110-57-6	Trans-1,4-Dichloro-2-Butene	5	5	U
100-41-4	Ethylbenzene	5	5	U
97-63-2	Ethyl Methacrylate	5	5	U
87-68-3	Hexachlorobutadiene	5	5	U
591-78-6	2-Hexanone	10	10	U
74-88-4	Iodomethane	5	5	U
98-82-8	Isopropylbenzene	5	5	U
99-87-6	P-Isopropyltoluene	5	5	U
126-98-7	Methacrylonitrile	5	5	U
75-09-2	Methylene Chloride	10	10	U
80-62-6	Methyl Methacrylate	5	5	U
108-10-1	4-Methyl-2-Pentanone	10	10	U
1634-04-4	Methyl-tert-Butyl ether	5	5	U
91-20-3	Naphthalene	5	5	U
76-01-7	Pentachloroethane	5	5	U
103-65-1	N-Propylbenzene	5	5	U
100-42-5	Styrene	5	5	U
630-20-6	1,1,1,2-Tetrachloroethane	5	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	5	U
127-18-4	Tetrachloroethene	5	5	U
108-88-3	Toluene	5	5	U
87-61-6	1,2,3-Trichlorobenzene	5	5	U
120-82-1	1,2,4-Trichlorobenzene	5	5	U
71-55-6	1,1,1-Trichloroethane	5	5	U
79-00-5	1,1,2-Trichloroethane	5	5	U
79-01-6	Trichloroethene	5	5	U

Treated Soil
900°F, N_2
(RTAN)

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

IEA Project Number: 2436-004 | Date Received: 10/13/97 WORST
IEA Sample Number: 971022802 | Date Sampled: 10/09/97 CASE
Client Name: Focus Environmental, Inc. | Date Analyzed: 10/22/97 SOIL
Client Project: 772686.01000000 FOCUS-ACS | Lab File ID: 1022711.D
Sample Identification: #1153-046-9 | Analyst: DIXON
Matrix: (soil/water) SOIL | Dilution Factor: 1.0
% Moisture: not dec. 1

CAS NO.	COMPOUND	QUANT LIMIT: ug/kg	RESULT: ug/kg	Q
75-69-4	Trichlorofluoromethane	5	5	U
96-18-4	1,2,3-Trichloropropane	5	5	U
95-63-6	1,2,4-Trimethylbenzene	5	5	U
108-67-8	1,3,5-Trimethylbenzene	5	5	U
108-05-4	Vinyl Acetate	10	10	U
75-01-4	Vinyl Chloride	10	10	U
1330-20-7	Xylene (Total)	5	5	U

1E

SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

#1153-046-9 Treated Soil 900°F, N_2

Lab Name: IEA-NC Method: 8260

Lab Code: IEA Case No.: 2436-004 SDG No.: 10228

Matrix: (soil/water) SOIL Lab Sample ID: 971022802

Sample wt/vol: 5 (g/mL) g Lab File ID: 1022711.D

Level: (low/med) LOW Date Received: 10/13/97

% Moisture: not dec. 1 Date Analyzed: 10/22/97

GC Column: DB-624 ID: .530(mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs Found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

Treated Soil
700°F, Air
(RTA2)
Typical Case
Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

IEA Project Number: 2436-004 | Date Received: 10/13/97

IEA Sample Number: 971022803 | Date Sampled: 10/09/97

Client Name: Focus Environmental, Inc. | Date Analyzed: 10/22/97

Client Project: 772686.01000000 FOCUS-ACS | Lab File ID: 1021V04.D

Sample Identification: #1153-046-17 | Analyst: DIXON

Matrix: (soil/water) SOIL | Dilution Factor: 1.0

% Moisture: not dec. 2

CAS NO.	COMPOUND	QUANT LIMIT: ug/kg	RESULT: ug/kg	Q
67-64-1	Acetone	50	68	
107-13-1	Acrylonitrile	5	5	U
107-05-1	Allyl Chloride	5	5	U
71-43-2	Benzene	5	5	U
108-86-1	Bromobenzene	5	5	U
74-97-5	Bromochloromethane	5	5	U
75-27-4	Bromodichloromethane	5	5	U
75-25-2	Bromoform	5	5	U
74-83-9	Bromomethane	10	10	U
78-93-3	2-Butanone	10	10	U
104-51-8	N-Butylbenzene	5	5	U
135-98-8	Sec-Butylbenzene	5	5	U
98-06-6	Tert-Butylbenzene	5	5	U
75-15-0	Carbon Disulfide	5	5	U
56-23-5	Carbon Tetrachloride	5	5	U
108-90-7	Chlorobenzene	5	5	U
124-48-1	Chlorodibromomethane	5	5	U
75-00-3	Chloroethane	10	10	U
110-75-8	2-Chloroethyl Vinyl Ether	10	10	U
67-66-3	Chloroform	5	5	U
74-87-3	Chloromethane	10	10	U
95-49-8	2-Chlorotoluene	5	5	U
106-43-4	4-Chlorotoluene	5	5	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	5	U
106-93-4	1,2-Dibromoethane	5	5	U
74-95-3	Dibromomethane	5	5	U
95-50-1	1,2-Dichlorobenzene	5	5	U
541-73-1	1,3-Dichlorobenzene	5	5	U
106-46-7	1,4-Dichlorobenzene	5	5	U
75-71-8	Dichlorodifluoromethane	10	10	U
75-34-3	1,1-Dichloroethane	5	5	U
107-06-2	1,2-Dichloroethane	5	5	U
75-35-4	1,1-Dichloroethene	5	5	U
156-59-2	Cis-1,2-Dichloroethene	5	5	U

Treated Soil
700°F, Air
(RTA2)
Typical
Case
Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

IEA Project Number: 2436-004
IEA Sample Number: 971022803
Client Name: Focus Environmental, Inc.
Client Project: 772686.01000000 FOCUS-ACS
Sample Identification: #1153-046-17
Matrix: (soil/water) SOIL
% Moisture: not dec. 2

Date Received: 10/13/97
Date Sampled: 10/09/97
Date Analyzed: 10/22/97
Lab File ID: 1021V04.D
Analyst: DIXON
Dilution Factor: 1.0

CAS NO.	COMPOUND	QUANT LIMIT: ug/kg	RESULT: ug/kg	Q
156-60-5	Trans-1,2-Dichloroethene	5	5	U
78-87-5	1,2-Dichloropropane	5	5	U
142-28-9	1,3-Dichloropropane	5	5	U
594-20-7	2,2-Dichloropropane	5	5	U
563-58-6	1,1-Dichloropropene	5	5	U
10061-01-5	Cis-1,3-Dichloropropene	5	5	U
10061-02-6	Trans-1,3-Dichloropropene	5	5	U
110-57-6	Cis-1,4-Dichloro-2-Butene	5	5	U
110-57-6	Trans-1,4-Dichloro-2-Butene	5	5	U
100-41-4	Ethylbenzene	5	5	U
97-63-2	Ethyl Methacrylate	5	5	U
87-68-3	Hexachlorobutadiene	5	5	U
591-78-6	2-Hexanone	10	10	U
74-88-4	Iodomethane	5	5	U
98-82-8	Isopropylbenzene	5	5	U
99-87-6	P-Isopropyltoluene	5	5	U
126-98-7	Methacrylonitrile	5	5	U
75-09-2	Methylene Chloride	10	10	U
80-62-6	Methyl Methacrylate	5	5	U
108-10-1	4-Methyl-2-Pentanone	10	10	U
1634-04-4	Methyl-tert-Butyl ether	5	5	U
91-20-3	Naphthalene	5	5	U
76-01-7	Pentachloroethane	5	5	U
103-65-1	N-Propylbenzene	5	5	U
100-42-5	Styrene	5	5	U
630-20-6	1,1,1,2-Tetrachloroethane	5	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	5	U
127-18-4	Tetrachloroethene	5	5	U
108-88-3	Toluene	5	5	U
87-61-6	1,2,3-Trichlorobenzene	5	5	U
120-82-1	1,2,4-Trichlorobenzene	5	5	U
71-55-6	1,1,1-Trichloroethane	5	5	U
79-00-5	1,1,2-Trichloroethane	5	5	U
79-01-6	Trichloroethene	5	5	U

Treated Soil
700°F, Air
(RTA2)
Typical
Case
Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

IEA Project Number: 2436-004
IEA Sample Number: 971022803
Client Name: Focus Environmental, Inc.
Client Project: 772686.01000000 FOCUS-ACS
Sample Identification: #1153-046-17
Matrix: (soil/water) SOIL
% Moisture: not dec. 2

Date Received: 10/13/97
Date Sampled: 10/09/97
Date Analyzed: 10/22/97
Lab File ID: 1021V04.D
Analyst: DIXON
Dilution Factor: 1.0

CAS NO.	COMPOUND	QUANT LIMIT: ug/kg	RESULT: ug/kg	Q
75-69-4	Trichlorofluoromethane	5	5	U
96-18-4	1,2,3-Trichloropropane	5	5	U
95-63-6	1,2,4-Trimethylbenzene	5	5	U
108-67-8	1,3,5-Trimethylbenzene	5	5	U
108-05-4	Vinyl Acetate	10	10	U
75-01-4	Vinyl Chloride	10	10	U
1330-20-7	Xylene (Total)	5	5	U

1E

CLIENT SAMPLE NO.

SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

#1153-046-17 Treated Soil 700°F, Air

Lab Name: IEA-NC Method: 8260

Lab Code: IEA Case No.: 2436-004 SDG No.: 10228

Matrix: (soil/water) SOIL Lab Sample ID: 971022803

Sample wt/vol: 5 (g/mL) g Lab File ID: 1021V04.D

Level: (low/med) LOW Date Received: 10/13/97

% Moisture: not dec. 2 Date Analyzed: 10/22/97

GC Column: DB-624 ID: .530(mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs Found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

Treated Soil
900°F, Air
(RTAI)
Worst Case Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8270

IEA Project Number: 2436-004 | Date Received: 10/13/97

IEA Sample Number: 971022809 | Date Sampled: 10/09/97

Client Name: Focus Environmental, Inc. | Date Analyzed: 11/04/97

Client Project: 772686.01000000 FOCUS-ACS | Date Extracted: 10/20/97

Sample Identification: #1153-046-2 | Lab File ID: 1104602.D

Matrix: (soil/water) SOIL | Dilution Factor: 2.0

% Moisture: not dec. 1 | Analyst: VAN LARE

CAS NO.	COMPOUND	QUANT LIMIT: ug/kg	RESULT: ug/kg	Q
108-95-2	Phenol	330	670	U
111-44-4	Bis(2-Chloroethyl)Ether	330	670	U
95-57-8	2-Chlorophenol	330	670	U
541-73-1	1,3-Dichlorobenzene	330	670	U
106-46-7	1,4-Dichlorobenzene	330	670	U
95-50-1	1,2-Dichlorobenzene	330	670	U
95-48-7	2-Methylphenol	330	670	U
108-60-1	Bis(2-Chloroisopropyl)Ether	330	670	U
106-44-5	4-Methylphenol	330	670	U
621-64-7	N-Nitroso-Di-N-Propylamine	330	670	U
67-72-1	Hexachloroethane	330	670	U
98-95-3	Nitrobenzene	330	670	U
78-59-1	Isophorone	330	670	U
88-75-5	2-Nitrophenol	330	670	U
105-67-9	2,4-Dimethylphenol	330	670	U
111-91-1	Bis(2-Chloroethoxy)Methane	330	670	U
120-83-2	2,4-Dichlorophenol	330	670	U
120-82-1	1,2,4-Trichlorobenzene	330	670	U
91-20-3	Naphthalene	330	670	U
106-47-8	4-Chloroaniline	660	1300	U
87-68-3	Hexachlorobutadiene	330	670	U
59-50-7	4-Chloro-3-Methylphenol	660	1300	U
91-57-6	2-Methylnaphthalene	330	670	U
77-47-4	Hexachlorocyclopentadiene	330	670	U
88-06-2	2,4,6-Trichlorophenol	330	670	U
95-95-4	2,4,5-Trichlorophenol	330	670	U
91-58-7	2-Chloronaphthalene	330	670	U
88-74-4	2-Nitroaniline	1600	3200	U
131-11-3	Dimethylphthalate	330	670	U
208-96-8	Acenaphthylene	330	670	U
606-20-2	2,6-Dinitrotoluene	330	670	U
99-09-2	3-Nitroaniline	1600	3200	U
83-32-9	Acenaphthene	330	670	U

Treated Soil
900°F, Air
(RTA1)
Worst Case Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8270

IEA Project Number: 2436-004
IEA Sample Number: 971022809
Client Name: Focus Environmental, Inc.
Client Project: 772686.01000000 FOCUS-ACS
Sample Identification: #1153-046-2
Matrix: (soil/water) SOIL
% Moisture: not dec. 1

Date Received: 10/13/97
Date Sampled: 10/09/97
Date Analyzed: 11/04/97
Date Extracted: 10/20/97
Lab File ID: 1104602.D
Dilution Factor: 2.0
Analyst: VAN LARE

CAS NO.	COMPOUND	QUANT LIMIT: ug/kg	RESULT: ug/kg	Q
51-28-5	2,4-Dinitrophenol	1600	3200	U
100-02-7	4-Nitrophenol	1600	3200	U
132-64-9	Dibenzofuran	330	670	U
121-14-2	2,4-Dinitrotoluene	330	670	U
84-66-2	Diethylphthalate	330	670	U
7005-72-3	4-Chlorophenyl-phenylether	330	670	U
86-73-7	Fluorene	330	670	U
100-01-6	4-Nitroaniline	1600	3200	U
534-52-1	4,6-Dinitro-2-Methylphenol	1600	3200	U
86-30-6	N-Nitrosodiphenylamine (1)	330	670	U
101-55-3	4-Bromophenyl-phenylether	330	670	U
118-74-1	Hexachlorobenzene	330	670	U
87-86-5	Pentachlorophenol	1600	3200	U
85-01-8	Phenanthrene	330	670	U
120-12-7	Anthracene	330	670	U
84-74-2	Di-N-Butylphthalate	330	670	U
206-44-0	Fluoranthene	330	670	U
129-00-0	Pyrene	330	670	U
85-68-7	Butylbenzylphthalate	330	670	U
91-94-1	3,3'-Dichlorobenzidine	660	1300	U
56-55-3	Benzo(a)Anthracene	330	670	U
218-01-9	Chrysene	330	670	U
117-81-7	Bis(2-Ethylhexyl)Phthalate	330	670	U
117-84-0	Di-N-Octylphthalate	330	670	U
205-99-2	Benzo(b)Fluoranthene	330	670	U
207-08-9	Benzo(k)Fluoranthene	330	670	U
50-32-8	Benzo(a)Pyrene	330	670	U
193-39-5	Indeno(1,2,3-Cd)Pyrene	330	670	U
53-70-3	Dibenz(A,H)Anthracene	330	670	U
191-24-2	Benzo(G,H,I)Perylene	330	670	U
100-51-6	Benzyl Alcohol	660	1300	U
65-85-0	Benzoic Acid	1600	2800	J

1F

CLIENT SAMPLE NO.

SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

#1153-046-2 Treated Soil 900°F, AIT

Lab Name: IEA-NC Method: 8270

Lab Code: IEA Case No.: 2436-004 SDG No.: 10228

Matrix: (soil/water) SOIL Lab Sample ID: 971022809

Sample wt/vol: 30 (g/mL) g Lab File ID: 1104602.D

Level: (low/med) LOW Date Received: 10/13/97

% Moisture: 1 decanted: (Y/N) Date Extracted: 10/20/97

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/04/97

Injection Volume: 2 (uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH:

Number TICs Found: 9

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	UNKNOWN	7.87	490	JB
000100-52-7	BENZALDEHYDE	8.25	350	JN
000872-50-4	2-PYRROLIDINONE, 1-METHYL-	9.71	180	JN
000098-86-2	ACETOPHENONE	10.16	280	JN
	UNKNOWN ACID	13.23	140	J
	UNKNOWN	14.91	140	J
000085-41-6	1H-ISOINDOLE-1,3(2H)-DIONE	16.02	1300	JN
	UNKNOWN	17.44	140	J
000057-10-3	HEXADECANOIC ACID	21.33	200	JNXB

Treated Soil
900°F, N_2
(RTHN)
Worst Case Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8270

IEA Project Number: 2436-004
IEA Sample Number: 971022810
Client Name: Focus Environmental, Inc.
Client Project: 772686.01000000 FOCUS-ACS
Sample Identification: #1153-046-10
Matrix: (soil/water) SOIL
% Moisture: not dec. 1

Date Received: 10/13/97
Date Sampled: 10/09/97
Date Analyzed: 11/03/97
Date Extracted: 10/20/97
Lab File ID: 1103607.D
Dilution Factor: 1.0
Analyst: VAN LARE

CAS NO.	COMPOUND	QUANT LIMIT: ug/kg	RESULT: ug/kg	Q
108-95-2	Phenol	330	330	U
111-44-4	Bis(2-Chloroethyl)Ether	330	330	U
95-57-8	2-Chlorophenol	330	330	U
541-73-1	1,3-Dichlorobenzene	330	330	U
106-46-7	1,4-Dichlorobenzene	330	330	U
95-50-1	1,2-Dichlorobenzene	330	330	U
95-48-7	2-Methylphenol	330	330	U
108-60-1	Bis(2-Chloroisopropyl)Ether	330	330	U
106-44-5	4-Methylphenol	330	330	U
621-64-7	N-Nitroso-Di-N-Propylamine	330	330	U
67-72-1	Hexachloroethane	330	330	U
98-95-3	Nitrobenzene	330	330	U
78-59-1	Isophorone	330	330	U
88-75-5	2-Nitrophenol	330	330	U
105-67-9	2,4-Dimethylphenol	330	330	U
111-91-1	Bis(2-Chloroethoxy)Methane	330	330	U
120-83-2	2,4-Dichlorophenol	330	330	U
120-82-1	1,2,4-Trichlorobenzene	330	330	U
91-20-3	Naphthalene	330	330	U
106-47-8	4-Chloroaniline	660	660	U
87-68-3	Hexachlorobutadiene	330	330	U
59-50-7	4-Chloro-3-Methylphenol	660	660	U
91-57-6	2-Methylnaphthalene	330	330	U
77-47-4	Hexachlorocyclopentadiene	330	330	U
88-06-2	2,4,6-Trichlorophenol	330	330	U
95-95-4	2,4,5-Trichlorophenol	330	330	U
91-58-7	2-Chloronaphthalene	330	330	U
88-74-4	2-Nitroaniline	1600	1600	U
131-11-3	Dimethylphthalate	330	330	U
208-96-8	Acenaphthylene	330	330	U
606-20-2	2,6-Dinitrotoluene	330	330	U
99-09-2	3-Nitroaniline	1600	1600	U
83-32-9	Acenaphthene	330	330	U

Treated Soil
900°F, N_2
(RTAN)

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8270

Worst Case Soil

IEA Project Number: 2436-004
IEA Sample Number: 971022810
Client Name: Focus Environmental, Inc.
Client Project: 772686.01000000 FOCUS-ACS
Sample Identification: #1153-046-10
Matrix: (soil/water) SOIL
% Moisture: not dec. 1

Date Received: 10/13/97
Date Sampled: 10/09/97
Date Analyzed: 11/03/97
Date Extracted: 10/20/97
Lab File ID: 1103607.D
Dilution Factor: 1.0
Analyst: VAN LARE

CAS NO.	COMPOUND	QUANT LIMIT: ug/kg	RESULT: ug/kg	Q
51-28-5	2,4-Dinitrophenol	1600	1600	U
100-02-7	4-Nitrophenol	1600	1600	U
132-64-9	Dibenzofuran	330	330	U
121-14-2	2,4-Dinitrotoluene	330	330	U
84-66-2	Diethylphthalate	330	330	U
7005-72-3	4-Chlorophenyl-phenylether	330	330	U
86-73-7	Fluorene	330	330	U
100-01-6	4-Nitroaniline	1600	1600	U
534-52-1	4,6-Dinitro-2-Methylphenol	1600	1600	U
86-30-6	N-Nitrosodiphenylamine (1)	330	330	U
101-55-3	4-Bromophenyl-phenylether	330	330	U
118-74-1	Hexachlorobenzene	330	330	U
87-86-5	Pentachlorophenol	1600	1600	U
85-01-8	Phenanthrene	330	330	U
120-12-7	Anthracene	330	330	U
84-74-2	Di-N-Butylphthalate	330	330	U
206-44-0	Fluoranthene	330	330	U
129-00-0	Pyrene	330	330	U
85-68-7	Butylbenzylphthalate	330	330	U
91-94-1	3,3'-Dichlorobenzidine	660	660	U
56-55-3	Benzo(a)Anthracene	330	330	U
218-01-9	Chrysene	330	330	U
117-81-7	Bis(2-Ethylhexyl)Phthalate	330	330	U
117-84-0	Di-N-Octylphthalate	330	330	U
205-99-2	Benzo(b)Fluoranthene	330	330	U
207-08-9	Benzo(k)Fluoranthene	330	330	U
50-32-8	Benzo(a)Pyrene	330	330	U
193-39-5	Indeno(1,2,3-Cd)Pyrene	330	330	U
53-70-3	Dibenz(A,H)Anthracene	330	330	U
191-24-2	Benzo(G,H,I)Perylene	330	330	U
100-51-6	Benzyl Alcohol	660	660	U
65-85-0	Benzoic Acid	1600	2400	

1F

SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

#1153-046-10 Treated Soil 900°F, N_2

Lab Name: IEA-NC Method: 8270

Lab Code: IEA Case No.: 2436-004 SDG No.: 10228

Matrix: (soil/water) SOIL Lab Sample ID: 971022810

Sample wt/vol: 30.1 (g/mL) g Lab File ID: 1103607.D

Level: (low/med) LOW Date Received: 10/13/97

% Moisture: 1 decanted: (Y/N) Date Extracted: 10/20/97

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/03/97

Injection Volume: 2 (uL) Dilution Factor: 1.0

GPC Cleanup: - (Y/N) N pH:

Number TICs Found: 20

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	UNKNOWN	7.43	110	JB
	UNKNOWN	7.96	380	JB
000100-52-7	BENZALDEHYDE	8.30	210	JN
000872-50-4	2-PYRROLIDINONE, 1-METHYL-	9.75	240	JN
000098-86-2	ACETOPHENONE	10.21	300	JN
	UNKNOWN	15.54	110	J
000085-41-6	1H-ISOINDOLE-1,3(2H)-DIONE	16.09	900	JN
	UNKNOWN	17.08	120	J
	UNKNOWN	17.50	130	J
	UNKNOWN ALKANE	18.61	110	J
000491-30-5	1(2H)-ISOQUINOLINONE	18.96	170	JN
	UNKNOWN	19.38	120	J
	UNKNOWN	20.80	120	J
000057-10-3	HEXADECANOIC ACID	21.40	280	JNXB
000057-11-4	OCTADECANOIC ACID	23.28	160	JN
	UNKNOWN	23.45	120	J
	UNKNOWN	23.55	110	J
	METHYLATED PAH	24.10	400	J
	UNKNOWN	24.96	470	J
	UNKNOWN ALKANE	26.01	130	J

Treated Soil
700°F, Air
(RTA2)
Typical
Case
Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8270

IEA Project Number: 2436-004
IEA Sample Number: 971022811
Client Name: Focus Environmental, Inc.
Client Project: 772686.01000000 FOCUS-ACS
Sample Identification: #1153-046-18
Matrix: (soil/water) SOIL
% Moisture: not dec. 1

Date Received: 10/13/97
Date Sampled: 10/09/97
Date Analyzed: 11/04/97
Date Extracted: 10/20/97
Lab File ID: 1104607.D
Dilution Factor: 20.0
Analyst: VAN LARE

CAS NO.	COMPOUND	QUANT LIMIT: ug/kg	RESULT: ug/kg	Q
108-95-2	Phenol	330	6700	U
111-44-4	Bis(2-Chloroethyl)Ether	330	6700	U
95-57-8	2-Chlorophenol	330	6700	U
541-73-1	1,3-Dichlorobenzene	330	6700	U
106-46-7	1,4-Dichlorobenzene	330	6700	U
95-50-1	1,2-Dichlorobenzene	330	6700	U
95-48-7	2-Methylphenol	330	6700	U
108-60-1	Bis(2-Chloroisopropyl)Ether	330	6700	U
106-44-5	4-Methylphenol	330	6700	U
621-64-7	N-Nitroso-Di-N-Propylamine	330	6700	U
67-72-1	Hexachloroethane	330	6700	U
98-95-3	Nitrobenzene	330	6700	U
78-59-1	Isophorone	330	6700	U
88-75-5	2-Nitrophenol	330	6700	U
105-67-9	2,4-Dimethylphenol	330	6700	U
111-91-1	Bis(2-Chloroethoxy)Methane	330	6700	U
120-83-2	2,4-Dichlorophenol	330	6700	U
120-82-1	1,2,4-Trichlorobenzene	330	6700	U
91-20-3	Naphthalene	330	6700	U
106-47-8	4-Chloroaniline	660	13000	U
87-68-3	Hexachlorobutadiene	330	6700	U
59-50-7	4-Chloro-3-Methylphenol	660	13000	U
91-57-6	2-Methylnaphthalene	330	6700	U
77-47-4	Hexachlorocyclopentadiene	330	6700	U
88-06-2	2,4,6-Trichlorophenol	330	6700	U
95-95-4	2,4,5-Trichlorophenol	330	6700	U
91-58-7	2-Chloronaphthalene	330	6700	U
88-74-4	2-Nitroaniline	1600	32000	U
131-11-3	Dimethylphthalate	330	6700	U
208-96-8	Acenaphthylene	330	6700	U
606-20-2	2,6-Dinitrotoluene	330	6700	U
99-09-2	3-Nitroaniline	1600	32000	U
83-32-9	Acenaphthene	330	6700	U

Treated Soil
700°F, Air
(RTA2)

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8270

Typical Case Soil

IEA Project Number: 2436-004
IEA Sample Number: 971022811
Client Name: Focus Environmental, Inc.
Client Project: 772686.01000000 FOCUS-ACS
Sample Identification: #1153-046-18
Matrix: (soil/water) SOIL
% Moisture: not dec. 1

Date Received: 10/13/97
Date Sampled: 10/09/97
Date Analyzed: 11/04/97
Date Extracted: 10/20/97
Lab File ID: 1104607.D
Dilution Factor: 20.0
Analyst: VAN LARE

CAS NO.	COMPOUND	QUANT LIMIT: ug/kg	RESULT: ug/kg	Q
51-28-5	2,4-Dinitrophenol	1600	32000	U
100-02-7	4-Nitrophenol	1600	32000	U
132-64-9	Dibenzofuran	330	6700	U
121-14-2	2,4-Dinitrotoluene	330	6700	U
84-66-2	Diethylphthalate	330	6700	U
7005-72-3	4-Chlorophenyl-phenylether	330	6700	U
86-73-7	Fluorene	330	6700	U
100-01-6	4-Nitroaniline	1600	32000	U
534-52-1	4,6-Dinitro-2-Methylphenol	1600	32000	U
86-30-6	N-Nitrosodiphenylamine (1)	330	6700	U
101-55-3	4-Bromophenyl-phenylether	330	6700	U
118-74-1	Hexachlorobenzene	330	6700	U
87-86-5	Pentachlorophenol	1600	32000	U
85-01-8	Phenanthrene	330	6700	U
120-12-7	Anthracene	330	6700	U
84-74-2	Di-N-Butylphthalate	330	6700	U
206-44-0	Fluoranthene	330	6700	U
129-00-0	Pyrene	330	6700	U
85-68-7	Butylbenzylphthalate	330	6700	U
91-94-1	3,3'-Dichlorobenzidine	660	13000	U
56-55-3	Benzo(a)Anthracene	330	6700	U
218-01-9	Chrysene	330	6700	U
117-81-7	Bis(2-Ethylhexyl)Phthalate	330	6700	U
117-84-0	Di-N-Octylphthalate	330	6700	U
205-99-2	Benzo(b)Fluoranthene	330	6700	U
207-08-9	Benzo(k)Fluoranthene	330	6700	U
50-32-8	Benzo(a)Pyrene	330	6700	U
193-39-5	Indeno(1,2,3-Cd)Pyrene	330	6700	U
53-70-3	Dibenz(A,H)Anthracene	330	6700	U
191-24-2	Benzo(G,H,I)Perylene	330	6700	U
100-51-6	Benzyl Alcohol	660	13000	U
65-85-0	Benzoic Acid	1600	53000	

1F

CLIENT SAMPLE NO.

SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

#1153-046-18 Treated Soil 700°F, Air

Lab Name: IEA-NC Method: 8270

Lab Code: IEA Case No.: 2436-004 SDG No.: 10228

Matrix: (soil/water) SOIL Lab Sample ID: 971022811

Sample wt/vol: 30 (g/mL) g Lab File ID: 1104607.D

Level: (low/med) LOW Date Received: 10/13/97

% Moisture: 1 decanted: (Y/N) Date Extracted: 10/20/97

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/04/97

Injection Volume: 2 (uL) Dilution Factor: 20.0

GPC Cleanup: (Y/N) N pH:

Number TICs Found: 17

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
000872-50-4	2-PYRROLIDINONE, 1-METHYL-	9.69	4400	JN
000111-14-8	HEPTANOIC ACID	10.30	1700	JN
	UNKNOWN	15.49	2000	J
000085-41-6	1H-ISOINDOLE-1,3(2H)-DIONE	16.00	6800	JN
	UNKNOWN	17.03	3400	J
000544-63-8	TETRADECANOIC ACID	19.28	3300	JN
	UNKNOWN	21.18	1500	J
000057-10-3	HEXADECANOIC ACID	21.36	25000	JNXB
	METHYLTAED PAH	22.52	1700	J
000112-80-1	OLEIC ACID	23.09	44000	JN
000057-11-4	OCTADECANOIC ACID	23.25	16000	JN
	SUBSTI..TED BENZENE	23.45	8800	J
	SUBSTITUTED BENZENE	23.56	3300	J
	METHYLATED PAH	24.05	5100	J
	UNKNOWN	24.82	1700	J
	PHENANTHRENECARBOXYLIC ACID	25.88	9400	J
	UNKNOWN	28.35	2000	J

2D
SW-846 SOIL SEMIVOLATILE SURROGATE RECOVERY

.b Name: IEA-NC Method: 8270

Lab Code: IEA Case No.: 2436-004 SDG No.: 10228

Level:(low/med) LOW

	CLIENT SAMPLE NO.	S1 (NBZ)#	S2 (FBP)#	S3 (TPH)#	S4 (PHL)#	S5 (2FP)#	S6 (TBP)#	TOT OUT
01	SVB024	82	96	92	83	80	98	0
02	#1153-046-10	80	78	82	72	64	67	0
03	#1153-046-2	72	79	85	72	66	74	0
04	#1153-046-18	75	79	72	85	57	67	0
05	WF-S-10/9-T1R1 MS	79	81	87	91	87	86	0
06	WF-S-10/9-T1R1 MSD	77	79	85	90	86	86	0
07								
09								
10								
11								
12								
13								
14								
15								
16								
7								
3								
20								
21								
22								
23								
24								
25								
27								
3								
9								
30								

		QC LIMITS
S1 (NBZ)	= Nitrobenzene-d5	(23-120)
S2 (FBP)	= 2-Fluorobiphenyl	(30-115)
S3 (TPH)	= Terphenyl-d14	(18-137)
S4 (PHL)	= Phenol-d5	(24-113)
S5 (2FP)	= 2-Fluorophenol	(25-121)
S6 (TBP)	= 2,4,6-Tribromophenol	(19-122)

Column to be used to flag recovery values
* Values outside of QC limits.
D System Monitoring Compound diluted out

FORM II SV-2

3D

SW-846 SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: IEA-NC Method: 8270

Lab Code: IEA Case No.: 2436-004 SDG No.: 10228

Matrix Spike - Client Sample No.: WF-S-10/9-T1R1 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC. LIMITS REC.
Phenol	1900	0	1600	84	26-90
2-Chlorophenol	1900	0	1600	84	25-102
1,4-Dichlorobenzene	1900	0	1400	74	28-104
N-Nitroso-di-n-prop.(1)	1900	0	1400	74	41-126
1,2,4-Trichlorobenzene	1900	0	1500	79	38-107
4-Chloro-3-Methylphenol	1900	0	1700	89	26-103
Acenaphthene	1900	0	1500	79	31-137
4-Nitrophenol	1900	0	1600	84	11-114
2,4-Dinitrotoluene	1900	0	1600	84	28-89
Pentachlorophenol	1900	0	1500	79	17-109
Pyrene	1900	0	1600	84	35-142

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Phenol	1900	1600	84	0	35	26-90
2-Chlorophenol	1900	1600	84	0	50	25-102
1,4-Dichlorobenzene	1900	1400	74	0	27	28-104
N-Nitroso-di-n-prop.(1)	1900	1400	74	0	38	41-126
1,2,4-Trichlorobenzene	1900	1400	74	6	23	38-107
4-Chloro-3-Methylphenol	1900	1600	84	6	33	26-103
Acenaphthene	1900	1500	79	0	19	31-137
4-Nitrophenol	1900	1600	84	0	50	11-114
2,4-Dinitrotoluene	1900	1600	84	0	47	28-89
Pentachlorophenol	1900	1500	79	0	47	17-109
Pyrene	1900	1600	84	0	36	35-142

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits.
RPD: 0 out of 11 outside limits
Spike Recovery: 0 out of 22 outside limits
COMMENTS: _____

_____

Treated Soil
900°F, Air
(RTA-1)
WORST CASE
SOIL

Industrial & Environmental Analysts, Inc. (IEA)
GC SEMIVOLATILE SW-846 METHOD 8081 PCB in SOIL

IEA Project Number:	2436-004	Date Received:	10/13/97
IEA Sample Number:	9710228-18	Date Sampled:	10/09/97
Client Name:	Focus Environmental, Inc.	Date Extracted:	10/20/97
Client Project ID:	772686.01000000 FOCUS-ACS	Date Analyzed:	10/22/97
Sample Identification:	#1153-046-3	Analysis By:	Briggs
Associated QC Blank:	PB618	Dilution Factor:	1.0
QC Batch ID#:	618	Matrix:	Soil
Moisture Correction Factor:	1.01	Time of Analysis:	1906

Number	Compound	Quantitation Limit (ug/kg)	Results Concentration (ug/kg)
1	Aroclor 1016	80	BQL
2	Aroclor 1221	80	BQL
3	Aroclor 1232	80	BQL
4	Aroclor 1242	80	BQL
5	Aroclor 1248	80	BQL
6	Aroclor 1254	160	BQL
7	Aroclor 1260	160	BQL

Surrogate Compounds:	Acceptance Criteria	% Recovery
Tetrachloro-m-xylene	60 - 150	105
Decachlorobiphenyl	60 - 150	107

Comments:
Sample specific quantitation limits may be calculated by multiplying the quantitation limit by the dilution factor and/or moisture correction factor where reported.
BQL = Below Quantitation Limit

FORM RPCBS Rev. 082296

Treated Soil
900°F, N_2
(RTAN)
Worst Case
Soil

Industrial & Environmental Analysts, Inc. (IEA)
GC SEMIVOLATILE SW-846 METHOD 8081 PCB in SOIL

IEA Project Number:	2436-004	Date Received:	10/13/97
IEA Sample Number:	9710228-19	Date Sampled:	10/09/97
Client Name:	Focus Environmental, Inc.	Date Extracted:	10/20/97
Client Project ID:	772686.01000000 FOCUS-ACS	Date Analyzed:	10/22/97
Sample Identification:	#1153-046-11	Analysis By:	Briggs
Associated QC Blank:	PB618	Dilution Factor:	1.0
QC Batch ID#:	618	Matrix:	Soil
Moisture Correction Factor:	1.01	Time of Analysis:	1941

Number	Compound	Quantitation Limit (ug/kg)	Results Concentration (ug/kg)
1	Aroclor 1016	80	BQL
2	Aroclor 1221	80	BQL
3	Aroclor 1232	80	BQL
4	Aroclor 1242	80	BQL
5	Aroclor 1248	80	BQL
6	Aroclor 1254	160	BQL
7	Aroclor 1260	160	BQL

Surrogate Compounds:	Acceptance Criteria	% Recovery
Tetrachloro-m-xylene	60 - 150	94
Decachlorobiphenyl	60 - 150	100

Comments:
Sample specific quantitation limits may be calculated by multiplying the quantitation limit by the dilution factor and/or moisture correction factor where reported.
BQL = Below Quantitation Limit

FORM RPCBS Rev. 082296

TREATED SOIL
700°F, Air
(RTA-2)
TYPICAL CASE
SOIL

Industrial & Environmental Analysts, Inc. (IEA)
GC SEMIVOLATILE SW-846 METHOD 8081 PCB in SOIL

IEA Project Number:	2436-004	Date Received:	10/13/97
IEA Sample Number:	9710228-20	Date Sampled:	10/09/97
Client Name:	Focus Environmental, Inc.	Date Extracted:	10/20/97
Client Project ID:	772686.01000000 FOCUS-ACS	Date Analyzed:	10/24/97
Sample Identification:	#1153-046-19	Analysis By:	Briggs
Associated QC Blank:	PB618	Dilution Factor:	1.0
QC Batch ID#:	618	Matrix:	Soil
Moisture Correction Factor:	1.02	Time of Analysis:	1550

Number	Compound	Quantitation Limit (ug/kg)	Results Concentration (ug/kg)
1	Aroclor 1016	80	BQL
2	Aroclor 1221	80	BQL
3	Aroclor 1232	80	BQL
4	Aroclor 1242	80	BQL
5	Aroclor 1248	80	BQL
6	Aroclor 1254	160	BQL
7	Aroclor 1260	160	BQL

Surrogate Compounds:	Acceptance Criteria	% Recovery
Tetrachloro-m-xylene	60 - 150	85
Decachlorobiphenyl	60 - 150	313 *

Comments:
Sample specific quantitation limits may be calculated by multiplying the quantitation limit by the dilution factor and/or moisture correction factor where reported.
BQL = Below Quantitation Limit
* = matrix interference

FORM RPCBS Rev. 082296

BLANK

Industrial & Environmental Analysts, Inc. (IEA)
GC SEMIVOLATILE SW-846 METHOD 8081 PCB in SOIL

IEA Project Number:	2436-004	Date Received:	N/A
IEA Sample Number:	9710228	Date Sampled:	N/A
Client Name:	Focus Environmental, Inc.	Date Extracted:	10/20/97
Client Project ID:	772686.01000000 FOCUS-ACS	Date Analyzed:	10/22/97
Sample Identification:	QC Blank	Analysis By:	Briggs
Associated QC Blank:	PB618	Dilution Factor:	1.0
QC Batch ID#:	618	Matrix:	Soil
Moisture Correction Factor:	1.00	Time of Analysis:	1644

Number	Compound	Quantitation Limit (ug/kg)	Results Concentration (ug/kg)
1	Aroclor 1016	80	BQL
2	Aroclor 1221	80	BQL
3	Aroclor 1232	80	BQL
4	Aroclor 1242	80	BQL
5	Aroclor 1248	80	BQL
6	Aroclor 1254	160	BQL
7	Aroclor 1260	160	BQL

Surrogate Compounds:	Acceptance Criteria	% Recovery
Tetrachloro-m-xylene	60 - 150	85
Decachlorobiphenyl	60 - 150	93

Comments:
Sample specific quantitation limits may be calculated by multiplying the quantitation limit by the dilution factor and/or moisture correction factor where reported.
BQL = Below Quantitation Limit
N/A = Not Applicable
Corresponding Samples: 9710228-18, 19, 20

FORM RPCBS Rev. 082296

Industrial & Environmental Analysts, Inc. (IEA)
SOIL MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY
GC PCB SW-846 METHOD 8081

IEA Project No:	2436-004	Date Received:	10/13/97
IEA Sample No:	9710228-18	Date Sampled:	10/09/97
Client Name:	Focus Environmental, Inc.	Date Extracted:	10/20/97
Sample ID:	#1153-046-3	MS Date Analyzed:	10/22/97
Associated QC Blank:	PB618	MSD Date Analyzed:	10/22/97
QC Batch ID:	618	MS Time Analyzed:	1755
IEA MS Sample No:	9710228-18MS	MSD Time Analyzed:	1830
IEA MSD Sample No:	9710228-18MSD	Dilution Factor:	1.0
MCF:	1.01		

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC LIMITS REC
AR1260	330	BQL	340	103	10-127

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC#	% RPD	QC LIMITS REC
AR1260	330	310	94	9	10-127

Corresponding Samples: 9710228-18, 19, 20
MCF = Moisture Correction Factor
BQL = Below Quantitation Limit.

FORM RPCBSMS Rev. 073196

FORM 1A: PCDD/PCDF ANALYSIS DATA SHEET
Use for Sample and Blank Results

EPA SAMPLE NO.

1153-046-4

Lab Name: SOUTHWEST LAB. OF OKLAHOMA

Episode No.: 31487

Contract No.: IEA-NC

Lab Sample ID: 31487.04

Matrix (aqueous/solid/leachate): solid

Sample Wt/Vol: 2.00 g or mL: g

Sample Receipt Date: 10/17/97

Initial Calibration Date: 11/19/97

Treated Soil

Ext. Date: 11/03/97 Shift:

Instrument ID: Autospec

Analysis Date: 5-NOV-97 Time: 17:16:07

GC Column ID: DB-5

RTAI

Extract Volume (uL): 20

Sample Data Filename: A103645#3

Injection Volume (uL): 2

Blank Data Filename: A103644#2

Dilution Factor: 1

Cal. Ver. Data Filename: A103644#1

Concentration Units (pg/L or ng/Kg dry weight): ng/Kg % Solids: 99.22

ANALYTE	CONCENTRATION FOUND	DETECTION LIMIT	EMPC	ION ABUND. RATIO (1)	RRT (1)
2,3,7,8-TCDD	*	3.640	*	*	*
1,2,3,7,8-PeCDD	*	3.885	*	*	*
1,2,3,4,7,8-HxCDD	5.76	1.804	*	1.25	1.000
1,2,3,6,7,8-HxCDD	4.74	1.779	*	1.41	1.001
1,2,3,7,8,9-HxCDD	12.46	1.659	*	1.28	1.008
1,2,3,4,6,7,8-HpCDD	59.26	2.978	*	0.94	1.000
OCDD	144.90	2.161	*	0.92	1.000
2,3,7,8-TCDF	*	2.590	*	*	*
1,2,3,7,8-PeCDF	*	1.908	*	*	*
2,3,4,7,8-PeCDF	*	1.748	*	*	*
1,2,3,4,7,8-HxCDF	*	1.325	*	*	*
1,2,3,6,7,8-HxCDF	*	1.254	*	*	*
1,2,3,7,8,9-HxCDF	*	1.719	*	*	*
2,3,4,6,7,8-HxCDF	*	1.306	*	*	*
1,2,3,4,6,7,8-HpCDF	*	1.510	3.400	1.47	1.000
1,2,3,4,7,8,9-HpCDF	*	2.010	*	*	*
OCDF	5.51	1.900	*	0.90	1.003
Total Tetra-Dioxins	*	3.640			
Total Penta-Dioxins	*	3.885			
Total Hexa-Dioxins	76.63	1.748			
Total Hepta-Dioxins	198.32	2.978			
Total Tetra-Furans	*	2.590			
Total Penta-Furans	7.93	1.828			
Total Hexa-Furans	13.46	1.381			
Total Hepta-Furans	9.65	1.730			

(1) Contract-required limits for RRTs and ion abundance ratios are specified in Tables 2 and 9, respectively, Method 1613

RFP C500273T1

USEPA, EAD

FORM 2: PCDD/PCDF LABELED COMPOUND AND CLEANUP STANDARD RECOVERIES

EPA SAMPLE NO.
1153-046-4

Lab Name: SOTHWEST LAB. OF OKLAHOMA
Episode No.: 31487

Contract No.: IEA-NC
Lab Sample ID: 31487.04

Matrix (aqueous/solid/leachate): solid
Sample Wt/Vol: 2.00 g or mL: g

Sample Receipt Date: 10/17/97
Initial Calibration Date: 11/19/97

Ext. Date: 11/03/97 Shift:
Instrument ID: Autospec

Analysis Date: 5-NOV-97 Time: 17:16:07
GC Column ID: DB-5

Extract Volume (uL): 20
Sample Data Filename: A103645#3

Injection Volume (uL): 2
Blank Data Filename: A103644#2

Dilution Factor: 1
Cal. Ver. Data Filename: A103644#1

Concentration Units (pg/L or ng/Kg dry weight): ng/Kg % Solids: 99.22

	SPIKE CONC.	CONC. FOUND	R(%) (1)	ION ABUND. RATIO (2)	RRT (2)
LABELED COMPOUNDS					
13C-2,3,7,8-TCDD	2000	1019.22	50.96	0.78	1.011
13C-1,2,3,7,8-PeCDD	2000	822.96	41.15	1.62	1.261
13C-1,2,3,4,7,8-HxCDD	2000	966.54	48.33	1.32	0.989
13C-1,2,3,6,7,8-HxCDD	2000	890.55	44.53	1.35	0.992
13C-1,2,3,4,6,7,8-HpCDD	2000	966.93	48.35	1.14	1.076
13C-OCDD	4000	2153.20	53.83	0.87	1.156
13C-2,3,7,8-TCDF	2000	1064.41	53.22	0.79	0.969
13C-1,2,3,7,8-PeCDF	2000	934.33	46.72	1.66	1.205
13C-2,3,4,7,8-PeCDF	2000	988.26	49.41	1.70	1.243
13C-1,2,3,4,7,8-HxCDF	2000	1004.21	50.21	0.53	0.966
13C-1,2,3,6,7,8-HxCDF	2000	946.71	47.34	0.53	0.969
13C-1,2,3,7,8,9-HxCDF	2000	921.56	46.08	0.54	1.006
13C-2,3,4,6,7,8-HxCDF	2000	1055.60	52.78	0.53	0.985
13C-1,2,3,4,6,7,8-HpCDF	2000	1098.01	54.90	0.44	1.050
13C-1,2,3,4,7,8,9-HpCDF	2000	1023.78	51.19	0.42	1.086
CLEANUP STANDARD					
37Cl-2,3,7,8-TCDD	800	461.99	57.75		1.012

(1) Contract-required limits for percent recovery (R) are specified in Section 9.3.3, Method 1613.
(2) Contract-required limits for RRTs and ion abundance ratios are specified in Tables 2 and 9, respectively, Method 1613. NOTE: There is no ion abundance ratio for 37Cl4-2378-TCDD (cleanup standard).

RFP C500273T1

FORM 1A: PCDD/PCDF ANALYSIS DATA SHEET
Use for Sample and Blank Results

EPA SAMPLE NO.

1153-046-12

Lab Name: SOUTHWEST LAB. OF OKLAHOMA

Episode No.: 31487

Contract No.: IEA-NC

Lab Sample ID: 31487.05

Matrix (aqueous/solid/leachate): solid

Sample Wt/Vol: 2.0 g or mL: g

Sample Receipt Date: 10/17/97

Initial Calibration Date: 11/19/97

Treated Soil

Ext. Date: 11/03/97 Shift:

Instrument ID: Autospec

Analysis Date: 5-NOV-97 Time: 18:05:03

GC Column ID: DB-5

RTAN

Extract Volume (uL): 20

Sample Data Filename: A103645#4

Injection Volume (uL): 2

Blank Data Filename: A103644#2

Dilution Factor: 1

Cal. Ver. Data Filename: A103644#1

Concentration Units (pg/L or ng/Kg dry weight): ng/Kg % Solids: 98.82

ANALYTE	CONCENTRATION FOUND	DETECTION LIMIT	EMPC	ION ABUND. RATIO (1)	RRT (1)
2,3,7,8-TCDD	*	1.975	*	*	*
1,2,3,7,8-PeCDD	*	1.863	*	*	*
1,2,3,4,7,8-HxCDD	4.12	1.338	*	1.18	1.001
1,2,3,6,7,8-HxCDD	2.70	1.310	*	1.38	1.000
1,2,3,7,8,9-HxCDD	7.81	1.225	*	1.28	1.008
1,2,3,4,6,7,8-HpCDD	38.89	1.566	*	1.16	1.001
OCDD	86.09	2.395	*	0.85	1.000
2,3,7,8-TCDF	*	1.746	*	*	*
1,2,3,7,8-PeCDF	*	1.513	*	*	*
2,3,4,7,8-PeCDF	*	1.349	*	*	*
1,2,3,4,7,8-HxCDF	*	1.116	*	*	*
1,2,3,6,7,8-HxCDF	*	1.066	*	*	*
1,2,3,7,8,9-HxCDF	*	1.367	*	*	*
2,3,4,6,7,8-HxCDF	*	1.114	*	*	*
1,2,3,4,6,7,8-HpCDF	*	1.504	*	*	*
1,2,3,4,7,8,9-HpCDF	*	1.942	4.440	1.48	0.968
OCDF	*	1.827	4.940	0.71	1.003
Total Tetra-Dioxins	*	1.975			
Total Penta-Dioxins	*	0.000			
Total Hexa-Dioxins	59.03	1.291			
Total Hepta-Dioxins	118.83	1.566			
Total Tetra-Furans	*	1.746			
Total Penta-Furans	3.17	1.429			
Total Hexa-Furans	12.43	1.155			
Total Hepta-Furans	6.21	1.703			

(1) Contract-required limits for RRTs and ion abundance ratios are specified in Tables 2 and 9, respectively, Method 1613

RFP C500273T1

USEPA, EAD

FORM 2: PCDD/PCDF LABELED COMPOUND AND CLEANUP STANDARD RECOVERIES

EPA SAMPLE NO.
1153-046-12

Lab Name: SOTHWEST LAB. OF OKLAHOMA
Episode No.: 31487

Contract No.: IEA-NC
Lab Sample ID: 31487.05

Matrix (aqueous/solid/leachate): solid
Sample Wt/Vol: 2.0 g or mL: g

Sample Receipt Date: 10/17/97
Initial Calibration Date: 11/19/97

Ext. Date: 11/03/97 Shift:
Instrument ID: Autospec

Analysis Date: 5-NOV-97 Time: 18:05:03
GC Column ID: DB-5

Extract Volume (uL): 20
Sample Data Filename: A103645#4

Injection Volume (uL): 2
Blank Data Filename: A103644#2

Dilution Factor: 1
Cal. Ver. Data Filename: A103644#1

Concentration Units (pg/L or ng/Kg dry weight): ng/Kg % Solids: 98.82

	SPIKE CONC.	CONC. FOUND	R(%) (1)	ION ABUND. RATIO (2)	RRT (2)
LABELED COMPOUNDS					
13C-2,3,7,8-TCDD	2000	1199.90	59.99	0.79	1.011
13C-1,2,3,7,8-PeCDD	2000	970.87	48.54	1.68	1.261
13C-1,2,3,4,7,8-HxCDD	2000	995.23	49.76	1.40	0.989
13C-1,2,3,6,7,8-HxCDD	2000	936.13	46.81	1.21	0.992
13C-1,2,3,4,6,7,8-HpCDD	2000	1049.87	52.49	1.02	1.075
13C-OCDD	4000	2538.33	63.46	0.90	1.156
13C-2,3,7,8-TCDF	2000	1244.77	62.24	0.78	0.969
13C-1,2,3,7,8-PeCDF	2000	1044.51	52.23	1.66	1.205
13C-2,3,4,7,8-PeCDF	2000	1145.01	57.25	1.69	1.243
13C-1,2,3,4,7,8-HxCDF	2000	1049.55	52.48	0.53	0.966
13C-1,2,3,6,7,8-HxCDF	2000	1019.51	50.98	0.53	0.969
13C-1,2,3,7,8,9-HxCDF	2000	1030.04	51.50	0.53	1.006
13C-2,3,4,6,7,8-HxCDF	2000	1111.62	55.58	0.52	0.985
13C-1,2,3,4,6,7,8-HpCDF	2000	1212.66	60.63	0.43	1.050
13C-1,2,3,4,7,8,9-HpCDF	2000	1198.74	59.94	0.44	1.086
CLEANUP STANDARD					
37Cl-2,3,7,8-TCDD	800	508.99	63.62		1.012

(1) Contract-required limits for percent recovery (R) are specified in Section 9.3.3, Method 1613.
(2) Contract-required limits for RRTs and ion abundance ratios are specified in Tables 2 and 9, respectively, Method 1613. NOTE: There is no ion abundance ratio for 37Cl4-2378-TCDD (cleanup standard).

RFP C500273T1

FORM 1A: PCDD/PCDF ANALYSIS DATA SHEET
Use for Sample and Blank Results

EPA SAMPLE NO.

1153-046-20

Lab Name: SOUTHWEST LAB. OF OKLAHOMA

Episode No.: 31487

Contract No.: IEA-NC

Lab Sample ID: 31487.06

Matrix (aqueous/solid/leachate): solid

Sample Wt/Vol: 2.0 g or mL: g

Sample Receipt Date: 10/17/97

Initial Calibration Date: 11/19/97

Ext. Date: 11/03/97 Shift:

Instrument ID: Autospec

Treated Soil

Analysis Date: 5-NOV-97 Time: 18:53:59

GC Column ID: DB-5

Extract Volume (uL): 20

Sample Data Filename: A103645#5

RTA 2

Injection Volume (uL): 2

Blank Data Filename: A103644#2

Dilution Factor: 1

Cal. Ver. Data Filename: A103644#1

Concentration Units (pg/L or ng/Kg dry weight): ng/Kg % Solids: 98.19

ANALYTE	CONCENTRATION FOUND	DETECTION LIMIT	EMPC	ION ABUND. RATIO (1)	RRT (1)
2,3,7,8-TCDD	4.78	3.618	*	0.84	1.001
1,2,3,7,8-PeCDD	*	3.319	14.110	3.55	1.001
1,2,3,4,7,8-HxCDD	15.67	2.861	*	1.34	1.000
1,2,3,6,7,8-HxCDD	24.25	2.943	*	1.30	1.000
1,2,3,7,8,9-HxCDD	70.22	2.687	*	1.07	1.009
1,2,3,4,6,7,8-HpCDD	117.05	2.807	*	1.05	1.000
OCDD	86.21	2.853	*	0.97	1.000
2,3,7,8-TCDF	73 ecv	1.311	~~73.110~~	0.76	1.002
1,2,3,7,8-PeCDF	21.70	1.533	*	1.47	1.001
2,3,4,7,8-PeCDF	19.85	1.459	*	1.55	1.001
1,2,3,4,7,8-HxCDF	*	2.426	5.070	0.71	1.000
1,2,3,6,7,8-HxCDF	*	2.409	3.090	0.77	1.000
1,2,3,7,8,9-HxCDF	*	2.945	2.760	0.97	1.000
2,3,4,6,7,8-HxCDF	*	2.320	2.510	0.52	1.000
1,2,3,4,6,7,8-HpCDF	*	9.453	8.840	43.£	0.999
1,2,3,4,7,8,9-HpCDF	*	11.846	*	*	*
OCDF	*	17.540	*	*	*

Total Tetra-Dioxins	88.82	3.618
Total Penta-Dioxins	122.69	3.319
Total Hexa-Dioxins	373.52	2.831
Total Hepta-Dioxins	288.28	2.807
Total Tetra-Furans	529.06	1.311
Total Penta-Furans	150.89	1.496
Total Hexa-Furans	24.00	2.507
Total Hepta-Furans	*	10.545

(1) Contract-required limits for RRTs and ion abundance ratios are specified in Tables 2 and 9, respectively, Method 1613

USEPA, EAD

FORM 2: PCDD/PCDF LABELED COMPOUND AND CLEANUP STANDARD RECOVERIES

EPA SAMPLE NO.
1153-046-20

Lab Name: SOTHWEST LAB. OF OKLAHOMA | Episode No.: 31487

Contract No.: IEA-NC | Lab Sample ID: 31487.06

Matrix (aqueous/solid/leachate): solid | Sample Wt/Vol: 2.0 g or mL: g

Sample Receipt Date: 10/17/97 | Initial Calibration Date: 11/19/97

Ext. Date: 11/03/97 Shift: | Instrument ID: Autospec

Analysis Date: 5-NOV-97 Time: 18:53:59 | GC Column ID: DB-5

Extract Volume (uL): 20 | Sample Data Filename: A103645#5

Injection Volume (uL): 2 | Blank Data Filename: A103644#2

Dilution Factor: 1 | Cal. Ver. Data Filename: A103644#1

Concentration Units (pg/L or ng/Kg dry weight): ng/Kg % Solids: 98.19

	SPIKE CONC.	CONC. FOUND	R(%) (1)	ION ABUND. RATIO (2)	RRT (2)
LABELED COMPOUNDS					
13C-2,3,7,8-TCDD	2000	1339.03	66.95	0.79	1.011
13C-1,2,3,7,8-PeCDD	2000	1015.25	50.76	1.65	1.261
13C-1,2,3,4,7,8-HxCDD	2000	1050.34	52.52	1.29	0.989
13C-1,2,3,6,7,8-HxCDD	2000	1023.88	51.19	1.28	0.992
13C-1,2,3,4,6,7,8-HpCDD	2000	1137.40	56.87	1.01	1.075
13C-OCDD	4000	2764.23	69.11	0.90	1.155
13C-2,3,7,8-TCDF	2000	1423.97	71.20	0.79	0.969
13C-1,2,3,7,8-PeCDF	2000	1125.83	56.29	1.65	1.205
13C-2,3,4,7,8-PeCDF	2000	1178.22	58.91	1.66	1.243
13C-1,2,3,4,7,8-HxCDF	2000	1126.67	56.33	0.53	0.965
13C-1,2,3,6,7,8-HxCDF	2000	1068.21	53.41	0.54	0.969
13C-1,2,3,7,8,9-HxCDF	2000	1118.05	55.90	0.54	1.006
13C-2,3,4,6,7,8-HxCDF	2000	1209.79	60.49	0.54	0.985
13C-1,2,3,4,6,7,8-HpCDF	2000	1265.12	63.26	0.44	1.050
13C-1,2,3,4,7,8,9-HpCDF	2000	1266.14	63.31	0.43	1.085
CLEANUP STANDARD					
37Cl-2,3,7,8-TCDD	800	598.67	74.83		1.012

(1) Contract-required limits for percent recovery (R) are specified in Section 9.3.3, Method 1613.
(2) Contract-required limits for RRTs and ion abundance ratios are specified in Tables 2 and 9, respectively, Method 1613. NOTE: There is no ion abundance ratio for 37Cl4-2378-TCDD (cleanup standard).

RFP C500273T1

Industrial & Environmental Analysts, Inc. (IEA)
Level 2 Metals Results Report

Treated Soil
900°F, Air
(RTA 1)
Worst Case Soil

IEA Project #: 2436_004
IEA Sample #: 971022824
Client Name: Focus Environmental, Inc.
Client Proj. I.D.: 772686.01000000 FOCUS-ACS
Sample I.D.: #1153-046-5

Matrix: SOIL
Date Received: 10/13/97
Date Sampled: 10/09/97

Parameter	Method	Quant Limit	Result (mg/kg)	Date Prepared	Date Analyzed	Analyst	IEA Run	Prep Batch
ALUMINUM	SW846 6010	20.1	4880	10/20/97	10/21/97	FXW	R13130	10209705P
ANTIMONY	SW846 6010	6.03	18.9	10/20/97	10/21/97	FXW	R13130	10209705P
ARSENIC	SW846 6010	1.00	3.79	10/20/97	10/21/97	FXW	R13130	10209705P
BARIUM	SW846 6010	20.1	540	10/20/97	10/21/97	FXW	R13130	10209705P
BERYLLIUM	SW846 6010	0.502	BQL	10/20/97	10/21/97	FXW	R13130	10209705P
CADMIUM	SW846 6010	0.502	19.1	10/20/97	10/21/97	FXW	R13130	10209705P
CALCIUM	SW846 6010	502	16600	10/20/97	10/21/97	FXW	R13130	10209705P
CHROMIUM	SW846 6010	1.00	112	10/20/97	10/21/97	FXW	R13130	10209705P
COBALT	SW846 6010	5.02	14.8	10/20/97	10/21/97	FXW	R13130	10209705P
COPPER	SW846 6010	2.51	1450	10/20/97	10/21/97	FXW	R13130	10209705P
IRON	SW846 6010	10.0	10400	10/20/97	10/21/97	FXW	R13130	10209705P
LEAD	SW846 6010	0.302	1240	10/20/97	10/21/97	FXW	R13130	10209705P
MAGNESIUM	SW846 6010	502	5760	10/20/97	10/21/97	FXW	R13130	10209705P
MANGANESE	SW846 6010	1.51	199	10/20/97	10/21/97	FXW	R13130	10209705P
MERCURY	SW846 7471	0.100	BQL	10/29/97	10/30/97	PW	R13222	10299703H
NICKEL	SW846 6010	4.02	17.6	10/20/97	10/21/97	FXW	R13130	10209705P
POTASSIUM	SW846 6010	502	786	10/20/97	10/21/97	FXW	R13130	10209705P
SELENIUM	SW846 6010	0.502	2.10	10/20/97	10/21/97	FXW	R13130	10209705P
SILVER	SW846 6010	1.00	8.66	10/20/97	10/21/97	FXW	R13130	10209705P
SODIUM	SW846 6010	502	BQL	10/20/97	10/22/97	RH	R13124	10209705P
THALLIUM	SW846 6010	1.00	BQL	10/20/97	10/21/97	FXW	R13130	10209705P
VANADIUM	SW846 6010	5.02	9.29	10/20/97	10/21/97	FXW	R13130	10209705P
ZINC	SW846 6010	2.01	1020	10/20/97	10/21/97	FXW	R13130	10209705P

ments:

Industrial & Environmental Analysts, Inc. (IEA)
Level 2 Metals Results Report

Treated Soil
900°F, N_2
(RTAN)
Worst Case
Soil

IEA Project #: 2436_004
IEA Sample #: 971022825
Client Name: Focus Environmental, Inc.
Client Proj. I.D.: 772686.01000000 FOCUS-ACS
Sample I.D.: #1153-046-13

Matrix: SOIL
Date Received: 10/13/97
Date Sampled: 10/09/97

Parameter	Method	Quant Limit	Result (mg/kg)	Date Prepared	Date Analyzed	Analyst	IEA Run	Prep Batch
ALUMINUM	SW846 6010	20.2	4530	10/20/97	10/21/97	FXW	R13130	10209705P
ANTIMONY	SW846 6010	6.05	13.0	10/20/97	10/21/97	FXW	R13130	10209705P
ARSENIC	SW846 6010	1.01	3.55	10/20/97	10/21/97	FXW	R13130	10209705P
BARIUM	SW846 6010	20.2	336	10/20/97	10/21/97	FXW	R13130	10209705P
BERYLLIUM	SW846 6010	0.504	BQL	10/20/97	10/21/97	FXW	R13130	10209705P
CADMIUM	SW846 6010	0.504	17.3	10/20/97	10/21/97	FXW	R13130	10209705P
CALCIUM	SW846 6010	504	8000	10/20/97	10/21/97	FXW	R13130	10209705P
CHROMIUM	SW846 6010	1.01	80.9	10/20/97	10/21/97	FXW	R13130	10209705P
C[illegible]T	SW846 6010	5.04	9.61	10/20/97	10/21/97	FXW	R13130	10209705P
COPPER	SW846 6010	2.52	1060	10/20/97	10/21/97	FXW	R13130	10209705P
IRON	SW846 6010	10.1	10200	10/20/97	10/21/97	FXW	R13130	10209705P
LEAD	SW846 6010	0.302	789	10/20/97	10/21/97	FXW	R13130	10209705P
MAGNESIUM	SW846 6010	504	3190	10/20/97	10/21/97	FXW	R13130	10209705P
MANGANESE	SW846 6010	1.51	127	10/20/97	10/21/97	FXW	R13130	10209705P
MERCURY	SW846 7471	0.101	BQL	10/29/97	10/30/97	PW	R13222	10299703H
NICKEL	SW846 6010	4.03	16.4	10/20/97	10/21/97	FXW	R13130	10209705P
[illegible]TASSIUM	SW846 6010	504	656	10/20/97	10/21/97	FXW	R13130	10209705P
[illegible]NIUM	SW846 6010	0.504	1.64	10/20/97	10/21/97	FXW	R13130	10209705P
[illegible]VER	SW846 6010	1.01	1.90	10/20/97	10/21/97	FXW	R13130	10209705P
SODIUM	SW846 6010	504	BQL	10/20/97	10/22/97	RH	R13124	10209705P
THALLIUM	SW846 6010	1.01	BQL	10/20/97	10/21/97	FXW	R13130	10209705P
VANADIUM	SW846 6010	5.04	9.54	10/20/97	10/21/97	FXW	R13130	10209705P
ZINC	SW846 6010	2.02	487	10/20/97	10/21/97	FXW	R13130	10209705P

[illegible]ments:

Treated Soil
700°F, Air
(RTA2)
Typical Case
Soil

Industrial & Environmental Analysts, Inc. (IEA)
Level 2 Metals Results Report

IEA Project #: 2436_004
IEA Sample #: 971022826
Client Name: Focus Environmental, Inc.
Client Proj. I.D.: 772686.01000000 FOCUS-ACS
Sample I.D.: #1153-046-21

Matrix: SOIL
Date Received: 10/13/97
Date Sampled: 10/09/97

Parameter	Method	Quant Limit	Result (mg/kg)	Date Prepared	Date Analyzed	Analyst	IEA Run	Prep Batch
ALUMINUM	SW846 6010	20.3	5270	10/20/97	10/21/97	FXW	R13130	10209705P
ANTIMONY	SW846 6010	6.10	36.9	10/20/97	10/21/97	FXW	R13130	10209705P
ARSENIC	SW846 6010	1.02	3.38	10/20/97	10/21/97	FXW	R13130	10209705P
BARIUM	SW846 6010	20.3	4110	10/20/97	10/21/97	FXW	R13130	10209705P
BERYLLIUM	SW846 6010	0.508	BQL	10/20/97	10/21/97	FXW	R13130	10209705P
CADMIUM	SW846 6010	0.508	29.8	10/20/97	10/21/97	FXW	R13130	10209705P
CALCIUM	SW846 6010	508	10900	10/20/97	10/21/97	FXW	R13130	10209705P
CHROMIUM	SW846 6010	1.02	456	10/20/97	10/21/97	FXW	R13130	10209705P
COBALT	SW846 6010	5.08	12.4	10/20/97	10/21/97	FXW	R13130	10209705P
COPPER	SW846 6010	2.54	504	10/20/97	10/21/97	FXW	R13130	10209705P
IRON	SW846 6010	10.2	11300	10/20/97	10/21/97	FXW	R13130	10209705P
LEAD	SW846 6010	0.305	2460	10/20/97	10/21/97	FXW	R13130	10209705P
MAGNESIUM	SW846 6010	508	4570	10/20/97	10/21/97	FXW	R13130	10209705P
MANGANESE	SW846 6010	1.52	180	10/20/97	10/21/97	FXW	R13130	10209705P
MERCURY	SW846 7471	0.102	BQL	10/29/97	10/30/97	PW	R13222	10299703H
NICKEL	SW846 6010	4.06	33.4	10/20/97	10/21/97	FXW	R13130	10209705P
POTASSIUM	SW846 6010	508	676	10/20/97	10/21/97	FXW	R13130	10209705P
SELENIUM	SW846 6010	0.508	2.22	10/20/97	10/21/97	FXW	R13130	10209705P
SILVER	SW846 6010	1.02	9.96	10/20/97	10/21/97	FXW	R13130	10209705P
SODIUM	SW846 6010	508	BQL	10/20/97	10/22/97	RH	R13124	10209705P
THALLIUM	SW846 6010	1.02	BQL	10/20/97	10/21/97	FXW	R13130	10209705P
VANADIUM	SW846 6010	5.08	10.5	10/20/97	10/21/97	FXW	R13130	10209705P
ZINC	SW846 6010	2.03	1300	10/20/97	10/21/97	FXW	R13130	10209705P

Comments:

Industrial & Environmental Analysts, Inc. (IEA)
Level 2 Metals Results Report
PREPARATION BLANKS

BLANK

IEA Project #: 2436_004
Matrix: SOIL
Client Name: Focus Environmental, Inc.
Client Proj. I.D.: 772686.01000000 FOCUS-ACS
Sample Number: PBS 10209705P

Parameter	Method	Quant Limit	Result (mg/kg)	Date Prepared	Date Analyzed	Analyst	IEA Run	Prep Batch
ALUMINUM	SW846 6010	20.0	BQL	10/20/97	10/21/97	FXW	R13130	10209705P
ANTIMONY	SW846 6010	6.00	BQL	10/20/97	10/21/97	FXW	R13130	10209705P
ARSENIC	SW846 6010	1.00	BQL	10/20/97	10/21/97	FXW	R13130	10209705P
BARIUM	SW846 6010	20.0	BQL	10/20/97	10/21/97	FXW	R13130	10209705P
BERYLLIUM	SW846 6010	0.500	BQL	10/20/97	10/21/97	FXW	R13130	10209705P
CADMIUM	SW846 6010	0.500	BQL	10/20/97	10/21/97	FXW	R13130	10209705P
CALCIUM	SW846 6010	500	BQL	10/20/97	10/21/97	FXW	R13130	10209705P
CHROMIUM	SW846 6010	1.00	BQL	10/20/97	10/21/97	FXW	R13130	10209705P
COBALT	SW846 6010	5.00	BQL	10/20/97	10/21/97	FXW	R13130	10209705P
COPPER	SW846 6010	2.50	BQL	10/20/97	10/21/97	FXW	R13130	10209705P
IRON	SW846 6010	10.0	BQL	10/20/97	10/21/97	FXW	R13130	10209705P
LEAD	SW846 6010	0.300	BQL	10/20/97	10/21/97	FXW	R13130	10209705P
MAGNESIUM	SW846 6010	500	BQL	10/20/97	10/21/97	FXW	R13130	10209705P
MANGANESE	SW846 6010	1.50	BQL	10/20/97	10/21/97	FXW	R13130	10209705P
NICKEL	SW846 6010	4.00	BQL	10/20/97	10/21/97	FXW	R13130	10209705P
POTASSIUM	SW846 6010	500	BQL	10/20/97	10/21/97	FXW	R13130	10209705P
SELENIUM	SW846 6010	0.500	BQL	10/20/97	10/21/97	FXW	R13130	10209705P
SILVER	SW846 6010	1.00	BQL	10/20/97	10/21/97	FXW	R13130	10209705P
SODIUM	SW846 6010	500	BQL	10/20/97	10/22/97	RH	R13124	10209705P
THALLIUM	SW846 6010	1.00	BQL	10/20/97	10/21/97	FXW	R13130	10209705P
VANADIUM	SW846 6010	5.00	BQL	10/20/97	10/21/97	FXW	R13130	10209705P
ZINC	SW846 6010	2.00	3.62	10/20/97	10/21/97	FXW	R13130	10209705P

Corresponding Samples:
971022824, 971022825, 971022826, 971026810, 971026811, 971026812, 971026813, 971026814, 971026815, 971026816, 971029601, 971029602, 971029603, 971029604, 971029605, 971029606

Comments:

Industrial & Environmental Analysts, Inc. (IEA)
Level 2 Metals Results Report
PREPARATION BLANKS

IEA Project #: 2436_004
Matrix: SOIL
Client Name: Focus Environmental, Inc.
Client Proj. I.D.: 772686.01000000 FOCUS-ACS
Sample Number: PBS 10299703H

Parameter	Method	Quant Limit	Result (mg/kg)	Date Prepared	Date Analyzed	Analyst	IEA Run	Prep Batch
MERCURY	SW846 7471	0.100	BQL	10/29/97	10/30/97	PW	R13222	10299703H

Corresponding Samples:
971022824, 971022825, 971022826, 971034840, 971034841, 971034842, 971034843, 971034844, 971042402, 971042403, 971042404, 971042405, 971042406

Comments:

Industrial & Environmental Analysts, Inc. (IEA)
Level 2 Metals Results Report
LABORATORY CONTROL SAMPLE

IEA Project #: 2436_004
IEA Sample #: LCSS 10209705P
Matrix: SOIL

Parameter	Method	Results (mg/kg) True	Found	Limits Lower	Upper	% RCY	Date Analyzed	IEA Run	Prep Batch
ALUMINUM	SW846 6010	4500	4780	2820	6190	106.	10/21/97	R13130	10209705P
ANTIMONY	SW846 6010	38.2	26.3	7.41	81.3	68.8	10/21/97	R13130	10209705P
ARSENIC	SW846 6010	103	112	74.3	133	109.	10/21/97	R13130	10209705P
BARIUM	SW846 6010	170	188	126	214	110.	10/21/97	R13130	10209705P
BERYLLIUM	SW846 6010	120	126	91.2	148	105.	10/21/97	R13130	10209705P
CADMIUM	SW846 6010	88.8	97.4	66.9	111	110.	10/21/97	R13130	10209705P
CALCIUM	SW846 6010	1990	1980	1440	2530	99.5	10/21/97	R13130	10209705P
CHROMIUM	SW846 6010	133	138	104	163	104.	10/21/97	R13130	10209705P
C[illegible]LT	SW846 6010	72.9	76.0	56.3	89.5	104.	10/21/97	R13130	10209705P
C[illegible]ER	SW846 6010	85	92.0	68	102	108.	10/21/97	R13130	10209705P
IRON	SW846 6010	7580	6700	4270	10900	88.4	10/21/97	R13130	10209705P
LEAD	SW846 6010	86.4	87.9	58	115	102.	10/21/97	R13130	10209705P
MAGNESIUM	SW846 6010	1180	1130	810	1560	95.4	10/21/97	R13130	10209705P
MANGANESE	SW846 6010	187	191	147	228	102.	10/21/97	R13130	10209705P
NICKEL	SW846 6010	95.5	101	72.1	119	106.	10/21/97	R13130	10209705P
POTASSIUM	SW846 6010	2160	2160	1580	2740	100.	10/21/97	R13130	10209705P
SELENIUM	SW846 6010	129	144	93.9	165	112.	10/21/97	R13130	10209705P
[illegible]VER	SW846 6010	117	135	84.5	150	116.	10/21/97	R13130	10209705P
[illegible]UM	SW846 6010	392	BQL	258	526		10/22/97	R13124	10209705P
[illegible]LLIUM	SW846 6010	105	114	55.4	155	108.	10/21/97	R13130	10209705P
VANADIUM	SW846 6010	73.5	76.6	47	100	104.	10/21/97	R13130	10209705P
ZINC	SW846 6010	71.8	73.1	53.4	90.2	102.	10/21/97	R13130	10209705P

Comments:

Industrial & Environmental Analysts, Inc. (IEA)
Level 2 Metals Results Report
LABORATORY CONTROL SAMPLE

IEA Project #: 2436_004
IEA Sample #: LCSS_10299703H
Matrix: SOIL

Parameter	Method	Results (mg/kg) True	Found	Limits Lower	Upper	% RCY	Date Analyzed	IEA Run	Prep Batch
MERCURY	SW846 7471	9.99	10.1	5.25	15.6	101.	10/30/97	R13222	10299703H

Comments:

Industrial & Environmental Analysts, Inc. (IEA)
Level 2 Metals Results Report
DUPLICATE ANALYSIS

IEA Project #: 2436_004
IEA Sample #: 971022826
Matrix: SOIL

Parameter	Method	Duplicate Analysis Sample (mg/kg)	Duplicate (mg/kg)	RPD %	Date Analyzed	Samp Run	Dup Run	Prep Batch
MERCURY	SW846 7471	BQL	BQL		10/30/97	R13222	R13222	10299703H

$$RPD = \frac{S-D}{(S+D)/2} \times 100$$

Control Limits: +/- 20%

Corresponding Samples:
971022824, 971022825, 971022826, 971034840, 971034841, 971034842, 971034843, 971034844, 971042402, 971042403, 971042404, 971042405, 971042406

Comments:

Industrial & Environmental Analysts, Inc. (IEA)
Level 2 Metals Results Report
DUPLICATE ANALYSIS

IEA Project #: 2436_004
IEA Sample #: 971026810
Matrix: SOIL

Duplicate Analysis

Parameter	Method	Sample (mg/kg)	Duplicate (mg/kg)	RPD %	Date Analyzed	Samp Run	Dup Run	Prep Batch
ALUMINUM	SW846 6010	25100	34500	31.6	10/21/97	R13130	R13130	10209705P
ANTIMONY	SW846 6010	BQL	BQL		10/21/97	R13130	R13130	10209705P
ARSENIC	SW846 6010	BQL	BQL		10/21/97	R13130	R13130	10209705P
BARIUM	SW846 6010	76.8	78.7	2.48	10/21/97	R13130	R13130	10209705P
BERYLLIUM	SW846 6010	0.595	0.711	17.7	10/21/97	R13130	R13130	10209705P
CADMIUM	SW846 6010	BQL	0.709		10/21/97	R13130	R13130	10209705P
CALCIUM	SW846 6010	BQL	BQL		10/21/97	R13130	R13130	10209705P
CHROMIUM	SW846 6010	40.5	42.2	4.12	10/21/97	R13130	R13130	10209705P
COBALT	SW846 6010	9.30	9.04	2.90	10/21/97	R13130	R13130	10209705P
COPPER	SW846 6010	15.1	17.5	14.6	10/21/97	R13130	R13130	10209705P
I[illegible]	SW846 6010	30200	36900	19.9	10/21/97	R13130	R13130	10209705P
L[illegible]D	SW846 6010	21.2	23.4	10.2	10/21/97	R13130	R13130	10209705P
MAGNESIUM	SW846 6010	5010	5010	0.03	10/21/97	R13130	R13130	10209705P
MANGANESE	SW846 6010	403	381	5.58	10/21/97	R13130	R13130	10209705P
NICKEL	SW846 6010	18.8	19.3	2.59	10/21/97	R13130	R13130	10209705P
POTASSIUM	SW846 6010	5920	6190	4.42	10/21/97	R13130	R13130	10209705P
SELENIUM	SW846 6010	BQL	BQL		10/21/97	R13130	R13130	10209705P
SILVER	SW846 6010	BQL	BQL		10/21/97	R13130	R13130	10209705P
[illegible]ODIUM	SW846 6010	BQL	BQL		10/22/97	R13124	R13124	10209705P
[illegible]LLIUM	SW846 6010	BQL	BQL		10/21/97	R13130	R13130	10209705P
[illegible]ADIUM	SW846 6010	58.0	66.2	13.2	10/21/97	R13130	R13130	10209705P
ZINC	SW846 6010	44.0	46.8	5.99	10/21/97	R13130	R13130	10209705P

$$RPD = \frac{S-D}{(S+D)/2} \times 100$$

Control Limits: +/- 20%

Corresponding Samples:
971022824, 971022825, 971022826, 971026810, 971026811, 971026812, 971026813, 971026814, 971026815, 971026816, 971027501, 971027502, 971027503, 971027504, 971027505, 971027506, 971027507, 971027508, 971027509, 971027510, 971027511, 971027512, 971027513, 971029601, 971029602, 971029603, 971029604, 971029605, 971029606

[illegible]omments:

Industrial & Environmental Analysts, Inc. (IEA)
Level 2 Metals Results Report
SPIKE RESULTS

IEA Project #: 2436_004
IEA Sample #: 971026810
Matrix: SOIL

Spike Results (mg/kg)

Parameter	Method	SA	SR	SSR	%RCY	Date Analyzed	Samp Run	Spike Run	Prep Batch
ALUMINUM	SW846 6010	175	25100	36500	6510	10/21/97	R13130	R13130	10209705P
ANTIMONY	SW846 6010	43.8	BQL	12.7	29.0	10/21/97	R13130	R13130	10209705P
ARSENIC	SW846 6010	175	BQL	152	86.9	10/21/97	R13130	R13130	10209705P
BARIUM	SW846 6010	175	76.8	249	98.3	10/21/97	R13130	R13130	10209705P
BERYLLIUM	SW846 6010	4.38	0.595	4.67	93.2	10/21/97	R13130	R13130	10209705P
CADMIUM	SW846 6010	4.38	BQL	4.40	100.	10/21/97	R13130	R13130	10209705P
CALCIUM	SW846 6010	1750	BQL	1800	103.	10/21/97	R13130	R13130	10209705P
CHROMIUM	SW846 6010	17.5	40.5	52.7	69.7	10/21/97	R13130	R13130	10209705P
COBALT	SW846 6010	43.8	9.30	47.8	87.9	10/21/97	R13130	R13130	10209705P
COPPER	SW846 6010	21.9	15.1	37.0	100.	10/21/97	R13130	R13130	10209705P
IRON	SW846 6010	87.6	30200	34800	5260	10/21/97	R13130	R13130	10209705P
LEAD	SW846 6010	43.8	21.2	62.0	93.3	10/21/97	R13130	R13130	10209705P
MAGNESIUM	SW846 6010	1750	5010	7180	124.	10/21/97	R13130	R13130	10209705P
MANGANESE	SW846 6010	43.8	403	443	90.8	10/21/97	R13130	R13130	10209705P
NICKEL	SW846 6010	43.8	18.8	59.0	91.6	10/21/97	R13130	R13130	10209705P
POTASSIUM	SW846 6010	1750	5920	8180	129.	10/21/97	R13130	R13130	10209705P
SELENIUM	SW846 6010	175	BQL	147	83.8	10/21/97	R13130	R13130	10209705P
SILVER	SW846 6010	4.38	BQL	3.95	90.2	10/21/97	R13130	R13130	10209705P
SODIUM	SW846 6010	1750	BQL	1750	99.8	10/22/97	R13124	R13124	10209705P
THALLIUM	SW846 6010	175	BQL	159	90.8	10/21/97	R13130	R13130	10209705P
VANADIUM	SW846 6010	43.8	58.0	104	106.	10/21/97	R13130	R13130	10209705P
ZINC	SW846 6010	43.8	44.0	89.4	104.	10/21/97	R13130	R13130	10209705P

%R = ((SSR - SR) / SA) * 100 Control Limits: 75-125%

Corresponding Samples:
971022824, 971022825, 971022826, 971026810, 971026811, 971026812, 971026813, 971026814, 971026815, 971026816, 971027501, 971027502, 971027503, 971027504, 971027505, 971027506, 971027507, 971027508, 971027509, 971027510, 971027511, 971027512, 971027513, 971029601, 971029602, 971029603, 971029604, 971029605, 971029606

Comments:

Industrial & Environmental Analysts, Inc. (IEA)
Level 2 Metals Results Report
SPIKE RESULTS

IEA Project #: 2436_004
IEA Sample #: 971042402
Matrix: SOIL

Spike Results (mg/kg)

Parameter	Method	SA	SR	SSR	%RCY	Date Analyzed	Samp Run	Spike Run	Prep Batch
MERCURY	SW846 7471	0.212	BQL	0.209	98.7	10/30/97	R13222	R13222	10299703H

%R = ((SSR - SR) / SA) * 100 Control Limits: 75-125%

Corresponding Samples:
971022824, 971022825, 971022826, 971024701, 971024702, 971024703, 971024704, 971024705, 971024706, 971024707, 971027308, 971027309, 971027310, 971027311, 971027312, 971027313, 971027314, 971027315, 971027316, 971027317, 971027318, 971027319, 971034840, 971034841, 971034842, 971034843, 971034844, 971042402, 971042403, 971042404, 971042405, 971042406

Comments:

Industrial & Environmental Analysts, Inc. (IEA)
Level 2 Metals Results Report
SPIKE DUPLICATE RESULTS

IEA Project #: 2436_004
IEA Sample #: 971026810S
Matrix: SOIL

Spike Duplicate Results

Parameter	Method	Sample (mg/kg)	Duplicate (mg/kg)	RPD %	Date Analyzed	Samp Run	Dup Run	Prep Batch
ALUMINUM	SW846 6010	36500	35000	4.22	10/21/97	R13130	R13130	10209705P
ANTIMONY	SW846 6010	12.7	10.5	18.9	10/21/97	R13130	R13130	10209705P
ARSENIC	SW846 6010	152	146	4.22	10/21/97	R13130	R13130	10209705P
BARIUM	SW846 6010	249	241	3.35	10/21/97	R13130	R13130	10209705P
BERYLLIUM	SW846 6010	4.67	4.58	2.09	10/21/97	R13130	R13130	10209705P
CADMIUM	SW846 6010	4.40	4.29	2.66	10/21/97	R13130	R13130	10209705P
CALCIUM	SW846 6010	1800	1770	1.31	10/21/97	R13130	R13130	10209705P
CHROMIUM	SW846 6010	52.7	49.1	6.99	10/21/97	R13130	R13130	10209705P
COBALT	SW846 6010	47.8	47.8	0.02	10/21/97	R13130	R13130	10209705P
COPPER	SW846 6010	37.0	35.9	3.15	10/21/97	R13130	R13130	10209705P
IRON	SW846 6010	34800	30600	13.1	10/21/97	R13130	R13130	10209705P
LEAD	SW846 6010	62.0	60.3	2.78	10/21/97	R13130	R13130	10209705P
MAGNESIUM	SW846 6010	7180	6510	9.84	10/21/97	R13130	R13130	10209705P
MANGANESE	SW846 6010	443	501	12.4	10/21/97	R13130	R13130	10209705P
NICKEL	SW846 6010	59.0	56.7	3.90	10/21/97	R13130	R13130	10209705P
POTASSIUM	SW846 6010	8180	7580	7.66	10/21/97	R13130	R13130	10209705P
SELENIUM	SW846 6010	147	142	2.84	10/21/97	R13130	R13130	10209705P
SILVER	SW846 6010	3.95	3.92	0.71	10/21/97	R13130	R13130	10209705P
SODIUM	SW846 6010	1750	1710	2.05	10/22/97	R13124	R13124	10209705P
THALLIUM	SW846 6010	159	158	0.84	10/21/97	R13130	R13130	10209705P
VANADIUM	SW846 6010	104	96.1	8.21	10/21/97	R13130	R13130	10209705P
ZINC	SW846 6010	89.4	84.0	6.25	10/21/97	R13130	R13130	10209705P

$$RPD = \frac{S-D}{(S+D)/2} \times 100$$

Control Limits: +/- 20%

Corresponding Samples:
971022824, 971022825, 971022826, 971026810, 971026811, 971026812, 971026813, 971026814, 971026815, 971026816, 971027501, 971027502, 971027503, 971027504, 971027505, 971027506, 971027507, 971027508, 971027509, 971027510, 971027511, 971027512, 971027513, 971029601, 971029602, 971029603, 971029604, 971029605, 971029606

Comments:

Industrial & Environmental Analysts, Inc. (IEA)
Level 2 Metals Results Report
SPIKE DUPLICATE RESULTS

IEA Project #: 2436_004
IEA Sample #: 971042402S
Matrix: SOIL

Spike Duplicate Results

Parameter	Method	Sample (mg/kg)	Duplicate (mg/kg)	RPD %	Date Analyzed	Samp Run	Dup Run	Prep Batch
MERCURY	SW846 7471	0.209	0.213	1.95	10/30/97	R13222	R13222	10299703H

$$RPD = \frac{S-D}{(S+D)/2} \times 100$$

Control Limits: +/- 20%

Corresponding Samples:
971022824, 971022825, 971022826, 971024701, 971024702, 971024703, 971024704, 971024705, 971024706, 971024707, 971027308, 971027309, 971027310, 971027311, 971027312, 971027313, 971027314, 971027315, 971027316, 971027317, 971027318, 971027319, 971034840, 971034841, 971034842, 971034843, 971034844, 971042402, 971042403, 971042404, 971042405, 971042406

mments:

Treated Soil
900°F, Air
(RTAI)
Worst Case
Soil

Industrial & Environmental Analysts, Inc. (IEA)
Level 2 Metals Results Report
TCLP METALS REGULATED

IEA Project #: 2436_004
IEA Sample #: 971022827
Client Name: Focus Environmental, Inc.
Client Proj. I.D.: 772686.01000000 FOCUS-ACS
Sample I.D.: #1153-046-6

Matrix: LEACHATE
Date Received: 10/13/97
Date Sampled: 10/09/97
TCLP Extraction: 10/16/97

Parameter	Method	Federal Regulatory Level	Quant Limit	Result (ug/l)	Date Prepared	Date Analyzed	Analyst	IEA Run	Prep Batch
ARSENIC	SW846 6010	5000	500.	BQL	10/27/97	10/28/97	RH	R13193	10279704P
BARIUM	SW846 6010	100000	10000	BQL	10/27/97	10/28/97	RH	R13193	10279704P
CADMIUM	SW846 6010	1000	100.	203.	10/27/97	10/28/97	RH	R13193	10279704P
CHROMIUM	SW846 6010	5000	500.	BQL	10/27/97	10/28/97	RH	R13193	10279704P
LEAD	SW846 6010	5000	500.	9640	10/27/97	10/28/97	RH	R13193	10279704P
MERCURY	SW846 7470	200	20.0	BQL	10/27/97	10/28/97	KDH	R13178	10279702H
SELENIUM	SW846 6010	1000	100.	BQL	10/27/97	10/28/97	RH	R13193	102797[illegible]
SILVER	SW846 6010	5000	500.	BQL	10/27/97	10/28/97	RH	R13193	102797[illegible]P

Comments:

Industrial & Environmental Analysts, Inc. (IEA)
Level 2 Metals Results Report
TCLP METALS REGULATED

Treated Soil
900°F, N_2
(RTAN)
Worst Case
Soil

IEA Project #: 2436_004
IEA Sample #: 971022828
Client Name: Focus Environmental, Inc.
Client Proj. I.D.: 772686.01000000 FOCUS-ACS
Sample I.D.: #1153-046-14

Matrix: LEACHATE
Date Received: 10/13/97
Date Sampled: 10/09/97
TCLP Extraction: 10/16/97

Parameter	Method	Federal Regulatory Level	Quant Limit	Result (ug/l)	Date Prepared	Date Analyzed	Analyst	IEA Run	Prep Batch
ARSENIC	SW846 6010	5000	500.	BQL	10/27/97	10/28/97	RH	R13193	10279704P
BARIUM	SW846 6010	100000	10000	BQL	10/27/97	10/28/97	RH	R13193	10279704P
CADMIUM	SW846 6010	1000	100.	149.	10/27/97	10/28/97	RH	R13193	10279704P
CHROMIUM	SW846 6010	5000	500.	BQL	10/27/97	10/28/97	RH	R13193	10279704P
LEAD	SW846 6010	5000	500.	8390	10/27/97	10/28/97	RH	R13193	10279704P
MERCURY	SW846 7470	200	20.0	BQL	10/27/97	10/28/97	KDH	R13178	10279702H
SELENIUM	SW846 6010	1000	100.	BQL	10/27/97	10/28/97	RH	R13193	10279704P
SILVER	SW846 6010	5000	500.	BQL	10/27/97	10/28/97	RH	R13193	10279704P

Comments:

Treated Soil
700°F, Air
(RTA2)
Typical Case
Soil

Industrial & Environmental Analysts, Inc. (IEA)
Level 2 Metals Results Report
TCLP METALS REGULATED

IEA Project #: 2436_004
IEA Sample #: 971022829
Client Name: Focus Environmental, Inc.
Client Proj. I.D.: 772686.01000000 FOCUS-ACS
Sample I.D.: #1153-046-22

Matrix: LEACHATE
Date Received: 10/13/97
Date Sampled: 10/09/97
TCLP Extraction: 10/16/97

Parameter	Method	Federal Regulatory Level	Quant Limit	Result (ug/l)	Date Prepared	Date Analyzed	Analyst	IEA Run	Prep Batch
ARSENIC	SW846 6010	5000	500.	BQL	10/27/97	10/28/97	RH	R13193	10279704P
BARIUM	SW846 6010	100000	10000	BQL	10/27/97	10/28/97	RH	R13193	10279704P
CADMIUM	SW846 6010	1000	100.	822.	10/27/97	10/28/97	RH	R13193	10279704P
CHROMIUM	SW846 6010	5000	500.	BQL	10/27/97	10/28/97	RH	R13193	10279704P
LEAD	SW846 6010	5000	500.	12000	10/27/97	10/28/97	RH	R13193	10279704P
MERCURY	SW846 7470	200	20.0	BQL	10/27/97	10/28/97	KDH	R13178	10279702H
SELENIUM	SW846 6010	1000	100.	BQL	10/27/97	10/28/97	RH	R13193	10279704P
SILVER	SW846 6010	5000	500.	BQL	10/27/97	10/28/97	RH	R13193	10279704P

Comments:

Industrial & Environmental Analysts, Inc. (IEA)
Level 2 Metals Results Report
PREPARATION BLANKS

BLANK

IEA Project #: 2436_004
Matrix: LEACHATE
Client Name: Focus Environmental, Inc.
Client Proj. I.D.: 772686.01000000 FOCUS-ACS
Sample Number: PBW 10279704P

Parameter	Method	Quant Limit	Result (ug/l)	Date Prepared	Date Analyzed	Analyst	IEA Run	Prep Batch
ARSENIC	SW846 6010	500.	BQL	10/27/97	10/28/97	RH	R13193	10279704P
BARIUM	SW846 6010	10000	BQL	10/27/97	10/28/97	RH	R13193	10279704P
CADMIUM	SW846 6010	100.	BQL	10/27/97	10/28/97	RH	R13193	10279704P
CHROMIUM	SW846 6010	500.	BQL	10/27/97	10/28/97	RH	R13193	10279704P
LEAD	SW846 6010	500.	BQL	10/27/97	10/28/97	RH	R13193	10279704P
SELENIUM	SW846 6010	100.	BQL	10/27/97	10/28/97	RH	R13193	10279704P
SILVER	SW846 6010	500.	BQL	10/27/97	10/28/97	RH	R13193	10279704P

Corresponding Samples:
971022827, 971022828, 971022829, 971033901, 971036601

Comments:

Industrial & Environmental Analysts, Inc. (IEA)
Level 2 Metals Results Report
PREPARATION BLANKS

BLANK

IEA Project #: 2436_004
Matrix: LEACHATE
Client Name: Focus Environmental, Inc.
Client Proj. I.D.: 772686.01000000 FOCUS-ACS
Sample Number: TB961 10279702H

Parameter	Method	Quant Limit	Result (ug/l)	Date Prepared	Date Analyzed	Analyst	IEA Run	Prep Batch
MERCURY	SW846 7470	20.0	BQL	10/27/97	10/28/97	KDH	R13178	10279702H

Corresponding Samples:
971022827, 971022828, 971022829, 971031001, 971033801, 971033901, 971036601

Comments:

BLANK

Industrial & Environmental Analysts, Inc. (IEA)
Level 2 Metals Results Report
PREPARATION BLANKS

IEA Project #: 2436_004
Matrix: LEACHATE
Client Name: Focus Environmental, Inc.
Client Proj. I.D.: 772686.01000000 FOCUS-ACS
Sample Number: TB961 10279704P

Parameter	Method	Quant Limit	Result (ug/l)	Date Prepared	Date Analyzed	Analyst	IEA Run	Prep Batch
ARSENIC	SW846 6010	500.	BQL	10/27/97	10/28/97	RH	R13193	10279704P
BARIUM	SW846 6010	10000	BQL	10/27/97	10/28/97	RH	R13193	10279704P
CADMIUM	SW846 6010	100.	BQL	10/27/97	10/28/97	RH	R13193	10279704P
CHROMIUM	SW846 6010	500.	BQL	10/27/97	10/28/97	RH	R13193	10279704P
LEAD	SW846 6010	500.	BQL	10/27/97	10/28/97	RH	R13193	10279704P
SELENIUM	SW846 6010	100.	BQL	10/27/97	10/28/97	RH	R13193	10279704P
SILVER	SW846 6010	500.	BQL	10/27/97	10/28/97	RH	R13193	10279704P

Corresponding Samples:
971022827, 971022828, 971022829, 971033901, 971036601

Comments:

Industrial & Environmental Analysts, Inc. (IEA)
Level 2 Metals Results Report
LABORATORY CONTROL SAMPLE

IEA Project #: 2436_004
IEA Sample #: LCSW 10279704P
Matrix: LEACHATE

Parameter	Method	Results (ug/l) True	Found	Limits Lower	Upper	% RCY	Date Analyzed	IEA Run	Prep Batch
ARSENIC	SW846 6010	5000	4950	4000	6000	99.0	10/28/97	R13193	10279704P
BARIUM	SW846 6010	5000	5100	4000	6000	102.	10/28/97	R13193	10279704P
CADMIUM	SW846 6010	5000	5010	4000	6000	100.	10/28/97	R13193	10279704P
CHROMIUM	SW846 6010	5000	5090	4000	6000	102.	10/28/97	R13193	10279704P
LEAD	SW846 6010	5000	5080	4000	6000	102.	10/28/97	R13193	10279704P
SELENIUM	SW846 6010	5000	5100	4000	6000	102.	10/28/97	R13193	10279704P
SILVER	SW846 6010	500	475.	400	600	95.1	10/28/97	R13193	10279704P

Comments:

Industrial & Environmental Analysts, Inc. (IEA)
Level 2 Metals Results Report
MATRIX SPIKE RESULTS

IEA Project #: 2436_004
IEA Sample #: 971022827
Matrix: LEACHATE

Matrix Spike Results (ug/l)

Parameter	Method	SA	SR	SSR	%RCY	Date Analyzed	Samp Run	Spike Run
ARSENIC	SW846 6010	5000	BQL	9720	194.	10/28/97	R13193	R13193
BARIUM	SW846 6010	100000	BQL	112000	112.	10/28/97	R13193	R13193
CADMIUM	SW846 6010	1000	203.	2090	189.	10/28/97	R13193	R13193
CHROMIUM	SW846 6010	5000	BQL	9210	184.	10/28/97	R13193	R13193
LEAD	SW846 6010	5000	9640	16100	130.	10/28/97	R13193	R13193
MERCURY	SW846 7470	200	BQL	288.	144.	10/28/97	R13178	R13178
SELENIUM	SW846 6010	1000	BQL	2010	201.	10/28/97	R13193	R13193
SILVER	SW846 6010	1000	BQL	485.	48.5	10/28/97	R13193	R13193

%R = ((SSR - SR) / SA) * 100

Corresponding Samples:
971022827, 971022828, 971022829, 971031001, 971033801, 971033901, 971036601

Comments: Sample appears to have been double spiked. (Attached is a corrected Matrix Spike with spike added volume doubled.)

Industrial & Environmental Analysts, Inc. (IEA)
Level 2 Metals Results Report
MATRIX SPIKE RESULTS #2

IEA Project #: 2436_004
IEA Sample #: 971022827
Matrix: LEACHATE

Matrix Spike Results (ug/l)

Parameter	Method	SA	SR	SSR	%RCY	Date Analyzed	Samp Run	Spike Run
ARSENIC	SW846 6010	10000	BQL	9720	97.2	10/28/97	R13193	R13193
BARIUM	SW846 6010	200000	BQL	112000	56.0	10/28/97	R13193	R13193
CADMIUM	SW846 6010	2000	203.	2090	94.4	10/28/97	R13193	R13193
CHROMIUM	SW846 6010	10000	BQL	9210	92.1	10/28/97	R13193	R13193
LEAD	SW846 6010	10000	9640	16100	64.6	10/28/97	R13193	R13193
MERCURY	SW846 7470	200	BQL	288.	144.	10/28/97	R13178	R13178
SELENIUM	SW846 6010	2000	BQL	2010	201.	10/28/97	R13193	R13193
SILVER	SW846 6010	2000	BQL	485.	24.3	10/28/97	R13193	R13193

%R = ((SSR - SR) / SA) * 100

Corresponding Samples:
971022827, 971022828, 971022829, 971031001, 971033801, 971033901, 971036601

Comments: (Spike added volume doubled.)

Industrial & Environmental Analysts, Inc. (IEA)
Level 2 Metals Results Report
MATRIX SPIKE DUPLICATE RESULTS

IEA Project #: 2436_004
IEA Sample #: 971022827MS
Matrix: LEACHATE

Matrix Spike Duplicate Results

Parameter	Method	Sample (ug/l)	Duplicate (ug/l)	RPD %	Date Analyzed	Samp Run	Dup Run	Prep Batch
ARSENIC	SW846 6010	9720	9700	0.19	10/28/97	R13193	R13193	10279704P
BARIUM	SW846 6010	112000	102000	8.36	10/28/97	R13193	R13193	10279704P
CADMIUM	SW846 6010	2090	2080	0.40	10/28/97	R13193	R13193	10279704P
CHROMIUM	SW846 6010	9210	9160	0.54	10/28/97	R13193	R13193	10279704P
LEAD	SW846 6010	16100	16800	3.94	10/28/97	R13193	R13193	10279704P
MERCURY	SW846 7470	288.	10.5	186.	10/28/97	R13178	R13178	10279702H
SELENIUM	SW846 6010	2010	2060	2.51	10/28/97	R13193	R13193	10279704P
SILVER	SW846 6010	485.	574.	16.9	10/28/97	R13193	R13193	10279704P

$$RPD = \frac{S-D}{(S+D)/2} \times 100$$

Control Limits: +/- 20%

Corresponding Samples:
971022827, 971022828, 971022829, 971031001, 971033801, 971033901, 971036601

ments:

[redacted]

IMPINGER WATER ANALYTICAL DATA

Impinger Water 900°F, Air (RTA 1) Worst Case Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

IEA Project Number: 2436-004 | Date Received: 10/13/97

IEA Sample Number: 971022805 | Date Sampled: 10/09/97

Client Name: Focus Environmental, Inc. | Date Analyzed: 10/20/97

Client Project: 772686.01000000 FOCUS-ACS | Lab File ID: 1020L13.D

Sample Identification: #1153-047-5 | Analyst: MOORE

Matrix: (soil/water) WATER | Dilution Factor: 25000.0

% Moisture: not dec.

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
67-64-1	Acetone	50	3800000	
107-13-1	Acrylonitrile	5	120000	U
107-05-1	Allyl Chloride	5	120000	U
71-43-2	Benzene	5	120000	U
108-86-1	Bromobenzene	5	120000	U
74-97-5	Bromochloromethane	5	120000	U
75-27-4	Bromodichloromethane	5	120000	U
75-25-2	Bromoform	5	120000	U
74-83-9	Bromomethane	10	250000	U
78-93-3	2-Butanone	10	250000	U
104-51-8	N-Butylbenzene	5	120000	U
135-98-8	Sec-Butylbenzene	5	120000	U
98-06-6	Tert-Butylbenzene	5	120000	U
75-15-0	Carbon Disulfide	5	120000	U
56-23-5	Carbon Tetrachloride	5	120000	U
108-90-7	Chlorobenzene	5	120000	U
124-48-1	Chlorodibromomethane	5	120000	U
75-00-3	Chloroethane	10	250000	U
110-75-8	2-Chloroethyl Vinyl Ether	10	250000	U
67-66-3	Chloroform	5	120000	U
74-87-3	Chloromethane	10	250000	U
95-49-8	2-Chlorotoluene	5	120000	U
106-43-4	4-Chlorotoluene	5	120000	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	120000	U
106-93-4	1,2-Dibromoethane	5	120000	U
74-95-3	Dibromomethane	5	120000	U
95-50-1	1,2-Dichlorobenzene	5	120000	U
541-73-1	1,3-Dichlorobenzene	5	120000	U
106-46-7	1,4-Dichlorobenzene	5	120000	U
75-71-8	Dichlorodifluoromethane	10	250000	U
75-34-3	1,1-Dichloroethane	5	120000	U
107-06-2	1,2-Dichloroethane	5	120000	U
75-35-4	1,1-Dichloroethene	5	120000	U
156-59-2	Cis-1,2-Dichloroethene	5	120000	U

Impinger Water 900°F, Air (RTAI) Worst Case Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

IEA Project Number: 2436-004
IEA Sample Number: 971022805
Client Name: Focus Environmental, Inc.
Client Project: 772686.01000000 FOCUS-ACS
Sample Identification: #1153-047-5
Matrix: (soil/water) WATER
% Moisture: not dec.

Date Received: 10/13/97
Date Sampled: 10/09/97
Date Analyzed: 10/20/97
Lab File ID: 1020L13.D
Analyst: MOORE
Dilution Factor: 25000.0

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
156-60-5	Trans-1,2-Dichloroethene	5	120000	U
78-87-5	1,2-Dichloropropane	5	120000	U
142-28-9	1,3-Dichloropropane	5	120000	U
594-20-7	2,2-Dichloropropane	5	120000	U
563-58-6	1,1-Dichloropropene	5	120000	U
10061-01-5	Cis-1,3-Dichloropropene	5	120000	U
10061-02-6	Trans-1,3-Dichloropropene	5	120000	U
110-57-6	Cis-1,4-Dichloro-2-Butene	5	120000	U
110-57-6	Trans-1,4-Dichloro-2-Butene	5	120000	U
100-41-4	Ethylbenzene	5	120000	U
97-63-2	Ethyl Methacrylate	5	120000	U
87-68-3	Hexachlorobutadiene	5	120000	U
591-78-6	2-Hexanone	10	250000	U
74-88-4	Iodomethane	5	120000	U
98-82-8	Isopropylbenzene	5	120000	U
99-87-6	P-Isopropyltoluene	5	120000	U
126-98-7	Methacrylonitrile	5	120000	U
75-09-2	Methylene Chloride	10	250000	U
80-62-6	Methyl Methacrylate	5	120000	U
108-10-1	4-Methyl-2-Pentanone	10	250000	U
1634-04-4	Methyl-tert-Butyl ether	5	120000	U
91-20-3	Naphthalene	5	120000	U
76-01-7	Pentachloroethane	5	120000	U
103-65-1	N-Propylbenzene	5	120000	U
100-42-5	Styrene	5	120000	U
630-20-6	1,1,1,2-Tetrachloroethane	5	120000	U
79-34-5	1,1,2,2-Tetrachloroethane	5	120000	U
127-18-4	Tetrachloroethene	5	120000	U
108-88-3	Toluene	5	120000	U
87-61-6	1,2,3-Trichlorobenzene	5	120000	U
120-82-1	1,2,4-Trichlorobenzene	5	120000	U
71-55-6	1,1,1-Trichloroethane	5	120000	U
79-00-5	1,1,2-Trichloroethane	5	120000	U
79-01-6	Trichloroethene	5	120000	U

Impinger Water 900°F, Air (RTA1) Worst Case Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

IEA Project Number: 2436-004

IEA Sample Number: 971022805

Client Name: Focus Environmental, Inc.

Client Project: 772686.01000000 FOCUS-ACS

Sample Identification: #1153-047-5

Matrix: (soil/water) WATER

% Moisture: not dec.

Date Received: 10/13/97

Date Sampled: 10/09/97

Date Analyzed: 10/20/97

Lab File ID: 1020L13.D

Analyst: MOORE

Dilution Factor: 25000.0

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
75-69-4	Trichlorofluoromethane	5	120000	U
96-18-4	1,2,3-Trichloropropane	5	120000	U
95-63-6	1,2,4-Trimethylbenzene	5	120000	U
108-67-8	1,3,5-Trimethylbenzene	5	120000	U
108-05-4	Vinyl Acetate	10	250000	U
75-01-4	Vinyl Chloride	10	250000	U
1330-20-7	Xylene (Total)	5	120000	U

1E

CLIENT SAMPLE NO.

SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

#1153-047-5 Impinger Water 900°F, Air

Lab Name: IEA-NC Method: 8260

Lab Code: IEA Case No.: 2436-004 SDG No.: 10228

Matrix: (soil/water) WATER Lab Sample ID: 971022805

Sample wt/vol: 5 (g/mL) ml Lab File ID: 1020L13.D

Level: (low/med) LOW Date Received: 10/13/97

% Moisture: not dec. Date Analyzed: 10/20/97

GC Column: DB-624 ID: .530(mm) Dilution Factor: 25000.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs Found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/l

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

Impinger Water 900°F, N_2 (RTAN) Worst Case Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

IEA Project Number: 2436-004
IEA Sample Number: 971022806
Client Name: Focus Environmental, Inc.
Client Project: 772686.01000000 FOCUS-ACS
Sample Identification: #1153-047-11
Matrix: (soil/water) WATER
% Moisture: not dec.

Date Received: 10/13/97
Date Sampled: 10/09/97
Date Analyzed: 10/21/97
Lab File ID: 1020W08.D
Analyst: CREWES
Dilution Factor: 25000.0

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
67-64-1	Acetone	50	4500000	
107-13-1	Acrylonitrile	5	120000	U
107-05-1	Allyl Chloride	5	120000	U
71-43-2	Benzene	5	120000	U
108-86-1	Bromobenzene	5	120000	U
74-97-5	Bromochloromethane	5	120000	U
75-27-4	Bromodichloromethane	5	120000	U
75-25-2	Bromoform	5	120000	U
74-83-9	Bromomethane	10	250000	U
78-93-3	2-Butanone	10	250000	U
104-51-8	N-Butylbenzene	5	120000	U
135-98-8	Sec-Butylbenzene	5	120000	U
98-06-6	Tert-Butylbenzene	5	120000	U
75-15-0	Carbon Disulfide	5	120000	U
56-23-5	Carbon Tetrachloride	5	120000	U
108-90-7	Chlorobenzene	5	120000	U
124-48-1	Chlorodibromomethane	5	120000	U
75-00-3	Chloroethane	10	250000	U
110-75-8	2-Chloroethyl Vinyl Ether	10	250000	U
67-66-3	Chloroform	5	120000	U
74-87-3	Chloromethane	10	250000	U
95-49-8	2-Chlorotoluene	5	120000	U
106-43-4	4-Chlorotoluene	5	120000	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	120000	U
106-93-4	1,2-Dibromoethane	5	120000	U
74-95-3	Dibromomethane	5	120000	U
95-50-1	1,2-Dichlorobenzene	5	120000	U
541-73-1	1,3-Dichlorobenzene	5	120000	U
106-46-7	1,4-Dichlorobenzene	5	120000	U
75-71-8	Dichlorodifluoromethane	10	250000	U
75-34-3	1,1-Dichloroethane	5	120000	U
107-06-2	1,2-Dichloroethane	5	120000	U
75-35-4	1,1-Dichloroethene	5	120000	U
156-59-2	Cis-1,2-Dichloroethene	5	120000	U

Impinger Water 900°F, N_2 (RTAN) Worst Case Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

IEA Project Number: 2436-004
IEA Sample Number: 971022806
Client Name: Focus Environmental, Inc.
Client Project: 772686.01000000 FOCUS-ACS
Sample Identification: #1153-047-11
Matrix: (soil/water) WATER
% Moisture: not dec.

Date Received: 10/13/97
Date Sampled: 10/09/97
Date Analyzed: 10/21/97
Lab File ID: 1020W08.D
Analyst: CREWES
Dilution Factor: 25000.0

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
156-60-5	Trans-1,2-Dichloroethene	5	120000	U
78-87-5	1,2-Dichloropropane	5	120000	U
142-28-9	1,3-Dichloropropane	5	120000	U
594-20-7	2,2-Dichloropropane	5	120000	U
563-58-6	1,1-Dichloropropene	5	120000	U
10061-01-5	Cis-1,3-Dichloropropene	5	120000	U
10061-02-6	Trans-1,3-Dichloropropene	5	120000	U
110-57-6	Cis-1,4-Dichloro-2-Butene	5	120000	U
110-57-6	Trans-1,4-Dichloro-2-Butene	5	120000	U
100-41-4	Ethylbenzene	5	120000	U
97-63-2	Ethyl Methacrylate	5	120000	U
87-68-3	Hexachlorobutadiene	5	120000	U
591-78-6	2-Hexanone	10	250000	U
74-88-4	Iodomethane	5	120000	U
98-82-8	Isopropylbenzene	5	120000	U
99-87-6	P-Isopropyltoluene	5	120000	U
126-98-7	Methacrylonitrile	5	120000	U
75-09-2	Methylene Chloride	10	250000	U
80-62-6	Methyl Methacrylate	5	120000	U
108-10-1	4-Methyl-2-Pentanone	10	250000	U
1634-04-4	Methyl-tert-Butyl ether	5	120000	U
91-20-3	Naphthalene	5	120000	U
76-01-7	Pentachloroethane	5	120000	U
103-65-1	N-Propylbenzene	5	120000	U
100-42-5	Styrene	5	120000	U
630-20-6	1,1,1,2-Tetrachloroethane	5	120000	U
79-34-5	1,1,2,2-Tetrachloroethane	5	120000	U
127-18-4	Tetrachloroethene	5	120000	U
108-88-3	Toluene	5	120000	U
87-61-6	1,2,3-Trichlorobenzene	5	120000	U
120-82-1	1,2,4-Trichlorobenzene	5	120000	U
71-55-6	1,1,1-Trichloroethane	5	120000	U
79-00-5	1,1,2-Trichloroethane	5	120000	U
79-01-6	Trichloroethene	5	120000	U

Impinger Water 900°F, N_2 (RTAN) Worst Case Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

IEA Project Number: 2436-004
IEA Sample Number: 971022806
Client Name: Focus Environmental, Inc.
Client Project: 772686.01000000 FOCUS-ACS
Sample Identification: #1153-047-11
Matrix: (soil/water) WATER
% Moisture: not dec.

Date Received: 10/13/97
Date Sampled: 10/09/97
Date Analyzed: 10/21/97
Lab File ID: 1020W08.D
Analyst: CREWES
Dilution Factor: 25000.0

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
75-69-4	Trichlorofluoromethane	5	120000	U
96-18-4	1,2,3-Trichloropropane	5	120000	U
95-63-6	1,2,4-Trimethylbenzene	5	120000	U
108-67-8	1,3,5-Trimethylbenzene	5	120000	U
108-05-4	Vinyl Acetate	10	250000	U
75-01-4	Vinyl Chloride	10	250000	U
1330-20-7	Xylene (Total)	5	120000	U

1E

CLIENT SAMPLE NO.

SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

#1153-047-11 Impinger water 900F, N2

Lab Name: IEA-NC Method: 8260

Lab Code: IEA Case No.: 2436-004 SDG No.: 10228

Matrix: (soil/water) WATER Lab Sample ID: 971022806

Sample wt/vol: 5 (g/mL) ml Lab File ID: 1020W08.D

Level: (low/med) LOW Date Received: 10/13/97

% Moisture: not dec. Date Analyzed: 10/21/97

GC Column: DB-624 ID: .530(mm) Dilution Factor: 25000.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs Found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/l

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

IMPINGER WATER 700°F, Air (RTA2) Typical Case Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

IEA Project Number: 2436-004 | Date Received: 10/13/97

IEA Sample Number: 971022804 | Date Sampled: 10/09/97

Client Name: Focus Environmental, Inc. | Date Analyzed: 10/20/97

Client Project: 772686.01000000 FOCUS-ACS | Lab File ID: 1020W06.D

Sample Identification: #1153-047-1 | Analyst: CREWES

Matrix: (soil/water) WATER | Dilution Factor: 2500.0

% Moisture: not dec.

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
67-64-1	Acetone	50	260000	
107-13-1	Acrylonitrile	5	12000	U
107-05-1	Allyl Chloride	5	12000	U
71-43-2	Benzene	5	12000	U
108-86-1	Bromobenzene	5	12000	U
74-97-5	Bromochloromethane	5	12000	U
75-27-4	Bromodichloromethane	5	12000	U
75-25-2	Bromoform	5	12000	U
74-83-9	Bromomethane	10	25000	U
78-93-3	2-Butanone	10	75000	
104-51-8	N-Butylbenzene	5	12000	U
135-98-8	Sec-Butylbenzene	5	12000	U
98-06-6	Tert-Butylbenzene	5	12000	U
75-15-0	Carbon Disulfide	5	12000	U
56-23-5	Carbon Tetrachloride	5	12000	U
108-90-7	Chlorobenzene	5	12000	U
124-48-1	Chlorodibromomethane	5	12000	U
75-00-3	Chloroethane	10	25000	U
110-75-8	2-Chloroethyl Vinyl Ether	10	25000	U
67-66-3	Chloroform	5	12000	U
74-87-3	Chloromethane	10	25000	U
95-49-8	2-Chlorotoluene	5	12000	U
106-43-4	4-Chlorotoluene	5	12000	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	12000	U
106-93-4	1,2-Dibromoethane	5	12000	U
74-95-3	Dibromomethane	5	12000	U
95-50-1	1,2-Dichlorobenzene	5	12000	U
541-73-1	1,3-Dichlorobenzene	5	12000	U
106-46-7	1,4-Dichlorobenzene	5	12000	U
75-71-8	Dichlorodifluoromethane	10	25000	U
75-34-3	1,1-Dichloroethane	5	12000	U
107-06-2	1,2-Dichloroethane	5	12000	U
75-35-4	1,1-Dichloroethene	5	12000	U
156-59-2	Cis-1,2-Dichloroethene	5	12000	U

Impinger Water 700°F, Air (RA2) Typical Case Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

IEA Project Number: 2436-004
Date Received: 10/13/97
IEA Sample Number: 971022804
Date Sampled: 10/09/97
Client Name: Focus Environmental, Inc.
Date Analyzed: 10/20/97
Client Project: 772686.01000000 FOCUS-ACS
Lab File ID: 1020W06.D
Sample Identification: #1153-047-1
Analyst: CREWES
Matrix: (soil/water) WATER
Dilution Factor: 2500.0
% Moisture: not dec.

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
156-60-5	Trans-1,2-Dichloroethene	5	12000	U
78-87-5	1,2-Dichloropropane	5	12000	U
142-28-9	1,3-Dichloropropane	5	12000	U
594-20-7	2,2-Dichloropropane	5	12000	U
563-58-6	1,1-Dichloropropene	5	12000	U
10061-01-5	Cis-1,3-Dichloropropene	5	12000	U
10061-02-6	Trans-1,3-Dichloropropene	5	12000	U
110-57-6	Cis-1,4-Dichloro-2-Butene	5	12000	U
110-57-6	Trans-1,4-Dichloro-2-Butene	5	12000	U
100-41-4	Ethylbenzene	5	12000	U
97-63-2	Ethyl Methacrylate	5	12000	U
87-68-3	Hexachlorobutadiene	5	12000	U
591-78-6	2-Hexanone	10	25000	U
74-88-4	Iodomethane	5	12000	U
98-82-8	Isopropylbenzene	5	12000	U
99-87-6	P-Isopropyltoluene	5	12000	U
126-98-7	Methacrylonitrile	5	12000	U
75-09-2	Methylene Chloride	10	25000	U
80-62-6	Methyl Methacrylate	5	79000	
108-10-1	4-Methyl-2-Pentanone	10	25000	U
1634-04-4	Methyl-tert-Butyl ether	5	12000	U
91-20-3	Naphthalene	5	12000	U
76-01-7	Pentachloroethane	5	12000	U
103-65-1	N-Propylbenzene	5	12000	U
100-42-5	Styrene	5	12000	U
630-20-6	1,1,1,2-Tetrachloroethane	5	12000	U
79-34-5	1,1,2,2-Tetrachloroethane	5	12000	U
127-18-4	Tetrachloroethene	5	12000	U
108-88-3	Toluene	5	16000	
87-61-6	1,2,3-Trichlorobenzene	5	12000	U
120-82-1	1,2,4-Trichlorobenzene	5	12000	U
71-55-6	1,1,1-Trichloroethane	5	12000	U
79-00-5	1,1,2-Trichloroethane	5	12000	U
79-01-6	Trichloroethene	5	12000	U

Impinger Water 700°F, Air (RTA2) Typical Case Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

IEA Project Number: 2436-004
IEA Sample Number: 971022804
Client Name: Focus Environmental, Inc.
Client Project: 772686.01000000 FOCUS-ACS
Sample Identification: #1153-047-1
Matrix: (soil/water) WATER
% Moisture: not dec.

Date Received: 10/13/97
Date Sampled: 10/09/97
Date Analyzed: 10/20/97
Lab File ID: 1020W06.D
Analyst: CREWES
Dilution Factor: 2500.0

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
75-69-4	Trichlorofluoromethane	5	12000	U
96-18-4	1,2,3-Trichloropropane	5	12000	U
95-63-6	1,2,4-Trimethylbenzene	5	12000	U
108-67-8	1,3,5-Trimethylbenzene	5	12000	U
108-05-4	Vinyl Acetate	10	25000	U
75-01-4	Vinyl Chloride	10	25000	U
1330-20-7	Xylene (Total)	5	12000	U

1E

SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

#1153-047-1 Impinger Water 700°F, Air

Lab Name: IEA-NC Method: 8260

Lab Code: IEA Case No.: 2436-004 SDG No.: 10228

Matrix: (soil/water) WATER Lab Sample ID: 971022804

Sample wt/vol: 5 (g/mL) ml Lab File ID: 1020W06.D

Level: (low/med) LOW Date Received: 10/13/97

% Moisture: not dec. Date Analyzed: 10/20/97

GC Column: DB-624 ID: .530(mm) Dilution Factor: 2500.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs Found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/l

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
000075-07-0	ACETALDEHYDE	6.15	22000	JN
000078-85-3	2-PROPENAL, 2-METHYL-	10.32	21000	JN
000123-72-8	BUTANAL	11.00	19000	JN

Impinger Water 900°F, Air (RTA 1) Worst Case Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8270

IEA Project Number: 2436-004
IEA Sample Number: 971022813
Client Name: Focus Environmental, Inc.
Client Project: 772686.01000000 FOCUS-ACS
Sample Identification: #1153-047-6
Matrix: (soil/water) WATER
% Moisture: not dec.

Date Received: 10/13/97
Date Sampled: 10/09/97
Date Analyzed: 10/21/97
Date Extracted: 10/15/97
Lab File ID: 1021N16.D
Dilution Factor: 600.0
Analyst: VAN LARE

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
108-95-2	Phenol	10	600000	
111-44-4	Bis(2-Chloroethyl)Ether	10	120000	U
95-57-8	2-Chlorophenol	10	120000	U
541-73-1	1,3-Dichlorobenzene	10	120000	U
106-46-7	1,4-Dichlorobenzene	10	120000	U
95-50-1	1,2-Dichlorobenzene	10	120000	U
95-48-7	2-Methylphenol	10	120000	U
108-60-1	Bis(2-Chloroisopropyl)Ether	10	120000	U
106-44-5	4-Methylphenol	10	150000	
621-64-7	N-Nitroso-Di-N-Propylamine	10	120000	U
67-72-1	Hexachloroethane	10	120000	U
98-95-3	Nitrobenzene	10	120000	U
78-59-1	Isophorone	10	140000	
88-75-5	2-Nitrophenol	10	120000	U
105-67-9	2,4-Dimethylphenol	10	120000	U
111-91-1	Bis(2-Chloroethoxy)Methane	10	120000	U
120-83-2	2,4-Dichlorophenol	10	120000	U
120-82-1	1,2,4-Trichlorobenzene	10	120000	U
91-20-3	Naphthalene	10	120000	U
106-47-8	4-Chloroaniline	20	240000	U
87-68-3	Hexachlorobutadiene	10	120000	U
59-50-7	4-Chloro-3-Methylphenol	10	120000	U
91-57-6	2-Methylnaphthalene	10	120000	U
77-47-4	Hexachlorocyclopentadiene	10	120000	U
88-06-2	2,4,6-Trichlorophenol	10	120000	U
95-95-4	2,4,5-Trichlorophenol	10	120000	U
91-58-7	2-Chloronaphthalene	10	120000	U
88-74-4	2-Nitroaniline	50	600000	U
131-11-3	Dimethylphthalate	10	120000	U
208-96-8	Acenaphthylene	10	120000	U
606-20-2	2,6-Dinitrotoluene	10	120000	U
99-09-2	3-Nitroaniline	50	600000	U
83-32-9	Acenaphthene	10	120000	U

Impinger Water 900°F, Air (RTAI) Worst Case Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8270

IEA Project Number: 2436-004
IEA Sample Number: 971022813
Client Name: Focus Environmental, Inc.
Client Project: 772686.01000000 FOCUS-ACS
Sample Identification: #1153-047-6
Matrix: (soil/water) WATER
% Moisture: not dec.

Date Received: 10/13/97
Date Sampled: 10/09/97
Date Analyzed: 10/21/97
Date Extracted: 10/15/97
Lab File ID: 1021N16.D
Dilution Factor: 600.0
Analyst: VAN LARE

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
51-28-5	2,4-Dinitrophenol	50	600000	U
100-02-7	4-Nitrophenol	50	600000	U
132-64-9	Dibenzofuran	10	120000	U
121-14-2	2,4-Dinitrotoluene	10	120000	U
84-66-2	Diethylphthalate	10	120000	U
7005-72-3	4-Chlorophenyl-phenylether	10	120000	U
86-73-7	Fluorene	10	120000	U
100-01-6	4-Nitroaniline	50	600000	U
534-52-1	4,6-Dinitro-2-Methylphenol	10	120000	U
86-30-6	N-Nitrosodiphenylamine (1)	10	120000	U
101-55-3	4-Bromophenyl-phenylether	10	120000	U
118-74-1	Hexachlorobenzene	10	120000	U
87-86-5	Pentachlorophenol	50	600000	U
85-01-8	Phenanthrene	10	120000	U
120-12-7	Anthracene	10	120000	U
84-74-2	Di-N-Butylphthalate	10	120000	U
206-44-0	Fluoranthene	10	120000	U
129-00-0	Pyrene	10	120000	U
85-68-7	Butylbenzylphthalate	10	120000	U
91-94-1	3,3'-Dichlorobenzidine	20	240000	U
56-55-3	Benzo(a)Anthracene	10	120000	U
218-01-9	Chrysene	10	120000	U
117-81-7	Bis(2-Ethylhexyl)Phthalate	10	120000	U
117-84-0	Di-N-Octylphthalate	10	120000	U
205-99-2	Benzo(b)Fluoranthene	10	120000	U
207-08-9	Benzo(k)Fluoranthene	10	120000	U
50-32-8	Benzo(a)Pyrene	10	120000	U
193-39-5	Indeno(1,2,3-Cd)Pyrene	10	120000	U
53-70-3	Dibenz(A,H)Anthracene	10	120000	U
191-24-2	Benzo(G,H,I)Perylene	10	120000	U
100-51-6	Benzyl Alcohol	20	240000	U
65-85-0	Benzoic Acid	50	600000	U

1F

CLIENT SAMPLE NO.

SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

#1153-047-6 Impinger Water 900F, Air

Lab Name: IEA-NC Method: 8270

Lab Code: IEA Case No.: 2436-004 SDG No.: 10228

Matrix: (soil/water) WATER Lab Sample ID: 971022813

Sample wt/vol: 250 (g/mL) ml Lab File ID: 1021N16.D

Level: (low/med) LOW Date Received: 10/13/97

% Moisture: decanted: (Y/N) Date Extracted: 10/15/97

Concentrated Extract Volume: 5000(uL) Date Analyzed: 10/21/97

Injection Volume: 2 (uL) Dilution Factor: 600.0

GPC Cleanup: (Y/N) N pH:

Number TICs Found: 8

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/l

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	UNKNOWN	7.18	190000	J
	UNKNOWN	8.35	290000	J
000872-50-4	2-PYRROLIDINONE, 1-METHYL-	9.73	330000	JN
000098-86-2	ACETOPHENONE	10.18	36000	JN
	SUBSTITUTED PHENOL	11.82	57000	J
	UNKNOWN	15.48	160000	J
000085-41-6	1H-ISOINDOLE-1,3(2H)-DIONE	16.02	350000	JN
000000-00-0	PHTHALIMIDE, N-ACETONYL-	19.23	25000	JN

Impinger Water 900°F, ~~Air~~ N_2 (RTAN) Worst Case Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8270

IEA Project Number: 2436-004
IEA Sample Number: 971022814
Client Name: Focus Environmental, Inc.
Client Project: 772686.01000000 FOCUS-ACS
Sample Identification: #1153-047-12
Matrix: (soil/water) WATER
% Moisture: not dec.

Date Received: 10/13/97
Date Sampled: 10/09/97
Date Analyzed: 10/22/97
Date Extracted: 10/15/97
Lab File ID: 1022N05.D
Dilution Factor: 600.0
Analyst: VAN LARE

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
108-95-2	Phenol	10	580000	
111-44-4	Bis(2-Chloroethyl)Ether	10	120000	U
95-57-8	2-Chlorophenol	10	120000	U
541-73-1	1,3-Dichlorobenzene	10	120000	U
106-46-7	1,4-Dichlorobenzene	10	120000	U
95-50-1	1,2-Dichlorobenzene	10	120000	U
95-48-7	2-Methylphenol	10	120000	U
108-60-1	Bis(2-Chloroisopropyl)Ether	10	120000	U
106-44-5	4-Methylphenol	10	160000	
621-64-7	N-Nitroso-Di-N-Propylamine	10	120000	U
67-72-1	Hexachloroethane	10	120000	U
98-95-3	Nitrobenzene	10	120000	U
78-59-1	Isophorone	10	180000	
88-75-5	2-Nitrophenol	10	120000	U
105-67-9	2,4-Dimethylphenol	10	120000	U
111-91-1	Bis(2-Chloroethoxy)Methane	10	120000	U
120-83-2	2,4-Dichlorophenol	10	120000	U
120-82-1	1,2,4-Trichlorobenzene	10	120000	U
91-20-3	Naphthalene	10	120000	U
106-47-8	4-Chloroaniline	20	240000	U
87-68-3	Hexachlorobutadiene	10	120000	U
59-50-7	4-Chloro-3-Methylphenol	10	120000	U
91-57-6	2-Methylnaphthalene	10	120000	U
77-47-4	Hexachlorocyclopentadiene	10	120000	U
88-06-2	2,4,6-Trichlorophenol	10	120000	U
95-95-4	2,4,5-Trichlorophenol	10	120000	U
91-58-7	2-Chloronaphthalene	10	120000	U
88-74-4	2-Nitroaniline	50	600000	U
131-11-3	Dimethylphthalate	10	120000	U
208-96-8	Acenaphthylene	10	120000	U
606-20-2	2,6-Dinitrotoluene	10	120000	U
99-09-2	3-Nitroaniline	50	600000	U
83-32-9	Acenaphthene	10	120000	U

Impinger Water
900°F, N_2
(RTAN)
Worst Case Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8270

IEA Project Number: 2436-004
IEA Sample Number: 971022814
Client Name: Focus Environmental, Inc.
Client Project: 772686.01000000 FOCUS-ACS
Sample Identification: #1153-047-12
Matrix: (soil/water) WATER
% Moisture: not dec.

Date Received: 10/13/97
Date Sampled: 10/09/97
Date Analyzed: 10/22/97
Date Extracted: 10/15/97
Lab File ID: 1022N05.D
Dilution Factor: 600.0
Analyst: VAN LARE

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
51-28-5	2,4-Dinitrophenol	50	600000	U
100-02-7	4-Nitrophenol	50	600000	U
132-64-9	Dibenzofuran	10	120000	U
121-14-2	2,4-Dinitrotoluene	10	120000	U
84-66-2	Diethylphthalate	10	120000	U
7005-72-3	4-Chlorophenyl-phenylether	10	120000	U
86-73-7	Fluorene	10	120000	U
100-01-6	4-Nitroaniline	50	600000	U
534-52-1	4,6-Dinitro-2-Methylphenol	10	120000	U
86-30-6	N-Nitrosodiphenylamine (1)	10	120000	U
101-55-3	4-Bromophenyl-phenylether	10	120000	U
118-74-1	Hexachlorobenzene	10	120000	U
87-86-5	Pentachlorophenol	50	600000	U
85-01-8	Phenanthrene	10	120000	U
120-12-7	Anthracene	10	120000	U
84-74-2	Di-N-Butylphthalate	10	120000	U
206-44-0	Fluoranthene	10	120000	U
129-00-0	Pyrene	10	120000	U
85-68-7	Butylbenzylphthalate	10	120000	U
91-94-1	3,3'-Dichlorobenzidine	20	240000	U
56-55-3	Benzo(a)Anthracene	10	120000	U
218-01-9	Chrysene	10	120000	U
117-81-7	Bis(2-Ethylhexyl)Phthalate	10	120000	U
117-84-0	Di-N-Octylphthalate	10	120000	U
205-99-2	Benzo(b)Fluoranthene	10	120000	U
207-08-9	Benzo(k)Fluoranthene	10	120000	U
50-32-8	Benzo(a)Pyrene	10	120000	U
193-39-5	Indeno(1,2,3-Cd)Pyrene	10	120000	U
53-70-3	Dibenz(A,H)Anthracene	10	120000	U
191-24-2	Benzo(G,H,I)Perylene	10	120000	U
100-51-6	Benzyl Alcohol	20	240000	U
65-85-0	Benzoic Acid	50	600000	U

1F

SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

#1153-047-12 Impinger Water 900°F, N2

Lab Name: IEA-NC Method: 8270

Lab Code: IEA Case No.: 2436-004 SDG No.: 10228

Matrix: (soil/water) WATER Lab Sample ID: 971022814

Sample wt/vol: 250 (g/mL) ml Lab File ID: 1022N05.D

Level: (low/med) LOW Date Received: 10/13/97

% Moisture: decanted: (Y/N) Date Extracted: 10/15/97

Concentrated Extract Volume: 5000(uL) Date Analyzed: 10/22/97

Injection Volume: 2 (uL) Dilution Factor: 600.0

GPC Cleanup: (Y/N) N pH:

Number TICs Found: 10

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/l

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	UNKNOWN	7.16	230000	J
000872-50-4	2-PYRROLIDINONE, 1-METHYL-	9.70	380000	JN
000098-86-2	ACETOPHENONE	10.14	36000	JN
	DIMETHYL PHENOL ISOMER	11.79	24000	J
	DIMETHYL PHENOL ISOMER	12.17	25000	J
	UNKNOWN	15.45	170000	J
000085-41-6	1H-ISOINDOLE-1,3(2H)-DIONE	15.97	300000	JN
	UNKNOWN	17.10	28000	J
	UNKNOWN	17.16	26000	J
000000-00-0	PHTHALIMIDE, N-ACETONYL-	19.19	27000	JN

Impinger Water 700°F, Air (RTA 2) Typical Case Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8270

IEA Project Number: 2436-004
IEA Sample Number: 971022812
Client Name: Focus Environmental, Inc.
Client Project: 772686.01000000 FOCUS-ACS
Sample Identification: #1153-047-2
Matrix: (soil/water) WATER
% Moisture: not dec.

Date Received: 10/13/97
Date Sampled: 10/09/97
Date Analyzed: 10/21/97
Date Extracted: 10/15/97
Lab File ID: 1021N05.D
Dilution Factor: 300.0
Analyst: VAN LARE

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
108-95-2	Phenol	10	360000	
111-44-4	Bis(2-Chloroethyl)Ether	10	60000	U
95-57-8	2-Chlorophenol	10	60000	U
541-73-1	1,3-Dichlorobenzene	10	60000	U
106-46-7	1,4-Dichlorobenzene	10	60000	U
95-50-1	1,2-Dichlorobenzene	10	60000	U
95-48-7	2-Methylphenol	10	60000	U
108-60-1	Bis(2-Chloroisopropyl)Ether	10	60000	U
106-44-5	4-Methylphenol	10	89000	
621-64-7	N-Nitroso-Di-N-Propylamine	10	60000	U
67-72-1	Hexachloroethane	10	60000	U
98-95-3	Nitrobenzene	10	60000	U
78-59-1	Isophorone	10	340000	
88-75-5	2-Nitrophenol	10	60000	U
105-67-9	2,4-Dimethylphenol	10	60000	U
111-91-1	Bis(2-Chloroethoxy)Methane	10	60000	U
120-83-2	2,4-Dichlorophenol	10	60000	U
120-82-1	1,2,4-Trichlorobenzene	10	60000	U
91-20-3	Naphthalene	10	60000	U
106-47-8	4-Chloroaniline	20	120000	U
87-68-3	Hexachlorobutadiene	10	60000	U
59-50-7	4-Chloro-3-Methylphenol	10	60000	U
91-57-6	2-Methylnaphthalene	10	60000	U
77-47-4	Hexachlorocyclopentadiene	10	60000	U
88-06-2	2,4,6-Trichlorophenol	10	60000	U
95-95-4	2,4,5-Trichlorophenol	10	60000	U
91-58-7	2-Chloronaphthalene	10	60000	U
88-74-4	2-Nitroaniline	50	300000	U
131-11-3	Dimethylphthalate	10	60000	U
208-96-8	Acenaphthylene	10	60000	U
606-20-2	2,6-Dinitrotoluene	10	60000	U
99-09-2	3-Nitroaniline	50	300000	U
83-32-9	Acenaphthene	10	60000	U

Impinger Water 700°F, Air (RTAL) Typical Case Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8270

IEA Project Number: 2436-004
IEA Sample Number: 971022812
Client Name: Focus Environmental, Inc.
Client Project: 772686.01000000 FOCUS-ACS
Sample Identification: #1153-047-2
Matrix: (soil/water) WATER
% Moisture: not dec.

Date Received: 10/13/97
Date Sampled: 10/09/97
Date Analyzed: 10/21/97
Date Extracted: 10/15/97
Lab File ID: 1021N05.D
Dilution Factor: 300.0
Analyst: VAN LARE

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
51-28-5	2,4-Dinitrophenol	50	300000	U
100-02-7	4-Nitrophenol	50	300000	U
132-64-9	Dibenzofuran	10	60000	U
121-14-2	2,4-Dinitrotoluene	10	60000	U
84-66-2	Diethylphthalate	10	60000	U
7005-72-3	4-Chlorophenyl-phenylether	10	60000	U
86-73-7	Fluorene	10	60000	U
100-01-6	4-Nitroaniline	50	300000	U
534-52-1	4,6-Dinitro-2-Methylphenol	10	60000	U
86-30-6	N-Nitrosodiphenylamine (1)	10	60000	U
101-55-3	4-Bromophenyl-phenylether	10	60000	U
118-74-1	Hexachlorobenzene	10	60000	U
87-86-5	Pentachlorophenol	50	300000	U
85-01-8	Phenanthrene	10	60000	U
120-12-7	Anthracene	10	60000	U
84-74-2	Di-N-Butylphthalate	10	60000	U
206-44-0	Fluoranthene	10	60000	U
129-00-0	Pyrene	10	60000	U
85-68-7	Butylbenzylphthalate	10	60000	U
91-94-1	3,3'-Dichlorobenzidine	20	120000	U
56-55-3	Benzo(a)Anthracene	10	60000	U
218-01-9	Chrysene	10	60000	U
117-81-7	Bis(2-Ethylhexyl)Phthalate	10	60000	U
117-84-0	Di-N-Octylphthalate	10	60000	U
205-99-2	Benzo(b)Fluoranthene	10	60000	U
207-08-9	Benzo(k)Fluoranthene	10	60000	U
50-32-8	Benzo(a)Pyrene	10	60000	U
193-39-5	Indeno(1,2,3-Cd)Pyrene	10	60000	U
53-70-3	Dibenz(A,H)Anthracene	10	60000	U
191-24-2	Benzo(G,H,I)Perylene	10	60000	U
100-51-6	Benzyl Alcohol	20	120000	U
65-85-0	Benzoic Acid	50	300000	U

1F

SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

#1153-047-2 Impinger Water 700°F, Air

Lab Name: IEA-NC Method: 8270

Lab Code: IEA Case No.: 2436-004 SDG No.: 10228

Matrix: (soil/water) WATER Lab Sample ID: 971022812

Sample wt/vol: 250 (g/mL) ml Lab File ID: 1021N05.D

Level: (low/med) LOW Date Received: 10/13/97

% Moisture: decanted: (Y/N) Date Extracted: 10/15/97

Concentrated Extract Volume: 5000(uL) Date Analyzed: 10/21/97

Injection Volume: 2 (uL) Dilution Factor: 300.0

GPC Cleanup: (Y/N) N pH:

Number TICs Found: 14

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/l

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	UNKNOWN	7.17	140000	J
000100-52-7	BENZALDEHYDE	8.27	34000	JN
000620-02-0	2-FURANCARBOXALDEHYDE, 5-MET	8.31	24000	JN
	UNKNOWN	9.47	22000	J
000872-50-4	2-PYRROLIDINONE, 1-METHYL-	9.70	76000	JN
000090-02-8	BENZALDEHYDE, 2-HYDROXY-	9.78	14000	JN
000098-86-2	ACETOPHENONE	10.17	20000	JN
	SUBSTITUTED PHENOL	11.77	22000	J
	DIMETHYL PHENOL ISOMER	11.80	27000	J
	SUBSTITUTED PHENOL	12.18	19000	J
	SUBSTITUTED PHENOL	12.68	14000	J
	UNKNOWN	15.07	14000	J
	UNKNOWN	15.47	60000	J
000085-41-6	1H-ISOINDOLE-1,3(2H)-DIONE	15.97	88000	JN

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8270

BLANK

IEA Project Number: 2436-004

IEA Sample Number: SVB017

Client Name: Focus Environmental, Inc.

Client Project: 772686.01000000 FOCUS-ACS

Sample Identification: SVB017

Matrix: (soil/water) WATER

% Moisture: not dec.

Date Received:

Date Sampled:

Date Analyzed: 10/16/97

Date Extracted: 10/15/97

Lab File ID: 1016N02.D

Dilution Factor: 1.0

Analyst: VAN LARE

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
108-95-2	Phenol	10	10	U
111-44-4	Bis(2-Chloroethyl)Ether	10	10	U
95-57-8	2-Chlorophenol	10	10	U
541-73-1	1,3-Dichlorobenzene	10	10	U
106-46-7	1,4-Dichlorobenzene	10	10	U
95-50-1	1,2-Dichlorobenzene	10	10	U
95-48-7	2-Methylphenol	10	10	U
108-60-1	Bis(2-Chloroisopropyl)Ether	10	10	U
106-44-5	4-Methylphenol	10	10	U
621-64-7	N-Nitroso-Di-N-Propylamine	10	10	U
67-72-1	Hexachloroethane	10	10	U
98-95-3	Nitrobenzene	10	10	U
78-59-1	Isophorone	10	10	U
88-75-5	2-Nitrophenol	10	10	U
105-67-9	2,4-Dimethylphenol	10	10	U
111-91-1	Bis(2-Chloroethoxy)Methane	10	10	U
120-83-2	2,4-Dichlorophenol	10	10	U
120-82-1	1,2,4-Trichlorobenzene	10	10	U
91-20-3	Naphthalene	10	10	U
106-47-8	4-Chloroaniline	20	20	U
87-68-3	Hexachlorobutadiene	10	10	U
59-50-7	4-Chloro-3-Methylphenol	10	10	U
91-57-6	2-Methylnaphthalene	10	10	U
77-47-4	Hexachlorocyclopentadiene	10	10	U
88-06-2	2,4,6-Trichlorophenol	10	10	U
95-95-4	2,4,5-Trichlorophenol	10	10	U
91-58-7	2-Chloronaphthalene	10	10	U
88-74-4	2-Nitroaniline	50	50	U
131-11-3	Dimethylphthalate	10	10	U
208-96-8	Acenaphthylene	10	10	U
606-20-2	2,6-Dinitrotoluene	10	10	U
99-09-2	3-Nitroaniline	50	50	U
83-32-9	Acenaphthene	10	10	U

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8270

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IEA Project Number: 2436-004
IEA Sample Number: SVB017
Client Name: Focus Environmental, Inc.
Client Project: 772686.01000000 FOCUS-ACS
Sample Identification: SVB017
Matrix: (soil/water) WATER
% Moisture: not dec.

Date Received:
Date Sampled:
Date Analyzed: 10/16/97
Date Extracted: 10/15/97
Lab File ID: 1016N02.D
Dilution Factor: 1.0
Analyst: VAN LARE

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
51-28-5	2,4-Dinitrophenol	50	50	U
100-02-7	4-Nitrophenol	50	50	U
132-64-9	Dibenzofuran	10	10	U
121-14-2	2,4-Dinitrotoluene	10	10	U
84-66-2	Diethylphthalate	10	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	10	U
86-73-7	Fluorene	10	10	U
100-01-6	4-Nitroaniline	50	50	U
534-52-1	4,6-Dinitro-2-Methylphenol	10	10	U
86-30-6	N-Nitrosodiphenylamine (1)	10	10	U
101-55-3	4-Bromophenyl-phenylether	10	10	U
118-74-1	Hexachlorobenzene	10	10	U
87-86-5	Pentachlorophenol	50	50	U
85-01-8	Phenanthrene	10	10	U
120-12-7	Anthracene	10	10	U
84-74-2	Di-N-Butylphthalate	10	10	U
206-44-0	Fluoranthene	10	10	U
129-00-0	Pyrene	10	10	U
85-68-7	Butylbenzylphthalate	10	10	U
91-94-1	3,3'-Dichlorobenzidine	20	20	U
56-55-3	Benzo(a)Anthracene	10	10	U
218-01-9	Chrysene	10	10	U
117-81-7	Bis(2-Ethylhexyl)Phthalate	10	10	U
117-84-0	Di-N-Octylphthalate	10	10	U
205-99-2	Benzo(b)Fluoranthene	10	10	U
207-08-9	Benzo(k)Fluoranthene	10	10	U
50-32-8	Benzo(a)Pyrene	10	10	U
193-39-5	Indeno(1,2,3-Cd)Pyrene	10	10	U
53-70-3	Dibenz(A,H)Anthracene	10	10	U
191-24-2	Benzo(G,H,I)Perylene	10	10	U
100-51-6	Benzyl Alcohol	20	20	U
65-85-0	Benzoic Acid	50	50	U

1F

SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SVB017 BLANK

Lab Name: IEA-NC Method: 8270

Lab Code: IEA Case No.: 2436-004 SDG No.: 10228

Matrix: (soil/water) WATER Lab Sample ID: SVB017

Sample wt/vol: 1000 (g/mL) ml Lab File ID: 1016N02.D

Level: (low/med) LOW Date Received:

% Moisture: decanted: (Y/N) Date Extracted: 10/15/97

Concentrated Extract Volume: 1000(uL) Date Analyzed: 10/16/97

Injection Volume: 2 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs Found: 0

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/l

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

2C
SW-846 WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: IEA-NC Method: 8270

Lab Code: IEA Case No.: 2436-004 SDG No.: 10228

	CLIENT SAMPLE NO.	S1 (NBZ)#	S2 (FBP)#	S3 (TPH)#	S4 (PHL)#	S5 (2FP)#	S6 (TBP)#	TOT OUT
01	SVB017	80	91	102	81	88	98	0
02	LCS017	82	86	80	77	87	92	0
03	DI017MS	84	88	84	76	88	93	0
04	DI017MSD	81	89	86	77	89	95	0
05	#1153-047-2	0D	0D	0D	0D	0D	0D	0
06	#1153-047-6	0D	0D	0D	0D	0D	0D	0
07	#1153-047-12	0D	0D	0D	0D	0D	0D	0
08								
09								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

		QC LIMITS
S1 (NBZ)	= Nitrobenzene-d5	(35-114)
S2 (FBP)	= 2-Fluorobiphenyl	(43-116)
S3 (TPH)	= Terphenyl-d14	(33-141)
S4 (PHL)	= Phenol-d5	(10-94)
S5 (2FP)	= 2-Fluorophenol	(21-100)
S6 (TBP)	= 2,4,6-Tribromophenol	(10-123)

Column to be used to flag recovery values
* Values outside of QC limits.
D System Monitoring Compound diluted out

FORM II SV-1

3C

SW-846 WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: IEA-NC Method: 8270

Lab Code: IEA Case No.: 2436-004 SDG No.: 10228

Matrix Spike - Client Sample No.: DI017

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC. LIMITS REC.
Phenol	50	0	37	74	12-110
2-Chlorophenol	50	0	44	88	27-123
1,4-Dichlorobenzene	50	0	40	80	36-97
N-Nitroso-di-n-prop.(1)	50	0	39	78	41-116
1,2,4-Trichlorobenzene	50	0	46	92	39-98
4-Chloro-3-Methylphenol	50	0	41	82	23-97
Acenaphthene	50	0	48	96	46-118
4-Nitrophenol	50	0	42	84 *	10-80
2,4-Dinitrotoluene	50	0	46	92	24-96
Pentachlorophenol	50	0	40	80	9-103
Pyrene	50	0	43	86	26-127

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Phenol	50	37	74	0	42	12-110
2-Chlorophenol	50	44	88	0	40	27-123
1,4-Dichlorobenzene	50	40	80	0	28	36-97
N-Nitroso-di-n-prop.(1)	50	39	78	0	38	41-116
1,2,4-Trichlorobenzene	50	45	90	2	28	39-98
4-Chloro-3-Methylphenol	50	40	80	2	42	23-97
Acenaphthene	50	47	94	2	31	46-118
4-Nitrophenol	50	42	84 *	0	50	10-80
2,4-Dinitrotoluene	50	46	92	0	38	24-96
Pentachlorophenol	50	41	82	2	50	9-103
Pyrene	50	44	88	2	31	26-127

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits.
RPD: 0 out of 11 outside limits
Spike Recovery: 2 out of 22 outside limits
COMMENTS: _____

3B

SW-846 SEMIVOLATILE ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

LCS017

Lab Name: IEA-NC Method: 8270

Lab Code: IEA Case No.: 2436-004 SDG No.: 10228

Matrix: (soil/water) WATER Lab Sample ID: LCS017

Sample wt/vol: 1000 (g/mL) ml Lab File ID: 1016N03.D

Level: (low/med) LOW Date Received:

% Moisture: decanted: (Y/N) Date Extracted: 10/15/97

Concentrated Extract Volume: 1000(uL) Date Analyzed: 10/16/97

Injection Volume: 2 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	SPIKE ug/l	AMOUNT ug/l	% RECOVERY	RECOVERY LIMITS
108-95-2	Phenol	50	37	74	30 - 112
111-44-4	Bis(2-Chloroethyl)Ether	50	33	66	12 - 158
95-57-8	2-Chlorophenol	50	43	86	40 - 134
541-73-1	1,3-Dichlorobenzene	50	41	82	10 - 124
106-46-7	1,4-Dichlorobenzene	50	40	80	40 - 124
95-50-1	1,2-Dichlorobenzene	50	43	86	32 - 129
95-48-7	2-Methylphenol	50	42	84	10 - 136
108-60-1	Bis(2-Chloroisopropyl)Ether	50	27	54	36 - 166
106-44-5	4-Methylphenol	50	45	90	10 - 132
621-64-7	N-Nitroso-Di-N-Propylamine	50	39	78	40 - 138
67-72-1	Hexachloroethane	50	46	92	40 - 113
98-95-3	Nitrobenzene	50	43	86	35 - 180
78-59-1	Isophorone	50	42	84	21 - [illegible]
88-75-5	2-Nitrophenol	50	43	86	29 - [illegible]
105-67-9	2,4-Dimethylphenol	50	41	82	32 - 119
111-91-1	Bis(2-Chloroethoxy)Methane	50	43	86	33 - 184
120-83-2	2,4-Dichlorophenol	50	42	84	39 - 135
120-82-1	1,2,4-Trichlorobenzene	50	45	90	44 - 142
91-20-3	Naphthalene	50	43	86	21 - 133
106-47-8	4-Chloroaniline	50	51	100	10 - 136
87-68-3	Hexachlorobutadiene	50	46	92	24 - 116
59-50-7	4-Chloro-3-Methylphenol	50	41	82	40 - 147
91-57-6	2-Methylnaphthalene	50	46	92	10 - 136
77-47-4	Hexachlorocyclopentadiene	50	47	94	10 - 110
88-06-2	2,4,6-Trichlorophenol	50	44	88	37 - 144
95-95-4	2,4,5-Trichlorophenol	50	43	86	10 - 144
91-58-7	2-Chloronaphthalene	50	43	86	60 - 118
88-74-4	2-Nitroaniline	50	43	86	10 - 159
131-11-3	Dimethylphthalate	50	41	82	10 - 112
208-96-8	Acenaphthylene	50	45	90	40 - 145
606-20-2	2,6-Dinitrotoluene	50	42	84	50 - 158
99-09-2	3-Nitroaniline	50	45	90	10 - 173
83-32-9	Acenaphthene	50	45	90	47 - 145

3C

SW-846 SEMIVOLATILE ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

LCS017

Lab Name: IEA-NC Method: 8270

Lab Code: IEA Case No.: 2436-004 SDG No.: 10228

Matrix: (soil/water) WATER Lab Sample ID: LCS017

Sample wt/vol: 1000 (g/mL) ml Lab File ID: 1016N03.D

Level: (low/med) LOW Date Received:

% Moisture: decanted: (Y/N) Date Extracted: 10/15/97

Concentrated Extract Volume: 1000(uL) Date Analyzed: 10/16/97

Injection Volume: 2 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	SPIKE ug/l	AMOUNT ug/l	% RECOVERY	RECOVERY LIMITS
51-28-5	2,4-Dinitrophenol	50	45	90	10 - 141
100-02-7	4-Nitrophenol	50	40	80	40 - 132
132-64-9	Dibenzofuran	50	43	86	10 - 142
121-14-2	2,4-Dinitrotoluene	50	43	86	40 - 139
84-66-2	Diethylphthalate	50	42	84	10 - 114
7005-72-3	4-Chlorophenyl-phenylether	50	44	88	25 - 158
86-73-7	Fluorene	50	43	86	59 - 121
100-01-6	4-Nitroaniline	50	43	86	10 - 165
534-52-1	4,6-Dinitro-2-Methylphenol	50	46	92	10 - 155
86-30-6	N-Nitrosodiphenylamine (1)	50	43	86	10 - 150
101-55-3	4-Bromophenyl-phenylether	50	42	84	53 - 127
118-74-1	Hexachlorobenzene	50	43	86	10 - 144
87-86-5	Pentachlorophenol	50	40	80	40 - 150
85-01-8	Phenanthrene	50	43	86	54 - 120
120-12-7	Anthracene	50	41	82	27 - 133
84-74-2	Di-N-Butylphthalate	50	41	82	10 - 118
206-44-0	Fluoranthene	50	41	82	26 - 137
129-00-0	Pyrene	50	40	80	52 - 115
85-68-7	Butylbenzylphthalate	50	41	82	10 - 146
91-94-1	3,3'-Dichlorobenzidine	50	41	82	10 - 157
56-55-3	Benzo(a)Anthracene	50	43	86	33 - 143
218-01-9	Chrysene	50	42	84	17 - 168
117-81-7	Bis(2-Ethylhexyl)Phthalate	50	40	80	10 - 145
117-84-0	Di-N-Octylphthalate	50	42	84	10 - 146
205-99-2	Benzo(b)Fluoranthene	50	44	88	24 - 159
207-08-9	Benzo(k)Fluoranthene	50	42	84	10 - 151
50-32-8	Benzo(a)Pyrene	50	44	88	17 - 163
193-39-5	Indeno(1,2,3-Cd)Pyrene	50	43	86	10 - 149
53-70-3	Dibenz(A,H)Anthracene	50	47	94	10 - 152
191-24-2	Benzo(G,H,I)Perylene	50	42	84	10 - 155
100-51-6	Benzyl Alcohol	50	62	120	10 - 145
65-85-0	Benzoic Acid	50	38	76	10 - 91

Industrial & Environmental Analysts, Inc. (IEA)
GC SEMIVOLATILE SW-846 METHOD 8081 PCB in WATER

Impinger Water
900°F, Air
Worst Case
Soil (RTA-1)

IEA Project Number:	2436-004	Date Received:	10/13/97
IEA Sample Number:	9710228-13	Date Sampled:	10/09/97
Client Name:	Focus Environmental, Inc.	Date Extracted:	10/15/97
Client Project ID:	772686.01000000 FOCUS-ACS	Date Analyzed:	10/20/97
Sample Identification:	#1153-047-6	Analysis By:	Briggs
Associated QC Blank:	PB614	Dilution Factor:	8.0
QC Batch ID#:	614	Matrix:	Water
		Time of Analysis:	1348

Number	Compound	Quantitation Limit (ug/L)	Results Concentration (ug/L)
1	Aroclor 1016	0.50	BQL
2	Aroclor 1221	0.50	BQL
3	Aroclor 1232	0.50	BQL
4	Aroclor 1242	0.50	96
5	Aroclor 1248	0.50	BQL
6	Aroclor 1254	1.0	BQL
7	Aroclor 1260	1.0	32

Surrogate Compounds:	Acceptance Criteria	% Recovery
Tetrachloro-m-xylene	60 - 150	99
Decachlorobiphenyl	60 - 150	420 *

Comments:
Sample specific quantitation limits may be calculated by multiplying the quantitation limit by the dilution factor and/or moisture correction factor where reported.
BQL = Below Quantitation Limit
* = outside method recovery limits
Lower initial volume extracted due to limited sample volume.

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Industrial & Environmental Analysts, Inc. (IEA)
GC SEMIVOLATILE SW-846 METHOD 8081 PCB in WATER

Impinger Water
900°F, N_2
Worst Case Soil
(RTAN)

IEA Project Number:	2436-004	Date Received:	10/13/97
IEA Sample Number:	9710228-14	Date Sampled:	10/09/97
Client Name:	Focus Environmental, Inc.	Date Extracted:	10/15/97
Client Project ID:	772686.01000000 FOCUS-ACS	Date Analyzed:	10/20/97
Sample Identification:	#1153-047-12	Analysis By:	Briggs
Associated QC Blank:	PB614	Dilution Factor:	8.0
QC Batch ID#:	614	Matrix:	Water
		Time of Analysis:	1424

Number	Compound	Quantitation Limit (ug/L)	Results Concentration (ug/L)
1	Aroclor 1016	0.50	BQL
2	Aroclor 1221	0.50	BQL
3	Aroclor 1232	0.50	BQL
4	Aroclor 1242	0.50	140
5	Aroclor 1248	0.50	BQL
6	Aroclor 1254	1.0	BQL
7	Aroclor 1260	1.0	46

Surrogate Compounds:	Acceptance Criteria	% Recovery
Tetrachloro-m-xylene	60 - 150	82
Decachlorobiphenyl	60 - 150	222 *

Comments:
Sample specific quantitation limits may be calculated by multiplying the quantitation limit by the dilution factor and/or moisture correction factor where reported.
BQL = Below Quantitation Limit
* = outside method recovery limits
Lower initial volume extracted due to limited sample volume.

FORM RPCBW Rev. 082296

Impinger Water
700°F, Air
(RTA2)
Typical Case
Soil

Industrial & Environmental Analysts, Inc. (IEA)
GC SEMIVOLATILE SW-846 METHOD 8081 PCB in WATER

IEA Project Number:	2436-004	Date Received:	10/13/97
IEA Sample Number:	9710228-12	Date Sampled:	10/09/97
Client Name:	Focus Environmental, Inc.	Date Extracted:	10/15/97
Client Project ID:	772686.01000000 FOCUS-ACS	Date Analyzed:	10/20/97
Sample Identification:	#1153-047-2	Analysis By:	Briggs
Associated QC Blank:	PB614	Dilution Factor:	20
QC Batch ID#:	614	Matrix:	Water
		Time of Analysis:	1313

Number	Compound	Quantitation Limit (ug/L)	Results Concentration (ug/L)
1	Aroclor 1016	0.50	BQL
2	Aroclor 1221	0.50	BQL
3	Aroclor 1232	0.50	BQL
4	Aroclor 1242	0.50	240
5	Aroclor 1248	0.50	BQL
6	Aroclor 1254	1.0	BQL
7	Aroclor 1260	1.0	BQL

Surrogate Compounds:	Acceptance Criteria	% Recovery
Tetrachloro-m-xylene	60 - 150	100
Decachlorobiphenyl	60 - 150	155 *

Comments:
Sample specific quantitation limits may be calculated by multiplying the quantitation limit by the dilution factor and/or moisture correction factor where reported.
BQL = Below Quantitation Limit
* = outside method recovery limits
Lower initial volume extracted due to limited sample volume.

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Industrial & Environmental Analysts, Inc. (IEA)
GC SEMIVOLATILE SW-846 METHOD 8081 PCB in WATER

IEA Project Number:	2436-004	Date Received:	N/A
IEA Sample Number:	9710228	Date Sampled:	N/A
Client Name:	Focus Environmental, Inc.	Date Extracted:	10/23/97
Client Project ID:	772686.01000000 FOCUS-ACS	Date Analyzed:	10/24/97
Sample Identification:	QC Blank	Analysis By:	Briggs
Associated QC Blank:	PB622	Dilution Factor:	1.0
QC Batch ID#:	622	Matrix:	Water
		Time of Analysis:	1439

Number	Compound	Quantitation Limit (ug/L)	Results Concentration (ug/L)
1	Aroclor 1016	0.50	BQL
2	Aroclor 1221	0.50	BQL
3	Aroclor 1232	0.50	BQL
4	Aroclor 1242	0.50	BQL
5	Aroclor 1248	0.50	BQL
6	Aroclor 1254	1.0	BQL
7	Aroclor 1260	1.0	BQL

Surrogate Compounds:	Acceptance Criteria	% Recovery
Tetrachloro-m-xylene	60 - 150	101
Decachlorobiphenyl	60 - 150	102

Comments:
Sample specific quantitation limits may be calculated by multiplying the quantitation limit by the dilution factor and/or moisture correction factor where reported.
BQL = Below Quantitation Limit
N/A = Not Applicable
Corresponding Samples: 9710228-15, 16, 17

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Industrial & Environmental Analysts, Inc. (IEA)
GC SEMIVOLATILE SW-846 METHOD 8081 PCB in WATER

IEA Project Number:	2436-004	Date Received:	N/A
IEA Sample Number:	9710228	Date Sampled:	N/A
Client Name:	Focus Environmental, Inc.	Date Extracted:	10/15/97
Client Project ID:	772686.01000000 FOCUS-ACS	Date Analyzed:	10/17/97
Sample Identification:	QC Blank	Analysis By:	Briggs
Associated QC Blank:	PB614	Dilution Factor:	1.0
QC Batch ID#:	614	Matrix:	Water
		Time of Analysis:	1517

Number	Compound	Quantitation Limit (ug/L)	Results Concentration (ug/L)
1	Aroclor 1016	0.50	BQL
2	Aroclor 1221	0.50	BQL
3	Aroclor 1232	0.50	BQL
4	Aroclor 1242	0.50	BQL
5	Aroclor 1248	0.50	BQL
6	Aroclor 1254	1.0	BQL
7	Aroclor 1260	1.0	BQL

Surrogate Compounds:	Acceptance Criteria	% Recovery
Tetrachloro-m-xylene	60 - 150	97
Decachlorobiphenyl	60 - 150	102

Comments:
Sample specific quantitation limits may be calculated by multiplying the quantitation limit by the dilution factor and/or moisture correction factor where reported.
BQL = Below Quantitation Limit
N/A = Not Applicable
Corresponding Samples: 9710228-12, 13, 14

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Industrial & Environmental Analysts, Inc. (IEA)
WATER MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY
GC PCB SW-846 METHOD 8081

IEA Project No:	2436-004	Date Received:	N/A
IEA Sample No:	9710228	Date Sampled:	N/A
Client Name:	Focus Environmental, Inc.	Date Extracted:	10/15/97
Sample ID:	DI MS/MSD	MS Date Analyzed:	10/17/97
Associated QC Blank:	PB614	MSD Date Analyzed:	10/17/97
QC Batch ID:	614	MS Time Analyzed:	1406
IEA MS Sample No:	DIMS	MSD Time Analyzed:	1553
IEA MSD Sample No:	DIMSD	Dilution Factor:	1.0

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC LIMITS REC
AR1260	5.0	BQL	5.5	110	10-127

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC#	% RPD	QC LIMIT REC
AR1260	5.0	5.5	110	0	10-1

Corresponding Sample: 9710228-12, 13, 14

FORM RPCBWMS Rev. 082296

ORGANIC LAYER AND RINSE ANALYTICAL DATA

Organic Phase 900°F, Air (RTA-1) Worst Case Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

IEA Project Number: 2436-004
IEA Sample Number: 971022807
Client Name: Focus Environmental, Inc.
Client Project: 772686.01000000 FOCUS-ACS
Sample Identification: #1153-047-9
Matrix: (soil/water) WATER
% Moisture: not dec.

Date Received: 10/13/97
Date Sampled: 10/09/97
Date Analyzed: 10/21/97
Lab File ID: 1020W09.D
Analyst: CREWES
Dilution Factor: 25000.0

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
67-64-1	Acetone	50	2700000	
107-13-1	Acrylonitrile	5	120000	U
107-05-1	Allyl Chloride	5	120000	U
71-43-2	Benzene	5	140000	
108-86-1	Bromobenzene	5	120000	U
74-97-5	Bromochloromethane	5	120000	U
75-27-4	Bromodichloromethane	5	120000	U
75-25-2	Bromoform	5	120000	U
74-83-9	Bromomethane	10	250000	U
78-93-3	2-Butanone	10	250000	U
104-51-8	N-Butylbenzene	5	120000	U
135-98-8	Sec-Butylbenzene	5	120000	U
98-06-6	Tert-Butylbenzene	5	120000	U
75-15-0	Carbon Disulfide	5	120000	U
56-23-5	Carbon Tetrachloride	5	120000	U
108-90-7	Chlorobenzene	5	120000	U
124-48-1	Chlorodibromomethane	5	120000	U
75-00-3	Chloroethane	10	250000	U
110-75-8	2-Chloroethyl Vinyl Ether	10	250000	U
67-66-3	Chloroform	5	120000	U
74-87-3	Chloromethane	10	250000	U
95-49-8	2-Chlorotoluene	5	120000	U
106-43-4	4-Chlorotoluene	5	120000	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	120000	U
106-93-4	1,2-Dibromoethane	5	120000	U
74-95-3	Dibromomethane	5	120000	U
95-50-1	1,2-Dichlorobenzene	5	140000	
541-73-1	1,3-Dichlorobenzene	5	120000	U
106-46-7	1,4-Dichlorobenzene	5	120000	U
75-71-8	Dichlorodifluoromethane	10	250000	U
75-34-3	1,1-Dichloroethane	5	120000	U
107-06-2	1,2-Dichloroethane	5	120000	U
75-35-4	1,1-Dichloroethene	5	120000	U
156-59-2	Cis-1,2-Dichloroethene	5	120000	U

Organic Phase 900°F, Air (RTAI) Worst Case Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

IEA Project Number: 2436-004 | Date Received: 10/13/97

IEA Sample Number: 971022807 | Date Sampled: 10/09/97

Client Name: Focus Environmental, Inc. | Date Analyzed: 10/21/97

Client Project: 772686.01000000 FOCUS-ACS | Lab File ID: 1020W09.D

Sample Identification: #1153-047-9 | Analyst: CREWES

Matrix: (soil/water) WATER | Dilution Factor: 25000.0

% Moisture: not dec.

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
156-60-5	Trans-1,2-Dichloroethene	5	120000	U
78-87-5	1,2-Dichloropropane	5	120000	U
142-28-9	1,3-Dichloropropane	5	120000	U
594-20-7	2,2-Dichloropropane	5	120000	U
563-58-6	1,1-Dichloropropene	5	120000	U
10061-01-5	Cis-1,3-Dichloropropene	5	120000	U
10061-02-6	Trans-1,3-Dichloropropene	5	120000	U
110-57-6	Cis-1,4-Dichloro-2-Butene	5	120000	U
110-57-6	Trans-1,4-Dichloro-2-Butene	5	120000	U
100-41-4	Ethylbenzene	5	160000	
97-63-2	Ethyl Methacrylate	5	120000	U
87-68-3	Hexachlorobutadiene	5	120000	U
591-78-6	2-Hexanone	10	250000	U
74-88-4	Iodomethane	5	120000	U
98-82-8	Isopropylbenzene	5	120000	U
99-87-6	P-Isopropyltoluene	5	120000	U
126-98-7	Methacrylonitrile	5	120000	U
75-09-2	Methylene Chloride	10	250000	U
80-62-6	Methyl Methacrylate	5	120000	U
108-10-1	4-Methyl-2-Pentanone	10	250000	U
1634-04-4	Methyl-tert-Butyl ether	5	120000	U
91-20-3	Naphthalene	5	280000	
76-01-7	Pentachloroethane	5	120000	U
103-65-1	N-Propylbenzene	5	120000	U
100-42-5	Styrene	5	220000	
630-20-6	1,1,1,2-Tetrachloroethane	5	120000	U
79-34-5	1,1,2,2-Tetrachloroethane	5	120000	U
127-18-4	Tetrachloroethene	5	120000	U
108-88-3	Toluene	5	240000	
87-61-6	1,2,3-Trichlorobenzene	5	120000	U
120-82-1	1,2,4-Trichlorobenzene	5	120000	U
71-55-6	1,1,1-Trichloroethane	5	120000	U
79-00-5	1,1,2-Trichloroethane	5	120000	U
79-01-6	Trichloroethene	5	120000	U

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

Organic Phase 900°F, Air (RTAI) Worst Case Air

IEA Project Number: 2436-004 | Date Received: 10/13/97

IEA Sample Number: 971022807 | Date Sampled: 10/09/97

Client Name: Focus Environmental, Inc. | Date Analyzed: 10/21/97

Client Project: 772686.01000000 FOCUS-ACS | Lab File ID: 1020W09.D

Sample Identification: #1153-047-9 | Analyst: CREWES

Matrix: (soil/water) WATER | Dilution Factor: 25000.0

% Moisture: not dec.

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
75-69-4	Trichlorofluoromethane	5	120000	U
96-18-4	1,2,3-Trichloropropane	5	120000	U
95-63-6	1,2,4-Trimethylbenzene	5	280000	
108-67-8	1,3,5-Trimethylbenzene	5	120000	U
108-05-4	Vinyl Acetate	10	250000	U
75-01-4	Vinyl Chloride	10	250000	U
1330-20-7	Xylene (Total)	5	450000	

1E

CLIENT SAMPLE NO.

SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

#1153-047-9 Organic Phase 900°F, Air

Lab Name: IEA-NC Method: 8260

Lab Code: IEA Case No.: 2436-004 SDG No.: 10228

Matrix: (soil/water) WATER Lab Sample ID: 971022807

Sample wt/vol: 5 (g/mL) ml Lab File ID: 1020W09.D

Level: (low/med) LOW Date Received: 10/13/97

% Moisture: not dec. Date Analyzed: 10/21/97

GC Column: DB-624 ID: .530(mm) Dilution Factor: 25000.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs Found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/l

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
000124-18-5	DECANE	20.88	250000	JN
	ETHYL METHYL BENZENE	21.40	200000	J
000526-73-8	BENZENE, 1,2,3-TRIMETHYL-	22.52	280000	JN
001074-43-7	BENZENE, 1-METHYL-3-PROPYL-	22.88	160000	JN
000105-05-5	BENZENE, 1,4-DIETHYL-	22.98	210000	JN
000629-50-5	TRIDECANE	23.11	210000	JN
	ETHYL DIMETHYL BENZENE	23.76	190000	J
	TETRAMETHYL BENZENE	24.63	140000	J
	TETRAMETHYL BENZENE	24.75	200000	J
	TETRAMETHYL BENZENE	25.77	150000	J

Organic Phase 900°F, N_2 (RTAN) Worst Case Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

IEA Project Number: 2436-004
IEA Sample Number: 971022808
Client Name: Focus Environmental, Inc.
Client Project: 772686.01000000 FOCUS-ACS
Sample Identification: #1153-047-14
Matrix: (soil/water) WATER
% Moisture: not dec.

Date Received: 10/13/97
Date Sampled: 10/09/97
Date Analyzed: 10/17/97
Lab File ID: 1016W09.D
Analyst: CREWES
Dilution Factor: 100000.0

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
67-64-1	Acetone	50	5000000	U
107-13-1	Acrylonitrile	5	500000	U
107-05-1	Allyl Chloride	5	500000	U
71-43-2	Benzene	5	3600000	
108-86-1	Bromobenzene	5	500000	U
74-97-5	Bromochloromethane	5	500000	U
75-27-4	Bromodichloromethane	5	500000	U
75-25-2	Bromoform	5	500000	U
74-83-9	Bromomethane	10	1000000	U
78-93-3	2-Butanone	10	1000000	U
104-51-8	N-Butylbenzene	5	500000	U
135-98-8	Sec-Butylbenzene	5	500000	U
98-06-6	Tert-Butylbenzene	5	500000	U
75-15-0	Carbon Disulfide	5	500000	U
56-23-5	Carbon Tetrachloride	5	500000	U
108-90-7	Chlorobenzene	5	500000	U
124-48-1	Chlorodibromomethane	5	500000	U
75-00-3	Chloroethane	10	1000000	U
110-75-8	2-Chloroethyl Vinyl Ether	10	1000000	U
67-66-3	Chloroform	5	500000	U
74-87-3	Chloromethane	10	1000000	U
95-49-8	2-Chlorotoluene	5	500000	U
106-43-4	4-Chlorotoluene	5	500000	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	500000	U
106-93-4	1,2-Dibromoethane	5	500000	U
74-95-3	Dibromomethane	5	500000	U
95-50-1	1,2-Dichlorobenzene	5	3300000	
541-73-1	1,3-Dichlorobenzene	5	500000	U
106-46-7	1,4-Dichlorobenzene	5	500000	U
75-71-8	Dichlorodifluoromethane	10	1000000	U
75-34-3	1,1-Dichloroethane	5	500000	U
107-06-2	1,2-Dichloroethane	5	500000	U
75-35-4	1,1-Dichloroethene	5	500000	U
156-59-2	Cis-1,2-Dichloroethene	5	500000	U

Organic Phase 900°F, N_2 (RTAN) Worst Case Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

IEA Project Number: 2436-004 | Date Received: 10/13/97

IEA Sample Number: 971022808 | Date Sampled: 10/09/97

Client Name: Focus Environmental, Inc. | Date Analyzed: 10/17/97

Client Project: 772686.01000000 FOCUS-ACS | Lab File ID: 1016W09.D

Sample Identification: #1153-047-14 | Analyst: CREWES

Matrix: (soil/water) WATER | Dilution Factor: 100000.0

% Moisture: not dec.

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
156-60-5	Trans-1,2-Dichloroethene	5	500000	U
78-87-5	1,2-Dichloropropane	5	500000	U
142-28-9	1,3-Dichloropropane	5	500000	U
594-20-7	2,2-Dichloropropane	5	500000	U
563-58-6	1,1-Dichloropropene	5	500000	U
10061-01-5	Cis-1,3-Dichloropropene	5	500000	U
10061-02-6	Trans-1,3-Dichloropropene	5	500000	U
110-57-6	Cis-1,4-Dichloro-2-Butene	5	500000	U
110-57-6	Trans-1,4-Dichloro-2-Butene	5	500000	U
100-41-4	Ethylbenzene	5	3900000	
97-63-2	Ethyl Methacrylate	5	500000	U
87-68-3	Hexachlorobutadiene	5	500000	U
591-78-6	2-Hexanone	10	1000000	U
74-88-4	Iodomethane	5	500000	U
98-82-8	Isopropylbenzene	5	660000	
99-87-6	P-Isopropyltoluene	5	500000	U
126-98-7	Methacrylonitrile	5	500000	U
75-09-2	Methylene Chloride	10	1000000	U
80-62-6	Methyl Methacrylate	5	840000	
108-10-1	4-Methyl-2-Pentanone	10	1000000	U
1634-04-4	Methyl-tert-Butyl ether	5	500000	U
91-20-3	Naphthalene	5	7300000	
76-01-7	Pentachloroethane	5	500000	U
103-65-1	N-Propylbenzene	5	1100000	
100-42-5	Styrene	5	5800000	
630-20-6	1,1,1,2-Tetrachloroethane	5	500000	U
79-34-5	1,1,2,2-Tetrachloroethane	5	500000	U
127-18-4	Tetrachloroethene	5	500000	U
108-88-3	Toluene	5	15000000	
87-61-6	1,2,3-Trichlorobenzene	5	500000	U
120-82-1	1,2,4-Trichlorobenzene	5	580000	
71-55-6	1,1,1-Trichloroethane	5	500000	U
79-00-5	1,1,2-Trichloroethane	5	500000	U
79-01-6	Trichloroethene	5	500000	U

Organic Phase 900°F, N_2 (RTAN) Worst Case Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

IEA Project Number: 2436-004
IEA Sample Number: 971022808
Client Name: Focus Environmental, Inc.
Client Project: 772686.01000000 FOCUS-ACS
Sample Identification: #1153-047-14
Matrix: (soil/water) WATER
% Moisture: not dec.

Date Received: 10/13/97
Date Sampled: 10/09/97
Date Analyzed: 10/17/97
Lab File ID: 1016W09.D
Analyst: CREWES
Dilution Factor: 100000.0

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
75-69-4	Trichlorofluoromethane	5	500000	U
96-18-4	1,2,3-Trichloropropane	5	500000	U
95-63-6	1,2,4-Trimethylbenzene	5	6900000	
108-67-8	1,3,5-Trimethylbenzene	5	1800000	
108-05-4	Vinyl Acetate	10	1000000	U
75-01-4	Vinyl Chloride	10	1000000	U
1330-20-7	Xylene (Total)	5	11000000	

1E

SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

#1153-047-14

Lab Name: IEA-NC Method: 8260

Lab Code: IEA Case No.: 2436-004 SDG No.: 10228

Matrix: (soil/water) WATER Lab Sample ID: 971022808

Sample wt/vol: 5 (g/mL) ml Lab File ID: 1016W09.D

Level: (low/med) LOW Date Received: 10/13/97

% Moisture: not dec. Date Analyzed: 10/17/97

GC Column: DB-624 ID: .530(mm) Dilution Factor: 100000.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs Found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/l

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
000611-14-3	BENZENE, 1-ETHYL-2-METHYL-	20.82	5100000	JN
000124-18-5	DECANE	20.88	4600000	JN
000620-14-4	BENZENE, 1-ETHYL-3-METHYL-	21.39	5000000	JN
	TRIMETHYL BENZENE	22.53	6800000	J
001074-43-7	BENZENE, 1-METHYL-3-PROPYL-	22.88	4200000	JN
001758-88-9	BENZENE, 2-ETHYL-1,4-DIMETHY	23.76	4100000	JN
000488-23-3	BENZENE, 1,2,3,4-TETRAMETHYL	24.62	3300000	JN
	UNKNOWN	25.45	3400000	J
000095-93-2	BENZENE, 1,2,4,5-TETRAMETHYL	25.77	3900000	JN
	UNKNOWN	25.85	2600000	J

Organic Phase and Rinse 900°F, Air (RTA1) Worst Case Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8270

IEA Project Number: 2436-004
IEA Sample Number: 971022816
Client Name: Focus Environmental, Inc.
Client Project: 772686.01000000 FOCUS-ACS
Sample Identification: #1153-047-10
Matrix: (soil/water) WATER
% Moisture: not dec.

Date Received: 10/13/97
Date Sampled: 10/09/97
Date Analyzed: 11/04/97
Date Extracted: 10/16/97
Lab File ID: 1104605.D
Dilution Factor: 1.0
Analyst: VAN LARE

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
108-95-2	Phenol	10	170000	
111-44-4	Bis(2-Chloroethyl)Ether	10	100000	U
95-57-8	2-Chlorophenol	10	100000	U
541-73-1	1,3-Dichlorobenzene	10	100000	U
106-46-7	1,4-Dichlorobenzene	10	100000	U
95-50-1	1,2-Dichlorobenzene	10	100000	U
95-48-7	2-Methylphenol	10	100000	U
108-60-1	Bis(2-Chloroisopropyl)Ether	10	100000	U
106-44-5	4-Methylphenol	10	100000	
621-64-7	N-Nitroso-Di-N-Propylamine	10	100000	U
67-72-1	Hexachloroethane	10	100000	U
98-95-3	Nitrobenzene	10	100000	U
78-59-1	Isophorone	10	200000	
88-75-5	2-Nitrophenol	10	100000	U
105-67-9	2,4-Dimethylphenol	10	100000	U
111-91-1	Bis(2-Chloroethoxy)Methane	10	100000	U
120-83-2	2,4-Dichlorophenol	10	100000	U
120-82-1	1,2,4-Trichlorobenzene	10	100000	U
91-20-3	Naphthalene	10	160000	
106-47-8	4-Chloroaniline	20	200000	U
87-68-3	Hexachlorobutadiene	10	100000	U
59-50-7	4-Chloro-3-Methylphenol	10	100000	U
91-57-6	2-Methylnaphthalene	10	100000	U
77-47-4	Hexachlorocyclopentadiene	10	100000	U
88-06-2	2,4,6-Trichlorophenol	10	100000	U
95-95-4	2,4,5-Trichlorophenol	10	100000	U
91-58-7	2-Chloronaphthalene	10	100000	U
88-74-4	2-Nitroaniline	50	500000	U
131-11-3	Dimethylphthalate	10	100000	U
208-96-8	Acenaphthylene	10	100000	U
606-20-2	2,6-Dinitrotoluene	10	100000	U
99-09-2	3-Nitroaniline	50	500000	U
83-32-9	Acenaphthene	10	100000	U

Organic Phase and Rinse 900°F, Air (RTAI) Worst Case Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8270

IEA Project Number: 2436-004
IEA Sample Number: 971022816
Client Name: Focus Environmental, Inc.
Client Project: 772686.01000000 FOCUS-ACS
Sample Identification: #1153-047-10
Matrix: (soil/water) WATER
% Moisture: not dec.

Date Received: 10/13/97
Date Sampled: 10/09/97
Date Analyzed: 11/04/97
Date Extracted: 10/16/97
Lab File ID: 1104605.D
Dilution Factor: 1.0
Analyst: VAN LARE

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
51-28-5	2,4-Dinitrophenol	50	500000	U
100-02-7	4-Nitrophenol	50	500000	U
132-64-9	Dibenzofuran	10	100000	U
121-14-2	2,4-Dinitrotoluene	10	100000	U
84-66-2	Diethylphthalate	10	100000	U
7005-72-3	4-Chlorophenyl-phenylether	10	100000	U
86-73-7	Fluorene	10	100000	U
100-01-6	4-Nitroaniline	50	500000	U
534-52-1	4,6-Dinitro-2-Methylphenol	10	100000	U
86-30-6	N-Nitrosodiphenylamine (1)	10	100000	U
101-55-3	4-Bromophenyl-phenylether	10	100000	U
118-74-1	Hexachlorobenzene	10	100000	U
87-86-5	Pentachlorophenol	50	500000	U
85-01-8	Phenanthrene	10	100000	U
120-12-7	Anthracene	10	100000	U
84-74-2	Di-N-Butylphthalate	10	150000	
206-44-0	Fluoranthene	10	100000	U
129-00-0	Pyrene	10	100000	U
85-68-7	Butylbenzylphthalate	10	100000	U
91-94-1	3,3'-Dichlorobenzidine	20	200000	U
56-55-3	Benzo(a)Anthracene	10	100000	U
218-01-9	Chrysene	10	100000	U
117-81-7	Bis(2-Ethylhexyl)Phthalate	10	170000	
117-84-0	Di-N-Octylphthalate	10	100000	U
205-99-2	Benzo(b)Fluoranthene	10	100000	U
207-08-9	Benzo(k)Fluoranthene	10	100000	U
50-32-8	Benzo(a)Pyrene	10	100000	U
193-39-5	Indeno(1,2,3-Cd)Pyrene	10	100000	U
53-70-3	Dibenz(A,H)Anthracene	10	100000	U
191-24-2	Benzo(G,H,I)Perylene	10	100000	U
100-51-6	Benzyl Alcohol	20	200000	U
65-85-0	Benzoic Acid	50	500000	U

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SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

#1153-047-10 Org. Phase + Rinse 900°F, Air

Lab Name: IEA-NC Method: 8270

Lab Code: IEA Case No.: 2436-004 SDG No.: 10228

Matrix: (soil/water) WATER Lab Sample ID: 971022816

Sample wt/vol: 1 (g/mL) ml Lab File ID: 1104605.D

Level: (low/med) LOW Date Received: 10/13/97

% Moisture: decanted: (Y/N) Date Extracted: 10/16/97

Concentrated Extract Volume: 10000(uL) Date Analyzed: 11/04/97

Injection Volume: 2 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs Found: 20

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/l

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	UNKNOWN	6.84	150000	J
	TRIMETHYL BENZENE ISOMER	8.23	120000	J
	TRIMETHYL BENZENE ISOMER	9.37	110000	J
	UNKNOWN ALKANE	10.61	200000	J
	SUBSTITUTED BENZENE	10.97	110000	J
	UNKNOWN	11.36	140000	J
	SUBSTITUTED PHENOL	11.81	190000	J
000618-45-1	PHENOL, 3-(1-METHYLETHYL)-	12.69	110000	JN
001450-74-4	ETHANONE, 1-(5-CHLORO-2-HYDR	15.11	180000	JN
000101-84-8	DIPHENYL ETHER	15.22	690000	JN
	UNKNOWN	15.50	180000	J
000085-41-6	1H-ISOINDOLE-1,3(2H)-DIONE	16.04	250000	JN
000112-39-0	HEXADECANOIC ACID, METHYL ES	20.98	170000	JNX
000057-10-3	HEXADECANOIC ACID	21.35	190000	JNX
	UNKNOWN	22.54	110000	J
	UNKNOWN ACID	22.67	250000	J
	UNKNOWN	23.05	380000	J
000057-11-4	OCTADECANOIC ACID	23.23	160000	JN
	UNKNOWN	23.41	130000	J
	UNKNOWN ALKENE	24.93	450000	J

Organic Phase and Rinse (RTAN) 900°F, N_2

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8270

Worst Case Soil

IEA Project Number: 2436-004
IEA Sample Number: 971022817
Client Name: Focus Environmental, Inc.
Client Project: 772686.01000000 FOCUS-ACS
Sample Identification: #1153-047-16
Matrix: (soil/water) WATER
% Moisture: not dec.

Date Received: 10/13/97
Date Sampled: 10/09/97
Date Analyzed: 11/04/97
Date Extracted: 10/16/97
Lab File ID: 1104606.D
Dilution Factor: 1.0
Analyst: VAN LARE

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
108-95-2	Phenol	10	220000	
111-44-4	Bis(2-Chloroethyl)Ether	10	100000	U
95-57-8	2-Chlorophenol	10	100000	U
541-73-1	1,3-Dichlorobenzene	10	100000	U
106-46-7	1,4-Dichlorobenzene	10	100000	U
95-50-1	1,2-Dichlorobenzene	10	100000	
95-48-7	2-Methylphenol	10	100000	
108-60-1	Bis(2-Chloroisopropyl)Ether	10	100000	U
106-44-5	4-Methylphenol	10	140000	
621-64-7	N-Nitroso-Di-N-Propylamine	10	100000	U
67-72-1	Hexachloroethane	10	100000	U
98-95-3	Nitrobenzene	10	100000	U
78-59-1	Isophorone	10	230000	
88-75-5	2-Nitrophenol	10	100000	U
105-67-9	2,4-Dimethylphenol	10	100000	U
111-91-1	Bis(2-Chloroethoxy)Methane	10	100000	U
120-83-2	2,4-Dichlorophenol	10	100000	U
120-82-1	1,2,4-Trichlorobenzene	10	100000	U
91-20-3	Naphthalene	10	180000	
106-47-8	4-Chloroaniline	20	200000	U
87-68-3	Hexachlorobutadiene	10	100000	U
59-50-7	4-Chloro-3-Methylphenol	10	100000	U
91-57-6	2-Methylnaphthalene	10	100000	U
77-47-4	Hexachlorocyclopentadiene	10	100000	U
88-06-2	2,4,6-Trichlorophenol	10	100000	U
95-95-4	2,4,5-Trichlorophenol	10	100000	U
91-58-7	2-Chloronaphthalene	10	100000	U
88-74-4	2-Nitroaniline	50	500000	U
131-11-3	Dimethylphthalate	10	110000	
208-96-8	Acenaphthylene	10	100000	U
606-20-2	2,6-Dinitrotoluene	10	100000	U
99-09-2	3-Nitroaniline	50	500000	U
83-32-9	Acenaphthene	10	100000	U

Organic Phase and Rinse 900°F, N_2 (RTAN) Worst Case Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8270

IEA Project Number: 2436-004
IEA Sample Number: 971022817
Client Name: Focus Environmental, Inc.
Client Project: 772686.01000000 FOCUS-ACS
Sample Identification: #1153-047-16
Matrix: (soil/water) WATER
% Moisture: not dec.

Date Received: 10/13/97
Date Sampled: 10/09/97
Date Analyzed: 11/04/97
Date Extracted: 10/16/97
Lab File ID: 1104606.D
Dilution Factor: 1.0
Analyst: VAN LARE

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
51-28-5	2,4-Dinitrophenol	50	500000	U
100-02-7	4-Nitrophenol	50	500000	U
132-64-9	Dibenzofuran	10	100000	U
121-14-2	2,4-Dinitrotoluene	10	100000	U
84-66-2	Diethylphthalate	10	100000	U
7005-72-3	4-Chlorophenyl-phenylether	10	100000	U
86-73-7	Fluorene	10	100000	U
100-01-6	4-Nitroaniline	50	500000	U
534-52-1	4,6-Dinitro-2-Methylphenol	10	100000	U
86-30-6	N-Nitrosodiphenylamine (1)	10	100000	U
101-55-3	4-Bromophenyl-phenylether	10	100000	U
118-74-1	Hexachlorobenzene	10	100000	U
87-86-5	Pentachlorophenol	50	500000	U
85-01-8	Phenanthrene	10	100000	U
120-12-7	Anthracene	10	100000	U
84-74-2	Di-N-Butylphthalate	10	200000	
206-44-0	Fluoranthene	10	100000	U
129-00-0	Pyrene	10	100000	U
85-68-7	Butylbenzylphthalate	10	100000	U
91-94-1	3,3'-Dichlorobenzidine	20	200000	U
56-55-3	Benzo(a)Anthracene	10	100000	U
218-01-9	Chrysene	10	100000	U
117-81-7	Bis(2-Ethylhexyl)Phthalate	10	230000	
117-84-0	Di-N-Octylphthalate	10	100000	U
205-99-2	Benzo(b)Fluoranthene	10	100000	U
207-08-9	Benzo(k)Fluoranthene	10	100000	U
50-32-8	Benzo(a)Pyrene	10	100000	U
193-39-5	Indeno(1,2,3-Cd)Pyrene	10	100000	U
53-70-3	Dibenz(A,H)Anthracene	10	100000	U
191-24-2	Benzo(G,H,I)Perylene	10	100000	U
100-51-6	Benzyl Alcohol	20	200000	U
65-85-0	Benzoic Acid	50	500000	U

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CLIENT SAMPLE NO.

SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

#1153-047-16 Org. Phase + Rinse 900°F, N_2

Lab Name: IEA-NC Method: 8270

Lab Code: IEA Case No.: 2436-004 SDG No.: 10228

Matrix: (soil/water) WATER Lab Sample ID: 971022817

Sample wt/vol: 1 (g/mL) ml Lab File ID: 1104606.D

Level: (low/med) LOW Date Received: 10/13/97

% Moisture: decanted: (Y/N) Date Extracted: 10/16/97

Concentrated Extract Volume: 10000(uL) Date Analyzed: 11/04/97

Injection Volume: 2 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs Found: 20

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/l

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	UNKNOWN	6.84	200000	J
	TRIMETHYL BENZENE ISOMER	9.39	130000	J
	UNKNOWN ALKANE	10.61	200000	J
	SUBSTITUTED BENZENE	11.37	160000	J
	SUBSTITUTED BENZENE	11.55	170000	J
	SUBSTITUTED PHENOL	11.81	200000	J
000618-45-1	PHENOL, 3-(1-METHYLETHYL)-	12.69	160000	JN
001450-74-4	ETHANONE, 1-(5-CHLORO-2-HYDR	15.12	260000	JN
	UNKNOWN	15.51	240000	J
000085-41-6	1H-ISOINDOLE-1,3(2H)-DIONE	16.07	380000	JN
	UNKNOWN ALKENE	17.36	140000	J
000112-39-0	HEXADECANOIC ACID, METHYL ES	20.97	190000	JNX
000057-10-3	HEXADECANOIC ACID	21.37	290000	JNX
	UNKNOWN	22.54	160000	J
	UNKNOWN ACID	22.68	150000	J
	UNKNOWN	23.06	620000	J
000057-11-4	OCTADECANOIC ACID	23.24	160000	JN
	UNKNOWN	23.42	180000	J
	METHYLATED PAH	24.06	150000	J
	UNKNOWN ACID	24.94	640000	J

Solvent Rinse 700°F, Air (RTA2)

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8270

Typical Case Soil

IEA Project Number: 2436-004
IEA Sample Number: 971022815
Client Name: Focus Environmental, Inc.
Client Project: 772686.01000000 FOCUS-ACS
Sample Identification: #1153-047-3
Matrix: (soil/water) WATER
% Moisture: not dec.

Date Received: 10/13/97
Date Sampled: 10/09/97
Date Analyzed: 11/04/97
Date Extracted: 10/16/97
Lab File ID: 1104604.D
Dilution Factor: 1.0
Analyst: VAN LARE

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
108-95-2	Phenol	10	100000	U
111-44-4	Bis(2-Chloroethyl)Ether	10	100000	U
95-57-8	2-Chlorophenol	10	100000	U
541-73-1	1,3-Dichlorobenzene	10	100000	U
106-46-7	1,4-Dichlorobenzene	10	100000	U
95-50-1	1,2-Dichlorobenzene	10	100000	U
95-48-7	2-Methylphenol	10	100000	U
108-60-1	Bis(2-Chloroisopropyl)Ether	10	100000	U
106-44-5	4-Methylphenol	10	100000	U
621-64-7	N-Nitroso-Di-N-Propylamine	10	100000	U
67-72-1	Hexachloroethane	10	100000	U
98-95-3	Nitrobenzene	10	100000	U
78-59-1	Isophorone	10	100000	
88-75-5	2-Nitrophenol	10	100000	U
105-67-9	2,4-Dimethylphenol	10	100000	U
111-91-1	Bis(2-Chloroethoxy)Methane	10	100000	U
120-83-2	2,4-Dichlorophenol	10	100000	U
120-82-1	1,2,4-Trichlorobenzene	10	100000	U
91-20-3	Naphthalene	10	120000	
106-47-8	4-Chloroaniline	20	200000	U
87-68-3	Hexachlorobutadiene	10	100000	U
59-50-7	4-Chloro-3-Methylphenol	10	100000	U
91-57-6	2-Methylnaphthalene	10	100000	U
77-47-4	Hexachlorocyclopentadiene	10	100000	U
88-06-2	2,4,6-Trichlorophenol	10	100000	U
95-95-4	2,4,5-Trichlorophenol	10	100000	U
91-58-7	2-Chloronaphthalene	10	100000	U
88-74-4	2-Nitroaniline	50	500000	U
131-11-3	Dimethylphthalate	10	100000	U
208-96-8	Acenaphthylene	10	100000	U
606-20-2	2,6-Dinitrotoluene	10	100000	U
99-09-2	3-Nitroaniline	50	500000	U
83-32-9	Acenaphthene	10	100000	U

Solvent Rinse 700°F, Air (RTA2) Typical Case Soil

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8270

IEA Project Number: 2436-004
IEA Sample Number: 971022815
Client Name: Focus Environmental, Inc.
Client Project: 772686.01000000 FOCUS-ACS
Sample Identification: #1153-047-3
Matrix: (soil/water) WATER
% Moisture: not dec.

Date Received: 10/13/97
Date Sampled: 10/09/97
Date Analyzed: 11/04/97
Date Extracted: 10/16/97
Lab File ID: 1104604.D
Dilution Factor: 1.0
Analyst: VAN LARE

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
51-28-5	2,4-Dinitrophenol	50	500000	U
100-02-7	4-Nitrophenol	50	500000	U
132-64-9	Dibenzofuran	10	100000	U
121-14-2	2,4-Dinitrotoluene	10	100000	U
84-66-2	Diethylphthalate	10	100000	U
7005-72-3	4-Chlorophenyl-phenylether	10	100000	U
86-73-7	Fluorene	10	100000	U
100-01-6	4-Nitroaniline	50	500000	U
534-52-1	4,6-Dinitro-2-Methylphenol	10	100000	U
86-30-6	N-Nitrosodiphenylamine (1)	10	100000	U
101-55-3	4-Bromophenyl-phenylether	10	100000	U
118-74-1	Hexachlorobenzene	10	100000	U
87-86-5	Pentachlorophenol	50	500000	U
85-01-8	Phenanthrene	10	100000	U
120-12-7	Anthracene	10	100000	U
84-74-2	Di-N-Butylphthalate	10	100000	U
206-44-0	Fluoranthene	10	100000	U
129-00-0	Pyrene	10	100000	U
85-68-7	Butylbenzylphthalate	10	100000	U
91-94-1	3,3'-Dichlorobenzidine	20	200000	U
56-55-3	Benzo(a)Anthracene	10	100000	U
218-01-9	Chrysene	10	100000	U
117-81-7	Bis(2-Ethylhexyl)Phthalate	10	100000	
117-84-0	Di-N-Octylphthalate	10	100000	U
205-99-2	Benzo(b)Fluoranthene	10	100000	U
207-08-9	Benzo(k)Fluoranthene	10	100000	U
50-32-8	Benzo(a)Pyrene	10	100000	U
193-39-5	Indeno(1,2,3-Cd)Pyrene	10	100000	U
53-70-3	Dibenz(A,H)Anthracene	10	100000	U
191-24-2	Benzo(G,H,I)Perylene	10	100000	U
100-51-6	Benzyl Alcohol	20	200000	U
65-85-0	Benzoic Acid	50	500000	U

1F

CLIENT SAMPLE NO.

SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

#1153-047-3 Solvent Rinse 700°F, Air

Lab Name: IEA-NC Method: 8270

Lab Code: IEA Case No.: 2436-004 SDG No.: 10228

Matrix: (soil/water) WATER Lab Sample ID: 971022815

Sample wt/vol: 1 (g/mL) ml Lab File ID: 1104604.D

Level: (low/med) LOW Date Received: 10/13/97

% Moisture: decanted: (Y/N) Date Extracted: 10/16/97

Concentrated Extract Volume: 10000(uL) Date Analyzed: 11/04/97

Injection Volume: 2 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs Found: 20

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/l

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	UNKNOWN	6.85	55000	J
	SUBSTITUTED BENZENE	8.24	80000	J
	TRIMETHYL BENZENE ISOMER	8.37	73000	J
000097-88-1	2-PROPENOIC ACID, 2-METHYL-,	8.56	76000	JN
	UNKNOWN ALKANE	8.89	94000	
	TRIMETHYL BENZENE ISOMER	9.38	92000	J
	SUBSTITUTED BENZENE	9.86	120000	J
	SUBSTITUTED BENZENE	10.14	58000	J
	UNKNOWN ALKANE	10.60	200000	J
	DIMETHYL BENZENE ISOMER	10.96	88000	J
	SUBSTITUTED BENZENE	11.37	92000	J
001450-74-4	ETHANONE, 1-(5-CHLORO-2-HYDR	15.11	70000	JN
000101-84-8	DIPHENYL ETHER	15.20	310000	JN
	UNKNOWN	15.50	78000	J
000085-41-6	1H-ISOINDOLE-1,3(2H)-DIONE	16.02	170000	JN
000112-39-0	HEXADECANOIC ACID, METHYL ES	20.97	76000	JNX
000057-10-3	HEXADECANOIC ACID	21.33	51000	JNX
	UNKNOWN ACID	22.67	57000	J
	UNKNOWN	23.02	74000	J
	UNKNOWN	24.92	78000	J

2C

SW-846 WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: IEA-NC Method: 8270

Lab Code: IEA Case No.: 2436-004 SDG No.: 10228

	CLIENT SAMPLE NO.	S1 (NBZ)#	S2 (FBP)#	S3 (TPH)#	S4 (PHL)#	S5 (2FP)#	S6 (TBP)#	TOT OUT
01	SVB021	104	110	104	112D	110D	103	0
02	LCS021	97	112	109	110D	120D	98	0
03	#1153-047-3	90	105	93	114D	108D	100	0
04	#1153-047-10	102	103	97	106D	101D	94	0
05	#1153-047-16	102	113	100	108D	100	98	0
06								
07								
10								
11								
12								
13								
14								
15								
20								
21								
22								
23								
24								
25								
28								
29								
30								

		QC LIMITS
S1 (NBZ)	= Nitrobenzene-d5	(35-114)
S2 (FBP)	= 2-Fluorobiphenyl	(43-116)
S3 (TPH)	= Terphenyl-d14	(33-141)
S4 (PHL)	= Phenol-d5	(10-94)
S5 (2FP)	= 2-Fluorophenol	(21-100)
S6 (TBP)	= 2,4,6-Tribromophenol	(10-123)

Column to be used to flag recovery values
* Values outside of QC limits.
D System Monitoring Compound diluted out

FORM II SV-1

3B

CLIENT SAMPLE NO.

SW-846 SEMIVOLATILE ANALYSIS DATA SHEET

LCS021

Lab Name: IEA-NC Method: 8270

Lab Code: IEA Case No.: 2436-004 SDG No.: 10228

Matrix: (soil/water) WATER Lab Sample ID: LCS021

Sample wt/vol: 1 (g/mL) ml Lab File ID: 1031605.D

Level: (low/med) LOW Date Received:

% Moisture: decanted: (Y/N) Date Extracted: 10/16/97

Concentrated Extract Volume: 10000(uL) Date Analyzed: 10/31/97

Injection Volume: 2 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	SPIKE ug/l	AMOUNT ug/l	% RECOVERY	RECOVERY LIMITS
108-95-2	Phenol	50	57	114 110	30 - 112
111-44-4	Bis(2-Chloroethyl)Ether	50	54	108 110	12 - 158
95-57-8	2-Chlorophenol	50	58	116 120	40 - 134
541-73-1	1,3-Dichlorobenzene	50	55	110 110	10 - 124
106-46-7	1,4-Dichlorobenzene	50	54	108 110	40 - 124
95-50-1	1,2-Dichlorobenzene	50	58	116 120	32 - 129
95-48-7	2-Methylphenol	50	72	144 140	10 - 136
108-60-1	Bis(2-Chloroisopropyl)Ether	50	57	114 110	36 - 166
106-44-5	4-Methylphenol	50	65	130 130	10 - 132
621-64-7	N-Nitroso-Di-N-Propylamine	50	57	114 110	40 - 138
67-72-1	Hexachloroethane	50	65	130 130	40 - 113
98-95-3	Nitrobenzene	50	50	100 100	35 - 180
78-59-1	Isophorone	50	53	106 110	21 - [illegible]
88-75-5	2-Nitrophenol	50	47	[illegible] 94	29 - 102
105-67-9	2,4-Dimethylphenol	50	53	106 110	32 - 119
111-91-1	Bis(2-Chloroethoxy)Methane	50	52	104 100	33 - 184
120-83-2	2,4-Dichlorophenol	50	43	[illegible] 86	39 - 135
120-82-1	1,2,4-Trichlorobenzene	50	54	108 110	44 - 142
91-20-3	Naphthalene	50	52	104 100	21 - 133
106-47-8	4-Chloroaniline	50	19	38	10 - 136
87-68-3	Hexachlorobutadiene	50	57	114 110	24 - 116
59-50-7	4-Chloro-3-Methylphenol	50	47	94	40 - 147
91-57-6	2-Methylnaphthalene	50	58	116 120	10 - 136
77-47-4	Hexachlorocyclopentadiene	50	48	96	10 - 110
88-06-2	2,4,6-Trichlorophenol	50	48	96	37 - 144
95-95-4	2,4,5-Trichlorophenol	50	55	110 110	10 - 144
91-58-7	2-Chloronaphthalene	50	50	100	60 - 118
88-74-4	2-Nitroaniline	50	55	110 100	10 - 159
131-11-3	Dimethylphthalate	50	57	114 110	10 - 112
208-96-8	Acenaphthylene	50	57	114 110	40 - 145
606-20-2	2,6-Dinitrotoluene	50	50	100	50 - 158
99-09-2	3-Nitroaniline	50	43	86	10 - 173
83-32-9	Acenaphthene	50	60	[illegible] 120	47 - 145

3C

SW-846 SEMIVOLATILE ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

LCS021

Lab Name: IEA-NC Method: 8270

Lab Code: IEA Case No.: 2436-004 SDG No.: 10228

Matrix: (soil/water) WATER Lab Sample ID: LCS021

Sample wt/vol: 1 (g/mL) ml Lab File ID: 1031605.D

Level: (low/med) LOW Date Received:

% Moisture: decanted: (Y/N) Date Extracted: 10/16/97

Concentrated Extract Volume: 10000(uL) Date Analyzed: 10/31/97

Injection Volume: 2 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	SPIKE ug/l	AMOUNT ug/l	% RECOVERY	RECOVERY LIMITS
51-28-5	2,4-Dinitrophenol	50	43	86	10 - 141
100-02-7	4-Nitrophenol	50	45	90	40 - 132
132-64-9	Dibenzofuran	50	55	110	10 - 142
121-14-2	2,4-Dinitrotoluene	50	56	112 110	40 - 139
84-66-2	Diethylphthalate	50	59	118 120	10 - 114
7005-72-3	4-Chlorophenyl-phenylether	50	53	106 110	25 - 158
86-73-7	Fluorene	50	59	118 120	59 - 121
100-01-6	4-Nitroaniline	50	48	96	10 - 165
534-52-1	4,6-Dinitro-2-Methylphenol	50	46	92	10 - 155
86-30-6	N-Nitrosodiphenylamine (1)	50	51	102 100	10 - 150
101-55-3	4-Bromophenyl-phenylether	50	49	98	53 - 127
118-74-1	Hexachlorobenzene	50	51	102 100	10 - 144
87-86-5	Pentachlorophenol	50	47	94	40 - 150
85-01-8	Phenanthr ne	50	59	118 120	54 - 120
120-12-7	Anthracene	50	56	112 110	27 - 133
84-74-2	Di-N-Butylphthalate	50	53	106 110	10 - 118
206-44-0	Fluoranthene	50	53	106 110	26 - 137
129-00-0	Pyrene	50	54	108 110	52 - 115
85-68-7	Butylbenzylphthalate	50	55	110	10 - 146
91-94-1	3,3'-Dichlorobenzidine	50	47	94	10 - 157
56-55-3	Benzo(a)Anthracene	50	56	112 110	33 - 143
218-01-9	Chrysene	50	53	106 110	17 - 168
117-81-7	Bis(2-Ethylhexyl)Phthalate	50	54	108 110	10 - 145
117-84-0	Di-N-Octylphthalate	50	52	104 100	10 - 146
205-99-2	Benzo(b)Fluoranthene	50	50	100	24 - 159
207-08-9	Benzo(k)Fluoranthene	50	46	92	10 - 151
50-32-8	Benzo(a)Pyrene	50	47	94	17 - 163
193-39-5	Indeno(1,2,3-Cd)Pyrene	50	38	76	10 - 149
53-70-3	Dibenz(A,H)Anthracene	50	38	76	10 - 152
191-24-2	Benzo(G,H,I)Perylene	50	43	86	10 - 155
100-51-6	Benzyl Alcohol	50	0	0	10 - 145
65-85-0	Benzoic Acid	50	49	98	10 - 91

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8270

BLANK

IEA Project Number: 2436-004

IEA Sample Number: SVB024

Client Name: Focus Environmental, Inc.

Client Project: 772686.01000000 FOCUS-ACS

Sample Identification: SVB024

Matrix: (soil/water) SOIL

% Moisture: not dec. 0

Date Received:

Date Sampled:

Date Analyzed: 10/31/97

Date Extracted: 10/20/97

Lab File ID: 1031602.D

Dilution Factor: 1.0

Analyst: VAN LARE

CAS NO.	COMPOUND	QUANT LIMIT: ug/kg	RESULT: ug/kg	Q
108-95-2	Phenol	330	330	U
111-44-4	Bis(2-Chloroethyl)Ether	330	330	U
95-57-8	2-Chlorophenol	330	330	U
541-73-1	1,3-Dichlorobenzene	330	330	U
106-46-7	1,4-Dichlorobenzene	330	330	U
95-50-1	1,2-Dichlorobenzene	330	330	U
95-48-7	2-Methylphenol	330	330	U
108-60-1	Bis(2-Chloroisopropyl)Ether	330	330	U
106-44-5	4-Methylphenol	330	330	U
621-64-7	N-Nitroso-Di-N-Propylamine	330	330	U
67-72-1	Hexachloroethane	330	330	U
98-95-3	Nitrobenzene	330	330	U
78-59-1	Isophorone	330	330	U
88-75-5	2-Nitrophenol	330	330	U
105-67-9	2,4-Dimethylphenol	330	330	U
111-91-1	Bis(2-Chloroethoxy)Methane	330	330	U
120-83-2	2,4-Dichlorophenol	330	330	U
120-82-1	1,2,4-Trichlorobenzene	330	330	U
91-20-3	Naphthalene	330	330	U
106-47-8	4-Chloroaniline	660	660	U
87-68-3	Hexachlorobutadiene	330	330	U
59-50-7	4-Chloro-3-Methylphenol	660	660	U
91-57-6	2-Methylnaphthalene	330	330	U
77-47-4	Hexachlorocyclopentadiene	330	330	U
88-06-2	2,4,6-Trichlorophenol	330	330	U
95-95-4	2,4,5-Trichlorophenol	330	330	U
91-58-7	2-Chloronaphthalene	330	330	U
88-74-4	2-Nitroaniline	1600	1600	U
131-11-3	Dimethylphthalate	330	330	U
208-96-8	Acenaphthylene	330	330	U
606-20-2	2,6-Dinitrotoluene	330	330	U
99-09-2	3-Nitroaniline	1600	1600	U
83-32-9	Acenaphthene	330	330	U

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8270

BLANK

IEA Project Number: 2436-004

IEA Sample Number: SVB024

Client Name: Focus Environmental, Inc.

Client Project: 772686.01000000 FOCUS-ACS

Sample Identification: SVB024

Matrix: (soil/water) SOIL

% Moisture: not dec. 0

Date Received:

Date Sampled:

Date Analyzed: 10/31/97

Date Extracted: 10/20/97

Lab File ID: 1031602.D

Dilution Factor: 1.0

Analyst: VAN LARE

CAS NO.	COMPOUND	QUANT LIMIT: ug/kg	RESULT: ug/kg	Q
51-28-5	2,4-Dinitrophenol	1600	1600	U
100-02-7	4-Nitrophenol	1600	1600	U
132-64-9	Dibenzofuran	330	330	U
121-14-2	2,4-Dinitrotoluene	330	330	U
84-66-2	Diethylphthalate	330	330	U
7005-72-3	4-Chlorophenyl-phenylether	330	330	U
86-73-7	Fluorene	330	330	U
100-01-6	4-Nitroaniline	1600	1600	U
534-52-1	4,6-Dinitro-2-Methylphenol	1600	1600	U
86-30-6	N-Nitrosodiphenylamine (1)	330	330	U
101-55-3	4-Bromophenyl-phenylether	330	330	U
118-74-1	Hexachlorobenzene	330	330	U
87-86-5	Pentachlorophenol	1600	1600	U
85-01-8	Phenanthrene	330	330	U
120-12-7	Anthracene	330	330	U
84-74-2	Di-N-Butylphthalate	330	330	U
206-44-0	Fluoranthene	330	330	U
129-00-0	Pyrene	330	330	U
85-68-7	Butylbenzylphthalate	330	330	U
91-94-1	3,3'-Dichlorobenzidine	660	660	U
56-55-3	Benzo(a)Anthracene	330	330	U
218-01-9	Chrysene	330	330	U
117-81-7	Bis(2-Ethylhexyl)Phthalate	330	330	U
117-84-0	Di-N-Octylphthalate	330	330	U
205-99-2	Benzo(b)Fluoranthene	330	330	U
207-08-9	Benzo(k)Fluoranthene	330	330	U
50-32-8	Benzo(a)Pyrene	330	330	U
193-39-5	Indeno(1,2,3-Cd)Pyrene	330	330	U
53-70-3	Dibenz(A,H)Anthracene	330	330	U
191-24-2	Benzo(G,H,I)Perylene	330	330	U
100-51-6	Benzyl Alcohol	660	660	U
65-85-0	Benzoic Acid	1600	1600	U

1F

SW-846 SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SVB024 BLANK

Lab Name: IEA-NC Method: 8270

Lab Code: IEA Case No.: 2436-004 SDG No.: 10228

Matrix: (soil/water) SOIL Lab Sample ID: SVB024

Sample wt/vol: 30 (g/mL) g Lab File ID: 1031602.D

Level: (low/med) LOW Date Received:

% Moisture: 0 decanted: (Y/N) Date Extracted: 10/20/97

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/31/97

Injection Volume: 2 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs Found: 3

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
	UNKNOWN	7.40	200	J
	UNKNOWN	7.94	660	J
000057-10-3	HEXADECANOIC ACID	21.36	76	JNX

Organic Phase and Rinse 900°F, Air (RTA-1) WORST CASE SOIL

Industrial & Environmental Analysts, Inc. (IEA)
GC SEMIVOLATILE SW-846 METHOD 8081 PCB in WATER

IEA Project Number:	2436-004	Date Received:	10/13/97
IEA Sample Number:	9710228-16	Date Sampled:	10/09/97
Client Name:	Focus Environmental, Inc.	Date Extracted:	10/23/97
Client Project ID:	772686.01000000 FOCUS-ACS	Date Analyzed:	10/27/97
Sample Identification:	#1153-047-10	Analysis By:	Briggs
Associated QC Blank:	PB622	Dilution Factor:	2000
QC Batch ID#:	622	Matrix:	Water
		Time of Analysis:	1434

Number	Compound	Quantitation Limit (ug/L)	Results Concentration (ug/L)
1	Aroclor 1016	0.50	BQL
2	Aroclor 1221	0.50	BQL
3	Aroclor 1232	0.50	BQL
4	Aroclor 1242	0.50	71000
5	Aroclor 1248	0.50	BQL
6	Aroclor 1254	1.0	BQL
7	Aroclor 1260	1.0	23000

Surrogate Compounds:	Acceptance Criteria	% Recovery
Tetrachloro-m-xylene	60 - 150	88
Decachlorobiphenyl	60 - 150	251 *

Comments:
Sample specific quantitation limits may be calculated by multiplying the quantitation limit by the dilution factor and/or moisture correction factor where reported.
BQL = Below Quantitation Limit
* = outside method recovery limits
Lower initial volume extracted due to limited sample volume.

FORM RPC3W Rev. 082296

ORGANIC PHASE AND RINSE
900°F, N_2
(RTAN)
Worst Case
Soil

Industrial & Environmental Analysts, Inc. (IEA)
GC SEMIVOLATILE SW-846 METHOD 8081 PCB in WATER

IEA Project Number:	2436-004	Date Received:	10/13/97
IEA Sample Number:	9710228-17	Date Sampled:	10/09/97
Client Name:	Focus Environmental, Inc.	Date Extracted:	10/23/97
Client Project ID:	772686.01000000 FOCUS-ACS	Date Analyzed:	10/27/97
Sample Identification:	#1153-047-16	Analysis By:	Briggs
Associated QC Blank:	PB622	Dilution Factor:	2000
QC Batch ID#:	622	Matrix:	Water
		Time of Analysis:	1509

Number	Compound	Quantitation Limit (ug/L)	Results Concentration (ug/L)
1	Aroclor 1016	0.50	BQL
2	Aroclor 1221	0.50	BQL
3	Aroclor 1232	0.50	BQL
4	Aroclor 1242	0.50	84000
5	Aroclor 1248	0.50	BQL
6	Aroclor 1254	1.0	BQL
7	Aroclor 1260	1.0	26000

Surrogate Compounds:	Acceptance Criteria	% Recovery
Tetrachloro-m-xylene	60 - 150	87
Decachlorobiphenyl	60 - 150	271 *

Comments:
Sample specific quantitation limits may be calculated by multiplying the quantitation limit by the dilution factor and/or moisture correction factor where reported.
BQL = Below Quantitation Limit
* = outside method recovery limits
Lower initial volume extracted due to limited sample volume.

FORM RPCBW Rev. 082296

SOLVENT RINSE
700°F, AIR
(RTA-2)
Typical Case
Soil

Industrial & Environmental Analysts, Inc. (IEA)
GC SEMIVOLATILE SW-846 METHOD 8081 PCB in WATER

IEA Project Number:	2436-004	Date Received:	10/13/97
IEA Sample Number:	9710228-15	Date Sampled:	10/09/97
Client Name:	Focus Environmental, Inc.	Date Extracted:	10/23/97
Client Project ID:	772686.01000000 FOCUS-ACS	Date Analyzed:	10/24/97
Sample Identification:	#1153-047-3	Analysis By:	Briggs
Associated QC Blank:	PB622	Dilution Factor:	1000
QC Batch ID#:	622	Matrix:	Water
		Time of Analysis:	1626

Number	Compound	Quantitation Limit (ug/L)	Results Concentration (ug/L)
1	Aroclor 1016	0.50	BQL
2	Aroclor 1221	0.50	BQL
3	Aroclor 1232	0.50	BQL
4	Aroclor 1242	0.50	36000
5	Aroclor 1248	0.50	BQL
6	Aroclor 1254	1.0	BQL
7	Aroclor 1260	1.0	23000

Surrogate Compounds:	Acceptance Criteria	% Recovery
Tetrachloro-m-xylene	60 - 150	9[illegible]
Decachlorobiphenyl	60 - 150	195 *

Comments:
Sample specific quantitation limits may be calculated by multiplying the quantitation limit by the dilution factor and/or moisture correction factor where reported.
BQL = Below Quantitation Limit
* = outside method recovery limits
Lower initial volume extracted due to limited sample volume.

FORM RPCBW Rev. 082296

FORM 1A: PCDD/PCDF ANALYSIS DATA SHEET
Use for Sample and Blank Results

EPA SAMPLE NO.

1153-047-10

Lab Name: SOUTHWEST LAB. OF OKLAHOMA

Episode No.: 31487

Contract No.: IEA-NC

Lab Sample ID: 31487.02

Matrix (aqueous/solid/leachate): solid

Sample Wt/Vol: 0.55 g or mL: g

Sample Receipt Date: 10/17/97

Initial Calibration Date: 11/19/97

Ext. Date: 11/03/97 Shift:

Instrument ID: Autospec

Organic Phase and Rinse

Analysis Date: 5-NOV-97 Time: 15:38:17

GC Column ID: DB-5

RTA1

Extract Volume (uL): 20

Sample Data Filename: A103645#1

Injection Volume (uL): 2

Blank Data Filename: A103644#2

Dilution Factor: 1

Cal. Ver. Data Filename: A103644#1

Concentration Units (pg/L or ng/Kg dry weight): ng/Kg % Solids:

ANALYTE	CONCENTRATION FOUND	DETECTION LIMIT	EMPC	ION ABUND. RATIO (1)	RRT (1)
2,3,7,8-TCDD	*	68.040	91.400	2.44	1.001
1,2,3,7,8-PeCDD	*	149.929	325.440	5.63	1.000
1,2,3,4,7,8-HxCDD	*	32.103	1268.520	1.44	1.000
1,2,3,6,7,8-HxCDD	1629.28	32.600	*	1.36	1.000
1,2,3,7,8,9-HxCDD	4528.96	29.913	*	1.28	1.008
1,2,3,4,6,7,8-HpCDD	19355.03	34.465	*	1.00	1.000
OCDD	28473.86	32.944	*	0.92	1.000
2,3,7,8-TCDF	935.63	12.840	*	0.73	1.002
1,2,3,7,8-PeCDF	251.33	12.107	*	1.64	1.000
2,3,4,7,8-PeCDF	*	10.423	355.860	1.91	1.001
1,2,3,4,7,8-HxCDF	*	88.882	393.460	1.30	1.001
1,2,3,6,7,8-HxCDF	117.44	85.998	*	1.23	1.000
1,2,3,7,8,9-HxCDF	*	117.319	*	*	*
2,3,4,6,7,8-HxCDF	*	82.836	*	*	*
1,2,3,4,6,7,8-HpCDF	*	397.741	940.690	4.21	0.999
1,2,3,4,7,8,9-HpCDF	*	537.418	*	*	*
OCDF	*	500.997	*	*	*

Total Tetra-Dioxins	5528.89	68.040
Total Penta-Dioxins	7164.40	149.929
Total Hexa-Dioxins	30354.42	31.521
Total Hepta-Dioxins	52217.83	34.465
Total Tetra-Furans	8385.44	12.840
Total Penta-Furans	5665.33	11.229
Total Hexa-Furans	4128.03	92.202
Total Hepta-Furans	*	460.093

(1) Contract-required limits for RRTs and ion abundance ratios are specified in Tables 2 and 9, respectively, Method 1613

USEPA, EAD

FORM 2: PCDD/PCDF LABELED COMPOUND AND CLEANUP STANDARD RECOVERIES

EPA SAMPLE NO.
1153-047-10

Lab Name: SOTHWEST LAB. OF OKLAHOMA
Episode No.: 31487

Contract No.: IEA-NC
Lab Sample ID: 31487.02

Matrix (aqueous/solid/leachate): solid
Sample Wt/Vol: 0.55 g or mL: g

Sample Receipt Date: 10/17/97
Initial Calibration Date: 11/19/97

Ext. Date: 11/03/97 Shift:
Instrument ID: Autospec

Analysis Date: 5-NOV-97 Time: 15:38:17
GC Column ID: DB-5

Extract Volume (uL): 20
Sample Data Filename: A103645#1

Injection Volume (uL): 2
Blank Data Filename: A103644#2

Dilution Factor: 1
Cal. Ver. Data Filename: A103644#1

Concentration Units (pg/L or ng/Kg dry weight): ng/Kg % Solids:

	SPIKE CONC.	CONC. FOUND	R(%) (1)	ION ABUND. RATIO (2)	RRT (2)
LABELED COMPOUNDS					
13C-2,3,7,8-TCDD	2000	1273.72	63.69	0.79	1.012
13C-1,2,3,7,8-PeCDD	2000	1266.64	63.33	1.66	1.258
13C-1,2,3,4,7,8-HxCDD	2000	1141.83	57.09	1.29	0.989
13C-1,2,3,6,7,8-HxCDD	2000	1147.90	57.40	1.29	0.992
13C-1,2,3,4,6,7,8-HpCDD	2000	1057.89	52.89	0.97	1.075
13C-OCDD	4000	2563.78	64.09	0.88	1.155
13C-2,3,7,8-TCDF	2000	1533.01	76.65	0.77	0.970
13C-1,2,3,7,8-PeCDF	2000	1368.16	68.41	1.80	1.202
13C-2,3,4,7,8-PeCDF	2000	1560.85	78.04	1.76	1.239
13C-1,2,3,4,7,8-HxCDF	2000	1337.69	66.88	0.53	0.966
13C-1,2,3,6,7,8-HxCDF	2000	1270.01	63.50	0.53	0.969
13C-1,2,3,7,8,9-HxCDF	2000	1197.16	59.86	0.55	1.006
13C-2,3,4,6,7,8-HxCDF	2000	1411.89	70.59	0.53	0.985
13C-1,2,3,4,6,7,8-HpCDF	2000	1338.59	66.93	0.43	1.050
13C-1,2,3,4,7,8,9-HpCDF	2000	1282.87	64.14	0.44	1.085
CLEANUP STANDARD					
37Cl-2,3,7,8-TCDD	800	1695.90	211.99		1.012

(1) Contract-required limits for percent recovery (R) are specified in Section 9.3.3, Method 1613.
(2) Contract-required limits for RRTs and ion abundance ratios are specified in Tables 2 and 9, respectively, Method 1613. NOTE: There is no ion abundance ratio for 37Cl4-2378-TCDD (cleanup standard).

RFP C500273T1

FORM 1A: PCDD/PCDF ANALYSIS DATA SHEET
Use for Sample and Blank Results

EPA SAMPLE NO.

1153-047-16

Lab Name: SOUTHWEST LAB. OF OKLAHOMA

Episode No.: 31487

Contract No.: IEA-NC

Lab Sample ID: 31487.03

Matrix (aqueous/solid/leachate): solid

Sample Wt/Vol: 0.54 g or mL: g

Sample Receipt Date: 10/17/97

Initial Calibration Date: 11/19/97

Ext. Date: 11/03/97 Shift:

Instrument ID: Autospec

Analysis Date: 5-NOV-97 Time: 16:27:12

GC Column ID: DB-5

Extract Volume (uL): 20

Sample Data Filename: A103645#2

Injection Volume (uL): 2

Blank Data Filename: A103644#2

Dilution Factor: 1

Cal. Ver. Data Filename: A103644#1

Organic Phase and Rinse

RTAN

Concentration Units (pg/L or ng/Kg dry weight): ng/Kg % Solids:

ANALYTE	CONCENTRATION FOUND	DETECTION LIMIT	EMPC	ION ABUND. RATIO (1)	RRT (1)
2,3,7,8-TCDD	*	41.462	102.460	2.01	1.002
1,2,3,7,8-PeCDD	*	34.733	772.200	2.13	1.001
1,2,3,4,7,8-HxCDD	895.63	32.151	*	1.41	1.000
1,2,3,6,7,8-HxCDD	1326.77	31.810	*	1.25	1.000
1,2,3,7,8,9-HxCDD	3124.00	29.587	*	1.27	1.008
1,2,3,4,6,7,8-HpCDD	12396.87	31.043	*	1.05	1.000
OCDD	20977.49	14.335	*	0.92	1.000
2,3,7,8-TCDF	560.47	13.765	*	0.70	1.002
1,2,3,7,8-PeCDF	*	8.523	90.500	2.53	1.000
2,3,4,7,8-PeCDF	*	7.652	164.820	1.83	1.000
1,2,3,4,7,8-HxCDF	229.99	44.516	*	1.07	1.000
1,2,3,6,7,8-HxCDF	*	46.286	59.850	1.00	1.001
1,2,3,7,8,9-HxCDF	*	60.261	*	*	*
2,3,4,6,7,8-HxCDF	54.82	44.162	*	1.15	1.001
1,2,3,4,6,7,8-HpCDF	*	98.947	542.240	2.23	1.000
1,2,3,4,7,8,9-HpCDF	*	130.404	*	*	*
OCDF	*	167.136	332.310	1.10	1.003

Total Tetra-Dioxins	3870.11	41.462
Total Penta-Dioxins	11208.33	34.733
Total Hexa-Dioxins	22769.21	31.178
Total Hepta-Dioxins	31832.70	31.043
Total Tetra-Furans	3656.99	13.765
Total Penta-Furans	719.43	8.084
Total Hexa-Furans	1372.01	48.170
Total Hepta-Furans	*	113.100

(1) Contract-required limits for RRTs and ion abundance ratios are specified in Tables 2 and 9, respectively, Method 1613

USEPA, EAD

EPA SAMPLE NO.

FORM 2: PCDD/PCDF LABELED COMPOUND AND CLEANUP STANDARD RECOVERIES

1153-047-16

Lab Name: SOTHWEST LAB. OF OKLAHOMA | Episode No.: 31487

Contract No.: IEA-NC | Lab Sample ID: 31487.03

Matrix (aqueous/solid/leachate): solid | Sample Wt/Vol: 0.54 g or mL: g

Sample Receipt Date: 10/17/97 | Initial Calibration Date: 11/19/97

Ext. Date: 11/03/97 Shift: | Instrument ID: Autospec

Analysis Date: 5-NOV-97 Time: 16:27:12 | GC Column ID: DB-5

Extract Volume (uL): 20 | Sample Data Filename: A103645#2

Injection Volume (uL): 2 | Blank Data Filename: A103644#2

Dilution Factor: 1 | Cal. Ver. Data Filename: A103644#1

Concentration Units (pg/L or ng/Kg dry weight): ng/Kg % Solids:

	SPIKE CONC.	CONC. FOUND	R(%) (1)	ION ABUND. RATIO (2)	RRT (2)
LABELED COMPOUNDS					
13C-2,3,7,8-TCDD	2000	1288.49	64.42	0.80	1.011
13C-1,2,3,7,8-PeCDD	2000	1445.45	72.27	1.67	1.258
13C-1,2,3,4,7,8-HxCDD	2000	1236.55	61.83	1.29	0.989
13C-1,2,3,6,7,8-HxCDD	2000	1168.84	58.44	1.23	0.992
13C-1,2,3,4,6,7,8-HpCDD	2000	1243.31	62.17	1.00	1.075
13C-OCDD	4000	2885.61	72.14	0.90	1.155
13C-2,3,7,8-TCDF	2000	1456.65	72.83	0.77	0.970
13C-1,2,3,7,8-PeCDF	2000	1683.17	84.16	1.75	1.202
13C-2,3,4,7,8-PeCDF	2000	1806.29	90.31	1.67	1.240
13C-1,2,3,4,7,8-HxCDF	2000	1480.18	74.01	0.53	0.966
13C-1,2,3,6,7,8-HxCDF	2000	1443.74	72.19	0.53	0.969
13C-1,2,3,7,8,9-HxCDF	2000	1374.22	68.71	0.54	1.006
13C-2,3,4,6,7,8-HxCDF	2000	1576.70	78.84	0.53	0.985
13C-1,2,3,4,6,7,8-HpCDF	2000	1507.29	75.36	0.43	1.050
13C-1,2,3,4,7,8,9-HpCDF	2000	1466.40	73.32	0.42	1.085
CLEANUP STANDARD					
37Cl-2,3,7,8-TCDD	800	1569.23	196.15		1.011

(1) Contract-required limits for percent recovery (R) are specified in Section 9.3.3, Method 1613.
(2) Contract-required limits for RRTs and ion abundance ratios are specified in Tables 2 and 9, respectively, Method 1613. NOTE: There is no ion abundance ratio for 37Cl4-2378-TCDD (cleanup standard).

RFP CS00273T1

FORM 1A: PCDD/PCDF ANALYSIS DATA SHEET
Use for Sample and Blank Results

EPA SAMPLE NO.

1153-047-3

Lab Name: SOUTHWEST LAB. OF OKLAHOMA

Episode No.: 31487

Contract No.: IEA-NC

Lab Sample ID: 31487.01

Matrix (aqueous/solid/leachate): solid

Sample Wt/Vol: 0.5 g or mL: g

Sample Receipt Date: 10/17/97

Initial Calibration Date: 11/19/96

Ext. Date: 11/03/97 Shift:

Instrument ID: Autospec

Analysis Date: 5-NOV-97 Time: 14:41:55

GC Column ID: DB-5

Extract Volume (uL): 20

Sample Data Filename: A103644#4

Injection Volume (uL): 2

Blank Data Filename: A103644#2

Dilution Factor: 1

Cal. Ver. Data Filename: A103644#1

Solvent Rinse

RTA2

Concentration Units (pg/L or ng/Kg dry weight): ng/Kg % Solids:

ANALYTE	CONCENTRATION FOUND	DETECTION LIMIT	EMPC	ION ABUND. RATIO (1)	RRT (1)
2,3,7,8-TCDD	*	30.096	61.340	0.50	1.001
1,2,3,7,8-PeCDD	1116.31	38.549	*	1.58	1.000
1,2,3,4,7,8-HxCDD	*	21.570	605.030	1.46	1.000
1,2,3,6,7,8-HxCDD	1646.59	21.457	*	1.43	1.000
1,2,3,7,8,9-HxCDD	2839.70	19.908	*	1.32	1.009
1,2,3,4,6,7,8-HpCDD	13177.28	22.473	*	1.06	1.000
OCDD	23140.19	56.133	*	0.93	1.000
2,3,7,8-TCDF	2381.97	27.326	*	0.77	1.002
1,2,3,7,8-PeCDF	407.36	16.352	*	1.35	1.000
2,3,4,7,8-PeCDF	811.68	16.015	*	1.50	1.001
1,2,3,4,7,8-HxCDF	*	99.252	1019.560	1.20	1.000
1,2,3,6,7,8-HxCDF	280.17	92.996	*	1.32	1.000
1,2,3,7,8,9-HxCDF	36.54	131.834	*	1.16	1.000
2,3,4,6,7,8-HxCDF	*	97.652	360.570	1.27	1.000
1,2,3,4,6,7,8-HpCDF	*	651.587	1210.290	4.14	0.999
1,2,3,4,7,8,9-HpCDF	*	871.178	*	*	*
OCDF	451.50	428.709	*	1.77	1.003

Total Tetra-Dioxins	8015.09	30.096
Total Penta-Dioxins	11443.74	38.549
Total Hexa-Dioxins	22373.04	20.979
Total Hepta-Dioxins	30218.79	22.473
Total Tetra-Furans	17395.50	27.326
Total Penta-Furans	10362.12	16.196
Total Hexa-Furans	4085.69	103.715
Total Hepta-Furans	*	749.808

(1) Contract-required limits for RRTs and ion abundance ratios are specified in Tables 2 and 9, respectively, Method 1613

USEPA, EAD

FORM 2: PCDD/PCDF LABELED COMPOUND AND CLEANUP STANDARD RECOVERIES

EPA SAMPLE NO.
1153-047-3

Lab Name: SOTHWEST LAB. OF OKLAHOMA
Episode No.: 31487

Contract No.: IEA-NC
Lab Sample ID: 31487.01

Matrix (aqueous/solid/leachate): solid
Sample Wt/Vol: 0.5 g or mL: g

Sample Receipt Date: 10/17/97
Initial Calibration Date: 11/19/96

Ext. Date: 11/03/97 Shift:
Instrument ID: Autospec

Analysis Date: 5-NOV-97 Time: 14:41:55
GC Column ID: DB-5

Extract Volume (uL): 20
Sample Data Filename: A103644#4

Injection Volume (uL): 2
Blank Data Filename: A103644#2

Dilution Factor: 1
Cal. Ver. Data Filename: A103644#1

Concentration Units (pg/L or ng/Kg dry weight): ng/Kg % Solids:

	SPIKE CONC.	CONC. FOUND	R(%) (1)	ION ABUND. RATIO (2)	RRT (2)
LABELED COMPOUNDS					
13C-2,3,7,8-TCDD	2000	1298.48	64.92	0.79	1.011
13C-1,2,3,7,8-PeCDD	2000	1228.34	61.42	1.66	1.260
13C-1,2,3,4,7,8-HxCDD	2000	1168.15	58.41	1.27	0.989
13C-1,2,3,6,7,8-HxCDD	2000	1101.70	55.09	1.27	0.992
13C-1,2,3,4,6,7,8-HpCDD	2000	1114.31	55.72	0.99	1.075
13C-OCDD	4000	2632.84	65.82	0.85	1.156
13C-2,3,7,8-TCDF	2000	1460.80	73.04	0.77	0.969
13C-1,2,3,7,8-PeCDF	2000	1456.88	72.84	1.66	1.204
13C-2,3,4,7,8-PeCDF	2000	1440.79	72.04	1.68	1.241
13C-1,2,3,4,7,8-HxCDF	2000	1209.42	60.47	0.53	0.966
13C-1,2,3,6,7,8-HxCDF	2000	1230.18	61.51	0.54	0.969
13C-1,2,3,7,8,9-HxCDF	2000	1146.94	57.35	0.53	1.006
13C-2,3,4,6,7,8-HxCDF	2000	1300.07	65.00	0.53	0.985
13C-1,2,3,4,6,7,8-HpCDF	2000	1253.47	62.67	0.44	1.050
13C-1,2,3,4,7,8,9-HpCDF	2000	1205.80	60.29	0.43	1.085
CLEANUP STANDARD					
37Cl-2,3,7,8-TCDD	800	2145.30	268.16		1.012

(1) Contract-required limits for percent recovery (R) are specified in Section 9.3.3, Method 1613.
(2) Contract-required limits for RRTs and ion abundance ratios are specified in Tables 2 and 9, respectively, Method 1613. NOTE: There is no ion abundance ratio for 37Cl4-2378-TCDD (cleanup standard).

RFP C500273T1

OFFGAS ANALYTICAL DATA

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

IEA Project Number: 2436-004 Date Received: 10/13/97

IEA Sample Number: 971022836 Date Sampled: 10/08/97

Client Name: Focus Environmental, Inc. Date Analyzed: 10/21/97

Client Project: 772686.01000000 FOCUS-ACS Lab File ID: 1021L07.D

Sample Identification: RTA1 ~~RUN#2~~ MEOH TRAP Analyst: MOORE

Matrix: (soil/water) WATER 900°F, Air Dilution Factor: 2500.0

% Moisture: not dec. Worst Case Soil

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
67-64-1	Acetone	50	250000	
107-13-1	Acrylonitrile	5	12000	U
107-05-1	Allyl Chloride	5	12000	U
71-43-2	Benzene	5	97000	
108-86-1	Bromobenzene	5	12000	U
74-97-5	Bromochloromethane	5	12000	U
75-27-4	Bromodichloromethane	5	12000	U
75-25-2	Bromoform	5	12000	U
74-83-9	Bromomethane	10	25000	U
78-93-3	2-Butanone	10	25000	U
104-51-8	N-Butylbenzene	5	12000	U
135-98-8	Sec-Butylbenzene	5	12000	U
98-06-6	Tert-Butylbenzene	5	12000	U
75-15-0	Carbon Disulfide	5	120[illegible]	U
56-23-5	Carbon Tetrachloride	5	12000	U
108-90-7	Chlorobenzene	5	12000	U
124-48-1	Chlorodibromomethane	5	12000	U
75-00-3	Chloroethane	10	66000	
110-75-8	2-Chloroethyl Vinyl Ether	10	25000	U
67-66-3	Chloroform	5	12000	U
74-87-3	Chloromethane	10	120000	
95-49-8	2-Chlorotoluene	5	12000	U
106-43-4	4-Chlorotoluene	5	12000	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	12000	U
106-93-4	1,2-Dibromoethane	5	12000	U
74-95-3	Dibromomethane	5	12000	U
95-50-1	1,2-Dichlorobenzene	5	12000	U
541-73-1	1,3-Dichlorobenzene	5	12000	U
106-46-7	1,4-Dichlorobenzene	5	12000	U
75-71-8	Dichlorodifluoromethane	10	25000	U
75-34-3	1,1-Dichloroethane	5	12000	U
107-06-2	1,2-Dichloroethane	5	12000	U
75-35-4	1,1-Dichloroethene	5	12000	U
156-59-2	Cis-1,2-Dichloroethene	5	12000	U

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

IEA Project Number: 2436-004 Date Received: 10/13/97

IEA Sample Number: 971022836 Date Sampled: 10/08/97

Client Name: Focus Environmental, Inc. Date Analyzed: 10/21/97

Client Project: 772686.01000000 FOCUS-ACS Lab File ID: 1021L07.D

Sample Identification: RTA1 RUN#2 MEOH TRAP Analyst: MOORE

Matrix: (soil/water) WATER 900°F, Air Worst Case Soil Dilution Factor: 2500.0

% Moisture: not dec.

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
156-60-5	Trans-1,2-Dichloroethene	5	12000	U
78-87-5	1,2-Dichloropropane	5	12000	U
142-28-9	1,3-Dichloropropane	5	12000	U
594-20-7	2,2-Dichloropropane	5	12000	U
563-58-6	1,1-Dichloropropene	5	12000	U
10061-01-5	Cis-1,3-Dichloropropene	5	12000	U
10061-02-6	Trans-1,3-Dichloropropene	5	12000	U
110-57-6	Cis-1,4-Dichloro-2-Butene	5	12000	U
110-57-6	Trans-1,4-Dichloro-2-Butene	5	12000	U
100-41-4	Ethylbenzene	5	40000	
97-63-2	Ethyl Methacrylate	5	12000	U
87-68-3	Hexachlorobutadiene	5	12000	U
591-78-6	2-Hexanone	10	25000	U
74-88-4	Iodomethane	5	12000	U
98-82-8	Isopropylbenzene	5	12000	U
99-87-6	P-Isopropyltoluene	5	12000	U
126-98-7	Methacrylonitrile	5	12000	U
75-09-2	Methylene Chloride	10	25000	U
80-62-6	Methyl Methacrylate	5	12000	U
108-10-1	4-Methyl-2-Pentanone	10	25000	U
1634-04-4	Methyl-tert-Butyl ether	5	12000	U
91-20-3	Naphthalene	5	12000	U
76-01-7	Pentachloroethane	5	12000	U
103-65-1	N-Propylbenzene	5	12000	U
100-42-5	Styrene	5	12000	U
630-20-6	1,1,1,2-Tetrachloroethane	5	12000	U
79-34-5	1,1,2,2-Tetrachloroethane	5	12000	U
127-18-4	Tetrachloroethene	5	12000	U
108-88-3	Toluene	5	160000	
87-61-6	1,2,3-Trichlorobenzene	5	12000	U
120-82-1	1,2,4-Trichlorobenzene	5	12000	U
71-55-6	1,1,1-Trichloroethane	5	12000	U
79-00-5	1,1,2-Trichloroethane	5	12000	U
79-01-6	Trichloroethene	5	12000	U

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

IEA Project Number: 2436-004 Date Received: 10/13/97

IEA Sample Number: 971022836 Date Sampled: 10/08/97

Client Name: Focus Environmental, Inc. Date Analyzed: 10/21/97

Client Project: 772686.01000000 FOCUS-ACS Lab File ID: 1021L07.D

Sample Identification: RTA1 RUN#2 MEOH TRAP Analyst: MOORE

Matrix: (soil/water) WATER 900°F, Air Worst Case Soil Dilution Factor: 2500.0

% Moisture: not dec.

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
75-69-4	Trichlorofluoromethane	5	12000	U
96-18-4	1,2,3-Trichloropropane	5	12000	U
95-63-6	1,2,4-Trimethylbenzene	5	26000	
108-67-8	1,3,5-Trimethylbenzene	5	12000	U
108-05-4	Vinyl Acetate	10	25000	U
75-01-4	Vinyl Chloride	10	25000	U
1330-20-7	Xylene (Total)	5	190000	

1E

CLIENT SAMPLE NO.

SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

RTA1 RUN#2 MEOH TRAP
900°F, Air

Lab Name: IEA-NC Method: 8260

Lab Code: IEA Case No.: 2436-004 SDG No.: 10228

Matrix: (soil/water) WATER Lab Sample ID: 971022836

Sample wt/vol: 5 (g/mL) ml Lab File ID: 1021L07.D

Level: (low/med) LOW Date Received: 10/13/97

% Moisture: not dec. Date Analyzed: 10/21/97

GC Column: DB-624 ID: .530(mm) Dilution Factor: 2500.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs Found: 9

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/l

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
000109-67-1	1-PENTENE	7.53	21000	JN
000542-92-7	1,3-CYCLOPENTADIENE	9.01	20000	JN
000592-41-6	1-HEXENE	10.05	43000	JN
000110-54-3	HEXANE	10.19	120000	JN
	UNKNOWN	10.81	20000	J
	UNKNOWN	12.12	61000	J
	UNKNOWN	12.91	15000	J
000124-18-5	DECANE	20.88	22000	JN
	TRIMETHYL BENZENE	22.53	14000	J

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

IEA Project Number: 2436-004 Date Received: 10/13/97

IEA Sample Number: 971022837 Date Sampled: 10/09/97

Client Name: Focus Environmental, Inc. Date Analyzed: 10/21/97

Client Project: 772686.01000000 FOCUS-ACS Lab File ID: 1020W11.D

Sample Identification: RTAN RUN#3 MEOH TRAP Analyst: CREWES

Matrix: (soil/water) WATER 900°F, N_2 Dilution Factor: 4000.0

% Moisture: not dec. Worst Case Soil

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
67-64-1	Acetone	50	550000	
107-13-1	Acrylonitrile	5	20000	U
107-05-1	Allyl Chloride	5	20000	U
71-43-2	Benzene	5	84000	
108-86-1	Bromobenzene	5	20000	U
74-97-5	Bromochloromethane	5	20000	U
75-27-4	Bromodichloromethane	5	20000	U
75-25-2	Bromoform	5	20000	U
74-83-9	Bromomethane	10	40000	U
78-93-3	2-Butanone	10	40000	U
104-51-8	N-Butylbenzene	5	20000	U
135-98-8	Sec-Butylbenzene	5	20000	U
98-06-6	Tert-Butylbenzene	5	20000	U
75-15-0	Carbon Disulfide	5	20000	U
56-23-5	Carbon Tetrachloride	5	20000	U
108-90-7	Chlorobenzene	5	20000	U
124-48-1	Chlorodibromomethane	5	20000	U
75-00-3	Chloroethane	10	73000	
110-75-8	2-Chloroethyl Vinyl Ether	10	40000	U
67-66-3	Chloroform	5	20000	U
74-87-3	Chloromethane	10	140000	
95-49-8	2-Chlorotoluene	5	20000	U
106-43-4	4-Chlorotoluene	5	20000	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	20000	U
106-93-4	1,2-Dibromoethane	5	20000	U
74-95-3	Dibromomethane	5	20000	U
95-50-1	1,2-Dichlorobenzene	5	20000	U
541-73-1	1,3-Dichlorobenzene	5	20000	U
106-46-7	1,4-Dichlorobenzene	5	20000	U
75-71-8	Dichlorodifluoromethane	10	40000	U
75-34-3	1,1-Dichloroethane	5	20000	U
107-06-2	1,2-Dichloroethane	5	20000	U
75-35-4	1,1-Dichloroethene	5	20000	U
156-59-2	Cis-1,2-Dichloroethene	5	20000	U

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

IEA Project Number: 2436-004 Date Received: 10/13/97

IEA Sample Number: 971022837 Date Sampled: 10/09/97

Client Name: Focus Environmental, Inc. Date Analyzed: 10/21/97

Client Project: 772686.01000000 FOCUS-ACS Lab File ID: 1020W11.D

Sample Identification: RTAN RUN#3 MEOH TRAP Analyst: CREWES

Matrix: (soil/water) WATER 900°F, N_2 Dilution Factor: 4000.0

% Moisture: not dec. Worst Case Soil

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
156-60-5	Trans-1,2-Dichloroethene	5	20000	U
78-87-5	1,2-Dichloropropane	5	20000	U
142-28-9	1,3-Dichloropropane	5	20000	U
594-20-7	2,2-Dichloropropane	5	20000	U
563-58-6	1,1-Dichloropropene	5	20000	U
10061-01-5	Cis-1,3-Dichloropropene	5	20000	U
10061-02-6	Trans-1,3-Dichloropropene	5	20000	U
110-57-6	Cis-1,4-Dichloro-2-Butene	5	20000	U
110-57-6	Trans-1,4-Dichloro-2-Butene	5	20000	U
100-41-4	Ethylbenzene	5	28000	
97-63-2	Ethyl Methacrylate	5	20000	U
87-68-3	Hexachlorobutadiene	5	20000	U
591-78-6	2-Hexanone	10	40000	U
74-88-4	Iodomethane	5	20000	U
98-82-8	Isopropylbenzene	5	20000	U
99-87-6	P-Isopropyltoluene	5	20000	U
126-98-7	Methacrylonitrile	5	20000	U
75-09-2	Methylene Chloride	10	40000	U
80-62-6	Methyl Methacrylate	5	20000	U
108-10-1	4-Methyl-2-Pentanone	10	40000	U
1634-04-4	Methyl-tert-Butyl ether	5	20000	U
91-20-3	Naphthalene	5	20000	U
76-01-7	Pentachloroethane	5	20000	U
103-65-1	N-Propylbenzene	5	20000	U
100-42-5	Styrene	5	20000	U
630-20-6	1,1,1,2-Tetrachloroethane	5	20000	U
79-34-5	1,1,2,2-Tetrachloroethane	5	20000	U
127-18-4	Tetrachloroethene	5	20000	U
108-88-3	Toluene	5	84000	
87-61-6	1,2,3-Trichlorobenzene	5	20000	U
120-82-1	1,2,4-Trichlorobenzene	5	20000	U
71-55-6	1,1,1-Trichloroethane	5	20000	U
79-00-5	1,1,2-Trichloroethane	5	20000	U
79-01-6	Trichloroethene	5	20000	U

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

IEA Project Number: 2436-004 Date Received: 10/13/97

IEA Sample Number: 971022837 Date Sampled: 10/09/97

Client Name: Focus Environmental, Inc. Date Analyzed: 10/21/97

Client Project: 772686.01000000 FOCUS-ACS Lab File ID: 1020W11.D

Sample Identification: RTAN RUN#3 MEOH TRAP Analyst: CREWES

Matrix: (soil/water) WATER 900°F, N_2 Dilution Factor: 4000.0

% Moisture: not dec. Worst Case Soil

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
75-69-4	Trichlorofluoromethane	5	20000	U
96-18-4	1,2,3-Trichloropropane	5	20000	U
95-63-6	1,2,4-Trimethylbenzene	5	20000	U
108-67-8	1,3,5-Trimethylbenzene	5	20000	U
108-05-4	Vinyl Acetate	10	40000	U
75-01-4	Vinyl Chloride	10	40000	U
1330-20-7	Xylene (Total)	5	130000	

1E

CLIENT SAMPLE NO.

SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

RTAN RUN#3 MEOH TRAP
900F, N2

Lab Name: IEA-NC Method: 8260

Lab Code: IEA Case No.: 2436-004 SDG No.: 10228

Matrix: (soil/water) WATER Lab Sample ID: 971022837

Sample wt/vol: 5 (g/mL) ml Lab File ID: 1020W11.D

Level: (low/med) LOW Date Received: 10/13/97

% Moisture: not dec. Date Analyzed: 10/21/97

GC Column: DB-624 ID: .530(mm) Dilution Factor: 4000.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs Found: 7

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/l

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
000115-11-7	1-PROPENE, 2-METHYL-	5.88	110000	JN
000109-67-1	1-PENTENE	7.54	31000	JN
000109-66-0	PENTANE	7.65	66000	JN
000542-92-7	1,3-CYCLOPENTADIENE	8.99	23000	JN
000592-41-6	1-HEXENE	10.05	50000	JN
000110-54-3	HEXANE	10.20	120000	JN
000592-76-7	1-HEPTENE	12.90	22000	JN

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

IEA Project Number: 2436-004 Date Received: 10/13/97

IEA Sample Number: 971022838 Date Sampled: 10/08/97

Client Name: Focus Environmental, Inc. Date Analyzed: 10/17/97

Client Project: 772686.01000000 FOCUS-ACS Lab File ID: 1016W12.D

Sample Identification: RTA2 RUN#1 MEOH TRAP Analyst: CREWES

Matrix: (soil/water) WATER 700°F, Air Dilution Factor: 2500.0

% Moisture: not dec. Typical Case Soil

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
67-64-1	Acetone	50	430000	
107-13-1	Acrylonitrile	5	12000	U
107-05-1	Allyl Chloride	5	12000	U
71-43-2	Benzene	5	74000	
108-86-1	Bromobenzene	5	12000	U
74-97-5	Bromochloromethane	5	12000	U
75-27-4	Bromodichloromethane	5	12000	U
75-25-2	Bromoform	5	12000	U
74-83-9	Bromomethane	10	25000	U
78-93-3	2-Butanone	10	25000	U
104-51-8	N-Butylbenzene	5	12000	U
135-98-8	Sec-Butylbenzene	5	12000	U
98-06-6	Tert-Butylbenzene	5	12000	U
75-15-0	Carbon Disulfide	5	120[illegible]	U
56-23-5	Carbon Tetrachloride	5	12000	U
108-90-7	Chlorobenzene	5	12000	U
124-48-1	Chlorodibromomethane	5	12000	U
75-00-3	Chloroethane	10	75000	
110-75-8	2-Chloroethyl Vinyl Ether	10	25000	U
67-66-3	Chloroform	5	12000	U
74-87-3	Chloromethane	10	130000	
95-49-8	2-Chlorotoluene	5	12000	U
106-43-4	4-Chlorotoluene	5	12000	U
96-12-8	1,2-Dibromo-3-Chloropropane	5	12000	U
106-93-4	1,2-Dibromoethane	5	12000	U
74-95-3	Dibromomethane	5	12000	U
95-50-1	1,2-Dichlorobenzene	5	12000	U
541-73-1	1,3-Dichlorobenzene	5	12000	U
106-46-7	1,4-Dichlorobenzene	5	12000	U
75-71-8	Dichlorodifluoromethane	10	25000	U
75-34-3	1,1-Dichloroethane	5	12000	U
107-06-2	1,2-Dichloroethane	5	12000	U
75-35-4	1,1-Dichloroethene	5	12000	U
156-59-2	Cis-1,2-Dichloroethene	5	12000	U

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

IEA Project Number: 2436-004 Date Received: 10/13/97

IEA Sample Number: 971022838 Date Sampled: 10/08/97

Client Name: Focus Environmental, Inc. Date Analyzed: 10/17/97

Client Project: 772686.01000000 FOCUS-ACS Lab File ID: 1016W12.D

Sample Identification: RTA2 RUN#1 MEOH TRAP Analyst: CREWES

Matrix: (soil/water) WATER 700°F, Air Dilution Factor: 2500.0

% Moisture: not dec. Typical Case Soil

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
156-60-5	Trans-1,2-Dichloroethene	5	12000	U
78-87-5	1,2-Dichloropropane	5	12000	U
142-28-9	1,3-Dichloropropane	5	12000	U
594-20-7	2,2-Dichloropropane	5	12000	U
563-58-6	1,1-Dichloropropene	5	12000	U
10061-01-5	Cis-1,3-Dichloropropene	5	12000	U
10061-02-6	Trans-1,3-Dichloropropene	5	12000	U
110-57-6	Cis-1,4-Dichloro-2-Butene	5	12000	U
110-57-6	Trans-1,4-Dichloro-2-Butene	5	12000	U
100-41-4	Ethylbenzene	5	61000	
97-63-2	Ethyl Methacrylate	5	12000	U
87-68-3	Hexachlorobutadiene	5	12000	U
591-78-6	2-Hexanone	10	25000	U
74-88-4	Iodomethane	5	12000	U
98-82-8	Isopropylbenzene	5	12000	U
99-87-6	P-Isopropyltoluene	5	12000	U
126-98-7	Methacrylonitrile	5	12000	U
75-09-2	Methylene Chloride	10	46000	
80-62-6	Methyl Methacrylate	5	29000	
108-10-1	4-Methyl-2-Pentanone	10	25000	U
1634-04-4	Methyl-tert-Butyl ether	5	12000	U
91-20-3	Naphthalene	5	12000	U
76-01-7	Pentachloroethane	5	12000	U
103-65-1	N-Propylbenzene	5	12000	U
100-42-5	Styrene	5	12000	U
630-20-6	1,1,1,2-Tetrachloroethane	5	12000	U
79-34-5	1,1,2,2-Tetrachloroethane	5	12000	U
127-18-4	Tetrachloroethene	5	12000	U
108-88-3	Toluene	5	270000	
87-61-6	1,2,3-Trichlorobenzene	5	12000	U
120-82-1	1,2,4-Trichlorobenzene	5	12000	U
71-55-6	1,1,1-Trichloroethane	5	12000	U
79-00-5	1,1,2-Trichloroethane	5	12000	U
79-01-6	Trichloroethene	5	12000	U

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.
SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
METHOD 8260

IEA Project Number: 2436-004 Date Received: 10/13/97

IEA Sample Number: 971022838 Date Sampled: 10/08/97

Client Name: Focus Environmental, Inc. Date Analyzed: 10/17/97

Client Project: 772686.01000000 FOCUS-ACS Lab File ID: 1016W12.D

Sample Identification: RTA2 RUN#1 MEOH TRAP Analyst: CREWES

Matrix: (soil/water) WATER 700°F, Air Dilution Factor: 2500.0

% Moisture: not dec. Typical Case Soil

CAS NO.	COMPOUND	QUANT LIMIT: ug/l	RESULT: ug/l	Q
75-69-4	Trichlorofluoromethane	5	12000	U
96-18-4	1,2,3-Trichloropropane	5	12000	U
95-63-6	1,2,4-Trimethylbenzene	5	52000	
108-67-8	1,3,5-Trimethylbenzene	5	16000	
108-05-4	Vinyl Acetate	10	25000	U
75-01-4	Vinyl Chloride	10	25000	U
1330-20-7	Xylene (Total)	5	350000	

1E

CLIENT SAMPLE NO.

SW-846 VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

RTA2 RUN#1 MEOH TRAP
700°F, Air

Lab Name: IEA-NC Method: 8260

Lab Code: IEA Case No.: 2436-004 SDG No.: 10228

Matrix: (soil/water) WATER Lab Sample ID: 971022838

Sample wt/vol: 5 (g/mL) ml Lab File ID: 1016W12.D

Level: (low/med) LOW Date Received: 10/13/97

% Moisture: not dec. Date Analyzed: 10/17/97

GC Column: DB-624 ID: .530(mm) Dilution Factor: 2500.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs Found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/l

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
000110-00-9	FURAN	8.11	16000	JN
000592-41-6	1-HEXENE	10.05	22000	JN
000534-22-5	FURAN, 2-METHYL-	10.82	23000	JN
	UNKNOWN	12.91	14000	J
	ETHYL METHYL BENZENE	20.82	39000	J
000124-18-5	DECANE	20.88	37000	JN
000611-14-3	BENZENE, 1-ETHYL-2-METHYL-	21.38	25000	JN
	TRIMETHYL BENZENE	22.53	30000	J
001074-43-7	BENZENE, 1-METHYL-3-PROPYL-	22.88	14000	JN
	UNKNOWN	22.98	19000	J

Tenax Tubes
Volatiles Offgas Samples

Company:	American Environmental Network	Client #:	43690
Analyst:	TAB	Enthalpy #:	1097-48
Parameters:	Organics	PO #:	NA
# Samples:	6	Report Date:	11/13/97

Compound	Sample ID/Catch weight (ng)				
	Run-1-A	Run-1-B	Run-2-A	Run-3-A	Run-3-B
Vinyl chloride	< 1,000	- 36,820	< 1,000	< 1,000	< 1,000
1,1- Dicholoroethene	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Methylene chloride	129,600	1,054,040	< 1,000	< 1,000	< 1,000
Chloroform	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
1,2-Dichloroethane	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
1,1,1-Trichloroethane	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Benzene	102,570	< 1,000	74,490	- 34,910	< 1,000
Carbon Tetrachloride	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
1,2-Dicholoropropane	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Tricholorethene	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
1,1,2-Tricholoethane	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Toluene	1,759,270	- 11,860	461,190	80,950	< 1,000
Tetrachloroethene	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Chlorobenzene	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Ethylbenzene	- 31,840	< 1,000	- 11,120	- 3,120	< 1,000
m & p-Xylene	149,750	< 1,000	47,800	- 17,180	< 1,000
Styrene	< 1,000	< 1,000	- 2,740	< 1,000	- 1,610
1,1,2,2-Tetrachloroethane	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
o-Xylene	47,940	< 1,000	- 12,780	- 3,330	< 1,000
Acetone	< 1,000	8,063,770	< 1,000	< 1,000	< 1,000
2-Butanone	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
4-Methyl-2-pentanone	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Chloroethane	403,200	1,830,900	247,800	227,100	866,700
cis-1,2-Dichloroethene	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
	RTA2		RTA1	RTAN	

TABLE SV-1.0
7097-2597A
IEA/NC
PAH'S

AIR

SVOC Offgas Results

All values are Total ug XAD Resin Tubes

Client Sample I.D.	Method Blank	RTA1 RUN#2	RTAN RUN#3	Quant. Limits with no Dilution
Lab Sample I.D.	SBLKAI	972597A-04	972597A-05	
Method Blank I.D.	SBLKAI	SBLKAI	SBLKAI	
Quant. Factor	1.00	50.0	100.	
Naphthalene	U	3500	7200	10
2-Methylnaphthalene	U	U	U	10
Acenaphthylene	U	U	U	10
Acenaphthene	U	U	U	10
Fluorene	U	U	U	10
Phenanthrene	U	U	U	10
Anthracene	U	U	U	10
Fluoranthene	U	U	U	10
Pyrene	U	U	U	10
Benzo(a)anthracene	U	U	U	10
Chrysene	U	U	U	10
Benzo(b)fluoranthene	U	U	U	10
Benzo(k)fluoranthene	U	U	U	10
Benzo(a)pyrene	U	U	U	10
Indeno(1,2,3-cd)pyrene	U	U	U	10
Dibenzo(a,h)anthracene	U	U	U	10
Benzo(g,h,i)perylene	U	U	U	10
Date Received		10/22/97	10/22/97	
Date Extracted	10/23/97	10/23/97	10/23/97	
Date Analyzed	10/30/97	11/05/97	11/05/97	

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture and sample dilution.

SVOC Offgas Results
XAD Resin
Tubes

TABLE SV-1.1
7097-2597A
IEA/NC
PAH'S

AIR

All values are Total ug

Client Sample I.D.	RTA2 RUN#1			Quant. Limits with no Dilution
Lab Sample I.D.	~~972~~597A-06			
Method Blank I.D.	SBLKAI			
Quant. Factor	10.0			
Naphthalene	760			10
2-Methylnaphthalene	U			10
Acenaphthylene	U			10
Acenaphthene	U			10
Fluorene	U			10
Phenanthrene	U			10
Anthracene	U			10
Fluoranthene	U			10
Pyrene	U			10
Benzo(a)anthracene	U			10
Chrysene	U			10
Benzo(b)fluoranthene	U			10
Benzo(k)fluoranthene	U			10
Benzo(a)pyrene	U			10
Indeno(1,2,3-cd)pyrene	U			10
Dibenzo(a,h)anthracene	U			10
Benzo(g,h,i)perylene	U			10
Date Received	10/22/97			
Date Extracted	10/23/97			
Date Analyzed	11/01/97			

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation facto
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture and sample dilution.

TABLE GC-1.0
7097-2597A
IEA/NC
Polychlorinated Biphenyl's

Offgas
PCB Results
XAD Tube

Air

All values are total ng

Client Sample I.D.	Method Blank	PBLK46 QC	RTA1 RTA RUN#2	
Lab Sample I.D.	102297-B04	102297-B04QC	972597A-04	Quant. Limits with no Dilution
Method Blank I.D.	PBLK46	PBLK46	PBLK46	
Quant Factor	1.0	1.0	5.0	
Aroclor-1016	U	U	U	500
Aroclor-1221	U	U	U	1000
Aroclor-1232	U	U	U	500
Aroclor-1242	U	810JX	5400	500
Aroclor-1248	U	U	U	500
Aroclor-1254	U	U	3000J	500
Aroclor-1260	U	870JX	2600J	500
Date Received			10/22/97	
Date Extracted	10/22/97	10/22/97	10/22/97	
Date Analyzed	10/30/97	10/30/97	10/30/97	

Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, %moisture and sample dilution.

TABLE GC-1.1
7097-2597A
IEA/NC
Polychlorinated Biphenyl's

Offgas
PCB Results
XAD Tube

Air

All values are total ng

Client Sample I.D.	RTAN RTAN RUN#3	RTA2 RTA2 RUN#1		
Lab Sample I.D.	972597A-05	972597A-06		Quant. Limits with no Dilution
Method Blank I.D.	PBLK46	PBLK46		
Quant Factor	1.0	1.0		
Aroclor-1016	U	U		500
Aroclor-1221	U	U		1000
Aroclor-1232	U	U		500
Aroclor-1242	2200	1900		500
Aroclor-1248	U	U		500
Aroclor-1254	600J	300J		500
Aroclor-1260	520J	290J		500
Date Received	10/22/97	10/22/97		
Date Extracted	10/22/97	10/22/97		
Date Analyzed	10/30/97	10/30/97		

Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, %moisture and sample dilution.

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

RTA1 RUN#2

Lab Name: IEA/CT Contract: _____

Lab Code: IEACT Case No.: 2597A SAS No.: _____ SDG No.: A2597

Matrix: (soil/water) ~~WATER~~ Air Lab Sample ID: 972597A-04

Sample wt/vol: ~~1000 (g/mL) MG~~ Lab File ID: >I3772

Level: (low/med) LOW 1 tube Date Received: 10/22/97

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 10/23/97

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 11/05/97

Injection Volume: 2.0 (uL) Dilution Factor: 50.0

GPC Cleanup: (Y/N) N pH: ____

JB 11/25/97

CONCENTRATION UNITS: ~~(ug/L or ug/Kg) UG/L~~ Total ug/g

CAS NO.	COMPOUND		Q
106-46-7	1,4-Dichlorobenzene	500	U
108-60-1	bis(2-Chloroisopropyl)ether	500	U
78-59-1	Isophorone	500	U
91-20-3	Naphthalene	3500	
87-68-3	Hexachlorobutadiene	500	U
91-57-6	2-Methylnaphthalene	500	U
208-96-8	Acenaphthylene	500	U
606-20-2	2,6-Dinitrotoluene	500	U
83-32-9	Acenaphthene	500	U
121-14-2	2,4-Dinitrotoluene	500	U
86-73-7	Fluorene	500	U
86-30-6	N-Nitrosodiphenylamine (1)	500	U
118-74-1	Hexachlorobenzene	500	U
87-86-5	Pentachlorophenol	2500	U
85-01-8	Phenanthrene	500	U
120-12-7	Anthracene	500	U
206-44-0	Fluoranthene	500	U
129-00-0	Pyrene	500	U
56-55-3	Benzo(a)anthracene	500	U
218-01-9	Chrysene	500	U
117-81-7	bis(2-Ethylhexyl)phthalate	58	J
205-99-2	Benzo(b)fluoranthene	500	U
207-08-9	Benzo(k)fluoranthene	500	U
50-32-8	Benzo(a)pyrene	500	U
193-39-5	Indeno(1,2,3-cd)pyrene	500	U
53-70-3	Dibenzo(a,h)anthracene	500	U
191-24-2	Benzo(g,h,i)perylene	500	U

Offgas
SVOC results
RTA1

FORM I SV-1

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

RTAN RUN#3

Lab Name: IEA/CT Contract: _____

Lab Code: IEACT Case No.: 2597A SAS No.: _____ SDG No.: A2597

Matrix: (soil/water) ~~WATER~~ AV Lab Sample ID: 972597A-05

Sample wt/vol: ~~1000 (g/ml) ML~~ Lab File ID: >I3773

Level: (low/med) LOW 1 liter Date Received: 10/22/97

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 10/23/97

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 11/05/97

Injection Volume: 2.0 (uL) Dilution Factor: 100.0

GPC Cleanup: (Y/N) N pH: ____

SB 11/14/97

CONCENTRATION UNITS: ~~(ug/L or ug/Kg) UG/L~~ Total ug Q

CAS NO.	COMPOUND		Q
106-46-7	1,4-Dichlorobenzene	1000	U
108-60-1	bis(2-Chloroisopropyl)ether	1000	U
78-59-1	Isophorone	1000	U
91-20-3	Naphthalene	7200	
87-68-3	Hexachlorobutadiene	1000	U
91-57-6	2-Methylnaphthalene	1000	U
208-96-8	Acenaphthylene	1000	U
606-20-2	2,6-Dinitrotoluene	1000	U
83-32-9	Acenaphthene	1000	U
121-14-2	2,4-Dinitrotoluene	1000	U
86-73-7	Fluorene	1000	U
86-30-6	N-Nitrosodiphenylamine (1)	1000	U
118-74-1	Hexachlorobenzene	1000	U
87-86-5	Pentachlorophenol	5000	U
85-01-8	Phenanthrene	1000	U
120-12-7	Anthracene	1000	U
206-44-0	Fluoranthene	1000	U
129-00-0	Pyrene	1000	U
56-55-3	Benzo(a)anthracene	1000	U
218-01-9	Chrysene	1000	U
117-81-7	bis(2-Ethylhexyl)phthalate	82	J
205-99-2	Benzo(b)fluoranthene	1000	U
207-08-9	Benzo(k)fluoranthene	1000	U
50-32-8	Benzo(a)pyrene	1000	U
193-39-5	Indeno(1,2,3-cd)pyrene	1000	U
53-70-3	Dibenzo(a,h)anthracene	1000	U
191-24-2	Benzo(g,h,i)perylene	1000	U

Offgas
SVOC results
RTAN

FORM I SV-1

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

RTA2 RUN#1

Lab Name: IEA/CT Contract: _____

Lab Code: IEACT Case No.: 2597A SAS No.: _____ SDG No.: A2597

Matrix: (soil/water) ~~WATER~~ Air Lab Sample ID: 972597A-06

Sample wt/vol: ~~1000 (g/ml) ML~~ Lab File ID: >I3726

Level: (low/med) LOW / Tube Date Received: 10/22/97

% Moisture: _____ decanted: (Y/N) ___ Date Extracted: 10/23/97

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 11/01/97

Injection Volume: 2.0 (uL) Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH: ____

JB 11/14/97

CONCENTRATION UNITS: (~~ug/L or ug/Kg~~) ~~UG/L~~ Total ug

CAS NO.	COMPOUND		
106-46-7	1,4-Dichlorobenzene	100	U
108-60-1	bis(2-Chloroisopropyl)ether	100	U
78-59-1	Isophorone	100	U
91-20-3	Naphthalene	760	
87-68-3	Hexachlorobutadiene	100	U
91-57-6	2-Methylnaphthalene	100	U
208-96-8	Acenaphthylene	100	U
606-20-2	2,6-Dinitrotoluene	100	U
83-32-9	Acenaphthene	100	U
121-14-2	2,4-Dinitrotoluene	100	U
86-73-7	Fluorene	100	U
86-30-6	N-Nitrosodiphenylamine (1)	100	U
118-74-1	Hexachlorobenzene	100	U
87-86-5	Pentachlorophenol	500	U
85-01-8	Phenanthrene	100	U
120-12-7	Anthracene	100	U
206-44-0	Fluoranthene	100	U
129-00-0	Pyrene	100	U
56-55-3	Benzo(a)anthracene	100	U
218-01-9	Chrysene	100	U
117-81-7	bis(2-Ethylhexyl)phthalate	22	J
205-99-2	Benzo(b)fluoranthene	100	U
207-08-9	Benzo(k)fluoranthene	100	U
50-32-8	Benzo(a)pyrene	100	U
193-39-5	Indeno(1,2,3-cd)pyrene	100	U
53-70-3	Dibenzo(a,h)anthracene	100	U
191-24-2	Benzo(g,h,i)perylene	100	U

Offsets
SVOC results
RTA2

FORM I SV-1

APPENDIX ( )

Appendix G

Elemental Analysis Data

Hazen Research, Inc.
4601 Indiana Street • Golden, CO 80403
Tel (303) 279-4501
Fax. (303) 278-1528

November 18, 1997

FAX AND FEDERAL EXPRESS TRANSMITTAL

Mr. Ken Sadler
Focus Environmental Inc.
9050 Executive Park Drive
Suite A-202
Knoxville, TN 37923

Re: Analytical Test Results
HRI Project 9231

Dear Mr. Sadler:

As requested, the samples that you provided were analyzed by Hazen Research, Inc. for the test work specified on the chain of custody document that arrived with the samples. Three different shipments of samples were sent to Hazen. The first shipment was incorrectly shipped. Replacement samples were received in a second shipment, and samples were submitted for analysis on October 7, 1997. The replacement samples are designated by a final "A" on the sample name. The original shipment was retrieved and will be returned with the other residual samples. A third shipment of samples was received and logged in on October 13, 1997.

The as-received soil samples were homogenized, and ground to minus 60 mesh for analysis. As you requested, the soil from the second shipment was not dried prior to analysis, but the samples from the third shipment were dried and ground. Six of the samples were subsequently submitted for chlorine analysis on November 5, 1997, in accordance with your telephone request. A summary of the analytical analyses performed on the samples follows.

CHEMICAL CHARACTERIZATION ANALYSIS

Table 1. details the methods used to perform the analyses. Analytical results for liquid and soil samples are presented in Tables 2 and 3.

Table 1. Analytical Methods

Parameter	Method Used
Ultimate	ASTM D-3176
Proximate	ASTM D-3172
Heating Value	ASTM D-3286
Chlorine	Hazen Method 58 (see enclosed "Analytical Procedure, Nov. 1983")
Leachable Chlorides	ASA 26-3.3
Ash Fusability	ASTM D-1857
Soil pH	SW-846 METHOD 9045
Acidity	EPA 305.1
Water pH	EPA 150.1
TOC	ASTM D-4129-Dirty sample ASTM 5310C-Clean water
Total Sulfur (Sulfate Method)	EPA 300.0
Total Chloride	EPA 300.0

Table 2. Analytical Results for Liquid Samples

	Sample Number	Total Organic Carbon (TOC) mg/l	Acidity mg/l	pH	Total Chloride mg/l	Total Sulfur mg/l
RTA2	1153-047-4	2880	954	3.66	123	22
RTA1	1153-047-7	15800	1540	4.57	83	52
RTAN	1153-047-13	15500	1030	4.84	83	25

Starting and Treated

Table 3. Analytical Results for Soil Samples

	Sample Number	Leachable Chloride (Water Soluble) %	Soil pH
SC1	1153-004-3A	0.12	6.80
SC2	1153-004-5A	0.05	7.19
RTA1	1153-046-8	0.35	8.78
RTAN	1153-046-16	0.34	8.77
RTA2	1153-046-24	0.19	6.94

Reports detailing the ultimate and proximate analyses and ash fusion results for each sample are enclosed.

The number of samples received and the tests performed varied slightly from the original request for pricing. The invoice for this test work will reflect the changes, as outlined in the enclosed Cost Adjustment Table.

We hope the data presented here prove beneficial to you. Should you have any questions concerning the test work or results, please do not hesitate to call. We look forward to hearing from you again in the future.

Sincerely,

Kari D. Moore
Project Engineer

KDM/lb

x.c.: Larry May, Hazen

Enclosures

Hazen Research, Inc.
4601 Indiana St. • Golden, Colo. 80403
Tel: (303) 279-4501
FAX: (303) 278-1528

Date November 18 1997
HRI Project 9231
HRI Series No. J138/97-1
Date Rec'd. 10/07/97
Cust. P.O.#

Kari Moore

Sample Identification
1153-004-3A

Starting Soil
SC1
Worst Case Soil

Reporting Basis >	As Rec'd	Dry	Eqm	Air Dry
Proximate (%)				
Moisture	8.53	0.00		8.53
Ash	82.29	89.96		82.29
Volatile	8.86	9.69		8.86
Fixed C	0.32	0.35		0.32
Total	100.00	100.00	100.00	100.00
Sulfur	0.14	0.15		0.14
Btu/lb (HHV)	1311	1433		1311
MMF Btu/lb				
MAF Btu/lb				
Air Dry Loss (%)				
Ultimate (%)				
Moisture	8.53	0.00		8.53
Carbon	9.64	10.54		9.64
Hydrogen	0.44	0.48		0.44
Nitrogen	0.28	0.31		0.28
Sulfur	0.14	0.15		0.14
Ash	82.29	89.96		82.29
Oxygen*	<0.01	<0.01		<0.01
Chlorine**	0.08	0.09		0.08

Forms of Sulfur (as S,%)

Sulfate		
Pyritic		
Organic		
Total	0.14	0.15

Water Soluble Alkalies (%)

Na2O
K2O

Lb. Alkali/MM Btu=
Lb. Ash/MM Btu= 627.84
Lb. SO2/MM Btu= 2.14
HGI= @ % Moisture
As Rec'd. Sp.Gr.=
Free Swelling Index=

Report Prepared By:

Fuels Laboratory Supervisor

* Oxygen by Difference.
** Not usually reported as part of the ultimate analysis.

Hazen Research, Inc.
4601 Indiana St. • Golden, Colo. 80403
Tel: (303) 279-4501
FAX: (303) 278-1528

Date November 18 1997
HRI Project 9231
HRI Series No. J138/97-3
Date Rec'd. 10/07/97
Cust. P.O.#

Kari Moore

Sample Identification
1153-004-4A

Starting Soil

SCI Duplicate

Worst Case Soil

Reporting Basis >	As Rec'd	Dry	Eqm	Air Dry
Proximate (%)				
Moisture	9.63	0.00		9.63
Ash	82.04	90.78		82.04
Volatile	6.62	7.33		6.62
Fixed C	1.71	1.89		1.71
Total	100.00	100.00	100.00	100.00
Sulfur	0.11	0.12		0.11
Btu/lb (HHV)	1251	1385		1251
MMF Btu/lb				
MAF Btu/lb				
Air Dry Loss (%)				
Ultimate (%)				
Moisture	9.63	0.00		9.63
Carbon	6.62	7.33		6.62
Hydrogen	0.16	0.18		0.16
Nitrogen	0.22	0.24		0.22
Sulfur	0.11	0.12		0.11
Ash	82.04	90.78		82.04
Oxygen*	1.2<	1.35		1.22
Total	100.00	100.00	100.00	100.00
Chlorine**	0.07	0.08		0.07

Forms of Sulfur (as S,%)

Sulfate		
Pyritic		
Organic	____	____
Total	0.11	0.12

Water Soluble Alkalies (%)

Na2O
K2O

Lb. Alkali/MM Btu=
Lb. Ash/MM Btu= 655.59
Lb. SO2/MM Btu= 1.76
HGI= @ % Moisture
As Rec'd. Sp.Gr.=
Free Swelling Index=

Report Prepared By:

Fuels Laboratory Supervisor

* Oxygen by Difference.
** Not usually reported as part of the ultimate analysis.

Hazen Research, Inc.
4601 Indiana St. • Golden, Colo. 80403
Tel: (303) 279-4501
FAX: (303) 278-1528

Date November 18 1997
HRI Project 9231
HRI Series No. J138/97-2
Date Rec'd. 10/07/97
Cust. P.O.#

Kari Moore

Sample Identification
1153-004-5A

Starting Soil
SC2
Typical Case Soil

Reporting Basis >	As Rec'd	Dry	Eqm	Air Dry
Proximate (%)				
Moisture	11.60	0.00		11.60
Ash	79.91	90.40		79.91
Volatile	8.84	10.00		8.84
Fixed C	<0.01	<0.01		<0.01
Sulfur	0.13	0.15		0.13
Btu/lb (HHV)	1056	1194		1056
MMF Btu/lb				
MAF Btu/lb				
Air Dry Loss (%)				
Ultimate (%)				
Moisture	11.60	0.00		11.60
Carbon	5.73	6.48		5.73
Hydrogen	<0.01	<0.01		<0.01
Nitrogen	0.18	0.20		0.18
Sulfur	0.13	0.15		0.13
Ash	79.91	90.40		79.91
Oxygen*	2.45	2.77		2.45
Total	100.00	100.00	100.00	100.00
Chlorine**	0.09	0.10		0.09

Forms of Sulfur (as S,%)

Sulfate		
Pyritic		
Organic		
Total	0.13	0.15

Water Soluble Alkalies (%)

Na2O
K2O

Lb. Alkali/MM Btu=
Lb. Ash/MM Btu= 756.78
Lb. SO2/MM Btu= 2.46
HGI= @ % Moisture
As Rec'd. Sp.Gr.=
Free Swelling Index=

Report Prepared By:

Fuels Laboratory Supervisor

* Oxygen by Difference.
** Not usually reported as part of the ultimate analysis.

Hazen Research, Inc.
4601 Indiana St. • Golden, Colo. 80403
Tel: (303) 279-4501
FAX: (303) 278-1528

Date November 18 1997
HRI Project 9231
HRI Series No. J278/97-1
Date Rec'd. 10/20/97
Cust. P.O.#

Kari Moore

Sample Identification
1153-046-7

Treated Soil
RTA-1

Reporting Basis >	As Rec'd	Dry	Eqm	Air Dry
Proximate (%)				
Moisture	0.92	0.00		0.26
Ash	94.54	95.42		95.17
Volatile	4.23	4.27		4.26
Fixed C	0.31	0.31		0.31
Total	100.00	100.00	100.00	100.00
Sulfur	0.15	0.15		0.15
Btu/lb (HHV)	384	387		386
MMF Btu/lb				
MAF Btu/lb				
Air Dry Loss (%)	0.66			
Ultimate (%)				
Moisture	0.92	0.00		0.26
Carbon	3.37	3.40		3.39
Hydrogen	0.40	0.40		0.40
Nitrogen	0.16	0.16		0.16
Sulfur	0.15	0.15		0.15
Ash	94.54	95.42		95.17
Oxygen*	0.46	0.47		0.47
Total	100.00	100.00	100.00	100.00
Chlorine**	0.33	0.33		0.33

Forms of Sulfur (as S,%)

Sulfate		
Pyritic		
Organic		
Total	0.15	0.15

Water Soluble Alkalies (%)

Na2O
K2O

Lb. Alkali/MM Btu=
Lb. Ash/MM Btu= 2462
Lb. SO2/MM Btu= 7.76
HGI= @ % Moisture
As Rec'd. Sp.Gr.=
Free Swelling Index=

Report Prepared By:

Fuels Laboratory Supervisor

* Oxygen by Difference.
** Not usually reported as part of the ultimate analysis.

Hazen Research, Inc.
4601 Indiana St. • Golden, Colo. 80403
Tel: (303) 279-4501
FAX: (303) 278-1528

Date November 18 1997
HRI Project 9231
HRI Series No. J278/97-3
Date Rec'd. 10/20/97
Cust. P.O.#

Kari Moore

Sample Identification
1153-046-15

Treated Soil
RTAN

Reporting Basis >	As Rec'd	Dry	Eqm	Air Dry
Proximate (%)				
Moisture	1.53	0.00		0.53
Ash	94.27	95.74		95.23
Volatile	3.53	3.59		3.57
Fixed C	0.67	0.67		0.67
Total	100.00	100.00	100.00	100.00
Sulfur	0.12	0.12		0.12
Btu/lb (HHV)	201	204		203
MMF Btu/lb				
MAF Btu/lb				
Air Dry Loss (%)	1.01			
Ultimate (%)				
Moisture	1.53	0.00		0.53
Carbon	3.02	3.07		3.05
Hydrogen	0.16	0.16		0.16
Nitrogen	0.12	0.12		0.12
Sulfur	0.12	0.12		0.12
Ash	94.27	95.74		95.23
Oxygen*	0.78	0.79		0.79
Total	100.00	100.00	100.00	100.00
Chlorine**	0.27	0.27		0.27

Lb. Alkali/MM Btu=
Lb. Ash/MM Btu= 4687
Lb. SO2/MM Btu= 11.81
HGI= @ % Moisture
As Rec'd. Sp.Gr.=
Free Swelling Index=

Forms of Sulfur (as S,%)

Sulfate		
Pyritic		
Organic		
Total	0.12	0.12

Report Prepared By:

Fuels Laboratory Supervisor

Water Soluble Alkalies (%)

Na20
K20

* Oxygen by Difference.
** Not usually reported as part of the ultimate analysis.

Hazen Research, Inc.
4601 Indiana St. • Golden, Colo. 80403
Tel: (303) 279-4501
FAX: (303) 278-1528

Date November 18 1997
HRI Project 9231
HRI Series No. J278/97-2
Date Rec'd. 10/20/97
Cust. P.O.#

Kari Moore

Sample Identification
1153-046-23

Treated Soil
RTA2

Reporting Basis >	As Rec'd	Dry	Eqm	Air Dry
Proximate (%)				
Moisture	1.95	0.00		0.30
Ash	90.71	92.51		92.23
Volatile	6.45	6.58		6.56
Fixed C	0.89	0.91		0.91
Total	100.00	100.00	100.00	100.00
Sulfur	0.14	0.14		0.14
Btu/lb (HHV)	531	541		540
MMF Btu/lb				
MAF Btu/lb				
Air Dry Loss (%)	1.65			
Ultimate (%)				
Moisture	1.95	0.00		0.30
Carbon	4.89	4.98		4.97
Hydrogen	0.23	0.24		0.24
Nitrogen	0.17	0.17		0.17
Sulfur	0.14	0.14		0.14
Ash	90.71	92.51		92.23
Oxygen*	1.91	1.96		1.95
Total	100.00	100.00	100.00	100.00
Chlorine**	0.22	0.22		0.22

Forms of Sulfur (as S.%)

Sulfate		
Pyritic		
Organic		
Total	0.14	0.14

Water Soluble Alkalies (%)

Na2O
K2O

Lb. Alkali/MM Btu=
Lb. Ash/MM Btu= 1708
Lb. SO2/MM Btu= 5.19
HGI= @ % Moisture
As Rec'd. Sp.Gr.=
Free Swelling Index=

Report Prepared By:

Fuels Laboratory Supervisor

* Oxygen by Difference.
** Not usually reported as part of the ultimate analysis.

Hazen Research, Inc.
4601 Indiana St. • Golden, Colo. 80403
Tel: (303) 279-4501
FAX: (303) 278-1528

Date: Oct. 31, 1997
PROJ. # 9231
CTRL # J277/97
REC'D 10/17/97

Kari Moore

Organic Phase Results

	RTA1	RTAN
Sample Number:	-1	-2
Sample Identification:	1153-047-8	1153-047-15
ULTIMATE		
Water, %	0.63	28.20
Ash, %	0.46	0.57
Sulfur, %	0.13	0.17
Carbon, %	57.99	64.21
Hydrogen, %	10.10	5.73
Nitrogen, %	0.65	0.79
Oxygen, %*	30.04	0.33
PROXIMATE		
Water, %	0.63	28.20
Ash, %	0.46	0.57
Volatile Matter, %	99.37	71.60
Fixed Carbon, %*	<0.01	<0.01
CALORIFIC VALUE		
BTU/lb	10895	14699

By:

Gerard H. Cunningham
Fuel Laboratory Manager

* by difference

Appendix H

Geotechnical Data

INTERNATIONAL TECHNOLOGY CORPORATION

GEOTECHNICAL LABORATORY

CERTIFICATE OF ANALYSIS

Ken Sadler
Focus Environmental
9050 Executive Park Drive, A202
Knoxville, Tennessee 37923

November 5, 1997

This is the Certificate of Analysis for the following samples:

Project ID:	**FOCUS - ACS**
IT project Number:	**772686.01000000**
Date Received by Lab:	August 29, 1997
Number of Samples:	Two (2)
Sample Type:	Soil

I. Introduction/Case Narrative

Two soil samples were received by the IT Geotechnical Laboratory on August 29, 1997. Requested testing included particle-size distribution, Atterberg limits, standard proctor, and USCS classification.

Please see Appendix A, Sample Number Cross Reference List; Appendix B, Analysis Results; and, Appendix C, Chain-of-Custody and Request-for-Analysis Records.

Reviewed and Approved:

Ralph Cole
Laboratory Manager, Geotechnical Services

IT GEOTECHNICAL
LABORATORY
OAK RIDGE, TN
(423)482-6497

II. Analytical Results/Methodology

REFERENCES: Annual Book of ASTM Standards, Section 4, Construction, Volume 04.08, *Soil and Rock (I)*, and Volume 04.09, *Soil and Rock (II)*, 1996.

Laboratory Determination of Water (Moisture) Content of Soil and Rock	**ASTM D 2216**
Particle-Size Analysis of Soils	**ASTM D 422**
Liquid Limit, Plastic Limit, and Plasticity Index of Soils	**ASTM D 4318**
Classification of Soils for Engineering Purposes	**ASTM D 2487**

III. Quality Control

Quality control checks such as duplicates and spikes (QC samples), are not normally applicable to geotechnical testing. This is due largely to the inability of obtaining samples with known characteristics, the heterogenous nature of the samples, and quality control procedures built-in to the analytical method.

QC measures to ensure accuracy and precision of test results include the following:

- 100% verification of all numerical results - raw data entries, transcriptions and calculations entered by lab technicians are checked, recalculated and verified. Most data calculations are performed by computer programs.

- Data validation through test reasonableness - summaries of all test results for individual reports are reviewed to determine the overall reasonableness of data and to determine the presence of any data that may be considered outliers.

- Quality control procedures are built into most standardized geotechnical procedures. For example, liquid limit and plastic limit analyses call for re-analyses and specify acceptance criteria.

- Routine instrument calibration - instruments, gauges and equipment used in testing are calibrated on a routine basis. All instrument calibration follows ASTM or manufacturer guidelines.

- Maintenance of all past calibration records - records and certification documents of all instruments, gauges and equipment are updated routinely and maintained in the Quality Control Coordinators Quality/Operations files.

IT GEOTECHNICAL
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OAK RIDGE, TN
(423)482-6497

- Certified and trained personnel - all technicians are certified by the National Institute for Certification of Engineering Technicians (NICET) in geotechnical soil testing, and are trained in the application of standard laboratory procedures for geotechnical analyses as well as the quality assurance measures implemented by IT.

IV. Data Qualification

None.

Appendix A

Sample Number Cross-Reference

Ken Sadler
Focus Environmental
November 5, 1997
IT Project ID: FOCUS - ACS
IT Project No.: 772686.01000000

IT GEOTECHNICAL LABORATORY
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(423)482-6497

SAMPLE NUMBER CROSS-REFERENCE LIST

LAB SAMPLE NO.	CLIENT SAMPLE NO.
ETDC-7243	1153-04-1
ETDC-7244	1153-004-2

Appendix B

Analysis Results

Ken Sadler
Focus Environmental
November 5, 1997
IT Project ID: FOCUS - ACS
IT Project No.: 772686.01000000

IT GEOTECHNICAL
LABORATORY
OAK RIDGE, TN
(423)482-6497

PARTICLE-SIZE ANALYSIS
ASTM D 422

Project Name FOCUS - ACS

Client Sample No. 1153-04-1

Project No. 772686.01000000

IT Lab Sample No. ETDC-7243

Specific Gravity = 2.65
assumed for calculations

Moisture Content = 11.9%
based on dry sample weight

SIEVE ANALYSIS

	Sieve No.	Diameter mm	Percent Finer
COARSE	3"	75.000	100.0%
	1.5"	37.500	100.0%
	0.75"	19.000	100.0%
	0.375"	9.500	100.0%
	#4	4.750	99.3%
	#10	2.000	86.0%

	Sieve No.	Diameter mm	Percent Finer
FINE	#20	0.850	76.8%
	#40	0.425	67.8%
	#60	0.250	52.4%
	#100	0.149	17.8%
	#140	0.106	6.9%
	#200	0.075	4.8%

HYDROMETER ANALYSIS

	Diameter mm	Percent Finer
HYDROMETER		
	0.05062	5.0%
	0.03579	4.1%
	0.02280	3.6%
	0.01279	3.2%
	0.00907	2.7%
	0.00665	2.3%
	0.00472	1.8%
	0.00327	1.8%
	0.00136	1.8%

Ken Sadler
Focus Environmental
November 5, 1997
IT Project ID: FOCUS - ACS
IT Project No.: 772686.01000000

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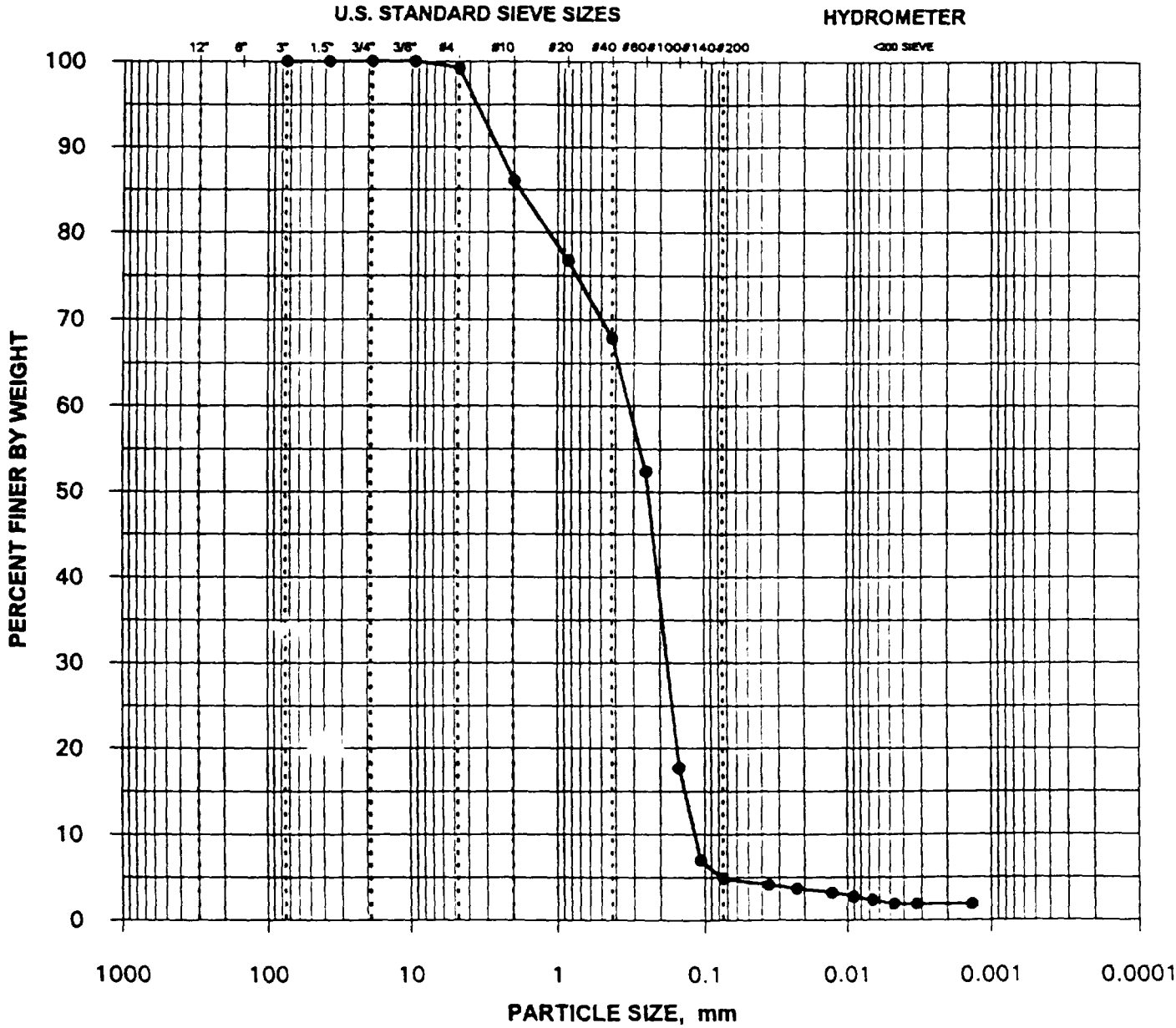
OAK RIDGE, TN
(423)482-6497

FOCUS - ACS



CLIENT SAMPLE NO.: 1153-04-1

IT LAB SAMPLE NO.: ETDC-7243

BOULDERS	COBBLES	GRAVEL		SAND			
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT 2 - 75 microns CLAY <2 microns

Ken Sadler
Focus Environmental
November 5, 1997
IT Project ID: FOCUS - ACS
IT Project No.: 772686.01000000

IT GEOTECHNICAL LABORATORY
OAK RIDGE, TN
(423)482-6497

PARTICLE-SIZE ANALYSIS
ASTM D 422

Project Name	FOCUS - ACS	Client Sample No.	1153-004-2
Project No.	772686.01000000	IT Lab Sample No.	ETDC-7244

Specific Gravity = 2.65
assumed for calculations

Moisture Content = 14.4%
based on dry sample weight

SIEVE ANALYSIS

	Sieve No.	Diameter mm	Percent Finer
COARSE	3"	75.000	100.0%
	1.5"	37.500	100.0%
	0.75"	19.000	100.0%
	0.375"	9.500	100.0%
	#4	4.750	99.5%
	#10	2.000	89.6%

	Sieve No.	Diameter mm	Percent Finer
FINE	#20	0.850	79.9%
	#40	0.425	72.0%
	#60	0.250	59.9%
	#100	0.149	26.2%
	#140	0.106	12.8%
	#200	0.075	9.5%

HYDROMETER ANALYSIS

	Diameter mm	Percent Finer
HYDROMETER		
	0.04934	8.5%
	0.03515	7.6%
	0.02235	6.7%
	0.01261	5.4%
	0.00898	4.5%
	0.00658	3.6%
	0.00469	2.7%
	0.00326	2.2%
	0.00136	1.8%

Ken Sadler
Focus Environmental
November 5, 1997
IT Project ID: FOCUS - ACS
IT Project No.: 772686.01000000

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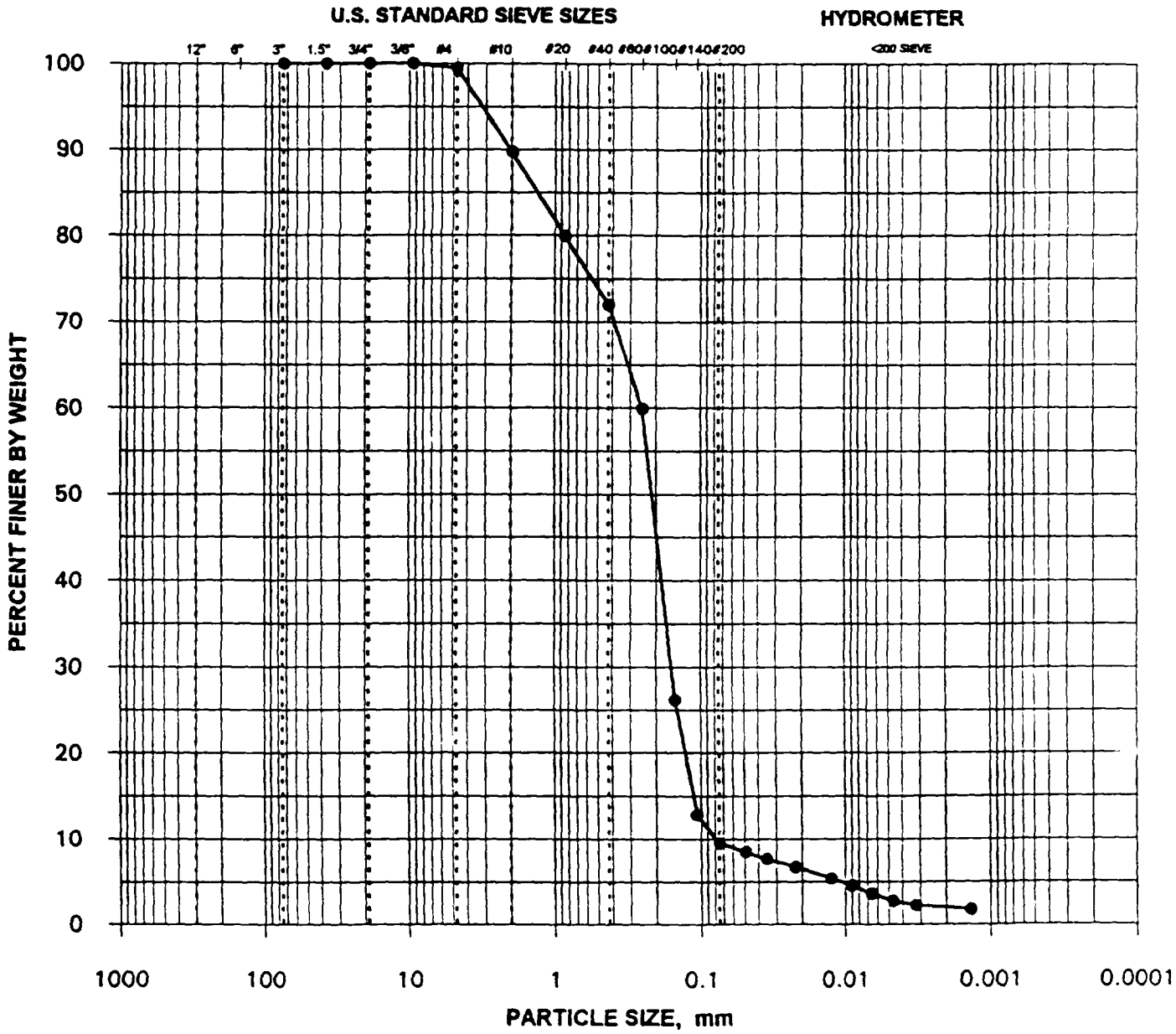
OAK RIDGE, TN
(423)482-6497

FOCUS - ACS



CLIENT SAMPLE NO.: 1153-004-2

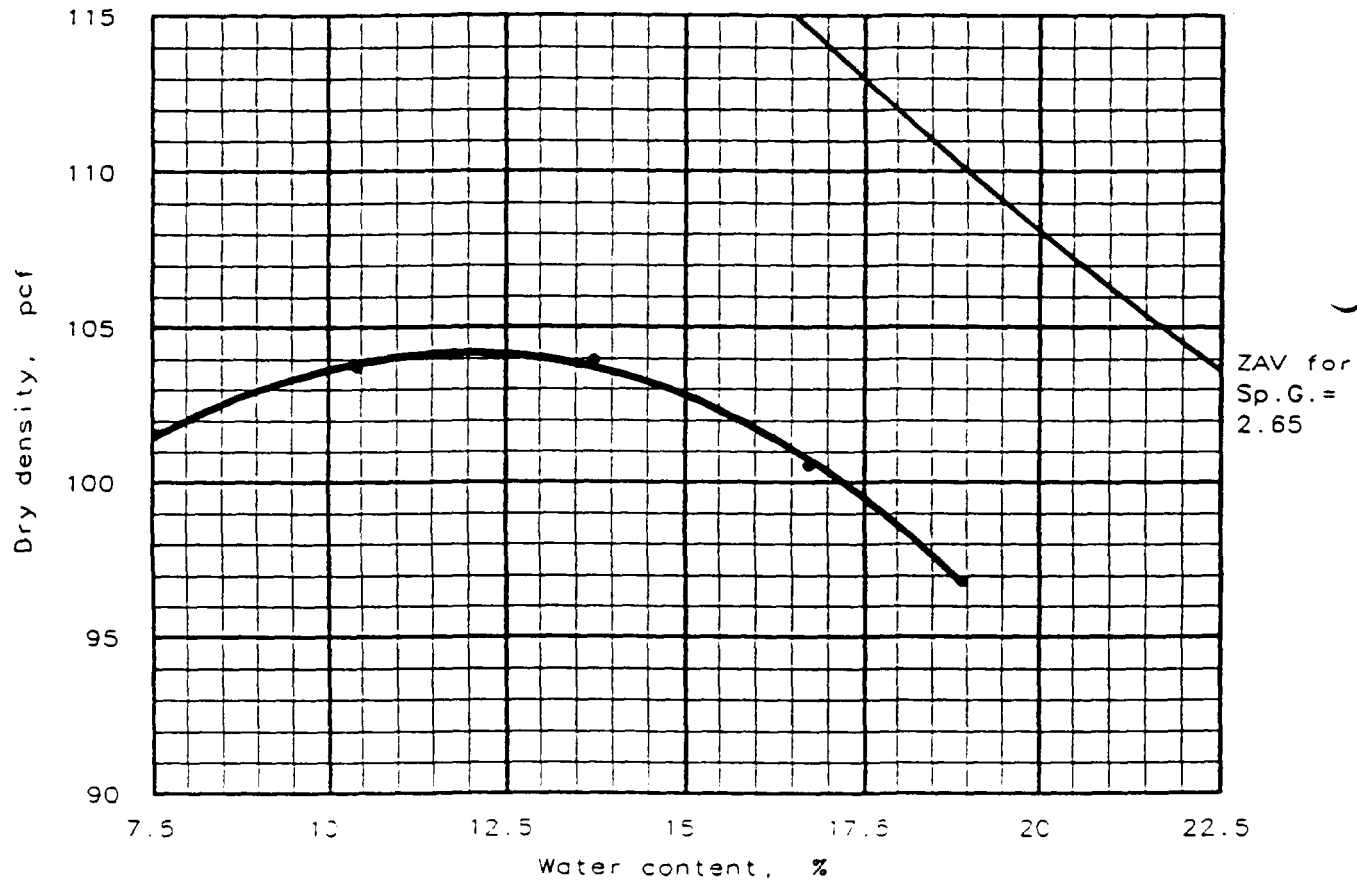
IT LAB SAMPLE NO.: ETDC-724

BOULDERS	COBBLES	GRAVEL		SAND			
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT 2 - 75 microns CLAY <2 microns

Ken Sadler
Focus Environmental
November 5, 1997
IT Project ID: FOCUS - ACS
IT Project No.: 772686.01000000

IT GEOTECHNICAL LABORATORY
OAK RIDGE, TN
(423)482-6497

Standard Proctor ASTM D 698



Test specification: ASTM D 698-91 Method A, Standard
Oversize correction applied to each point

Elev/ Depth	Classification USCS	Classification AASHTO	Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	NP		11.9 %	2.65			0.70 %	4.8 %

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 104.2 pcf Optimum moisture = 12.0 %	104.2 pcf 12.0 %	WORST CASE SOIL

ETDC Project Name: FOCUS-ACS

ETDC Project No.: 772686.01000000
ETDC Sample No.: 7243
Client Sample No.: 1153-04-1

Remarks:
Method A

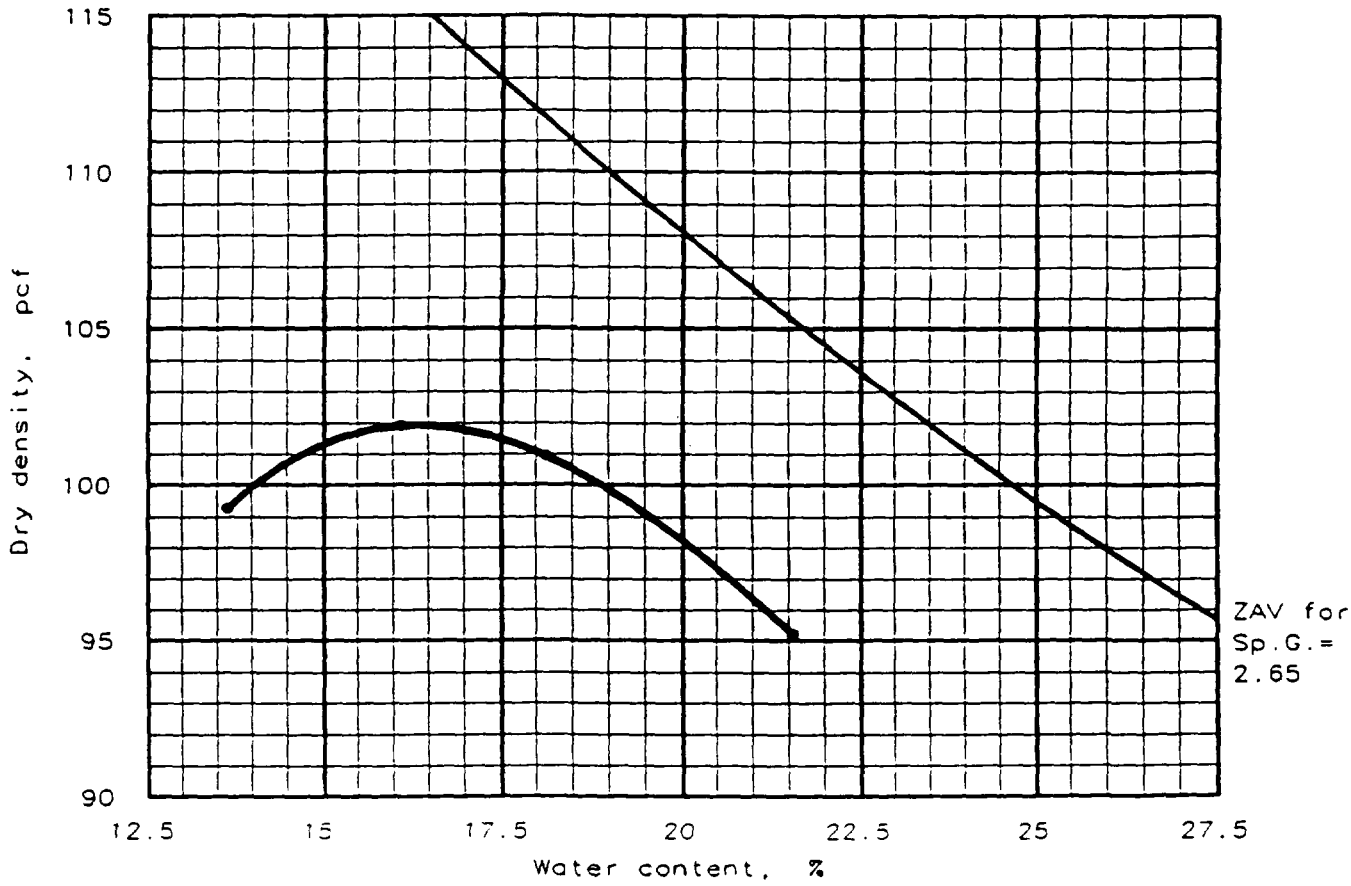
Standard Proctor ASTM D 698

IT Corp. - GEOTECHNICAL LABORATORY

Ken Sadler
Focus Environmental
November 5, 1997
IT Project ID: FOCUS - ACS
IT Project No.: 772686.01000000

IT GEOTECHNICAL LABORATORY
OAK RIDGE, TN
(423)482-6497

Standard Proctor ASTM D 698



Test specification: ASTM D 698-91 Method A, Standard
Oversize correction applied to each point

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
	NP		14.4 %	2.65			0.50 %	9.5 %

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 101.9 pcf Optimum moisture = 16.3 %	101.9 pcf 16.3 %	TYPICAL SOIL

ETDC Project Name: FOCUS-ACS

ETDC Project No.: 772686.01000000
ETDC Sample No.: 7244
Client Sample No.: 1153-004-02

Remarks:
Method A

Standard Proctor ASTM D 698

IT Corp. - GEOTECHNICAL LABORATORY

Ken Sadler
Focus Environmental
November 5, 1997
IT Project ID: FOCUS - ACS
IT Project No.: 772686.01000000

IT GEOTECHNICAL LABORATORY
OAK RIDGE, TN
(423)482-6497

ATTERBERG LIMITS
ASTM D 4318

PROJECT NAME: FOCUS - ACS

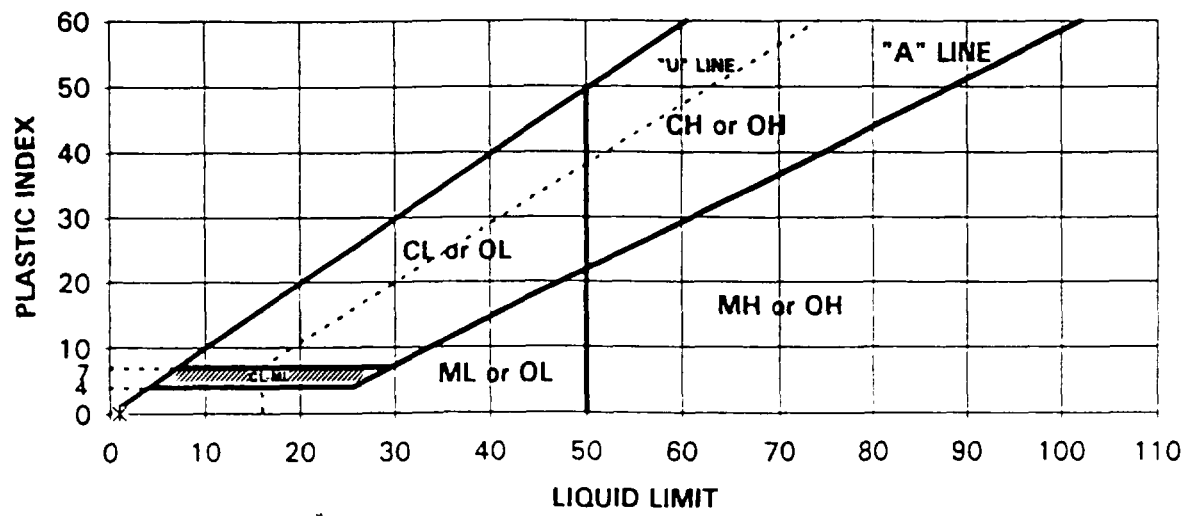
PROJECT NO. 772686.01000000

ATTERBERG LIMITS RESULTS

LAB SAMPLE NO.	FIELD SAMPLE NO.	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	USCS SYMBOL
ETDC-7243 •	1153-04-1	NP	NP	NP	NP
ETDC-7244 ◆	1153-004-2	NP	NP	NP	NP
□					
◇					
+					
○					
■					
x					
△					
*					

*NP = Nonplastic

PLASTICITY CHART



Ken Sadler
Focus Environmental
November 5, 1997
IT Project ID: FOCUS - ACS
IT Project No.: 772686.01000000

IT GEOTECHNICAL LABORATORY
OAK RIDGE, TN
(423)482-6497

SOIL CLASSIFICATION ASTM D 2487

PROJECT NAME: FOCUS - ACS **PROJECT NO:** 772686.01000000

	ETDC NUMBER:	CLIENT NUMBER:	GROUP SYMBOL:	CLASSIFICATION-GROUP NAME:
SAMPLE 1:	ETDC-7243	1153-04-1	SP	POORLY GRADED SAND
SAMPLE 2:	ETDC-7244	1153-004-2	SP-SM	POORLY GRADED SAND WITH SILT
SAMPLE 3:				
SAMPLE 4:				
SAMPLE 5:				
SAMPLE 6:				
SAMPLE 7:				
SAMPLE 8:				
SAMPLE 9:				
SAMPLE 10:				

Appendix C

Chain-of-Custody & Request-for-Analysis

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

Reference Document No. 47991
Page 1 of 1

Project Name/No. [1] FOCUS-ACS / 772686.0100.000
Samples Shipment Date [7] 8/28/97
Bill to: [5]

Team Members [2] A Glover
Lab Destination [8] IT-ETDC
Profit Center No. [3] 658500 1
Lab Contact [9] RALPH COLE
Project Manager [4] S SHEALY
Project Contact/Phone [12] ARLIE CROSS
Report to: [10] LEN SADLER, FOCUS ENVIRONMENTAL, 9052 EXECUTIVE PARK SUITE A 201, KNOXVILLE TN 37923
Purchase Order No. [6]
Carrier/Waybill No. [13]
Required Report Date [11]

ONE CONTAINER PER LINE

Sample Number [14]	Sample Description/Type [15]	Date/Time Collected [16]	Container Type [17]	Sample Volume [18]	Preservative [19]	Requested Testing Program [20]	Condition on Receipt [21]	Disposal Record No. [22]
53-004-1	WORST CASE SOIL	8/27/97		12 kg	—	ASTM D422, D4318	ETDC 7243	
3-004-2	TYPICAL SOIL	8/27/97		12 kg	—	D698, D2487	ETDC 7244	

Special Instructions: [23]

Visible Hazard Identification: [24]
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐

Sample Disposal: [25]
Return to Client ☐ Disposal by Lab ☒ Archive (mos.)

Turnaround Time Required: [26]
Normal ☒ Rush ☐

QC Level: [27]
I. ☐ II. ☐ III. ☐ Project Specific (specify):

Relinquished by [28] (Signature/Affiliation)	Date: 8/28/97 Time:	1. Received by [28] (Signature/Affiliation) IT/ETDC	Date: 8-29-97 Time: 0800
Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation)	Date: Time:
Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation)	Date: Time:

Comments: [29]

White: To accompany samples
Yellow: Field copy
*See back of form for special instructions.

Appendix I

IT Air Sampling Report

INTERNATIONAL
TECHNOLOGY
CORPORATION

American Chemical Service, Inc.
Griffith, Indian

Focus RTA Soil Test Results
from the
American Chemical Service Site

IT Project No. 77268
October 1997

RESPONSIVE TO THE NEEDS OF ENVIRONMENTAL MANAGEMENT

Focus RTA Soil Test Results from the American Chemical Service Site

Prepared for:

IT Corporation
Technical Development Laboratory
Knoxville, TN

by:

IT Air Quality Services
312 Directors Drive
Knoxville, TN 37923

IT Project Number 772686.01

October 1997

Table of Contents

1.0 Introduction 1-1
2.0 Testing Setup 2-1
3.0 Summary of Results 3-1

Attachment A - Graphs
Attachment B - Field Sheets and Flow Calculations
Attachment C - Calibration Sheets

1.0 INTRODUCTION

IT Air Quality Services personnel conducted emissions testing on eighth and ninth of October, 1997 on the Rotating Thermal Apparatus (RTA) located at Knoxville, TN. The test was performed while the RTA was processing soil samples from the American Chemical Service Site. The main objective of the test was to quantify Carbon Monoxide (CO), Total Hydrocarbon (THC), volatile, and semi-volatile emissions from the RTA gas stream. The CO and THC emissions were quantified using continuous emissions monitors (CEMs). The volatile and semi-volatile compounds were captured on Tenax and XAD resin and quantified by a laboratory.

IT-AQS personnel involved in the testing were:

Michael De Socio
Todd Gregg
Kris Kinder

During the sampling the RTA unit was controlled by Arie Groen, from the Technical Development Laboratory.

2.0 Testing Setup

During the test the RTA gas stream was pulled through a series of four impingers. The first three were filled with distilled water and the fourth impinger was left empty as a moister knock out. The sample was then branched into three different directions. The first branch of the gas stream lead directly into a series of two XAD resin traps, which were maintained at a sample flow rate of approximately 0.5 liters per minute. The second branch of the gas stream lead into two impingers and a condenser. The first impinger was filled with methanol and the second filled with DI water. The condenser was placed above the water impinger and used to cool the gas stream. The gas stream was then pulled through a pair of Tenax/Tenax Charcoal resin traps, with a flow rate being maintained at approximately 0.5 liters per minute. The third branch of the gas stream was pulled through a precision rotameter then to the CO monitor, and then finally to the THC monitor. The CO and THC sample flow rates were maintained at approximately 2.0 liters per minutes.

For the first test run the THC and CO monitors were set on scales of 0-10% and 0-5% respectively. At the request of Ken Sadler the CO monitor was placed on a 0-10% scale for the second and third run. The THC monitor was calibrated with propane gas, all calibration gases were certified.

3.0 Summary of Results

Test #1 (RTA2)

The highest THC and CO levels recorded during the test were 18,215 ppmv and 50,000 ppmv respectively. The average concentration recorded during the thirty five minute test was 8,533 ppmv THC and 12,243 ppmv CO. See Table 1. Moisture content in the gas stream was 62.55%. It should be noted that for five minutes in the first run the CO analyzer reached detector saturation. During this time the data logger could only log the CO analyzer's full scale reading which was fifty thousand ppm. During the next two runs the CO analyzer was set on a 10% scale.

For the Tenax resin traps a total sample volume of 16.7 liters was pulled, 17.21 liters at standard temperature and pressure (STP). For the XAD resin traps a total sample volume of 24.4 liters was pulled, 25.05 liters at STP. For the CEMs a total sample volume of 68.90 liters was pulled, 67.47 liters at STP. Total sample volume pulled from the RTA was 110.00 liters, 109.73 liters at STP. See Table 2

Test #2 (RTA1)

The highest THC and CO levels recorded during the test were 32,785 ppmv and 72,067 ppmv respectively. The average concentration recorded during the thirty five minute test was 15,181 ppmv THC and 22,289 ppmv CO. See Table 1. Moisture content in the gas stream was 69.50%.

For the Tenax resin traps a total sample volume of 12.40 liters was pulled, 12.64 liters at STP. For the XAD resin traps a total sample volume of 13.00 liters was pulled, 13.11 liters at STP. For the CEMs a total sample volume of 68.90 liters was pulled, 67.47 liters at STP. Total sample volume pulled from the RTA was 94.30 liters, 93.22 liters at STP. See Table 2

Test #3 (RTAN)

The highest THC and CO levels recorded during the test were 31,429 ppmv and 23,321 ppmv respectively. The average concentration recorded during the thirty six minute test was 15,787 ppmv THC and 7,954 ppmv CO. See Table 1. Moisture content in the gas stream was

ppmv THC and 7,954 ppmv CO. See Table 1. Moisture content in the gas stream was 66.52%.

For the Tenax resin traps a total sample volume of 10.50 liters was pulled, 10.77 liters at STP. For the XAD resin traps a total sample volume of 19.40 liters was pulled, 19.87 liters at STP. For the CEMs a total sample volume of 70.74 liters was pulled, 69.08 liters at STP. Total sample volume pulled from the RTA was 100.64 liters, 99.73 liters at STP. See Table 2

For ease of viewing graphs for each run have been plotted. Each graph shows the THC and CO concentration recorded on the data logger. Graphs are located in Attachment A. Field sheets and flow calculations can be viewed in Attachment B. Calibration information can be viewed in Attachment C.

Table 1
American Chemical Service, Inc. (RTA Focus)
THC & CO Concentrations

Run #1 (RTA2)			
Time	THC	CO	Temp. (F)
10:16	1274.9	380.7	121
10:17	2168.4	370.6	168
10:18	3031.8	380.7	205
10:19	3393.2	390.7	230
10:20	3644.1	430.7	257
10:21	4206.3	470.8	232
10:22	4587.8	561.0	232
10:23	5150.0	751.3	246
10:24	7850.4	1091.9	295
10:25	7820.3	1873.2	371
10:26	8071.3	4998.5	448
10:27	8111.4	7042.0	513
10:28	8081.3	8063.8	566
10:29	9624.0	18641.9	608
10:30	12117.2	35671.0	646
10:31	13919.6	50000.0	681
10:32	16109.5	50000.0	717
10:33	17524.5	50000.0	748
10:34	18063.5	50000.0	773
10:35	18215.1	50000.0	780
10:36	17120.2	40188.7	761
10:37	15031.4	25774.1	708
10:38	12420.4	11720.0	558
10:39	10213.6	6771.6	410
10:40	8647.0	4637.9	314
10:41	7820.3	3155.4	243
10:42	7207.9	1702.9	191
10:43	6816.4	791.4	158
10:44	6505.2	530.9	133
10:45	6204.0	420.7	119
10:46	5923.0	370.6	111
10:47	5651.9	340.6	104
10:48	5501.3	330.6	101
10:49	5390.9	330.6	101
10:50	5240.3	320.5	101
Avg. Con.	8533.1	12243.0	

Run #2 (RTA1)			
Time	THC	CO	Temp. (F)
15:12	5757.4	0.0	146
15:13	6383.8	0.0	200
15:14	7077.5	5.0	231
15:15	6875.2	105.7	235
15:16	7270.2	276.7	237
15:17	8532.3	548.4	256
15:18	7973.7	1021.4	318
15:19	7665.3	3144.7	411
15:20	7742.4	6405.2	499
15:21	8079.7	7995.1	576
15:22	10941.5	26561.6	641
15:23	14207.6	49072.8	696
15:24	18055.8	68152.4	751
15:25	21435.1	72067.0	798
15:26	23375.4	69521.0	839
15:27	23666.4	63825.3	869
15:28	25639.0	61973.7	899
15:29	27627.8	58330.8	923
15:30	29972.3	55654.0	945
15:31	31896.4	53098.0	964
15:32	32785.7	49515.5	979
15:33	31524.5	44242.5	985
15:34	28581.8	36866.2	942
15:35	23520.9	22908.7	784
15:36	17198.8	11939.9	584
15:37	13577.0	6445.4	438
15:38	11846.9	3990.0	330
15:39	10925.3	2993.8	249
15:40	10068.3	1937.1	197
15:41	9373.1	1061.7	162
15:42	8855.7	397.5	143
15:43	8499.9	85.5	129
15:44	8282.0	0.0	118
15:45	8137.5	0.0	109
15:46	7992.9	0.0	103
Avg. Con.	15181.3	22289.8	

Run #3 (RTAN)			
Time	THC	CO	Temp. (F)
09:58	2770.3	494.7	159
09:59	4663.0	484.7	209
10:00	5826.1	504.7	233
10:01	7021.0	534.7	246
10:02	6851.8	594.7	271
10:03	6524.0	844.5	312
10:04	6513.4	1374.2	377
10:05	7592.0	2123.8	456
10:06	7930.3	5881.6	524
10:07	7983.2	6071.5	579
10:08	8363.9	6781.1	634
10:09	10564.1	10928.8	685
10:10	13491.6	16255.7	732
10:11	16578.9	20773.2	777
10:12	19630.6	23301.7	817
10:13	21564.6	23191.8	853
10:14	23267.9	23321.7	880
10:15	24918.0	20983.0	904
10:16	26603.6	17714.9	925
10:17	28608.5	15206.3	942
10:18	30347.3	13477.3	957
10:19	31429.6	12238.0	969
10:20	30098.9	10758.9	979
10:21	30329.5	10978.7	986
10:22	29815.0	10349.1	967
10:23	26674.5	8969.9	899
10:24	21422.7	6551.3	774
10:25	16649.8	4182.6	586
10:26	14503.0	3153.2	447
10:27	13083.5	2363.7	330
10:28	12356.1	1774.0	241
10:29	11770.6	1274.3	179
10:30	11273.8	954.5	142
10:31	10777.0	764.6	122
10:32	10457.6	634.6	111
10:33	10102.8	554.7	104
Avg. Con.	15787.7	7954.1	

Table 2
American Chemical Service, Inc. (Focus RTA Study)
Metered Volume at Standard Conditions

Tenax Box Gamma 1.0689
XAD Box Gamma 1.0638

Test Date: 10/8/97

TEST #	METER	METER TEMP. (C)	METER TEMP. (F)	Barometric Pressure (Hg)	METER VOL. (L)	METER VOL. (Ft^3)	METER VOL. (L@ STP)	METER VOL. (Ft^3@ STP)
1	Tenax Metered	24.7	76.4	29.3	16.70	0.59	17.21	0.61
(RTA2)	XAD Metered	24.3	75.7	29.3	24.40	0.86	25.05	0.88
	CEMs Metered	20.0	68.0	29.3	68.90	2.43	67.47	2.38
Totals Volumes					110.00	3.88	109.73	3.87

Tenax Box Gamma 1.0689
XAD Box Gamma 1.0638

Test Date: 10/8/97

TEST #	METER	METER TEMP. (C)	METER TEMP. (F)	Barometric Pressure (Hg)	METER VOL. (L)	METER VOL. (Ft^3)	METER VOL. (L@ STP)	METER VOL. (Ft^3@ STP)
2	Tenax Metered	27.8	82.1	29.3	12.40	0.44	12.64	0.45
(RTA1)	XAD Metered	29.8	85.6	29.3	13.00	0.46	13.11	0.46
	CEMs Metered	20.0	68.0	29.3	68.90	2.43	67.47	2.38
Totals Volumes					94.30	3.33	93.22	3.29

Tenax Box Gamma 1.0689
XAD Box Gamma 1.0638

Test Date: 10/9/97

TEST #	METER	METER TEMP. (C)	METER TEMP. (F)	Barometric Pressure (Hg)	METER VOL. (L)	METER VOL. (Ft^3)	METER VOL. (L@ STP)	METER VOL. (Ft^3@ STP)
3	Tenax Metered	25.2	77.4	29.22	10.50	0.37	10.77	0.38
(RTAN)	XAD Metered	24.2	75.6	29.22	19.40	0.69	19.87	0.70
	CEMs Metered	20.0	68.0	29.22	70.74	2.50	69.08	2.44
Totals Volumes					100.64	3.55	99.73	3.52

Attachment A

Concentration Graphs

Table 1

Test #1 (RTA2)

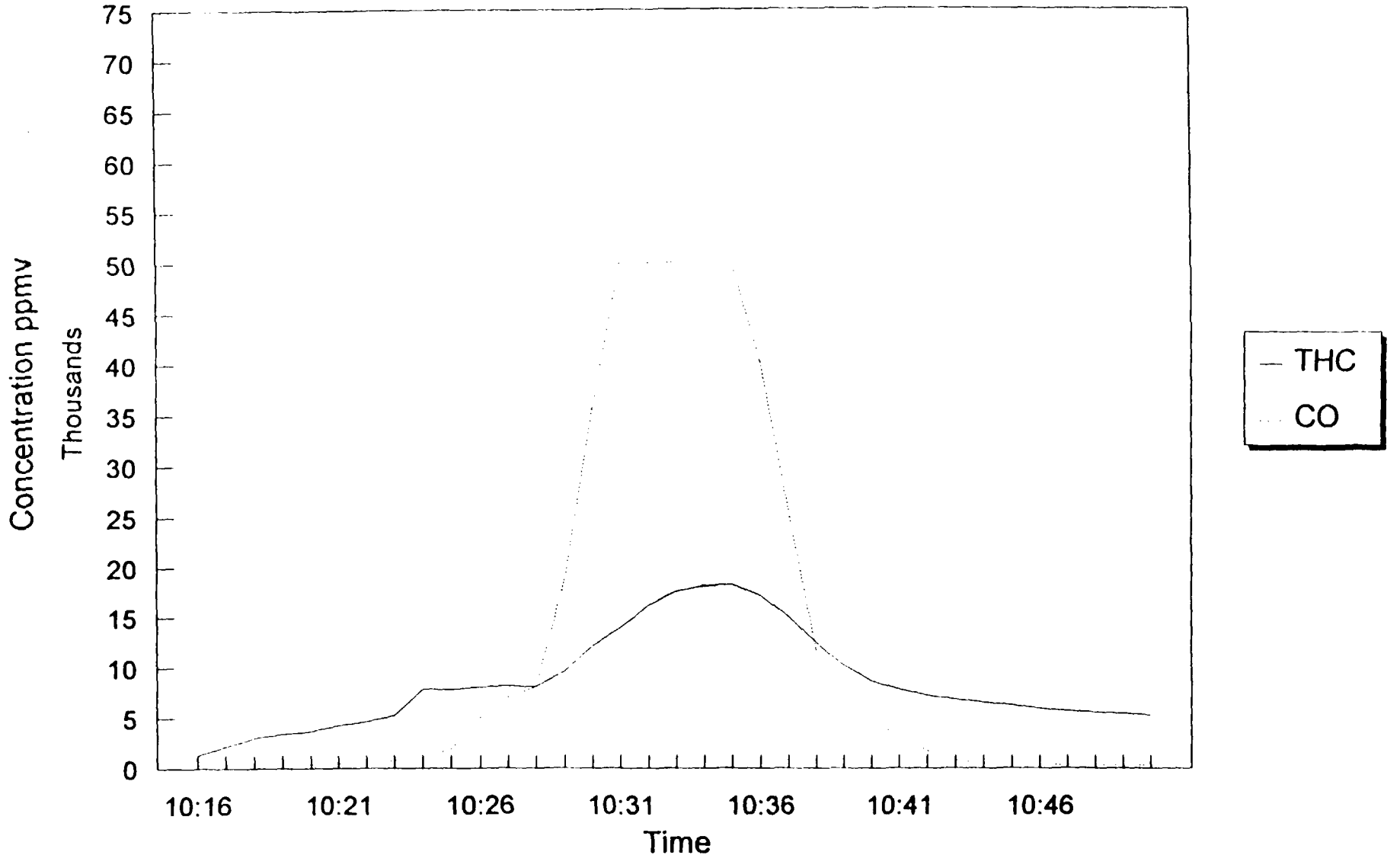
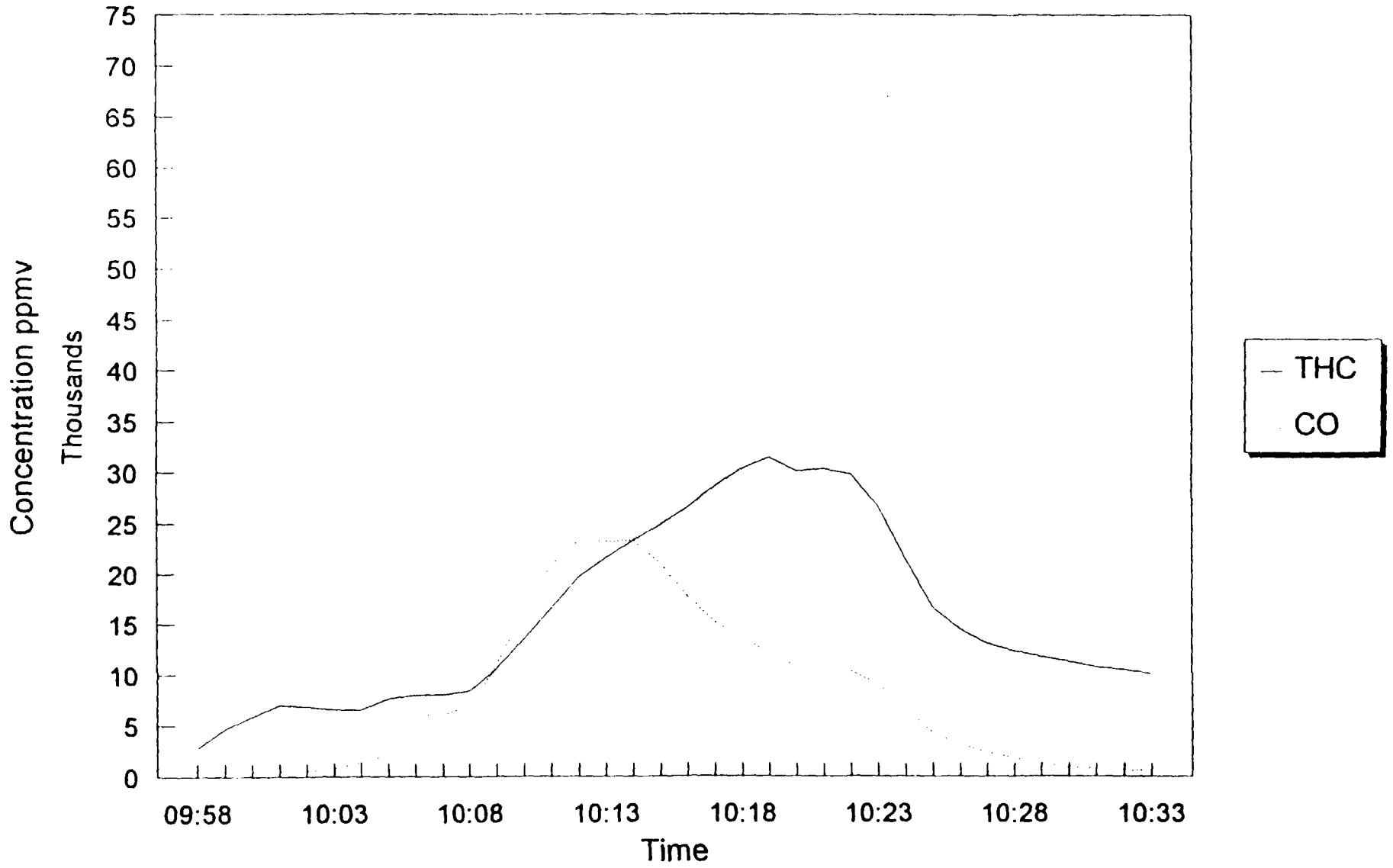


Table 3

Test #3 (RTAN)



Attachment B

Field Sheets and Flow Calculations

INTERNATIONAL TECHNOLOGY CORPORATION

312 Directors Drive
Knoxville Tennessee 37923-4799

STACK TEST DATA SHEET

Project:	Focus RTA	Barom. Pr.:	29.30
Project No:		Static Pr.:	N/A
Source:	RTA2-XAD	Delta H @:	N/A
Run No.:	#1	Gamma:	1.0638
Date:	10-8-97	Pitot Coef.:	N/A
Filter No.:		Stack Dia.:	
Meter Box I.D.:	40621	Stack Area:	
Sample Box No.:		Port Length:	
Probe Heater Setting:		Port Dia.:	
Personnel:	TG	Probe Liner:	

Schematic of Stack

712.5 - 897.7 = 185.2
635 - 672.7 = 35.2
597.0 - 517.2 = -79.8
496.0 - 496.9 = 0.9
2437.0 - 2578.5 = 141.5

TRAVERSE POINT NUMBER	SAMPLING TIME Clock	SAMPLING TIME Sample	VELOCITY DELTA P Actual	VELOCITY DELTA P Sq. Root	DELTA H	GAS SAMPLE VOLUME (Liters)	DRY GAS METER TEMPERATURE Inlet	DRY GAS METER TEMPERATURE Outlet	FILTER BOX TEMP	STACK TEMP	LAST IMPINGER TEMP	TRAIN VACUUM
	10:15	0				464.2		72				1.0
		5				475.0		72				1.0
		10				482.2		73				1.0
		15				483.6		75				1.0
		20				485.0		76				1.0
		25				485.4		78				1.0
	10:50	30				488.6		79				1.0
		35										
		40				24.4		75				
		45										
		50					Both Box					
		55					Avg 75.7					
		60										
AVERAGE												

LEAK CHECKS	
Pitot impact:	
Pitot static:	
Train initial:	0.0 @ 14" Hg
Train Final:	0.0 @ 3" Hg

NOZZLE MEASUREMENT	
I.D. No.:	
1	
2	
3	
Avg.	

STACK GAS ANALYSIS	CO2	O2	CO
1			
2			
3			
Avg.			

NOTES: Sample RTA2-XAD
offset 10.50 -

Operator Signature:

..I'' ..IAT..NA..
TE..NOLOGY
CORPORATION

..ACK SAMPLING DATA SH..ET

ate: 10-8-97	Test No.: RTA2 Run #1 VOC Methanol	Delta H@:	Sample Box No.: 40520
lient: TOLLIT	Nozzle Dia:	Meter Correction: 1.0689	Probe No.:
lant:	Static Press, Ps:	Pitot Correction:	Filter No.:
ocation:	Port Direction:	Control Box No.: 40520	Stack Diameter:
roject No.:	Ambient Temp:	Assumed Moisture:	Umbilical Length:
est Crew: KK	Barometric Press: 29.30	Calculator Multiplier:	

Point	Time	Meter Reading [dry] Liters	Velocity Head Delta P in. H2O	Orifice Delta H in. H2O Required	Orifice Delta H in. H2O Actual	Meter Vacuum Vm in. Hg	Stack Temp. Ts °F	Probe Temp. Tp °F	Oven Temp. To °F	Imp. Temp. Ti °F Out	Imp. Temp. Ti °F In	Meter Temp. Tm °F Out	Meter Temp. Tm °F In	Comments
Start 10:15	0	9351.3				5					75		75	
	5	9354.2				5					76		76	
	10	9357.0				6							76	
	15	9360.0				5							76	
	20	9362.8				5							77	
	25	9365.2				4							77	
Stop 10:50	30	9367.0				4							78	
	35	9368.0	Final											
	40												76.4	
	45	16.7												
	50													
	55													
	60													

Sample Train Leak Check

	in Hg	Rate, CFM
Before	15	0.0
After	5	0.0

Pitot Leak Check

Red	
Black	

Gas Analysis

	1	2	3	Ave
CO2				
O2				
CO				
N2				

Impinger	Grams Final	Grams Initial	Difference
1	683.8	MeOH 690.0	
2	592.0	H2O ~~592.5~~ 590.0	
3			
4			
5			

INTERNATIONAL TECHNOLOGY CORPORATION

312 Directors Drive
Knoxville, Tennessee 37923-4799

STACK TEST DATA SHEET

Project:	RTA	Barom. Pr.:	29.30
Project No:		Static Pr.:	
Source:	RTA1-TAD	Delta H @:	
Run No.:	#2	Gamma:	1.0638
Date:	10.8.97	Pitot Coef.:	
Filter No.:		Stack Dia.:	
Meter Box I.D.:	40621	Stack Area:	
Sample Box No.:		Port Length:	
Probe Heater Setting:		Port Dia.:	
Personnel:	TG	Probe Liner:	

Schematic of Stack

~~[illegible]~~ 549.0 - 69[illegible]
584.2 - 6[illegible]7.3
699.4 - 699.7
528.7 - 527.5

2361.3 - 2524.5

TRAVERSE POINT NUMBER	SAMPLING TIME Clock	SAMPLING TIME Sample	VELOCITY DELTA P Actual	VELOCITY DELTA P Sq. Root	DELTA H	GAS SAMPLE VOLUME L/1	DRY GAS METER TEMPERATURE Inlet	DRY GAS METER TEMPERATURE Outlet	FILTER BOX TEMP	STACK TEMP	LAST IMPINGER TEMP	TRAIN VACUUM
						~~492.6~~						
	15.14	0				492.6		82				1.0
		5				495.8		52				1.0
		10				497.0		83				1.0
		15				498.6		85				1.0
		20				499.6		86				1.0
		25				502.2		87				1.0
		30				503.0		88				1.0
		35				505.2		88				1.0
	15.46	36				505.6		89				1.0
						13.0		85.6				
							Both	83.85				
AVERAGE												

LEAK CHECKS	
Pitot impact:	
Pitot static:	
Train initial:	0.0 @ 10" Hg
Train Final:	0.0 @ 2" Hg

NOZZLE MEASUREMENT	
I.D. No.:	
1	
2	
3	
Avg.	

STACK GAS ANALYSIS	CO2	O2	CO
1			
2			
3			
Avg.			

NOTES:

Operator Signature:

TE NOLOGY CORPORATION

ACK SAMPL G DATA SH T

ate: 10-8-97	Test No.: RTA1 Run #2 VOC/MeOH	Delta H@:	Sample Box No.:
lient: TOL\IT	Nozzle Dia:	Meter Correction: 1.0589	Probe No.:
lant:	Static Press, Ps:	Pitot Correction:	Filter No.:
ocation:	Port Direction:	Control Box No.: 40520	Stack Diameter:
oject No.:	Ambient Temp:	Assumed Moisture:	Umbilical Length:
est Crew: KK	Barometric Press: 29.30	Calculator Multiplier:	

Point	Time	Meter Reading [dry] ~~CF~~ Liter	Velocity Head Delta P in. H2O	Orifice Delta H in. H2O Required	Actual	Meter Vacuum Vm in. Hg	Stack Temp. Ts °F	Probe Temp. Tp °F	Oven Temp. To °F	Imp. Temp. Ti °F Out	In	Meter Temp. Tm °F Out	In	Comments
start	0	9368.9				4							80	
s: 1	5	9371.0				4							80	
	10	9372.4				4							81	
	15	9374.2				4							82	
	20	9376.0				4							83	
	25	9378.0				4							84	
stop	30	9380.0				4							85	
15:46	35	9381.3	Final										82.1	
		12.4												

Sample Train Leak Check

	in Hg	Rate, CFM
Before	15	0.0
After	5	0.0

Pitot Leak Check

Red	
Black	

Gas Analysis

	1	2	3	Ave
CO2				
O2				
CO				
N2				

Impinger	Grams Final	Grams Initial M.OFI	Difference
1	687.8	688.0	
2	590.6	588.0	
3			
4			
5			

INTERNATIONAL TECHNOLOGY CORPORATION

312 Directors Drive
Knoxville, Tennessee 37923-4799

STACK TEST DATA SHEET

Project:	Focus RTA	Barom. Pr.:	29.22
Project No:		Static Pr.:	N/A
Source:	RTAN-XAD	Delta H @:	N/A
Run No.:	#3	Gamma:	1.0683
Date:	10-9-97	Pitot Coef.:	N/A
Filter No.:		Stack Dia.:	N/A
Meter Box I.D.:	406.71	Stack Area:	N/A
Sample Box No.:		Port Length:	N/A
Probe Heater Setting:		Port Dia.:	N/A
Personnel:	TG	Probe Liner:	N/A

Schematic of Stack

709.1 − 834.8 = 125.7
579.5 − 625.9 = 46.4
597.8 − 581.0 −16.8
529.0 − 527.1 −1.9
J
2415.4 − 2568.8 153.4

TRAVERSE POINT NUMBER	SAMPLING TIME Clock	SAMPLING TIME Sample	VELOCITY DELTA P Actual	VELOCITY DELTA P Sq. Root	DELTA H	GAS SAMPLE VOLUME	DRY GAS METER TEMPERATURE Inlet	DRY GAS METER TEMPERATURE Outlet	FILTER BOX TEMP	STACK TEMP	LAST IMPINGER TEMP	TRAIN VACUUM
	9:57	0				508.6		70				1.0
		5				521.4		71				1.0
		10				523.8		72				1.0
		15				525.0		74				1.0
		20				525.8		76				1.0
		25				526.4		78				1.0
		30				526.8		79				1.0
		35				527.8		80				1.0
	10:53	37				528.0		80				1.0
						19.4		75.6				
							76.5					
AVERAGE												

LEAK CHECKS	
Pitot impact:	
Pitot static:	
Train initial:	0.00 0.0 Hg
Train Final:	0.00 2" Hg

NOZZLE MEASUREMENT	
I.D. No.:	
1	
2	
3	
Avg.	

STACK GAS ANALYSIS	CO2	O2	CO
1			
2			
3			
Avg.			

NOTES:

Operator Signature

TECHNOLOGY CORPORATION

STACK SAMPLING DATA SHEET

Date: 10-9-97	Test No.: RTAN Run #3 VOC/MeOH	Delta H@:	Sample Box No.:
Client: TOLIT	Nozzle Dia:	Meter Correction: 1.0689	Probe No.:
Plant:	Static Press, Ps:	Pitot Correction:	Filter No.:
Location:	Port Direction:	Control Box No.: 40520	Stack Diameter:
Project No.:	Ambient Temp:	Assumed Moisture:	Umbilical Length:
Test Crew: KK	Barometric Press: 29.22	Calculator Multiplier:	

Point	Time	Meter Reading [dry] ~~Cf~~ Liters	Velocity Head Delta P in. H2O	Orifice Delta H in. H2O Required	Orifice Delta H in. H2O Actual	Meter Vacuum Vm in. Hg	Stack Temp. Ts °F	Probe Temp. Tp °F	Oven Temp. To °F	Imp. Temp. Ti °F Out	Imp. Temp. Ti °F In	Meter Temp. Tm °F Out	Meter Temp. Tm °F In	Comments
start	0	9382.1				3							76	
11:57	5	9384.0				3							76	
	10	9385.5				3							77	
	15	9387.0				3							77	
	20	9388.4				3							78	
	25	9389.6				3							78	
	30	9391.0				3							78	
	35	9392.2				3							79	
stop		Fin 9392.6												
12:33													77.4	
		10.5												

Sample Train Leak Check

	in Hg	Rate, CFM
Before	15	0.0
After	5	0.0

Pitot Leak Check

Red	
Black	

Gas Analysis

	1	2	3	Ave
CO2				
O2				
CO				
N2				

Impinger	Grams Final	Grams Initial MeOH	Difference
1	686.6	687.0	
2	598.4	597.5	
3			
4			
5			

INTERNATIONAL TECHNOLOGY CORPORATION

(CEMS)

By MD Date 10/8/97 Subject CO & THC CALS Sheet No. 1 of 2

Chkd. By ____ Date ____ Proj. No. ____

#1-RTA2
#2-RTA1
#3-RTA1

		THC	CO		
Zero	8:16	0.0	.009		
Co				0	0
MID	8:22		1.759	1.754	3040
HIGH	8:32		4.069	4.002	5160
					8460
THC					
HIGH	8:46		8.420		
MID	8:50		.5000		
LOW	8:58		.2.900		

START #1 10:15
STOP #1 10:50

FLOWS
1) [illegible] 2) [illegible] 3) [illegible] [illegible]

		THC	CO
POST Zero	11:11	.014	.043
MID	11:18		1.795
MID	11:22	.542	
1.5	11:29	1.286	
1.968	11:32	1.348	

Flow
6.7, 6.7, 6.7

INTERNATIONAL TECHNOLOGY CORPORATION

(CEMs Cals)

By MD Date 10/8/97 Subject CO & THC #2 CALS Sheet No. 2 of 2

Chkd. By ____ Date ____ Proj. No. ____

		THC	CO
Zero	14:16	-.003	.005
CO			
MID	14:21		1.710
HIGH	14:23		3.995
THC			
LOW	14:31	.3030	
MID	14:34	.529	
HIGH	14:40	.869	
1.5	14:42	1.238	
1.696	14:45	1.301	

Flow 6.7, 6.7, 6.7

~~Flows~~

~~Avg 6.6~~

#2 START 15:11 STOP 15:46

POST		
THC	15:53	.561
Zero	15:59	.022 & -.052
CO	16:05	1.729

		THC	CO
Zero	8:17	.001	.013
CO LOW	8:20		1.771
CO HIGH	8:25		4.033
THC LOW	8:46	.297	
THC MID	8:39	.498	
THC HIGH	8:36	.830	
1.5	8.49	1.204	
1.696	8:53	1.260	

Flow 6.7, 6.7, 6.7

~~Flows~~

~~Avg 6.6~~

Gilibrator 1969 cc Flow
1970 cc
1969 cc
1970 cc

START #3 9:57 END 10:38

Zero	10:47	.015	& .030
CO MID	10:51		1.782

American Chemical Service, Inc. (Focus RTA Study)
Rotameter Flows

TEST #	Reading	Barometric Pr .sure	METER TEMP. (F)	Reading @ STP	Time (min)	CEM Flow VOL. (cc)	METER VOL. (L)
1	6.7	29.3	68.0	6.6	35	68897.90	68.90
2	6.7	29.3	68.0	6.6	35	68897.90	68.90
3	6.7	29.2	68.0	6.6	36	70737.04	70.74

GAS COMPOSITION TEST
Test Location: TDL- Focus
Test Date: 10/8/98
Project No.:
Test No: #1 (RTA2)

INPUT PARAMETERS

Volume of water Collected (ml)	141.5	
Volume measured by dry gas meter	3.88	cubic feet
Gamma	1.065	
Barometric Pressure	29.3	
Static Pressure	0	
Stack Pressure	29.30	
Temperature of the meter box	75.70	(F)

SAMPLING CALCULATIONS

Volume of Water Collected

Vwstd = (Vl0)(0.04707)
Vwstd = 6.66 cubic feet

Volume of Gas Metered, Standard Conditions

Vmstd = ((Vm*gamma))((Pm*Tstd)/(Pstd*Tm))
Vmstd = 3.988 cubic feet

Moisture Content

Bwo = Vwstd/(Vmstd + Vwstd)
Bwo = 0.625

GAS COMPOSITION TEST RESULTS

Vol. Sampled at STP (ft3)	3.988
Moisture Content (% Vol)	62.55

GAS COMPOSITION TEST
Test Location: TDL- Focus
Test Date: 10/8/98
Project No.:
Test No: #2 (RTA1)

INPUT PARAMETERS

Volume of water Collected (ml)	163.2	
Volume measured by dry gas meter	3.33	cubic feet
Gamma	1.065	
Barometric Pressure	29.3	
Static Pressure	0	
Stack Pressure	29.30	
Temperature of the meter box	83.85	(F)

SAMPLING CALCULATIONS

Volume of Water Collected

Vwstd = (VI0)(0.04707)
Vwstd = 7.68 cubic feet

Volume of Gas Metered, Standard Conditions

Vmstd = ((Vm*gamma))((Pm*Tstd)/(Pstd*Tm))
Vmstd = 3.372 cubic feet

Moisture Content

Bwo = Vwstd/(Vmstd + Vwstd)
Bwo = 0.695

GAS COMPOSITION TEST RESULTS

Vol. Sampled at STP (ft3)	3.372
Moisture Content (% Vol)	69.50

GAS COMPOSITION TEST
Test Location: TDL- Focus
Test Date: 10/9/98
Project No.:
Test No: #3 (RTAN)

INPUT PARAMETERS

Volume of water Collected (ml)	153.4	
Volume measured by dry gas meter	3.55	cubic feet
Gamma	1.065	
Barometric Pressure	29.22	
Static Pressure	0	
Stack Pressure	29.22	
Temperature of the meter box	76.50	(F)

SAMPLING CALCULATIONS

Volume of Water Collected

Vwstd = (VI0)(0.04707)
Vwstd = 7.22 cubic feet

Volume of Gas Metered, Standard Conditions

Vmstd = ((Vm*gamma))((Pm*Tstd)/(Pstd*Tm))
Vmstd = 3.634 cubic feet

Moisture Content

Bwo = Vwstd/(Vmstd + Vwstd)
Bwo = 0.665

GAS COMPOSITION TEST RESULTS

Vol. Sampled at STP (ft3)	3.634
Moisture Content (% Vol)	66.52

Attachment C

Calibration Information

CEM CALIBRATIONS

PROJECT NAME	Focus RTA
PROJECT NUMBER	
DATE	10/8/97
RUN NUMBER	#1 (RTA2)
START TIME	10:15
STOP TIME	10:50

ANALYZER SPAN	
CO	50000
THC	25000

		CALIBRATION ERROR			SYSTEM BIAS CHECK				
	GAS	CAL. GAS	ANALYZER	CAL	PRETEST		POST TEST		
	CYLINDER NUMBER	VALUE (% or PPM)	RESP (% or PPM)	ERROR (% SPAN)	SYSTEM RESP.	SYS. BIAS (% SPAN)	SYSTEM RESP.	SYS. BIAS (% SPAN)	DRIFT (% SPAN)
CO zero		0	90	-0.18	90	0	430	-0.68	-0.68
CO low				0					
CO mid		17540	17590	-0.1	17590	0	17950	-0.72	-0.72
CO hi		40020	40690	-1.34					
THC zero		0	0	0	0	0	140	-0.56	-0.56
THC low		3040	2900	0.56					
THC mid		5160	5000	0.64	5000	0	5420	-1.68	-1.68
THC hi		8460	8420	0.16					

Correction factors

CO	Avg. Conc	-	260	*	1.001713
THC	Avg. Conc	-	70	*	1.003891

Calibration error = ((cal. gas value - analyzer resp) / analyzer span) * 100: allowable error ± 2 % , ± 5 % for THC

System Bias = ((analyzer resp - system resp) / analyzer span) * 100: allowable error ± 5 %

Drift = ((pretest sys resp - post test sys resp) / analyzer span) * 100: allowable error ± 3 %

Sys Bias (pre and post) must be performed on each run: To determine Drift.
Use zero gas and either mid or hi cal gas, choose cal gas closest to measured stack concentration.

Drift must be performed every hour on THC

Calibration Error is performed only at start, unless allowable error parameters are exceeded.

CEM CALIBRATIONS

PROJECT NAME	Focus RTA
PROJECT NUMBER	
DATE	10/8/97
RUN NUMBER	#2 (RTA1)
START TIME	15:11
STOP TIME	15:46

ANALYZER SPAN	
CO	50000
THC	25000

	CALIBRATION ERROR				SYSTEM BIAS CHECK				
	GAS CYLINDER NUMBER	CAL. GAS VALUE (% or PPM)	ANALYZER RESP (% or PPM)	CAL ERROR (% SPAN)	PRETEST SYSTEM RESP.	PRETEST SYS. BIAS (% SPAN)	POST TEST SYSTEM RESP.	POST TEST SYS. BIAS (% SPAN)	DRIFT (% SPAN)
CO zero		0	50	-0.1	50	0	-520	1.14	1.14
CO low				0					
CO mid		17540	17100	0.88	17100	0	17290	-0.38	-0.38
CO hi		40020	39950	0.14					
THC zero		0	-30	0.12	-30	0	220	-1	-1
THC low		3040	3030	0.04					
THC mid		5160	5290	-0.52	5290	0	5610	-1.28	-1.28
THC hi		8460	8690	-0.92					

Correction factors

CO	Avg. Conc	-	-235	*	1.006311
THC	Avg. Conc	-	95	*	0.963585

Calibration error = ((cal. gas value - analyzer resp) / analyzer span) * 100: allowable error ± 2 %, ± 5 % for THC

System Bias = ((analyzer resp - system resp) / analyzer span) * 100: allowable error ± 5 %

Drift = ((pretest sys resp - post test sys resp) / analyzer span) * 100: allowable error ± 3 %

Sys Bias (pre and post) must be performed on each run: To determine Drift.
Use zero gas and either mid or hi cal gas, choose cal gas closest to measured stack concentration.

Drift must be performed every hour on THC

Calibration Error is performed only at start, unless allowable error parameters are exceeded.

CEM CALIBRATIONS

PROJECT NAME	Focus RTA
PROJECT NUMBER	
DATE	10/9/97
RUN NUMBER	#3 (RTAN)
START TIME	09:57
STOP TIME	10:33

ANALYZER SPAN	
CO	50000
THC	25000

		CALIBRATION ERROR			SYSTEM BIAS CHECK				
	GAS CYLINDER NUMBER	CAL. GAS VALUE (% or PPM)	ANALYZER RESP (% or PPM)	CAL ERROR (% SPAN)	PRETEST SYSTEM RESP.	PRETEST SYS. BIAS (% SPAN)	POST TEST SYSTEM RESP.	POST TEST SYS. BIAS (% SPAN)	DRIFT (% SPAN)
CO zero		0	130	-0.26	130	0	300	-0.34	-0.34
CO low				0					
CO mid		17540	17710	-0.34	17710	0	17820	-0.22	-0.22
CO hi		40020	40330	-0.62					
THC zero		0	10	-0.04	10	0	150	-0.56	-0.56
THC low		3040	2970	0.28					
THC mid		5160	4980	0.72	4980	0	4940	0.16	0.16
THC hi		8460	8300	0.64					

Correction factors

CO	Avg. Conc	-	215	*	0.99943
THC	Avg. Conc	-	80	*	1.057377

Calibration error = ((cal. gas value - analyzer resp) / analyzer span) * 100: allowable error ± 2 %, ± 5 % for THC

System Bias = ((analyzer resp - system resp) / analyzer span) * 100: allowable error ± 5 %

Drift = ((pretest sys resp - post test sys resp) / analyzer span) * 100: allowable error ± 3 %

Sys Bias (pre and post) must be performed on each run: To determine Drift.
Use zero gas and either mid or hi cal gas, choose cal gas closest to measured stack concentration.

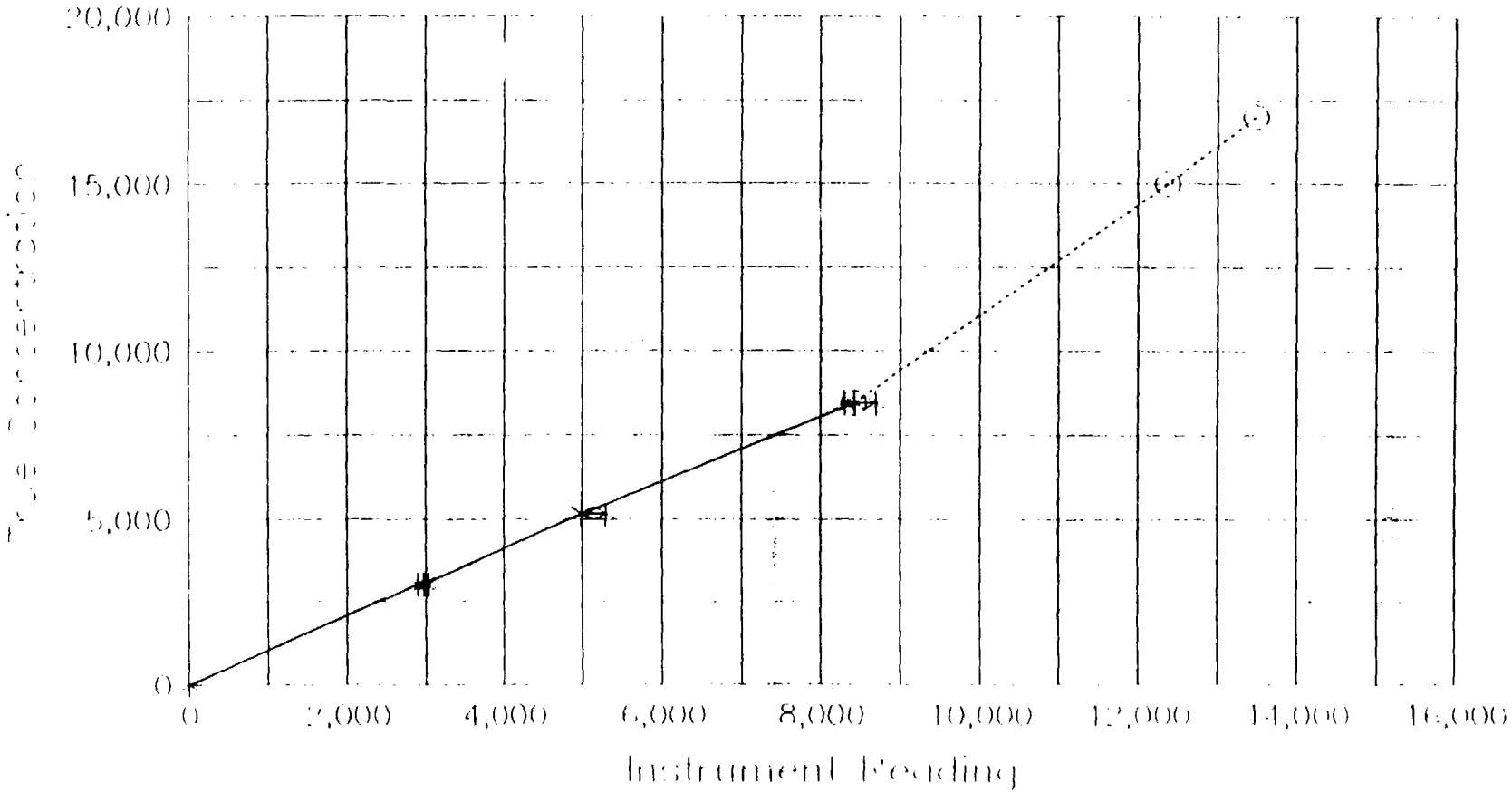
Drift must be performed every hour on THC

Calibration Error is performed only at start, unless allowable error parameters are exceeded.

Total Hydrocarbon Continuous Analysis

Focus Environmental

RTA Run



Below 8,400 ppmv Con. 0.9909 + 84.69

Above 8,400 ppmv Con. 1.678 - 5685.32

INTERNATIONAL TECHNOLOGY CORPORATION
KNOXVILLE - AIR QUALITY SERVICES

ROTAMETER CALIBRATION SPREADSHEET
PRIMARY STANDARD: GILIBRATOR

ENCLOSURES DENOTE INPUT DATA

ROTAMETER ID	1	CALIBRATED BY:	K.KINDER
CALIBRATION STANDARD:	PRIMARY	AMBIENT TEMPERATURE (F):	75.2
CALIBRATION STANDARD ID:	GIL-1	AMBIENT PRESSURE (In Hg):	29.23
DATE CALIBRATED:	10-7-97		

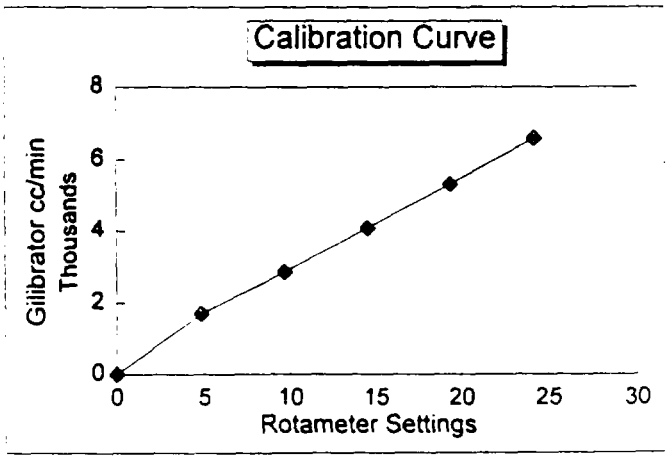
GAS VOLUME

Rotameter Setting	Rotameter Setting Corrected	Gas Volume Measured (cc/min)	Gas Volume Measured Corrected (cc/min)
0	0.00	0	0.00
5	4.84	1764	1706.58
10	9.67	2970	2873.32
15	14.51	4220	4082.62
20	19.35	5494	5315.15
25	24.19	6818	6596.05

REGRESSION ANALYSIS

Regression Output:

Constant	213.575
Std Err of Y Est	158.383
R Squared	0.997
No. of Observations	6.000
Degrees of Freedom	4.000
X Coefficient(s)	265.886
Std Err of Coef.	7.827



Flow Correction =
Rotameter Rate (corrected) * 265.886 + 213.575

INTERNATIONAL TECHNOLOGY CORPORATION
KNOXVILLE - AIR QUALITY SERVICES

VOST BOX CALIBRATION SPREADSHEET
PRIMARY STANDARD: WET TEST METER

ENCLOSURES DENOTE INPUT DATA

VOST BOX ID:	40520	CALIBRATED BY:	T. Gregg
CALIBRATION STANDARD:	PRIMARY		
CALIBRATION STANDARD ID:	WTM-1	AMBIENT TEMPERATURE (F):	68
DATE CALIBRATED:	7-30-97	AMBIENT PRESSURE (In Hg):	29.8

GAS VOLUME

Calibrated Orifice Delta H	Gas Volume Metered (ft3)	Gas Volume Corrected (ft3) Vw	Gas Volume C.B. Meter (ft3) Vd
20	0.25	0.250	0.2613
50	0.25	0.250	0.2684
50	0.5	0.500	0.5297
75	0.5	0.500	0.5227

TEMPERATURE

Calibrator Temperature (F) Tw	Control Box Inlet (F) Tdi	Control Box Outlet (F) Tdo	Average Control Box (F) Td
68.0	71.0	73.0	72.0
68.0	73.0	75.0	74.0
68.0	75.0	76.0	75.5
68.0	76.0	77.0	76.5

CALCULATIONS

Time (min)	Gamma (Y)
13.5000	1.0531
6.5500	1.0858
13.0600	1.0744
9.3800	1.0622

Avg Y
1.0689
1.0489
1.0889

Y - Ratio of Accuracy of Wet Test Meter Tolerance = +/- 0.02

Delta H@ - Orifice Pressure Differential that Yields 0.75 CFM of Air at 70 Degrees F and 29.92 Inches of Mercury
Tolorance = +/- 0.20

Is Unit Within Calibration Tolerances? YES

Calibrator Signature: Todd Gregg Approval Signature

INTERNATIONAL TECHNOLOGY CORPORATION
KNOXVILLE - AIR QUALITY SERVICES

VOST BOX CALIBRATION SPREADSHEET
PRIMARY STANDARD: WET TEST METER

ENCLOSURES DENOTE INPUT DATA

VOST BOX ID:	40520	CALIBRATED BY:	T. Gregg
CALIBRATION STANDARD:	PRIMARY		
CALIBRATION STANDARD ID:	WTM-1	AMBIENT TEMPERATURE (F):	71
DATE CALIBRATED:	10-09-97	AMBIENT PRESSURE (In Hg):	29.9

GAS VOLUME

Calibrated Orifice Delta H	Gas Volume Metered (ft3)	Gas Volume Corrected (ft3) Vw	Gas Volume C.B. Meter (ft3) Vd
20	0.25	0.250	0.2613
50	0.25	0.250	0.2613
50	0.5	0.500	0.5227
75	0.5	0.500	0.5227

TEMPERATURE

Calibrator Temperature (F) Tw	Control Box Inlet (F) Tdi	Control Box Outlet (F) Tdo	Average Control Box (F) Td
66.0	75.0	75.0	75.0
66.0	75.0	75.0	75.0
66.0	75.0	75.0	75.0
66.0	75.0	76.0	75.5

CALCULATIONS

Time (min)	Gamma (Y)
5.9000	1.0631
3.1000	1.0631
6.6000	1.0633
4.6000	1.0643
	Avg Y
	1.0634
	1.0434
	1.0834

Y - Ratio of Accuracy of Wet Test Meter Tolerance = +/- 0.02

Delta H@ - Orifice Pressure Differential that Yields 0.75 CFM of Air at 70 Degrees F and 29.92 Inches of Mercury
Tolorance = +/- 0.20

Is Unit Within Calibration Tolerances? YES

Calibrator Signature: [signature] Approval Signature _____

INTERNATIONAL TECHNOLOGY CORPORATION
KNOXVILLE - AIR QUALITY SERVICES

VOST BOX CALIBRATION SPREADSHEET
PRIMARY STANDARD: WET TEST METER

ENCLOSURES DENOTE INPUT DATA

VOST BOX ID:	40621	CALIBRATED BY:	T.Gregg
CALIBRATION STANDARD:	PRIMARY		
CALIBRATION STANDARD ID:	WTM-1	AMBIENT TEMPERATURE (F):	69.8
DATE CALIBRATED:	8-22-97	AMBIENT PRESSURE (In Hg):	29.06

GAS VOLUME

Calibrated Orifice Delta H	Gas Volume Metered (ft3)	Gas Volume Corrected (ft3) Vw	Gas Volume C.B. Meter (ft3) Vd
20	0.25	0.250	0.2595
50	0.25	0.250	0.2578
50	0.5	0.500	0.5262
75	0.5	0.500	0.5227

TEMPERATURE

Calibrator Temperature (F) Tw	Control Box Inlet (F) Tdi	Control Box Outlet (F) Tdo	Average Control Box (F) Td
66.0	71.0	74.0	72.5
66.0	75.0	77.0	76.0
66.0	78.0	80.0	79.0
66.0	80.0	82.0	81.0

CALCULATIONS

Time (min)	Gamma (Y)
11.9000	1.0508
6.5000	1.0508
12.2000	1.0784
9.3000	1.0752
	Avg Y
	1.0638
	1.0438
	1.0838

Y - Ratio of Accuracy of Wet Test Meter Tolerance = +/- 0.02

Delta H@ - Orifice Pressure Differential that Yields 0.75 CFM of Air at 70 Degrees F and 29.92 Inches of Mercury
Tolorance = +/- 0.20

Is Unit Within Calibration Tolerances? YES

Calibrator Signature: _____ Approval Signature _____

INTERNATIONAL TECHNOLOGY CORPORATION
KNOXVILLE – AIR QUALITY SERVICES

VOST BOX CALIBRATION SPREADSHEET
PRIMARY STANDARD: WET TEST METER

ENCLOSURES DENOTE INPUT DATA

VOST BOX ID:	40621	CALIBRATED BY:	T.Gregg
CALIBRATION STANDARD:	PRIMARY		
CALIBRATION STANDARD ID:	WTM-1	AMBIENT TEMPERATURE (F):	71
DATE CALIBRATED:	10-9-97	AMBIENT PRESSURE (In Hg):	29.9

GAS VOLUME

Calibrated Orifice Delta H	Gas Volume Metered (ft3)	Gas Volume Corrected (ft3) Vw	Gas Volume C.B. Meter (ft3) Vd
20	0.25	0.250	0.2613
50	0.25	0.250	0.2578
50	0.5	0.500	0.5227
75	0.5	0.500	0.5227

TEMPERATURE

Calibrator Temperature (F) Tw	Control Box Inlet (F) Tdi	Control Box Outlet (F) Tdo	Average Control Box (F) Td
66.0	77.0	77.0	77.0
66.0	77.0	78.0	77.5
66.0	78.0	79.0	78.5
66.0	79.0	80.0	79.5

CALCULATIONS

Time (min)	Gamma (Y)
5.8000	1.0671
3.2000	1.0537
6.5000	1.0702
4.7000	1.0722

Avg Y
1.0658
1.0458
1.0858

Y – Ratio of Accuracy of Wet Test Meter Tolerance = +/– 0.02

Delta H@ – Orifice Pressure Differential that Yields 0.75 CFM of Air at 70 Degrees F and 29.92 Inches of Mercury
Tolerance = +/– 0.20

Is Unit Within Calibration Tolerances? YES

Calibrator Signature: Todd Gregg Approval Signature _____

Scott Specialty Gases, Inc.

Shipped From: 1290 COMBERMERE STREET
TROY MI 48083
Phone: 810-589-2950 Fax: 810-589-2134

CERTIFICATE OF ANALYSIS

C A E INSTRUMENT RENTAL

246 WOODWORK LANE

PALATINE IL 60067

PROJECT #: 05-92250-007
PO#: 14650-71500
ITEM #: 05021454 2AL
DATE: 2/08/96

CYLINDER #: ALM066835
FILL PRESSURE: 2020 PSI
BLEND TYPE : ACUBLEND MASTER GAS

ANALYTICAL ACCURACY: +/-1%

COMPONENT	REQUESTED GAS CONC MOLES	ANALYSIS (MOLES)
CARBON MONOXIDE	4. %	4.002 %
NITROGEN	BALANCE	BALANCE

ACUBLEND MASTER GAS

ALM066837 ALM066863

ANALYST:

Scott Specialty Gases, Inc.

Shipped From: 1290 COMBERMERE STREET
TROY MI 48083
Phone: 810-589-2950 Fax: 810-589-2134

CERTIFICATE OF ANALYSIS

C A E INSTRUMENT RENTAL
246 WOODWORK LANE
PALATINE IL 60067

PROJECT #: 05-9225C-009
PO#: 14650-71500
ITEM #: 05021454 2AL
DATE: 2/08/96

CYLINDER #: ALM065480 ANALYTICAL ACCURACY: +/-1%
FILL PRESSURE: 1990 PSI
BLEND TYPE : ACUBLEND MASTER GAS

COMPONENT	REQUESTED GAS CONC MOLES	ANALYSIS (MOLES)
CARBON MONOXIDE	1.75 %	1.754 %
NITROGEN	BALANCE	BALANCE

ACUBLEND MASTER GAS

ALM066861 ALM066853

ANALYST:

MBP/C-

Scott Specialty Gases

Shipped From: 1290 COMBERMERE STREET
TROY MI 48083
Phone: 810-589-2950 Fax: 810-589-2134

CERTIFICATE OF ANALYSIS

C A E INSTRUMENT RENTAL

500 WEST WOOD STREET

PALATINE IL 60067

PROJECT #: 05-13990-003
PO#: 1634-71500
ITEM #: 05023453 4AL
DATE: 6/24/97

CYLINDER #: ALM004788
FILL PRESSURE: 2000 PSI
BLEND TYPE : CERTIFIED MASTER GAS

ANALYTICAL ACCURACY: +-2%
PRODUCT EXPIRATION: 6/24/2000

COMPONENT	REQUESTED GAS CONC MOLES		ANALYSIS (MOLES)	
PROPANE	1.5	%	1.50	%
NITROGEN		BALANCE		BALANCE

CERTIFIED MASTER GAS

ANALYST: Bob Pattoff

Scott Specialty Gases, Inc.

Shipped From: 1290 COMMERMORE STREET
TROY MI 48083
Phone: 810-589-2950 Fax: 810-589-2134

CERTIFICATE OF ANALYSIS

C A E INSTRUMENT RENTAL
246 WOODWORK LANE
PALATINE IL 60067

PROJECT #: 05-69609-004
PO#: 11857-71500
ITEM #: 05023451 2AL
DATE: 8/15/94

CYLINDER #: ALM024835 ANALYTICAL ACCURACY: +/-1%

BLEND TYPE : ACUBLEND MASTER GAS

COMPONENT	REQUESTED GAS CONC MOLES		ANALYSIS (MOLES)	
PROPANE	850.	PPM	850.6	PPM
NITROGEN		BALANCE		BALANCE

ACUBLEND MASTER GAS

ANALYTICAL METHOD: AMG

ANALYST: [signature]

Scott Specialty Gases

IT CORPORATION

CERTIFICATE OF ANALYSIS

PO No. 51239

CAS Reg Component No	Component	Certified Analysis	
74-98-6	PROPANE	3040.	PPM/M
7727-37-9	NITROGEN		BAL

Analysis Date 04/04/96 Project No 01-78082

Analytical Accuracy +/- 1% Analyst JAMES T KRAUS Cylinder No. ALM001271

Expiration Date 04/04/99 Item No 01023452 0AL

Grade EPA PROTOCOL

***** REFER TO BODY LABEL FOR COMPLETE EPA PROTOCOL INFORMATION

Scott Specialty Gases

CERTIFICATE OF ANALYSIS

IT CORPORATION

PO No 51239

CAS Reg	Component No	Component	Certified Analysis	
74-98-6		PROPANE	5160	PPM/M
7727-37-9		NITROGEN		BAL

Analysis Date 04/03/96 Project No 01-78002

Analytical Accuracy +/- 1% Analyst CRAIG LYTTLETON Cylinder No ALM002176

Expiration Date 04/03/99 Item No 01023452 BAL

Grade EPA PROTOCOL

***** REFER TO BODY LABEL FOR COMPLETE EPA PROTOCOL INFORMATION

Scott Specialty Gases

IT CORPORATION

CERTIFICATE OF ANALYSIS

PO No. 51239

CAS Reg Component No	Component	Certified Analysis	
74-98-6	PROPANE	8468	PPM/M
7727-37-9	NITROGEN		BAL

Analysis Date 04/04/96 Project No 01-79002

Analytical Accuracy +/- 1% Analyst JAMES T KRAUS Cylinder No AL-005076

Expiration Date 04/04/99 Item No 01023452 BAL

Grade EPA PROTOCOL

***** REFER TO BODY LABEL FOR COMPLETE EPA PROTOCOL INFORMATION

[redacted]

[redacted]

OPEN AND INSPECT IMMEDIATELY
QUESTIONS REGARDING THIS SHIPMENT SHOULD BE DIRECTED TO YOUR CUSTOMER SERVICE OFFICE WITHIN 10 DAYS
AT: 800 – 766 – 7000

SHIPMENT DETAIL DOCUMENT

FISHER SCIENTIFIC

PAGE 1

ATLANTA CUSTOMER SERVICE OFFICE	
SHIPPER SZO	A727[redacted]001

379269 – 001 CUSTOMER ORDER NO	10044278TP CUSTOMER PURCHASE ORDER NO
10/01/97 DATE ORDERED	CUSTOMER REQUISITION/RELEASE NO.
MIKE DESOCIO BUYER	(423)690 – 3211 BUYER PHONE NO

PLEASE REFERENCE THE ORDER NUMBER SHOWN ABOVE IN ALL CORRESPONDENCE.
RETURNS WILL NOT BE ACCEPTED WITHOUT PRIOR AUTHORIZATION.

SOLD TO:
IT CORPORATION
ACCOUNTS PAYABLE
312 DIRECTORS DR
KNOXVILLE TN 37923

SHIP TO:
IT CORPORATION 2
FIELD SERVICES
312 DIRECTORS DR
KNOXVILLE TN 37923
ATTN:MIKE DESOCIO

LINE NO	CATALOG NUMBER	QUANTITY SHIPPED	UNIT	DESCRIPTION / LOT NO / EXP DATE	SERIAL NO	UNIT PRICE	AMOUNT	QUANTITY ORDERED	BACK ORDERED
001	A454 4	1	EA	METHANOL OPTIMA GRADE 4L VCAT: BPA454 – 4				1	
	HAZM								
002	T291 4	1	EA	TOLUENE OPTIMA GRADE 4L VCAT: FLT291 – 4				1	
	HAZM								

[redacted]

10044278TP

[redacted]

A72744363001

PPC 9618 NO PKG UPS – 00102 NO OF PKGS 2 10/02/97

SEE REVERSE SIDE FOR FIELD DESCRIPTIONS

154959 19971001

SHIPMENT DETAIL DOCUMENT FORM 1147 REV 1/97

PACKING LIST

APPENDIX J

Appendix J

Bag Sample Analytical Data

INTERNATIONAL TECHNOLOGY CORPORATION

Memo Report: Gas Bag Analyses for ACS RTA Runs

From: A. Groen

Three RTA runs were performed on two soil composites for Focus Environmental. Test RTA-2 was performed with heating to a temperature of 700°F on the typical soil composite using air as the purge gas. Test RTA-1 was performed on the worst case soil composite, heating to a temperature of 900°F, again with air as the purge gas. Test RTA-N was also performed on the worst case composite, heating to 900 °F, with Nitrogen as the purge gas.

Gas samples were drawn from the exhaust line of the RTA system using a 1 liter valved gas syringe. The samples were transferred to Tedlar gas bags and the gas bag was connected to an MTI microcolumn GC.

The MTI GC has two parallel columns with an onboard sampling pump and gas sampling valves for each column. Column A is a molecular seive column capable of separating Hydrogen, Oxygen, Nitrogen, Methane, and Carbon Monoxide. Column B is a Porapak Q column column capable of separating Ethylene, Ethane, Acetylene, and Propane/Propylene from air and water vapor in the gas sample. The GC is capable of completing an analysis in under three minutes, allowing multiple analyses on a single sample at differing detector sensitivities or column conditions to cover possible ranges of sample concentrations.

In test RTA-2, gas, samples were drawn during the run at soil temperatures of 300, 400, 500, 600, and 700 °F. For the other two runs, gas samples were drawn at soil temperatures at or close to 300, 450, 600, 750, and 900 °F. In some of the samples, the analyses were run at both high and medium gain detector settings. For the last run, the analyses at the medium detector sensitivity were not recorded by the computer.

The sample concentrationsreportyed in the following table were calculated by external standard procedure based on a single nine component gravimetric gas standard mixture. Results are reported as ppm by weight of the analyte in the gas sample. Results are based on single point calibration but the mixture was analysed at a ten-fold dilution at the high detector sensitivity and at the normal concentration on the medium detector sensitivity.

Regional Office
312 Directors Drive • Knoxville, Tennessee 37923-4799 • 615-690-3211 • FAX: 615-690-3626

IT Corporation is a wholly owned subsidiary of International Technology Corporation

MTI GC Data from Gas Bags (e)

Sample #	Contaminant	Test RTA-2	Test RTA-1	Test RTA-N
Temperature F		300	300	300
1	Hydrogen	<1	3	34
	Oxygen	OR(c)	OR(c)	OR(c)
	Methane	ND	ND	ND
	Carbon Monoxide	ND	32	480
	Peak 1(a)	890	1000	6300
	Ethylene	ND	ND	ND
	Ethane	ND	ND	ND
	Acetylene	ND	ND	ND
	Propane(b)	ND	ND	ND
Temperature F		400	450	450
2	Hydrogen	310	800	220
	Oxygen	OR(c)	134000	129000
	Methane	ND	ND	ND
	Carbon Monoxide	4800	5000	3600
	Peak 1(a)	41300	89000	30000
	Ethylene	13	160	12
	Ethane	13	30	ND
	Acetylene	ND	ND	ND
	Propane(b)	ND	510	ND
Temperature F		500	600	600
3	Hydrogen	1370	4360	3100
	Oxygen	120000	104000	NR(d)
	Methane	220	1830	800
	Carbon Monoxide	11400	30300	7075
	Peak 1(a)	84500	112000	98000
	Ethylene	430	2580	500
	Ethane	39	170	60
	Acetylene	ND	13	ND
	Propane(b)	NR(d)	6400	2300
Temperature F		600	750	750
4	Hydrogen	4170	9570	>5000
	Oxygen	105000	69000	85000
	Methane	1300	16700	10000
	Carbon Monoxide	30300	47100	17500
	Peak 1(a)	93300	166000	139000
	Ethylene	1870	6700	2600
	Ethane	104	2100	1400
	Acetylene	20	40	20
	Propane(b)	4100	22600	13000
Temperature F		700	900	900
5	Hydrogen	6100	>10000	>5000
	Oxygen	83000	65000	68000
	Methane	7990	25200	16900
	Carbon Monoxide	44300	37400	11800
	Peak 1(a)	131000	104000	69500
	Ethylene	3700	6800	2720
	Ethane	550	6000	5530
	Acetylene	40	30	2
	Propane(b)	8700	34500	25500

(a) This peak is a combination of at least methane and CO, maybe also CO2
(b) This peak is calculated as propane but could be combined with propylene
(c) this peak was out of range for the given detector setting
(d) this peak could not be calculated from the chromatogram
(e) concentrations are given in parts per million by weight
peaks reported as > saturated the detector at the available sensitivity

APPENDIX K

Soil Sample Preparation Summary

Constituent	D01-S	SP01-S	SP02-S	KP01-S	SA02-S	SA04-S
Net Weight ("As Received") (lbs.)	46.5	39.5	43.0	43.5	39.5	50.0
Loss by Air Drying (lbs.)	3.0	2.5	3.5	2.5	3.0	4.5
Percent Loss by Air Drying (%)	6.5	6.3	8.1	5.7	7.6	9.0
Weight of Screened Debris (lbs.)	10.0	5.0	7.5	6.0	5.5	6.5
Weight of Screened Soil (lbs.)	33.5	32.0	32.0	35.0	31.0	39.0

Calculation of Total Dioxin/Furans and TEQ - Worst Case Soil

Analyte	TEF (a)	[illegible]		[illegible]		[illegible]	
Dioxins							
TCDDs (total)	0	0.038		< 0.007 ND		< 0.002 ND	
2,3,7,8-TCDD	1	0.004	3.70E-03	< 0.007 ND	0.00E+00	< 0.002 ND	0.00E+00
PeCDDs (total)	0	0.043		< 0.019 ND		< 0.002 ND	
1,2,3,7,8- PeCDD	0.5	0.010	5.05E-03	< 0.019 ND	0.00E+00	< 0.002 ND	0.00E+00
HxCDDs (total)	0	1.040		0.647		< 0.002 ND	
1,2,3,4,7,8-HxCDD	0.1	0.022	2.16E-03	0.009	8.79E-04	< 0.002 ND	0.00E+00
1,2,3,6,7,8-HxCDD	0.1	0.134	1.34E-02	0.110	1.10E-02	< 0.002 ND	0.00E+00
1,2,3,7,8,9-HxCDD	0.1	0.072	7.15E-03	0.064	6.42E-03	< 0.002 ND	0.00E+00
HpCDDs (totals)	0	7.430		10.270		0.014	
1,2,3,4,6,7,8-HpCDD	0.01	4.050	4.05E-02	5.963	5.96E-02	0.007	7.03E-05
OCDD	0.001	31.550	3.16E-02	30.388	3.04E-02	0.057	5.70E-05
Furans							
TCDFs (total)	0	0.628		0.514		< 0.002 ND	
2,3,7,8-TCDF	0.1	0.151	1.51E-02	0.164	1.64E-02	< 0.002 ND	0.00E+00
PeCDFs (total)	0	0.669		0.337		< 0.002 ND	
1,2,3,7,8-PeCDF	0.05	0.019	9.60E-04	0.021	1.04E-03	< 0.002 ND	0.00E+00
2,3,4,7,8-PeCDF	0.5	0.067	3.33E-02	0.071	3.54E-02	< 0.002 ND	0.00E+00
HxCDFs (total)	0	1.240		0.975		< 0.002 ND	
1,2,3,4,7,8-HxCDF	0.1	0.261	2.61E-02	0.255	2.55E-02	< 0.002 ND	0.00E+00
1,2,3,6,7,8-HxCDF	0.1	0.057	5.73E-03	0.104	1.04E-02	< 0.002 ND	0.00E+00
2,3,4,6,7,8-HxCDF	0.1	0.026	2.60E-03	< 0.011 ND	0.00E+00	< 0.002 ND	0.00E+00
1,2,3,7,8,9-HxCDF	0.1	0.004	3.80E-04	0.013	1.28E-03	< 0.002 ND	0.00E+00
HpCDFs (totals)	0	1.870		0.681		< 0.002 ND	
1,2,3,4,6,7,8-HpCDF	0.01	0.559	5.59E-03	0.608	6.08E-03	< 0.002 ND	0.00E+00
1,2,3,4,7,8,9-HpCDF	0.01	0.098	9.80E-04	0.074	7.38E-04	< 0.003 ND	0.00E+00
OCDF	0.001	1.960	1.96E-03	0.655	6.55E-04	< 0.002 ND	0.00E+00
TOTALS (µg/kg) (c)							
- PCDDs		**40.1**		**41.3**		**0.071**	
- PCDFs		**6.4**		**3.2**		**< 0.009**	
- PCDD/PCDFs		**46.5**		**44.5**		**0.071**	
- TCDD eq			**0.2**		**0.2**		**0.0001**

ND = Non Detect

Notes:

a) TEF = Toxicity Equivalency Factor (from EPA/625/3-89/016, March 1989)

b) TCDD eq is the 2,3,7,8-TCDD Equivalence. These values are calculated by multiplying the measured concentration by the "TEF" for each congener. Non-detect values are not considered.

c) Total PCDDs and PCDFs were calculated by summation of all "totals" isomers that were detected. If all the "totals" isomers were nondetect, then the detection limits were summed and the result reported as a "less than" value.

Calculation of Total Dioxin/Furans and TEQ - Typical Case Soil

Analyte	TEF [a]	Standing Soil Sample SC2 Conc. (µg/kg)	TCDD eq. (µg/kg) [b]	Test Pad Soil Sample Conc. (µg/kg)	TCDD eq. (µg/kg) [b]	Test Pad Soil Sample Conc. (µg/kg)	TCDD eq. (µg/kg) [b]
Dioxins							
TCDDs (total)	0	5.520		1.010		< 0.003 ND	
2,3,7,8-TCDD	1	0.039	3.90E-02	< 0.006 ND	0.00E+00	< 0.003 ND	0.00E+00
PeCDDs (total)	0	5.930		0.843		< 0.004 ND	
1,2,3,7,8- PeCDD	0.5	0.218	1.09E-01	0.065	3.26E-02	< 0.004 ND	0.00E+00
HxCDDs (total)	0	6.680		7.675		< 0.003 ND	
1,2,3,4,7,8-HxCDD	0.1	0.315	3.15E-02	0.102	1.02E-02	< 0.004 ND	0.00E+00
1,2,3,6,7,8-HxCDD	0.1	0.732	7.32E-02	0.864	8.64E-02	< 0.003 ND	0.00E+00
1,2,3,7,8,9-HxCDD	0.1	0.858	8.58E-02	0.677	6.77E-02	< 0.003 ND	0.00E+00
HpCDDs (totals)	0	15.010		21.244		< 0.005 ND	
1,2,3,4,6,7,8-HpCDD	0.01	7.570	7.57E-02	11.789	1.18E-01	< 0.005 ND	0.00E+00
OCDD	0.001	28.490	2.85E-02	69.420	6.94E-02	< 0.005 ND	0.00E+00
Furans							
TCDFs (total)	0	7.730		4.269		< 0.003 ND	
2,3,7,8-TCDF	0.1	1.390	1.39E-01	0.924	9.24E-02	< 0.003 ND	0.00E+00
PeCDFs (total)	0	7.530		3.651		< 0.003 ND	
1,2,3,7,8-PeCDF	0.05	0.237	1.19E-02	0.112	5.61E-03	< 0.003 ND	0.00E+00
2,3,4,7,8-PeCDF	0.5	0.477	2.39E-01	0.332	1.66E-01	< 0.003 ND	0.00E+00
HxCDFs (total)	0	6.000		3.170		< 0.003 ND	
1,2,3,4,7,8-HxCDF	0.1	1.500	1.50E-01	1.033	1.03E-01	< 0.003 ND	0.00E+00
1,2,3,6,7,8-HxCDF	0.1	0.363	3.63E-02	0.314	3.14E-02	< 0.003 ND	0.00E+00
2,3,4,6,7,8-HxCDF	0.1	0.647	6.47E-02	0.284	2.84E-02	< 0.003 ND	0.00E+00
1,2,3,7,8,9-HxCDF	0.1	0.017	1.68E-03	< 0.013 ND	0.00E+00	< 0.004 ND	0.00E+00
HpCDFs (totals)	0	4.140		2.135		< 0.003 ND	
1,2,3,4,6,7,8-HpCDF	0.01	2.220	2.22E-02	1.838	1.84E-02	< 0.003 ND	0.00E+00
1,2,3,4,7,8,9-HpCDF	0.01	0.161	1.61E-03	0.123	1.23E-03	< 0.003 ND	0.00E+00
OCDF	0.001	1.900	1.90E-03	1.312	1.31E-03	< 0.005 ND	0.00E+00
TOTALS (µg/kg) (c)							
- PCDDs		**61.6**		**100.2**		**< 0.020**	
- PCDFs		**27.3**		**14.5**		**< 0.016**	
- PCDD/PCDFs		**88.9**		**114.7**		**< 0.036**	
- TCDD eq			**1.1**		**0.8**		**0**

ND = Non Detect

Notes:

a) TEF = Toxicity Equivalency Factor (from EPA/625/3-89/016, March 1989)

b) TCDD eq is the 2,3,7,8-TCDD Equivalence. These values are calculated by multiplying the measured concentration by the "TEF" for each congener. Non-detect values are not considered.

c) Total PCDDs and PCDFs were calculated by summation of all "totals" isomers that were detected. If all the "totals" isomers were nondetect, then the detection limits were summed and the result reported as a "less than" value.

Calculation of Total Dioxin/Furans and TEQ - RTA1 (Worst Case Soil, 900 °F, Air Purge)

Analyte	TEF (a)	Starting Soil SCT Conc. (µg/kg)	Starting Soil SCT TCDD eq (µg/kg)	Treatment Residuals Treated Soil Conc. (µg/kg)	Treated Soil TCDD eq (µg/kg)	Organic Phase Conc. (µg/kg)	Organic Phase TCDD eq (µg/kg)
Dioxins							
TCDDs (total)	0	0.038		< 0.004 ND		5.530	
2,3,7,8-TCDD	1	0.004	3.70E-03	< 0.004 ND	0.00E+00	0.091	9.10E-02
PeCDDs (total)	0	0.043		< 0.004 ND		7.160	
1,2,3,7,8- PeCDD	0.5	0.010	5.05E-03	< 0.004 ND	0.00E+00	0.330	1.65E-01
HxCDDs (total)	0	1.040		0.076		30.350	
1,2,3,4,7,8-HxCDD	0.1	0.022	2.16E-03	0.006	6.00E-04	1.270	1.27E-01
1,2,3,6,7,8-HxCDD	0.1	0.134	1.34E-02	0.005	5.00E-04	1.630	1.63E-01
1,2,3,7,8,9-HxCDD	0.1	0.072	7.15E-03	0.012	1.20E-03	4.530	4.53E-01
HpCDDs (totals)	0	7.430		0.198		52.220	
1,2,3,4,6,7,8-HpCDD	0.01	4.050	4.05E-02	0.039	3.90E-04	19.360	1.94E-01
OCDD	0.001	31.550	3.16E-02	0.144	1.44E-04	28.470	2.85E-02
Furans							
TCDFs (total)	0	0.628		< 0.003 ND		8.390	
2,3,7,8-TCDF	0.1	0.151	1.51E-02	< 0.003 ND	0.00E+00	0.940	9.40E-02
PeCDFs (total)	0	0.669		0.008		5.670	
1,2,3,7,8-PeCDF	0.05	0.019	9.60E-04	< 0.002 ND	0.00E+00	0.250	1.25E-02
2,3,4,7,8-PeCDF	0.5	0.067	3.33E-02	< 0.002 ND	0.00E+00	0.360	1.80E-01
HxCDFs (total)	0	1.240		0.013		4.130	
1,2,3,4,7,8-HxCDF	0.1	0.261	2.61E-02	< 0.002 ND	0.00E+00	0.390	3.90E-02
1,2,3,6,7,8-HxCDF	0.1	0.057	5.73E-03	< 0.002 ND	0.00E+00	0.120	1.20E-02
2,3,4,6,7,8-HxCDF	0.1	0.026	2.60E-03	< 0.002 ND	0.00E+00	< 0.080 ND	0.00E+00
1,2,3,7,8,9-HxCDF	0.1	0.004	3.80E-04	< 0.002 ND	0.00E+00	< 0.120 ND	0.00E+00
HpCDFs (totals)	0	1.870		0.010		< 0.460 ND	
1,2,3,4,6,7,8-HpCDF	0.01	0.559	5.59E-03	< 0.002 ND	0.00E+00	0.940	9.40E-03
1,2,3,4,7,8,9-HpCDF	0.01	0.098	9.80E-04	< 0.002 ND	0.00E+00	< 0.540 ND	0.00E+00
OCDF	0.001	1.960	1.96E-03	0.005	5.00E-06	< 0.500 ND	0.00E+00
TOTALS (µg/kg) (c)							
- PCDDs		**40.1**		**0.43**		**123.7**	
- PCDFs		**6.4**		**0.04**		**19.2**	
- PCDD/PCDFs		**46.5**		**0.47**		**142.9**	
- TCDD eq			**0.20**		**0.003**		**1.57**

ND = Non Detect

Notes:

a) TEF = Toxicity Equivalency Factor (from EPA/625/3-89/016, March 1989)

b) TCDD eq is the 2,3,7,8-TCDD Equivalence. These values are calculated by multiplying the measured concentration by the "TEF" for each congener. Non-detect values are not considered.

c) Total PCDDs and PCDFs were calculated by summation of all "totals" isomers that were detected. If all the "totals" isomers were nondetect, then the detection limits were summed and the result reported as a "less than" value.

Calculation of Total Dioxin/Furans and TEQ - RTAN (Worst Case Soil, 900°F, Nitrogen Purge)

Analyte	TEF (a)	Conc. (µg/kg)	TCDD eq (b) (µg/kg)	Treatment Residuals: Treated Soil Conc. (µg/kg)	Treated Soil TCDD eq (b) (µg/kg)	Treatment Residuals: Condensate Conc. (µg/kg)	Condensate TCDD eq (b) (µg/kg)
Dioxins							
TCDDs (total)	0	0.038		< 0.002 ND		3.870	
2,3,7,8-TCDD	1	0.004	3.70E-03	< 0.002 ND	0.00E+00	0.100	1.00E-01
PeCDDs (total)	0	0.043		< 0.002 ND		11.200	
1,2,3,7,8- PeCDD	0.5	0.010	5.05E-03	< 0.002 ND	0.00E+00	0.770	3.85E-01
HxCDDs (total)	0	1.040		0.059		22.770	
1,2,3,4,7,8-HxCDD	0.1	0.022	2.16E-03	0.004	4.00E-04	0.900	9.00E-02
1,2,3,6,7,8-HxCDD	0.1	0.134	1.34E-02	0.003	3.00E-04	1.330	1.33E-01
1,2,3,7,8,9-HxCDD	0.1	0.072	7.15E-03	0.008	8.00E-04	3.120	3.12E-01
HpCDDs (totals)	0	7.430		0.118		31.930	
1,2,3,4,6,7,8-HpCDD	0.01	4.050	4.05E-02	0.038	3.80E-04	12.400	1.24E-01
OCDD	0.001	31.550	3.16E-02	0.086	8.60E-05	20.980	2.10E-02
Furans							
TCDFs (total)	0	0.628		< 0.002 ND		3.660	
2,3,7,8-TCDF	0.1	0.151	1.51E-02	< 0.002 ND	0.00E+00	0.560	5.60E-02
PeCDFs (total)	0	0.669		< 0.002 ND		0.720	
1,2,3,7,8-PeCDF	0.05	0.019	9.60E-04	< 0.002 ND	0.00E+00	0.090	4.50E-03
2,3,4,7,8-PeCDF	0.5	0.067	3.33E-02	< 0.002 ND	0.00E+00	0.160	8.00E-02
HxCDFs (total)	0	1.240		< 0.002 ND		1.370	
1,2,3,4,7,8-HxCDF	0.1	0.261	2.61E-02	< 0.002 ND	0.00E+00	0.230	2.30E-02
1,2,3,6,7,8-HxCDF	0.1	0.057	5.73E-03	< 0.002 ND	0.00E+00	0.059	5.90E-03
2,3,4,6,7,8-HxCDF	0.1	0.026	2.60E-03	< 0.002 ND	0.00E+00	0.054	5.40E-03
1,2,3,7,8,9-HxCDF	0.1	0.004	3.80E-04	< 0.002 ND	0.00E+00	< 0.060 ND	0.00E+00
HpCDFs (totals)	0	1.870		< 0.002 ND		< 0.113 ND	
1,2,3,4,6,7,8-HpCDF	0.01	0.559	5.59E-03	< 0.002 ND	0.00E+00	0.540	5.40E-03
1,2,3,4,7,8,9-HpCDF	0.01	0.098	9.80E-04	0.004	4.00E-05	< 0.130 ND	0.00E+00
OCDF	0.001	1.960	1.96E-03	0.004	4.00E-06	0.330	3.30E-04
TOTALS (µg/kg) (c)							
- PCDDs		**40.1**		**0.27**		**90.8**	
- PCDFs		**6.4**		**0.01**		**6.2**	
- PCDD/PCDFs		**46.5**		**0.28**		**96.9**	
- TCDD eq			**0.2**		**0.002**		**1.35**

ND = Non Detect

Notes:

a) TEF = Toxicity Equivalency Factor (from EPA/625/3-89/016, March 1989)

b) TCDD eq is the 2,3,7,8-TCDD Equivalence. These values are calculated by multiplying the measured concentration by the "TEF" for each congener. Non-detect values are not considered.

c) Total PCDDs and PCDFs were calculated by summation of all "totals" isomers that were detected. If all the "totals" isomers were nondetect, then the detection limits were summed and the result reported as a "less than" value.

Calculation of Total Dioxin/Furans and TEQ for RTA2 (Typical Case Soil, 700°F, Air Purge)

Analyte	TEF (a)	Starting Soil SC2 Conc. (µg/kg)	TEQ (b)	[illegible]	[illegible]	[illegible]	[illegible]
Dioxins							
TCDDs (total)	0	5.520		0.088		8.015	
2,3,7,8-TCDD	1	0.039	3.90E-02	0.005	5.00E-03	0.061	6.10E-02
PeCDDs (total)	0	5.930		0.122		11.440	
1,2,3,7,8- PeCDD	0.5	0.218	1.09E-01	0.014	7.00E-03	1.120	5.60E-01
HxCDDs (total)	0	6.680		0.373		22.370	
1,2,3,4,7,8-HxCDD	0.1	0.315	3.15E-02	0.015	1.50E-03	0.610	6.10E-02
1,2,3,6,7,8-HxCDD	0.1	0.732	7.32E-02	0.024	2.40E-03	1.650	1.65E-01
1,2,3,7,8,9-HxCDD	0.1	0.858	8.58E-02	0.070	7.00E-03	2.840	2.84E-01
HpCDDs (totals)	0	15.010		0.288		30.220	
1,2,3,4,6,7,8-HpCDD	0.01	7.570	7.57E-02	0.117	1.17E-03	13.180	1.32E-01
OCDD	0.001	28.490	2.85E-02	0.086	8.60E-05	23.140	2.31E-02
Furans							
TCDFs (total)	0	7.730		0.529		17.400	
2,3,7,8-TCDF	0.1	1.390	1.39E-01	0.073	7.30E-03	2.380	2.38E-01
PeCDFs (total)	0	7.530		0.150		10.360	
1,2,3,7,8-PeCDF	0.05	0.237	1.19E-02	0.021	1.05E-03	0.410	2.05E-02
2,3,4,7,8-PeCDF	0.5	0.477	2.39E-01	0.019	9.50E-03	0.810	4.05E-01
HxCDFs (total)	0	6.000		0.024		4.090	
1,2,3,4,7,8-HxCDF	0.1	1.500	1.50E-01	0.005	5.00E-04	1.020	1.02E-01
1,2,3,6,7,8-HxCDF	0.1	0.363	3.63E-02	0.003	3.00E-04	0.280	2.80E-02
2,3,4,6,7,8-HxCDF	0.1	0.647	6.47E-02	0.003	0.00E+00	0.360	3.60E-02
1,2,3,7,8,9-HxCDF	0.1	0.017	1.68E-03	0.003	3.00E-04	0.036	3.60E-03
HpCDFs (totals)	0	4.140		0.010		0.749	
1,2,3,4,6,7,8-HpCDF	0.01	2.220	2.22E-02	0.009	9.00E-05	1.210	1.21E-02
1,2,3,4,7,8,9-HpCDF	0.01	0.161	1.61E-03	< 0.011 ND	0.00E+00	< 0.870 ND	0.00E+00
OCDF	0.001	1.900	1.90E-03	< 0.017 ND	0.00E+00	0.450	4.50E-04
TOTALS (µg/kg) (c)							
- PCDDs		**61.6**		**1.0**		**95.2**	
- PCDFs		**27.3**		**0.7**		**33.0**	
- PCDD/PCDFs		**88.9**		**1.7**		**128.2**	
- TCDD eq			**1.1**		**0.04**		**2.13**

ND = Non Detect

Notes:

a) TEF = Toxicity Equivalency Factor (from EPA/625/3-89/016, March 1989)

b) TCDD eq is the 2,3,7,8-TCDD Equivalence. These values are calculated by multiplying the measured concentration by the "TEF" for each congener. Non-detect values are not considered.

c) Total PCDDs and PCDFs were calculated by summation of all "totals" isomers that were detected. If all the "totals" isomers were nondetect, then the detection limits were summed and the result reported as a "less than" value.

Mass Balance for RTA1 Test Run

Soil Matrix: Worst Case Soil (SC1)
Soil Temperature (°F): 900
Purge Gas: Air

Parameter	Starting Soil (wt %)	Treated Soil (wt %)	Impinger Water (mg/l)	Organic Layer (wt %)	% Overhead	% Condensable	% Recovery
CONCENTRATIONS							
Ash	82.1	94.54	NM	0.46			
Water	9.08	0.92	NM	0.63			
Carbon	8.13	3.37	15,800	57.99			
Hydrogen	0.3	0.4	NM	10.1			
Sulfur	0.13	0.15	52	0.13			
Volatiles	7.74	4.23					
MASS							
Matrix Mass (gm)	1,027.2	847.38	684.6	85.08			
Ash	843.98	801.11	NM	0.39	5.1	----	95.0
Water (a)	93.27	7.80	78.12	0.54	91.6	----	92.7
Carbon	83.51	28.56	10.82	49.34	65.8	72.0	See Above
Hydrogen	3.08	3.39	NM	8.59	(b)	(b)	(b)
Sulfur	1.28	1.27	0.04	0.11	(b)	(b)	110.4
Volatiles	79.50	35.84	NM	NM	54.9	NM	NM

Carbon Partitioning Data

	Wt% of Starting Carbon
Carbon Overhead	65.8
Carbon in Treated Soil	34.2
Carbon in Water	13.0
Carbon in Organic	59.1
Carbon in Offgas	3.3
Recovery	109.5

Notes:

a) The mass of water in the impinger is the change in impinger water mass during the test.
b) The mass overhead and recoveries for hydrogen and sulfur indicate sample nonhomogeneity.
c) The density of the impinger water was assumed to be equal to 1.0 g/ml for the calculation of constituent mass.
d) NM - Not Measured

Mass Balance for RTAN Test Run

Soil Matrix: Worst Case Soil (SC1)
Soil Temperature (°F): 900
Purge Gas: Nitrogen

Parameter	Starting Soil (wt %)	Treated Soil (wt %)	Impinger Water (mg/l)	Organic Layer (wt %)
CONCENTRATIONS				
Ash	82.17	94.27	NA	0.57
Water	9.08	1.53	NA	28.2
Carbon	8.13	3.02	15,500	64.21
Hydrogen	0.30	0.16		5.73
Sulfur	0.13	0.12	25	0.17
Volatiles	7.74	3.54	NM	NM

Carbon Partitioning Data

	Wt% of Starting Carbon
Carbon Overhead	69.2
Carbon in Treated Soil	30.8
Carbon in Water	13.4
Carbon in Organic	30.4
Carbon in Offgas	2.7
Recovery	77.4

MASS					% Overhead	% Condensable	% Recovery
Matrix Mass (gm)	1,023.7	849.94	721.43	39.44			
Ash	841.11	801.24	NM	0.22	4.7	----	95.3
Water (a)	92.95	13.00	113.96	11.12	86.0	----	148.6
Carbon	83.23	25.67	11.18	25.32	69.2	43.9	See above ~~74.7~~
Hydrogen	3.07	1.36	NM	2.26	55.7	73.6	117.9
Sulfur	1.28	1.02	0.02	0.07	20.3	6.6	86.4
Volatiles	79.23	30.09	NM	NM	62.0	NM	NM

Notes:

a) The mass of water in the impinger is the change in impinger water mass during the test.
b) The density of the impinger water was assumed to be equal to 1.0 g/ml for the calculation of constituent mass.
c) NM - Not Measured

Mass Balance for RTA2 Test Run

Soil Matrix: Typical Case Soil (SC2)
Soil Temperature (°F): 700
Purge Gas: Air

Parameter	Starting Soil (wt %)	Treated Soil (wt %)	Impinger Water (mg/l)	Organic Layer (wt %)
CONCENTRATIONS				
Ash	79.91	90.71	NA	NM
Water	11.6	1.95	NA	NM
Carbon	5.73	4.89	2,880	NM
Hydrogen	< 0.01	0.23		NM
Sulfur	0.13	0.14	22	NM
Volatiles	8.84	6.45	NM	NM
MASS				
Matrix Mass (gm)	982.2	835.38	701	NM
Ash	784.91	757.77	NM	NM
Water (a)	113.94	16.29	141.5	NM
Carbon	56.28	40.85	2.02	NM
Hydrogen	0.10	1.92	NM	NM
Sulfur	1.23	1.17	0.02	NM
Volatiles	86.83	53.88	NM	NM

Carbon Partitioning Data

	Wt% of Starting Carbon
Carbon Overhead	27.4
Carbon in Treated Soil	72.6
Carbon in Water	3.6
Carbon in Organic	NM
Carbon in Offgas	3.5
Recovery	> 79.7

	% Overhead	% Condensable	% Recovery
Ash	3.5	- - - -	96.5
Water (a)	85.7	- - - -	138.5
Carbon	27.4	(b)	See above
Hydrogen	(c)	(c)	(c)
Sulfur	4.7	1.3	96.5
Volatiles	37.9	NM	NM

Notes:

a) The mass of water in the impinger is the change in impinger water mass during the test.
b) Since the organic layer could not be collected in this test run, the condensable carbon could not be measured.
c) The mass overhead and recoveries for hydrogen indicate sample nonhomogeneity.
d) The density of the impinger water was assumed to be equal to 1.0 g/ml for the calculation of constituent mass.
e) NM - Not Measured

Metals Recovery - RTA1

Analyte	Metals Concentrations: Starting Soil SC1	Metals Concentrations: Treated Soil RTA1	Recovery (wt%)
Total Metals (mg/kg)			
Aluminum	5,590	4,880	
Antimony	< 6.7	18.9	
Arsenic	4.8	3.8	
Barium	297	540	
Cadmium	16	19	
Calcium	14,300	16,600	
Chromium	140	112	
Cobalt	10	15	
Copper	1,440	1,450	
Iron	11,600	10,400	
Lead	682	1,240	
Magnesium	5,950	5,760	
Manganese	189	199	
Mercury	2.2	< 0.1	
Nickel	14	18	
Potassium	1,010	786	
Selenium	1.2	2.1	
Silver	1.7	8.7	
Sodium	< 556	< 502	
Vanadium	11	9.3	
Zinc	476	1,020	
Mass of Metals (mg)			
Aluminum	5,742	4,135	72
Antimony	< 6.9	16.0	> 233
Arsenic	4.9	3.2	65
Barium	305	458	150
Cadmium	16.3	16.2	99
Calcium	14,689	14,067	96
Chromium	144	95	66
Cobalt	10.5	12.5	120
Copper	1,479	1,229	83
Iron	11,916	8,813	74
Lead	701	1,051	150
Magnesium	6,112	4,881	80
Manganese	194	169	87
Mercury	2.3	0.1	< 4
Nickel	14.4	14.9	104
Potassium	1,037	666	64
Selenium	1.2	1.8	144
Silver	1.7	7.4	427
Sodium	< 571	< 425	NA
Vanadium	10.8	7.9	73
Zinc	489	864	177

Metals Recovery - RTAN

Analyte	Metals Concentrations: Starting Soil SC1	Metals Concentrations: Treated Soil RTAN	Recovery (wt%)
Total Metals (mg/kg)			
Aluminum	5,590	4,530	
Antimony	< 6.7	13.0	
Arsenic	4.8	3.6	
Barium	297	336	
Cadmium	16	17	
Calcium	14,300	16,600	
Chromium	140	81	
Cobalt	10	10	
Copper	1,440	1,060	
Iron	11,600	10,200	
Lead	682	789	
Magnesium	5,950	3,190	
Manganese	189	127	
Mercury	2.2	< 0.1	
Nickel	14	16	
Potassium	1,010	656	
Selenium	1.2	1.6	
Silver	1.7	1.9	
Sodium	< 556	< 504	
Vanadium	11	9.5	
Zinc	476	487	
Mass of Metals (mg)			
Aluminum	5,722	3,850	67
Antimony	< 6.9	11.0	161
Arsenic	4.9	3.0	61
Barium	304	286	94
Cadmium	16.3	14.7	90
Calcium	14,639	14,108	96
Chromium	143	69	48
Cobalt	10.4	8.2	78
Copper	1,474	901	61
Iron	11,875	8,669	73
Lead	698	671	96
Magnesium	6,091	2,711	45
Manganese	193	108	56
Mercury	2.3	< 0.1	< 4
Nickel	14.3	13.9	97
Potassium	1,034	558	54
Selenium	1.2	1.4	111
Silver	1.7	1.6	94
Sodium	< 569	< 428	NA
Vanadium	10.7	8.1	75
Zinc	487	414	85

Metals Recovery - RTA2

Analyte	Starting Soil SC2	Treated Soil RTA2	Recovery (wt%)
Metals Concentrations (mg/kg)			
Aluminum	4,510	5,270	
Antimony	40.7	36.9	
Arsenic	3.9	3.4	
Barium	955	4,110	
Cadmium	40	30	
Calcium	14,600	10,900	
Chromium	532	456	
Cobalt	20	12	
Copper	635	504	
Iron	13,000	11,300	
Lead	2,920	2,460	
Magnesium	6,400	4,570	
Manganese	288	180	
Mercury	1.8	< 0.1	
Nickel	27	33	
Potassium	< 564	676	
Selenium	2.7	2.2	
Silver	13.4	10.0	
Sodium	< 564	< 508	
Vanadium	9	10.5	
Zinc	1,390	1,300	
Mass of Metals (mg)			
Aluminum	4,430	4,403	99
Antimony	40.0	30.8	77
Arsenic	3.8	2.8	74
Barium	938	3,433	366
Cadmium	39.1	24.9	64
Calcium	14,340	9,106	63
Chromium	523	381	73
Cobalt	19.5	10.4	53
Copper	624	421	68
Iron	12,769	9,440	74
Lead	2,868	2,055	72
Magnesium	6,286	3,818	61
Manganese	283	150	53
Mercury	1.7	< 0.1	< 5
Nickel	26.0	27.9	107
Potassium	< 554	565	102
Selenium	2.7	1.9	70
Silver	13.2	8.3	63
Sodium	< 554	< 424	NA
Vanadium	8.5	8.8	103
Zinc	1,365	1,086	80

RTA Test Results - PCB and Dioxin/Furan Recoveries

Analyte	Worst Case Soil								Typical Case Soil			
	Starting Soil	Treated Soil	Water Layer	Organic Layer	Starting Soil	Treated Soil	Water Layer	Organic Layer	Starting Soil	Treated Soil	Water Layer	Organic Layer
RTA Test Number	RTA1				RTAN				RTA2			
Soil Temperature (°F)	900				900				700			
Purge Gas	Air				Nitrogen				Air			
Media Mass (gm)	1027.2	847.4	684.6	521.7	1023.7	849.9	721.4	460.3	982.2	835.4	701.0	582.2
Concentrations	(mg/kg)	(mg/kg)	(mg/l)	(mg/l)	(mg/kg)	(mg/kg)	(mg/l)	(mg/l)	(mg/kg)	(mg/kg)	(mg/l)	(mg/l)
PCB's	118.0	< 0.16	0.13	94	118.0	< 0.16	0.19	110	82.0	< 0.16	0.24	59
Total Dioxin/Furans	0.047	0.0005	NA	0.143	0.047	0.0003	NA	0.097	0.089	0.0017	NA	0.128
Mass (mg)												
PCB's	121 21	0.14	0.09	49.0	120.80	0.14	0.13	50.6	80.54	0.13	0.17	34.3
Total Dioxin/Furans	0.048	0.0004	NA	0.075	0.048	0.0002	NA	0.045	0.087	0.0014	NA	0.075
Recovery (wt%)												
PCB's	40 64				42.14				43.02			
Total Dioxin/Furans	156.9				94.2				87.1			

Notes:
a) NA - Not Analyzed or Not Applicable

THC and CO Emission Factor Calculations

Parameter	RTA1		RTAN		RTA2	
	THC	CO	THC	CO	THC	CO
Average Offgas Concentrations (ppmv)						
- Total Test (a)	15,628	22,945	16,635	8,407	8,747	12,592
- Up to Target Temperature (b)	17,867	33,108	17,123	11,106	10,294	18,872
Test Duration Data (min)						
- Total Test	34		34		34	
- Up to Target Temperature	22		23		23	
Volume Data (std ft^3)						
- Total Test	3.29		3.52		3.87	
- Up to Target Temperature	2.13		2.38		2.62	
Mass in Offgas (lbs)						
- Total Test	0.0062	0.0058	0.0071	0.0023	0.0041	0.0038
- Up to Target Temperature	0.0046	0.0054	0.0049	0.0020	0.0033	0.0038
Starting Weights (lbs)						
- Test Soil (wet basis)	2.263		2.255		2.163	
- Total Carbon (c)	0.184		0.195		0.124	
Emission Factors						
Total Soil Basis (lb/lb soil)						
- Total Test	0.0028	0.0026	0.0031	0.0010	0.0019	0.0017
- Up to Target Temperature	0.0020	0.0026	0.0022	0.0010	0.0015	0.0017
Carbon Basis (lb/lb total carbon)						
- Total Test	0.0339	0.0316	0.0365	0.0117	0.0331	0.0303
- Up to Target Temperature	0.0250	0.0295	0.0254	0.0105	0.0263	0.0307

Notes;

a) These calculations are based on data for the entire test period, from initial soil heat-up to the target temperature and then back to ambient conditions. These results will be used for mass balance calculations only.

b) These calculations are based on data for the test period, from initial soil heat-up to the target temperature. These calculations will be used to predict full-scale emission factors.

c) The mass of carbon was calculated by multiplying the total soil mass by the following weight percent carbon in the starting soil:
RTA1 and RTAN - 8.13 wt% RTA2 - 5.73 wt%

VOC Emission Factor Calculations for RTA1 - Worst Case Soil

Parameter		Benzene	Acetone	2-Butanone	Toluene	Ethylbenzene	Xylenes	Chloroethane	Methyl methacrylate	1,2,4-Trimethyl benzene	N-Propyl benzene	1,2,4-Trichloro benzene	Chloromethane	TICs
Water Layer from Impinger Set														
Concentration in Impingers (Water Layer)	(µg/L)	0	3,800,000	0	0	0	0	0	0	0	0	0	0	1 100,000
Volume of Water Layer	(L)	0 68	0 68	0 68	0 68	0 68	0 68	0 68	0 68	0 68	0 68	0 68	0 68	0 68
Compound Wt	(lbs)	0	0 006	0	0	0	0	0	0	0	0	0	0	0 002
Organic Layer from Impinger Set														
Concentration in Impingers (Organic Layer)	(µg/L)	140,000	2,700,000	0	240,000	160,000	450,000	0	0	280,000	0	0	0	1,990,000
Volume of Organic Layer	(L)	0 09	0 09	0 09	0 09	0 09	0 09	0 09	0 09	0 09	0 09	0 09	0 09	0 09
Compound Wt	(lbs)	2 62E-05	5 06E-04	0	4 50E-05	3 00E-05	8 43E-05	0	0	5 25E-05	0	0	0	3 73E-04
MeOH Impinger to Tenax Resin														
Concentration in MeOH Impinger	(µg/L)	97,000	250,000	0	160,000	40,000	190,000	66,000	0	26,000	0	0	120,000	336,000
Mass of MeOH Layer	(g)	687 8	687 8	687 8	687 8	687 8	687 8	687 8	687 8	687 8	687 8	687 8	687 8	687 8
Volume of MeOH Layer	(L)	0 87	0 87	0 87	0 87	0 87	0 87	0 87	0 87	0 87	0 87	0 87	0 87	0 87
Flow to Tenax/Total Flow (a)	(scf/scf)	0 137	0 137	0 137	0 137	0 137	0 137	0 137	0 137	0 137	0 137	0 137	0 137	0 137
Adjusted Compound Wt	(lbs)	1 36E-03	3 50E-03	0	2 24E-03	5 59E-04	2 66E-03	9 23E-04	0	3 63E-04	0	0	1 68E-03	4 70E-03
Tenax Resin Tube Pair (b)														
Compound Wt on Tenax	(µg)	74	0	0	461	11	61	334	NA	NA	NA	NA	NA	NA
Average Flow to Tenax	(scfm)	0 013	0 013	0 013	0 013	0 013	0 013	0 013	0.013	0 013	0 013	0 013	0 013	0 013
Flow to Tenax/Total Flow (a)	(scf/scf)	0 137	0 137	0 137	0 137	0 137	0 137	0 137	0 137	0 137	0 137	0 137	0 137	0 137
Adjusted Compound Wt	(lbs)	1 20E-06	0	0	7 41E-06	1 79E-07	9 74E-07	5 37E-06	0	0	0	0	0	0
Starting Weights														
Total Test Soil	(lbs)	2 263	2 263	2 263	2 263	2 263	2 263	2 263	2 263	2 263	2 263	2 263	2 263	2 263
Carbon Concentration	(wt %)	8 13	8 13	8 13	8 13	8 13	8 13	8 13	8 13	8 13	8 13	8 13	8 13	8 13
Total Carbon	(lbs)	0 184	0 184	0 184	0 184	0 184	0 184	0 184	0 184	0 184	0 184	0 184	0 184	0 184
Emission Factors														
Total Soil Basis														
lb of compound/lb of Starting Soil		6 12E-04	4 30E-03	0	1 01E-03	2 60E-04	1 21E-03	4 10E-04	0	1 84E-04	0	0	7 41E-04	2 97E-03
Carbon Basis														
lb of compound/lb of Total Carbon		7 53E-03	5 29E-02	0	1 24E-02	3 20E-03	1 49E-02	5 05E-03	0	2 26E-03	0	0	9 12E-03	3 66E-02

(a) The offgas stream to the Tenax resin was one of three branched streams from the RTA This factor adjusts the data to account for the total offgas flow during the test
(b) Results are for the first tube pair only The second tube pair was desorbed and it saturated the gc column Therefore, this sample was lost
NA - not analyzed

VOC Emission Factor Calculations for RTAN - Worst Case Soil

Parameters		Benzene	Acetone	2-Butanone	Toluene	Ethylbenzene	Xylenes	Chloroethane	Methyl methacrylate	1,2,4-Trimethyl benzene	N-Propyl benzene	1,2,4-Trichloro benzene	Chloromethane	TICs
Water Layer from Impinger Set														
Concentration in Impingers (Water Layer)	(µg/L)	0	4,500,000	0	0	0	0	0	0	0	0	0	0	0
Volume of Water Layer	(L)	0 72	0 72	0 72	0 72	0 72	0 72	0 72	0 72	0 72	0 72	0 72	0 72	0 72
Compound Wt	(lbs)	0	7 15E-03	0	0	0	0	0	0	0	0	0	0	0
Organic Layer from Impinger Set														
Concentration in Impingers (Organic Layer)	(µg/L)	3,600,000	0	0	15,000,000	3,900,000	11,000,000	0	840,000	6,900,000	1,100,000	580,000	0	43,000,000
Volume of Organic Layer	(L)	0 635	0 635	0 635	0 635	0 635	0 635	0 635	0 635	0 635	0 635	0 635	0 635	0 635
Compound Wt	(lbs)	5 03E-03	0	0	2 10E-02	5 45E-03	1 54E-02	0	1 17E-03	9 65E-03	1 54E-03	8 11E-04	0	6 01E-02
MeOH Impinger to Tenax Resin														
Concentration in MeOH Impinger	(µg/L)	84,000	550,000	0	84,000	28,000	130,000	73,000	0	0	0	0	140,000	422,000
Mass of MeOH Layer	(g)	686 6	686 6	686 6	686 6	686 6	686 6	686 6	686 6	686 6	686 6	686 6	686 6	686 6
Volume of MeOH Layer	(L)	0 87	0 87	0 87	0 87	0 87	0 87	0 87	0 87	0 87	0 87	0 87	0 87	0 87
Flow to Tenax/Total Flow (a)	(scf/scf)	0 108	0 108	0 108	0 108	0 108	0 108	0 108	0 108	0 108	0 108	0 108	0 108	0 108
Adjusted Compound Wt	(lbs)	1 49E-03	9 74E-03	0	1 49E-03	4 96E-04	2 30E-03	1 29E-03	0	0	0	0	2 48E-03	7 47E-03
Tenax Resin Tube Pair (b)														
Compound Wt on Tenax	(µg)	35	0	0	81	3	21	1,784	NA	NA	NA	NA	NA	NA
Average Flow to Tenax	(scfm)	0 011	0 011	0 011	0 011	0 011	0 011	0 011	0 011	0 011	0 011	0 011	0 011	0 011
Flow to Tenax/Total Flow (a)	(scf/scf)	0 108	0 108	0 108	0 108	0 108	0 108	0 108	0 108	0 108	0 108	0 108	0 108	0 108
Adjusted Compound Wt	(lbs)	7 12E-07	0	0	1 65E-06	6 37E-08	4 18E-07	3 64E-05	0	0	0	0	0	0
Starting Weights														
Total Test Soil	(lbs)	2 255	2 255	2 255	2 255	2 255	2 255	2 255	2 255	2 255	2 255	2 255	2 255	2 255
Carbon Concentration	(wt %)	8 13	8 13	8 13	8 13	8 13	8 13	8 13	8 13	8 13	8 13	8 13	8 13	8 13
Total Carbon	(lbs)	0 183	0 183	0 183	0 183	0 183	0 183	0 183	0 183	0 183	0 183	0 183	0 183	0 183
Emission Factors														
Total Soil Basis														
lb of compound/lb of Starting Soil		2 89E-03	7 49E-03	0	9 96E-03	2 64E-03	7 84E-03	5 90E-04	5 21E-04	4 28E-03	6 82E-04	3 60E-04	1 10E-03	3 00E-02
Carbon Basis														
lb of compound/lb of Total Carbon		3 56E-02	9 21E-02	0	1 23E-01	3 25E-02	9 65E-02	7 25E-03	6 41E-03	5 26E-02	8 39E-03	4 42E-03	1 35E-02	3 69E-01

(a) The offgas stream to the Tenax resin was one of three branched streams from the RTA This factor adjusts the data to account for the total offgas flow during the test
(b) Results are a combination of the first and second tube pairs Each Tenax tube was analyzed separately
NA - not analyzed

VOC Emission Factor Calculations for RTA2 - Typical Case Soil

Parameters		Benzene	Acetone	2-Butanone	Toluene	Ethylbenzene	Xylenes	Chloroethane	Methyl methacrylate	1,2,4-Trimethyl benzene	N-Propyl benzene	1,2,4-Trichloro benzene	Chloromethane	TICs
Water Layer from Impinger Set														
Concentration in Impingers (Water Layer)	(µg/L)	0	260,000	75,000	16,000	0	0	0	79,000	0	0	0	0	62,000
Volume of Water Layer	(L)	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Compound Wt	(lbs.)	0	4.01E-04	1.16E-04	2.47E-05	0	0	0	1.22E-04	0	0	0	0	9.57E-05
Organic Layer from Impinger Set (a)														
Concentration in Impingers (Organic Layer)	(µg/L)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Volume of Organic Layer	(L)	----	----	----	----	----	----	----	----	----	----	----	----	----
Compound Wt	(lbs.)	0	0	0	0	0	0	0	0	0	0	0	0	0
MeOH Impinger to Tenax Resin														
Concentration in MeOH Impinger	(µg/L)	74,000	430,000	0	270,000	61,000	350,000	75,000	29,000	52,000	0	0	130,000	239,000
Mass of MeOH Layer	(g)	683.8	683.8	683.8	683.8	683.8	683.8	683.8	683.8	683.8	683.8	683.8	683.8	683.8
Volume of MeOH Layer	(L)	0.864	0.864	0.864	0.864	0.864	0.864	0.864	0.864	0.864	0.864	0.864	0.864	0.864
Flow to Tenax/Total Flow (b)	(scf/scf)	0.158	0.158	0.158	0.158	0.158	0.158	0.158	0.158	0.158	0.158	0.158	0.158	0.158
Adjusted Compound Wt	(lbs.)	8.94E-04	5.19E-03	0	3.26E-03	7.37E-04	4.23E-03	9.06E-04	3.50E-04	6.28E-04	0	0	1.57E-03	2.89E-03
Tenax Resin Tube Pair (c)														
Compound Wt on Tenax	(µg)	103	8,064	0	1,771	32	198	2,643	NA	NA	NA	NA	NA	NA
Average Flow to Tenax	(scfm)	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018
Flow to Tenax/Total Flow (b)	(scf/scf)	0.158	0.158	0.158	0.158	0.158	0.158	0.158	0.158	0.158	0.158	0.158	0.158	0.158
Adjusted Compound Wt	(lbs.)	1.43E-06	1.13E-04	0	2.48E-05	4.45E-07	2.76E-06	3.69E-05	0	0	0	0	0	0
Starting Weights														
Total Test Soil	(lbs.)	2.164	2.164	2.164	2.164	2.164	2.164	2.164	2.164	2.164	2.164	2.164	2.164	2.164
Carbon Concentration	(wt %)	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73
Total Carbon	(lbs.)	0.124	0.124	0.124	0.124	0.124	0.124	0.124	0.124	0.124	0.124	0.124	0.124	0.124
Emission Factors														
Total Soil Basis														
lb. of compound/lb. of Starting Soil		4.14E-04	2.64E-03	5.35E-05	1.53E-03	3.41E-04	1.96E-03	4.36E-04	2.18E-04	2.90E-04	0	0	7.26E-04	1.38E-03
Carbon Basis														
lb. of compound/lb. of Total Carbon		7.22E-03	4.60E-02	9.34E-04	2.67E-02	5.95E-03	3.41E-02	7.61E-03	3.81E-03	5.07E-03	0	0	1.27E-02	2.41E-02

(a) A filter was used for this test prior to the impinger set. Therefore, no organic layer was present in the impingers. No VOC sample was taken from the organic rinse.
(b) The offgas stream to the Tenax resin was one of three branched streams from the RTA. This factor adjusts the data to account for the total offgas flow during the test.
(c) Results are a combination of the first and second tube pairs. Each Tenax tube was analyzed separately.
NA - not analyzed

SVOC Emission Factor Calculations for RTA1 - Worst Case Soil

Parameters		Phenol	4-Methyl phenol	Isophorone	SVOC TICs	PCBs
Water Layer from Impinger Set						
Concentration in Impingers (Water Layer)	(µg/L)	600,000	150,000	140,000	1,438,000	128
Volume of Water Layer	(L)	0.68	0.68	0.68	0.68	0.68
Compound Wt.	(lbs.)	9.05E-04	2.26E-04	2.11E-04	2.17E-03	1.93E-07
Organic Layer from Impinger Set						
Concentration in Impingers (Organic Layer)	(µg/L)	170,000	100,000	200,000	4,270,000	94,000
Volume of Organic Layer	(L)	0.80	0.80	0.80	0.80	0.80
Compound Wt.	(lbs.)	3.01E-04	1.77E-04	3.54E-04	7.55E-03	1.66E-04
XAD Resin Tube Pair						
Compound Wt. on XAD	(µg)	0	0	0	0	11
Average Flow to XAD	(scfm)	0.014	0.014	0.014	0.014	0.014
Flow to XAD/Total Flow (a)	(scf/scf)	0.140	0.140	0.140	0.140	0.140
Adjusted Compound Wt.	(lbs.)	0	0	0	0	1.73E-07
Starting Weights						
Total Test Soil	(lbs.)	2.263	2.263	2.263	2.263	2.263
Carbon Concentration	(wt %)	8.13	8.13	8.13	8.13	8.13
Total Carbon	(lbs.)	0.184	0.184	0.184	0.184	0.184
Emission Factors						
Total Soil Basis						
lb. of compound/lb. of Starting Soil		5.33E-04	1.78E-04	2.50E-04	4.30E-03	7.36E-05
Carbon Basis						
lb. of compound/lb. of Total Carbon		6.55E-03	2.19E-03	3.07E-03	5.28E-02	9.06E-04

(a) The offgas stream to the XAD resin was one of three branched streams from the RTA. This factor adjusts the data to account for the total offgas flow during the test.

SVOC Emission Factor Calculations for RTAN - Worst Case Soil

Parameters		Phenol	4-Methyl phenol	Isophorone	SVOC TICs	PCBs
Water Layer from Impinger Set						
Concentration in Impingers (Water Layer)	(µg/L)	580,000	160,000	180,000	1,246,000	186
Volume of Water Layer	(L)	0.72	0.72	0.72	0.72	0.72
Compound Wt.	(lbs.)	9.22E-04	2.54E-04	2.86E-04	1.98E-03	2.96E-07
Organic Layer from Impinger Set						
Concentration in Impingers (Organic Layer)	(µg/L)	220,000	100,000	230,000	4,780,000	110,000
Volume of Organic Layer	(L)	0.635	0.635	0.635	0.635	0.635
Compound Wt.	(lbs.)	3.08E-04	1.40E-04	3.22E-04	6.68E-03	1.54E-04
XAD Resin Tube Pair						
Compound Wt. on XAD	(µg)	0	0	0	0	3.32
Average Flow to XAD	(scfm)	0.021	0.021	0.021	0.021	0.021
Flow to XAD/Total Flow (a)	(scf/scf)	0.199	0.199	0.199	0.199	0.199
Adjusted Compound Wt.	(lbs.)	0	0	0	0	3.68E-08
Starting Weights						
Total Test Soil	(lbs.)	2.255	2.255	2.255	2.255	2.255
Carbon Concentration	(wt %)	8.13	8.13	8.13	8.13	8.13
Total Carbon	(lbs.)	0.183	0.183	0.183	0.183	0.183
Emission Factors						
Total Soil Basis						
lb. of compound/lb. of Starting Soil		5.45E-04	1.75E-04	2.69E-04	3.84E-03	6.84E-05
Carbon Basis						
lb. of compound/lb. of Total Carbon		6.71E-03	2.15E-03	3.31E-03	4.73E-02	8.41E-04

(a) The offgas stream to the XAD resin was one of three branched streams from the RTA. This factor adjusts the data to account for the total offgas flow during the test.

SVOC Emission Factor Calculations for RTA2 - Typical Case Soil

Parameters		Phenol	4-Methyl phenol	Isophorone	SVOC TICs	PCBs
Water Layer from Impinger Set						
Concentration in Impingers (Water Layer)	(µg/L)	360,000	89,000	340,000	574,000	240
Volume of Water Layer	(L)	0.70	0.70	0.70	0.70	0.70
Compound Wt.	(lbs.)	5.56E-04	1.37E-04	5.25E-04	8.86E-04	3.71E-07
Organic Layer from Impinger Set						
Concentration in Impingers (Organic Layer)	(µg/L)	0	0	100,000	1,992,000	59,000
Volume of Organic Layer	(L)	0.72	0.72	0.72	0.72	0.72
Compound Wt.	(lbs.)	0	0	1.58E-04	3.16E-03	9.35E-05
XAD Resin Tube Pair						
Compound Wt. on XAD	(µg)	0	0	0	0	2.49
Average Flow to XAD	(scfm)	0.026	0.026	0.026	0.026	0.026
Flow to XAD/Total Flow (a)	(scf/scf)	0.227	0.227	0.227	0.227	0.227
Adjusted Compound Wt.	(lbs.)	0	0	0	0	2.41E-08
Starting Weights						
Total Test Soil	(lbs.)	2.164	2.164	2.164	2.164	2.164
Carbon Concentration	(wt %)	5.77	5.77	5.77	5.77	5.77
Total Carbon	(lbs.)	0.125	0.125	0.125	0.125	0.125
Emission Factors						
Total Soil Basis						
lb. of compound/lb. of Starting Soil		2.57E-04	6.35E-05	3.16E-04	1.87E-03	4.34E-05
Carbon Basis						
lb. of compound/lb. of Total Carbon		4.45E-03	1.10E-03	5.47E-03	3.24E-02	7.52E-04

(a) The offgas stream to the XAD resin was one of three branched streams from the RTA. This factor adjusts the data to account for the total offgas flow during the test.

Bag Sample Emission Factor Calculations for RTA1 - Worst Case Soil

Parameter		RTA1 Hydrogen	Methane	Ethylene	Ethane	Acetylene	Propane
Bag Sample Analyses							
Average Bag Concentration	(lbs./1E6 lbs.)	4,667	8,615	3,135	1,570	16	12,283
Total Flow during Bag Sampling	(scf)	2.226	2.226	2.226	2.226	2.226	2.226
Compound Wt.	(lbs.)	7.83E-04	1.45E-03	5.26E-04	2.64E-04	2.77E-06	2.06E-03
Starting Weights							
Total Test Soil	(lbs.)	2.263	2.263	2.263	2.263	2.263	2.263
Carbon Concentration	(wt %)	8.13	8.13	8.13	8.13	8.13	8.13
Total Carbon	(lbs.)	0.184	0.184	0.184	0.184	0.184	0.184
Emission Factors							
Total Soil Basis							
lb. of compound/lb. of Starting Soil		3.46E-04	6.39E-04	2.33E-04	1.17E-04	1.22E-06	9.11E-04
Carbon Basis							
lb. of compound/lb. of Total Carbon		4.26E-03	7.86E-03	2.86E-03	1.43E-03	1.50E-05	1.12E-02

Bag Sample Emission Factor Calculations for RTA2 - Typical Case Soil

Parameter		Hydrogen	Methane	Ethylene	Ethane	Acetylene	Propane
Bag Sample Analyses							
Average Bag Concentration	(lbs./1E6 lbs.)	1,548	1,216	787	83	8	1,703
Total Flow during Bag Sampling	(scf)	2.276	2.276	2.276	2.276	2.276	2.276
Compound Wt.	(lbs.)	2.66E-04	2.09E-04	1.35E-04	1.42E-05	1.37E-06	2.92E-04
Starting Weights							
Total Test Soil	(lbs.)	2.164	2.164	2.164	2.164	2.164	2.164
Carbon Concentration	(wt %)	5.73	8.13	8.13	8.13	8.13	8.13
Total Carbon	(lbs.)	0.124	0.176	0.176	0.176	0.176	0.176
Emission Factors							
Total Soil Basis							
lb. of compound/lb. of Starting Soil		1.23E-04	9.65E-05	6.24E-05	6.58E-06	6.35E-07	1.35E-04
Carbon Basis							
lb. of compound/lb. of Total Carbon		2.14E-03	1.19E-03	7.68E-04	8.10E-05	7.81E-06	1.66E-03

Bag Sample Emission Factor Calculations for RTA1 - Worst Case Soil

Parameter		Hydrogen	Methane	Ethylene	Ethane	Acetylene	Propane
Bag Sample Analyses							
Average Bag Concentration	(lbs./1E6 lbs.)	4,667	8,615	3,135	1,570	16	12,283
Total Flow during Bag Sampling	(scf)	2.226	2.226	2.226	2.226	2.226	2.226
Compound Wt.	(lbs.)	7.83E-04	1.45E-03	5.26E-04	2.64E-04	2.77E-06	2.06E-03
Starting Weights							
Total Test Soil	(lbs.)	2.263	2.263	2.263	2.263	2.263	2.263
Carbon Concentration	(wt %)	8.13	8.13	8.13	8.13	8.13	8.13
Total Carbon	(lbs.)	0.184	0.184	0.184	0.184	0.184	0.184
Emission Factors							
Total Soil Basis							
lb. of compound/lb. of Starting Soil		3.46E-04	6.39E-04	2.33E-04	1.17E-04	1.22E-06	9.11E-04
Carbon Basis							
lb. of compound/lb. of Total Carbon		4.26E-03	7.86E-03	2.86E-03	1.43E-03	1.50E-05	1.12E-02

Bag Sample Emission Factor Calculations for RTAN - Worst Case Soil

Parameter		Hydrogen	Methane	Ethylene	Ethane	Acetylene	Propane
Bag Sample Analyses							
Average Bag Concentration	(lbs./1E6 lbs.)	2,762	6,064	1,291	1,478	6	8,802
Total Flow during Bag Sampling	(scf)	2.588	2.588	2.588	2.588	2.588	2.588
Compound Wt.	(lbs.)	5.39E-04	1.18E-03	2.52E-04	2.89E-04	1.09E-06	1.72E-03
Starting Weights							
Total Test Soil	(lbs.)	2.255	2.255	2.255	2.255	2.255	2.255
Carbon Concentration	(wt %)	8.13	8.13	8.13	8.13	8.13	8.13
Total Carbon	(lbs.)	0.183	0.183	0.183	0.183	0.183	0.183
Emission Factors							
Total Soil Basis							
lb. of compound/lb. of Starting Soil		2.39E-04	5.25E-04	1.12E-04	1.28E-04	4.85E-07	7.62E-04
Carbon Basis							
lb. of compound/lb. of Total Carbon		2.94E-03	6.46E-03	1.37E-03	1.57E-03	5.96E-06	9.37E-03

Summary of CPAH Analytical Results

CPAH	(a) Method 8270	(b) Method 8310	Starting Soil		Treated Soil			
					Tray Test Results - Worst Case Soil (SC1)			
			SC1	SC2	TT1-500	TT1-700	TT1-900	TT1-1100
Benzo-a-anthracene	330	8.7	55,000	56,000	66,000	3,300	660	330
Chrysene	330	10.1	55,000	56,000	66,000	3,300	660	330
Benzo-b-fluoranthene	330	12.1	55,000	56,000	66,000	3,300	660	330
Benzo-k-fluoranthene	330	11.4	55,000	56,000	66,000	3,300	660	330
Benzo-a-pyrene	330	15.4	55,000	56,000	66,000	3,300	660	330
Dibenzo-a,h-anthracene	330	20.1	55,000	56,000	66,000	3,300	660	330
Benzo(g,h,i)perylene	330	50.9	55,000	56,000	66,000	3,300	660	330
Total CPAHs (µg/kg)	2,310	129	385,000	392,000	462,000	23,100	4,620	2,310
Cleanup Standard (µg/kg)	2.6							

a) Reporting Limits for Method 8270 were obtained from a blank sample from IEA Laboratories in Cary, NC.
b) Reporting limits for Method 8310 were obtained from John Todd of Intertek Laboratories in Richardson, T

Summary of CPAH Analytical Results

CPAH	Treated Soil						
	Tray Test Results - Typical Case Soil (SQ2)				RTA Test Results		
	TT2-500	TT2-700	TT2-900	TT2-1100	RTA1	RTAN	RTA2
Benzo-a-anthracene	66,000	3,300	340	330	670	330	6,700
Chrysene	66,000	3,300	340	330	670	330	6,700
Benzo-b-fluoranthene	66,000	3,300	340	330	670	330	6,700
Benzo-k-fluoranthene	66,000	3,300	340	330	670	330	6,700
Benzo-a-pyrene	66,000	3,300	340	330	670	330	6,700
Dibenzo-a,h-anthracene	66,000	3,300	340	330	670	330	6,700
Benzo(g,h,i)perylene	66,000	3,300	340	330	670	330	6,700
Total CPAHs (µg/kg)	462,000	23,100	2,380	2,310	4,690	2,310	46,900
Cleanup Standard (µg/kg)	2.6						