

WORK PLAN

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**Former Drum Storage Area
at the Former Peregrine, U.S., Inc. Property,
Coldwater Road Facility
G-1245 Coldwater Road
Flint, Michigan
EPA I.D. No. MIR 000 020 743**

**Remediation and Liability Management, Inc.
Troy, Michigan**

February 2004




O'BRIEN & GERE
ENGINEERS, INC.

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at the Former Peregrine, U.S., Inc. Property
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G-1245 East Coldwater Road
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*Prepared for:
Remediation and Liability Management Company, Inc.
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February 2004



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1. Introduction

General Motors Corporation (GM) completed closure of several RCRA Corrective Action Units (RCRA Units), Solid Waste Management Units (SWMUs), and other Areas of Concern (AOCs) at the Coldwater Road Facility in accordance with the October 1992 Corrective Action Consent Order (CACO) and the Michigan Department of Environmental Quality (MDEQ)-approved 1989 Closure and Post-Closure Care Plan (Closure Plan). This RCRA Closure program is now being managed by Remediation and Liability Management Company, Inc. (REALM), a subsidiary of GM.

The remaining RCRA unit that is not yet closed is the former Drum Storage Area, which is located on the former Peregrine (US), Inc. property. Subsequent to performing closure activities, a Closure Certification Report was submitted to the MDEQ in June 1999 by Roy F. Weston, Inc. (Weston) for the former Drum Storage Area. The MDEQ denied approval of the Closure Certification Report based on waste sludges removed from the former Drum Storage Area sumps constituting an unexpected event under 40 CFR 265.112(c), and therefore, the MDEQ requested soil sampling be performed beneath the concrete sumps to assess potential releases.

Initial sampling results indicated a release of trichloroethylene (TCE) to subsurface soil at the sump area. A series of investigations were subsequently performed to assess the extent of this impact.

Previously, three historical investigations were performed at the former Peregrine (US), Inc. property. These investigations included soil boring and/or monitoring well installation at the former Drum Storage Area. Results of these investigations indicated concentrations of TCE above MDEQ Generic Industrial cleanup criteria in subsurface soil and ground water. Therefore, this area was investigated to assess TCE impact to subsurface soil.

This Work Plan summarizes the results of the recent investigations performed by O'Brien & Gere Engineers, Inc. (O'Brien & Gere) to assess the potential releases identified in the initial sump area investigation and from historical investigations. In addition, this Work Plan outlines the proposed Interim Remedial Measure (IRM) that is to be conducted to accelerate closure of the former Drum Storage Area and the proposed verification sampling to document that the remedial objectives have been achieved.

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2. Background

Subsequent to cleaning and closure verification sampling at the former Drum Storage Area, REALM submitted a Final Closure Certification Documentation Package (Roy F. Weston, Inc., June 1999) to the MDEQ requesting closure for the Drum Storage Area and the Waste Pile Pad in accordance with the approved Closure Plan. MDEQ denied the closure request for the Drum Storage Area and requested additional investigation in this area in a March 26, 1998 letter from the MDEQ to Peregrine (US), Inc.¹

REALM submitted a Work Plan to the MDEQ for additional subsurface investigation at the Drum Storage Area on February 16, 2000. The Work Plan was approved by MDEQ as outlined in a letter, dated June 27, 2000. Following MDEQ approval, additional soil and ground water investigations were completed in the former Drum Storage Area. The results of these investigations, summarized in Section 3 of this Work Plan, identified TCE in soil and TCE and cis-1,2-dichloroethene in ground water above the applicable MDEQ generic criteria. The TCE impact to soil was delineated during the recent investigations.

Selected areas of concrete removal at the former Peregrine (US), Inc. property is scheduled to be performed to improve the property for potential sale or reuse. As part of this effort, specific areas at the site in which previous soil sampling indicated concentrations of compounds in shallow soils above the MDEQ Generic Industrial criteria for Direct Contact, Particulate Inhalation or Indoor Air Inhalation will also be removed. As part of this program, an Interim Remedial Measure (IRM) is scheduled to be performed at the former Drum Storage Area by Conestoga-Rovers and Associates, Inc. (CRA). The IRM will consist of removal of the former Drum Storage Area sumps and associated impacted soil and ground water. O'Brien & Gere will perform verification sampling associated with this IRM. Section 4 of this Work Plan outlines the IRM and proposed verification sampling at the former Drum Storage Area.

2.1. Historical investigations

Three historical investigations were performed at the Peregrine (US), Inc. property: GaiaTech, Inc. (Phase II Environmental Investigation dated November 25, 1996); RMT, Inc. (Post-Closing Environmental Assessment dated July 1997); and CRA (RCRA Facility Investigation

¹ Peregrine (US) Inc. previously owned and operated the property on which the former Drum Storage Area exists, however, the property has since reverted back to REALM.

dated November 2000, and investigation activities in response to MDEQ comments dated March 2002).

The Phase II Environmental Investigation (GaiaTech, Inc.) was performed to evaluate the potential for soil and ground water impact due to historical and current use of the property at the time of the investigation. The former Drum Storage Area was identified as an Area of Concern by GaiaTech, Inc. and was investigated through the installation of two soil borings and one monitoring well (SB-14, SB-15 and MW-14). The results of the soil sample analysis indicated a concentration of TCE (2,210 ug/kg) was detected at location MW-14 (3-5 ft below grade) above the MDEQ Industrial Drinking Water Protection criteria. The analytical results from the ground water sample collected at MW-14 indicated a concentration of TCE (21.3 ug/l) above the MDEQ Generic Industrial Drinking Water criteria (5 ug/l).

The RMT, Inc. Post-Closing Environmental Assessment was performed subsequent to Peregrine (US), Inc. acquiring the property. The assessment was performed to identify whether impact to soil or ground water had occurred as a result of GM's previous operations. RMT, Inc. installed one monitoring well (PFW-6) north of the former Drum Storage Area sump within the former Drum Storage Area pad and three soil borings (PFB-25, PFB-26 and PFB-27) south of the former Drum Storage Area pad inside the main manufacturing building. Analytical results from a soil sample collected at PFW-6 from the 3-5 ft below grade interval indicated a concentration of TCE (1,600 ug/kg) above the MDEQ Generic Industrial Drinking Water Protection criteria. Soil sample analytical results from borings PFB-25, PFB-26 and PFB-27 were below method detection limits for volatile organic compounds (VOCs). Ground water analytical results from monitoring well PFW-6 were below MDEQ Generic Industrial Drinking Water criteria.

The CRA RCRA Facility Investigation (RFI) was performed to investigate and characterize potential soil and ground water environmental quality at the identified areas of interest at the former Pergerine (US), Inc. facility. One soil boring (BH-12-1-00) was installed west of the former Drum Storage Area sump. A subsurface soil sample was collected at 1.5-2.5 ft below grade and was analyzed for the presence of VOCs. The analytical results exhibited a concentration of TCE of 110 ug/kg. This detection of TCE is above the MDEQ Industrial Drinking Water Protection criteria.

3. Summary of investigations at the former Drum Storage Area

O'Brien & Gere completed investigation of the former Drum Storage Area in a phased approach following the June 27, 2000 MDEQ approval of the Work Plan. An initial field investigation was performed on August 1, 2000 and subsequent investigations were performed on May 10, 2002, and June 4, 2002 to evaluate the extent of TCE in subsurface soil and evaluate ground water quality in the vicinity of the former Drum Storage Area. An investigation to assess the extent of soil impacts discovered during historical investigations was performed on November 26, 2002. The results of these investigations are summarized in the following sections.

3.1. Initial hydraulic probe boring investigation – August 2000

The purpose of the initial hydraulic probe investigation requested by the MDEQ was to assess the potential for a release from the former Drum Storage Area sumps.

O'Brien & Gere completed the soil sampling activities adjacent to the concrete sumps of the former Drum Storage Area on August 1, 2000 (see Figure 1 for geoprobe soil boring locations). Four hydraulic probe borings (GB-1 through GB-4) were installed at the former Drum Storage Area sumps; three to a depth of 12 ft below grade and one to a depth of 17 ft below grade. The borings were installed using a direct push hydraulic probe unit. A 4-ft long tubular sampler with disposable acetate liner was driven into the subsurface material to obtain representative samples. Soil samples were classified in accordance with ASTM method D-2488 by an O'Brien & Gere geologist. Completed soil boring logs are included in Appendix A. Soil samples were field screened by the headspace procedure using a photoionization detector (PID) in 2-ft intervals from the ground surface to the boring terminus. The headspace procedure was accomplished by placing a discrete portion of the soil sample (biased based on visual and olfactory observations) into a re-sealable plastic bag and allowing the sample to reach ambient air temperature prior to screening with the PID. The maximum PID reading was recorded on the boring log for each sample.

One soil sample from the bottom of each boring was selected for analysis based on this depth being below the bottom of the former Drum Storage Area sumps and most likely to have been impacted from a release. The sampling interval from 9-11 ft below grade was selected for analysis at boring locations GB-1 through GB-3 and 14-16 ft below grade for boring location GB-4. Boring GB-4 was extended to this depth since it was

located in the former main manufacturing building floor which is at a higher elevation than the adjacent outside surface grade. Soil samples were collected in accordance with USEPA Method 5035 and analyzed for the presence of VOCs by USEPA method 8260, cyanide by USEPA method 9010, chromium III and lead by USEPA method 6020, chromium VI by USEPA method 7197 and mercury by USEPA method 7471M.

A Level III data package was requested from the laboratory. Level III data includes the collection of various Quality Assurance/Quality Control (QA/QC) samples used to perform data validation. The data was independently validated by O'Brien & Gere to assess the suitability of the measurement system for providing useful analytical data. The results of data validation, included in Appendix B, indicated the VOCs, chromium, lead, mercury and cyanide data were 100% usable for qualitative and quantitative purposes.

VOCs were not detected in 3 of the 4 soil borings sampled at the former Drum Storage Area. Boring GB-1 was the only boring with detected VOCs. TCE and cis-1,2-dichloroethene were detected at concentrations of 6,720 and 820 ug/Kg, respectively in this boring (9 to 11 ft). The concentration of cis-1,2-dichloroethane was below all generic cleanup criteria; however, the concentration of TCE exceeded the Generic Industrial Drinking Water Protection criteria. Lead was detected in all the soil samples and tri-valent chromium was detected in 2 of the 4 samples; however the concentrations of these metals were below the Statewide Default Background Levels. A table summarizing these investigation analytical results is included as Table 1 and analytical data sheets are included in the Data Validation Report included in Appendix B.

The subsurface conditions observed during this initial investigation included silty clay from the surface to an approximate depth of 12 ft below grade (terminus of boring), in three of the four borings. In one boring (GB-4), approximately 5 ft of a sandy fill material was observed from the surface to the top of the clay. During installation of the soil borings saturated soil conditions were not observed.

In summary, initial investigation determined that soil impacted by TCE was present at a depth of 9-11 ft below grade at GB-1, west of the former Drum Storage Area sumps.

3.2. Hydraulic probe boring investigations – May through July 2002

Based on the results of the August 1, 2000 soil sampling at the former Drum Storage Area and discussions with MDEQ, three additional hydraulic probe borings (GB-5, GB-6 and GB-7) and one temporary monitoring well (DSA MW-1) were installed at the former Drum Storage Area to assess TCE impact to soil and assess the potential presence of

ground water. This investigation was performed between May 10 and July 23, 2002.

3.2.1. Soil investigation

The hydraulic probe borings were installed radially approximately 5-10 ft outward from GB-1 to assess the extent of TCE soil impact. The sampling was performed in accordance with the methods described in Section 3.1. The boring locations are shown on Figure 1. The hydraulic probe borings were installed to a depth of 20 ft below grade to vertically assess the previously detected impact. Although these borings appear to be installed deeper than the August 1, 2000 borings, the grade in this area had increased approximately 3-4 ft as a result demolishing the main manufacturing facility, therefore the borings were installed to a greater depth than the previous 12 ft below grade borings. The boring used for installation of the temporary monitoring well was installed to a depth of 25 ft below grade to vertically assess the previously detected impact to soil in this area at GB-1. Completed soil boring logs are included in Appendix A.

Two soil samples were collected from each of the hydraulic probe borings for laboratory analysis, except for boring DSA MW-1. In the hydraulic probe borings, one soil sample was collected from either the interval indicating potential impact through field screening or at the depth equivalent to previously identified impact (approximately 9-11 ft below grade at GB-1). The second soil sample was collected from the terminus of the boring. In DSA MW-1 one soil sample was collected from the terminus of the boring for laboratory analysis for vertical assessment of soil impact. Soil samples selected for analysis were collected using Encore® samplers, labeled, placed in a cooler with ice and chain-of-custody documentation and delivered to Fire & Environmental Consulting Laboratories, Inc. (currently Merit Laboratories, Inc. (Merit)) of East Lansing, Michigan. The samples were analyzed for the presence of VOCs by USEPA Method 8260.

A Level III data package was requested from the laboratory. Level III data includes the collection of various QA/QC samples used to perform data validation. The data was independently validated by O'Brien & Gere to assess the suitability of the measurement system for providing useful analytical data. The results of data validation, included in Appendix C, indicated the VOCs data were 100% usable for qualitative and quantitative purposes.

VOCs were not detected in 6 of 7 samples collected. The soil sample from 14-15 ft interval at GB-7 was the only sample that detected VOCs. TCE and cis-1, 2-dichloroethene were detected at concentrations of 1,510 and 300 ug/Kg, respectively. The concentration of cis-1, 2-dichloroethene was below all generic cleanup criteria, however TCE exceeded the Generic Industrial Drinking Water Protection criterion of 100 ug/Kg. At the request of the MDEQ and because ground water could not initially be sampled in this area (see Section 3.2.2), this soil sample was subsequently analyzed for leachable TCE by the Synthetic Precipitate Leaching Procedure (SPLP) USEPA Method 8260B. The

SPLP analytical results identified a leachable concentration of TCE of 19 ug/l, which is above the MDEQ Generic Industrial Drinking Water Criterion (5 ug/l).

The analytical results for the May 10, 2002 soil sampling event are summarized on Table 2 and the analytical data sheets are included in the Data Validation Report included in Appendix C. The analytical results for the SPLP TCE analysis are summarized on Table 3 and analytical data sheets are included in Appendix D.

Similar to the initial investigation, the subsurface conditions observed for this additional investigation included observations of silty clay in the borings from previous grade (approximately 4 ft below present grade), with fill material above, to a depth of 20 ft below grade. In two borings (GB-5 and DSA MW-1), a thin sand lense was observed and a monitoring well was set at DSA MW-1 straddling this sand lense to intercept potential ground water. A discussion on the ground water investigation is discussed in the following section.

3.2.2. Ground water investigation

Because the previously installed monitoring wells in the vicinity of the former Drum Storage Area could not be located, one temporary monitoring well was installed approximately 4 ft north of GB-1 to collect a ground water sample for VOC analysis. The location of this well (DSA MW-1) is shown on Figure 1. The temporary monitoring well was constructed of 2-inch diameter schedule 40 PVC riser flush threaded to a 5 ft length of no. 10 well slot, 2-inch schedule 40 PVC well screen. The screen was set at an approximate depth of 9.7 – 14.7 ft below grade across a thin (0.75 ft thick) sand lense (observed from 10-10.75 ft below grade). Once the screen and riser were placed through the augers, clean silica sand was placed around the well screen to approximately 2.5-ft above the screen. After the sand was placed around the well screen, a bentonite seal was placed above the sand pack. The well was finished above grade with a steel protective casing. A monitoring well construction detail is included in Appendix E.

An attempt was made to develop temporary well DSA MW-1 subsequent to installation; however, the well was observed to be dry the day of and one day after installation. The well was checked during each of the following two consecutive weeks and ground water was not observed in the well. On June 17, 2002, the well was again checked and a 5-ft water column was observed. The ground water elevation was measured to be 803.07' (approximately 9 ft below grade). This ground water was evacuated and the ground water level did not recover. The temporary well was again checked on June 26, 2002, and again a 5-ft water column was observed. This ground water was evacuated and recovery of a 1-ft water column was observed after approximately 4 hrs. Well development of DSA MW-1 was considered complete based on surging, and then evacuating the ground water out of the well on these two separate occasions.

A water sample was then collected from temporary well DSA MW-1 on July 23, 2002 after allowing the water to stabilize. The well was sampled to acquire ground water quality data and to assess whether TCE impact to soil was leaching to ground water. The water sample was split with a MDEQ Waste Management Division (WMD) representative. The temporary well was sampled using low-flow sampling methods and analyzed for the presence of VOCs by USEPA Method 8260.

A Level III data package was requested from the laboratory. Level III data includes the collection of various QA/QC samples used to perform data validation. The data was independently validated by O'Brien & Gere to assess the suitability of the measurement system for providing useful analytical data. The results of data validation, included in Appendix F, indicated the VOCs data were 100% usable for qualitative and quantitative purposes.

The O'Brien & Gere and MDEQ WMD analytical results for the ground water samples indicated concentrations of TCE and cis-1,2-dichloroethene of 1,420 and 650 ug/L, and 2,200 ug/l and 920 ug/l, respectively, which exceeds the MDEQ Generic Industrial Drinking Water Criteria. The O'Brien & Gere ground water analytical results are summarized on Table 4 and analytical data sheets are included in the Data Validation Report included in Appendix F. The MDEQ WMD ground water analytical results are included in Appendix G.

Based on the yield of the well observed and historical site information from previous investigations, it does not appear that the sand lense which well DSA MW-1 screens is continuous across the site or is capable of yielding usable quantities of ground water for economical use. Therefore, this saturated lense is not considered a useable aquifer. A study was performed by CRA to investigate the Groundwater Not In An Aquifer (GWNIAA) exposure pathway across the former Peregrine (US) Inc., facility. The results of this study indicated the perched zone at the site yields an insignificant amount of water for water supply purposes.

In summary, this phase of investigation determined that shallow ground water observed at the former Drum Storage Area is impacted by TCE and cis-1,2-dichloroethene with concentrations exceeding MDEQ Generic Industrial Drinking Water criteria. The extent of soil impact was determined to be assessed north, east and northwest of GB-1, however, soil impact required assessment to the south and southwest of GB-7.

3.3. Additional hydraulic probe boring investigation – June 2002

Based on the results of the May 10, 2002 soil sampling event indicating TCE impact in soil at GB-7 above MDEQ Generic Industrial Drinking Water Protection criterion, an additional phase of soil sampling was performed on June 4, 2002, to assess the extent of TCE impact to soil. The sampling was performed in accordance with the methods described in Section 3.1. Two rings of hydraulic probe borings (first ring-GB-8, GB-9 and GB-10, second ring- GB-11, GB-12 and GB-13) were placed

radially outward from GB-7 as shown on Figure 1. One soil sample from each soil boring was collected from either the interval indicating potential impact through field screening or at the approximate depth where previous sampling results indicated impact. The borings were installed to a depth of 20 ft below grade. Completed soil boring logs are included in Appendix A.

A Level III data package was requested from the laboratory. Level III data includes the collection of various QA/QC samples used to perform data validation. The data was independently validated by O'Brien & Gere to assess the suitability of the measurement system for providing useful analytical data. The results of data validation, included in Appendix H, indicated the VOCs data were 100% usable for qualitative and quantitative purposes.

The soil samples from the first ring were submitted to the laboratory for analysis of VOCs by USEPA Method 8260. The analytical results for the first ring of soil samples were below method detection limits, therefore the second/outer ring samples were not analyzed.

The soil sample analytical results for the June 4, 2002 sampling event are summarized on Table 5 and analytical data sheets are included in the Data Validation Report included in Appendix H.

Based on the above discussion, the TCE impact in subsurface soil associated with the release from the Drum Storage Area sumps has been delineated.

The subsurface conditions observed were similar to those observed in the previous investigations, which included silty clay observed to the terminus of the borings. Saturated conditions were not observed during the installation of these borings.

3.4. Investigation to address historic soil impacts – November 2002

Based on historical investigations indicating detections of TCE in subsurface soil above MDEQ IDWP criteria north of the DSA sumps, an investigation was performed to assess the vertical and horizontal extent of impact.

The sampling was performed in accordance with the methods described in Section 3.1. A hydraulic probe boring (GB-14) was installed between the historical detections of TCE exhibited at borings PFW-6 and MW-14 to assess the vertical extent of impact. Two rings of hydraulic probe borings (first ring-GB-15, GB-16 and GB-17, second ring- GB-18, GB-19 and GB-20) were placed radially outward from GB-14 as shown on Figure 1 to assess the potential horizontal extent of impact. One soil sample from each soil boring was collected from either the interval indicating potential impact through field screening or at the approximate depth where previous sampling results indicated impact. The borings

were installed to a depth of 15 ft below grade. Completed soil boring logs are included in Appendix A.

A Level III data package was requested from the laboratory. Level III data includes the collection of various QA/QC samples used to perform data validation. The data was independently validated by O'Brien & Gere to assess the suitability of the measurement system for providing useful analytical data. The results of data validation, included in Appendix I, indicated the TCE data was 100% usable for qualitative and quantitative purposes.

The soil samples from GB-14 and the first ring was submitted to the laboratory for analysis of TCE by USEPA Method 8260. The analytical results for these samples were below method detection limits, therefore, the second/outer ring samples were not analyzed.

The soil sample analytical results for the November 26, 2002 sampling event are summarized on Table 6 and analytical data sheets are included in the Data Validation Report included in Appendix I.

Based on the above discussion, the historical TCE impact in subsurface soil north of the Drum Storage Area sumps has been delineated.

The subsurface conditions observed were similar to those observed in the previous investigations, which included silty clay observed to the terminus of the borings. Saturated conditions were not observed during the installation of these borings. In two of the geoprobe borings (GB-17 and GB-20) a thin sand lense was observed at a depth between approximately 8-10 ft below grade. During sampling activities these borings were left open for the balance of the day in an attempt to collect a ground water sample. At the end of the day the open boreholes were checked and ground water was not observed in the holes. The holes were backfilled with soil cuttings mixed with bentonite.

3.5. Subsurface conditions

This section describes the subsurface conditions observed based on the installation of the hydraulic probe borings and monitoring well at the former Drum Storage Area.

Subsurface soil conditions consist almost entirely of a silty clay unit from the original ground surface to a depth of 21 ft below grade. A thin (approximately 0.33-0.83 ft thick) sand lense was observed in four of the borings (GB-5, DSA MW-1, GB-17 and GB-20) at the former Drum Storage Area. These borings are separated by borings in which this sand lense was not observed indicating the sand lense is not continuous in the vicinity of the former Drum Storage Area. Following demolition of the former manufacturing building, approximately 3-4 ft of sand fill was placed over this area.

Although saturated soil conditions were not observed in the hydraulic probe borings, a monitoring well installed at the former Drum Storage Area yielded water after several weeks.

3.6. Contaminant distribution

3.6.1. Soil

TCE was the only compound detected (in borings GB-1, GB-7 and historical borings BH-12-1-00, PFW-6 and MW-14) in soil at concentrations that exceeded MDEQ Generic Industrial Drinking Water Protection criterion at the former Drum Storage Area. Based on the results of the multiple phases of investigation at the former Drum Storage Area, the TCE extent of impact to soil from the release at the Drum Storage Area sump and from historical detections at the area north of the sumps, have been assessed vertically and horizontally.

Analytical results indicate the impact to soil is horizontally limited to a total area of approximately 1,500 sq ft (approximately 1,000 sq. ft surrounding the former Drum Storage Area sumps and 500 sq ft area north of the sumps). Contamination appears to be vertically limited to approximately 15 ft below grade immediately around the sumps and 12 ft below grade at the area north of the sumps.

The analytical results for the investigation at the former Drum Storage Area sumps demonstrated that TCE concentrations were below method detection limits from soil samples surrounding the sumps, including: GB-2, GB-3, GB-4, GB-5, GB-6, GB-8, GB-9, and GB-10. The vertical extent of impact is assessed through soil samples collected at DSA MW-1 and GB-5, GB-6 and GB-7, at an interval below the TCE detection at GB-1.

The analytical results for the investigation north of the former Drum Storage Area sumps demonstrated that TCE concentrations were below method detection limits from soil samples north of the sumps, including: GB-15, GB-16, and GB-17. The vertical extent of impact is assessed through the soil sample collected at GB-14 (10-12 ft below grade), the interval below the historical TCE detections at PFW-6 and MW-14.

3.6.2. Ground water

Ground water impact at the former Drum Storage Area consists of TCE and cis-1, 2-dichloroethene. These constituents were detected in the ground water sample collected at DSA MW-1 above the MDEQ Generic Industrial Drinking Water criteria. TCE was also detected in a historical ground water sample (March 1997) collected at MW-14 above the MDEQ Generic Industrial Drinking Water criteria. Therefore, TCE and cis-1, 2-dichloroethene are considered the Chemicals of Concern (COCs) in ground water for the former Drum Storage Area. Through recent

investigations, ground water at the former Drum Storage Area was observed to be present in one boring (DSA MW-1), in a limited area within a small sand lense which was observed in four borings (GB-5, DSA MW-1, GB-17 and GB-20). This sand lense appears to be discontinuous, based on the subsurface conditions observed at the former Drum Storage Area, demonstrating a discontinuous water-bearing unit. Therefore, ground water does not require additional investigation.

3.7. Migration pathways evaluation

In accordance with Part 201 of Act 451, Michigan Administrative Code Rule 299.5532, compliance for generic site closures are attained when chemical concentrations are below applicable values for migration pathways pertinent to the site. The following discussion summarizes the migration pathway evaluations for the appropriate pathways at the former Drum Storage Area.

3.7.1. Soil migration pathways

The following discussion evaluates the soil migration pathways for the former Drum Storage Area:

Direct Contact: Direct contact with soil is not a relevant pathway based on the concentrations of TCE detected in subsurface soil at the former Drum Storage Area below the MDEQ Generic Industrial Direct Contact criterion.

Ambient Air Inhalation: Ambient air inhalation is not a relevant pathway based on the concentrations of TCE detected in subsurface soil at the former Drum Storage Area below the MDEQ Generic Industrial Infinite Source Volatile Soil Inhalation (VSIC) criterion.

Indoor Air Inhalation: Indoor air inhalation is not a relevant pathway based on the concentrations of TCE detected in subsurface soil at the former Drum Storage Area below the MDEQ Soil Volatilization to Indoor Air Inhalation criterion.

Ground Water Incidental Contact: Ground water dermal contact is not a relevant pathway based on the concentrations of TCE detected in subsurface soil at the former Drum Storage Area below the MDEQ Groundwater Contact Protection criterion.

Ground Water Surface Water: Migration to surface waters is not a relevant pathway since it is unlikely ground water would vent to surface water based on the nearest surface body of water to the former Drum Storage Area which is located approximately 2,250 ft northwest of the former Drum Storage Area. There is not a storm sewer in close proximity to the former Drum Storage Area which could act as an indirect venting mechanism to surface water. Also, it is unlikely surface water is in

hydraulic connection with the deep usable aquifer at this site based on the significant thickness of the clay aquitard.

Soil Runoff to Surface Water: Soil runoff to surface waters is not a relevant pathway based on the nearest surface body of water located approximately 2,250 ft northwest of the former Drum Storage Area and the topography of the area between the former Drum Storage Area and the surface body of water, where it is unlikely for soil erosion or runoff to directly enter the surface body of water via overland flow.

Leaching to Drinking Water: The relevant pathway at the former Drum Storage Area is drinking water based on the TCE impact detected in soil and the TCE and cis-1,2-dichloroethene impact detected in ground water. However, ground water at the former Drum Storage Area is not used for drinking water, appears to be discontinuous across the site, and is not likely connected to the lower usable aquifer. Therefore, it is unlikely that TCE detected in soil at approximately 10 ft below former grade, and TCE and cis-1,2-dichloroethene detected in ground water would migrate through the clay aquitard into a deep usable aquifer (the clay aquitard is greater than 50 ft thick based on the CRA RCRA Facility Investigation (RFI) Report dated November 20, 2000).

3.7.2. Ground water migration pathways

The following discussion evaluates the ground water migration pathways for the former Drum Storage Area:

Dermal Exposure by Utility Workers: Dermal exposure by utility workers is not a relevant pathway based on ground water concentrations of compounds below the MDEQ Generic Industrial Groundwater Contact criteria.

Indoor Air: Indoor Air is not a relevant pathway based on ground water concentrations of compounds below the MDEQ Generic Industrial Groundwater Volatilization to Indoor Air Inhalation criteria.

Surface Water: Migration to surface waters is not a relevant pathway, since the nearest surface body of water is located approximately 2,250 ft northwest of the former Drum Storage Area and the topography of the area between the former Drum Storage Area and the surface body of water, where it is unlikely for ground water migration to directly enter the surface body of water.

Drinking Water: The relevant pathway at the former Drum Storage Area is drinking water based on the TCE and cis-1, 2-dichloroethene impact detected in ground water. However, ground water at the former Drum Storage Area is not used for drinking water, appears to be discontinuous across the site, and is not likely connected to the lower usable aquifer. Therefore it is unlikely that TCE detected in soil at approximately 10 ft below former grade, and TCE and cis-1, 2-dichloroethene detected in ground water would migrate through the clay aquitard into a deep usable

3. Summary of investigations at the former drum storage area

aquifer, (the clay aquitard is greater than 50 ft thick based on the CRA RCRA Facility Investigation (RFI) Report dated November 20, 2000).

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4. Work plan for verification sampling

Based on concrete and soil removal activities to be performed at various areas at the former Peregrine (US), Inc. property, REALM has elected to implement an IRM at the former Drum Storage Area by removal of the source area including the concrete sumps and surrounding impacted subsurface soil to the north, as well as isolated impacted ground water, to accelerate site closure.

CRA and their subcontractor(s) will be responsible for soil and equipment removal and O'Brien & Gere will perform the verification of soil remediation and ground water sampling and analysis at the former Drum Storage Area. The sampling and analysis will be performed in accordance with the site specific Quality Assurance Project Plan (QAPP) for the Coldwater Road Landfill RCRA closure program, dated January 2000 and subsequent QAPP Addendum, dated May 2002. The results of the sampling will be presented in the Former Drum Storage Area Closure Certification Addendum that will be prepared by O'Brien & Gere.

4.1. Subsurface soil excavation

This section provides a brief summary of the excavation activities.

Excavation at the former Drum Storage Area will begin with the removal of the concrete sumps. The sumps consist of two 6 ft by 6 ft by 8-ft deep concrete vaults (east sump and west sump). As detailed in the June 1999 Final Closure Certification Report (Weston), the sumps and associated piping were previously cleaned in accordance with the approved 1989 Closure Plan. Based on the TCE soil impact being assessed, a soil excavation area of 40 ft by 25 ft and 20 ft deep has been approximated for the area immediately surrounding the sumps. A figure depicting the assessment boring locations and extent of soil to be removed is included as Figure 2.

Based on the historical detections of TCE in soil north of the sumps being assessed, a soil excavation area of 30 ft by 15 ft by 12 ft deep has been approximated for this area. A figure depicting the assessment borings, previous historical boring and well locations and the extent of soil to be removed is included as Figure 2.

Soil removed from the excavations will be temporarily staged on-site pending characterization for disposal.

4.2. Verification of soil remediation soil sampling

Following removal of the concrete sumps and surrounding soil, but prior to backfilling, verification of remediation soil samples will be collected from the excavation in accordance with the MDEQ Sampling Strategies and Statistics Training Materials (S³TM) for Part 201 Cleanup Criteria. Based on this document, verification of remediation soil samples are required from three locations from the floor and eight locations from the sidewalls of the sump excavation. The assessment sample from GB-7 (19-20 ft) will be used as a verification of remediation floor sample and two other sample locations will be collected from the excavation floor. The assessment samples from GB-2, GB-3, GB-4, GB-5, GB-6, GB-8, GB-9 and GB-10 will be used as the sidewall verification of remediation samples. If subsurface conditions exist within the open excavation which would likely be identified as a potential migration pathway, an additional verification sample may be collected for analysis to evaluate this pathway.

Following removal of the soil north of the sumps, but prior to backfilling, verification of remediation soil samples will be collected from the excavation in accordance with the MDEQ S³TM. Based on this document, verification of remediation soil samples are required from two locations from the floor and six locations from the sidewalls of the excavation north of the sumps. The assessment sample from GB-14 (10-12 ft) will be used as a verification of remediation floor sample and one other sample location will be collected from the excavation floor. The assessment samples from GB-2, GB-15, GB-16, and GB-17 will be used as sidewall verification of remediation samples with two additional sidewall samples collected from the excavation. If subsurface conditions exist within the open excavation, which would likely be identified as a potential migration pathway, an additional verification sample may be collected for analysis to evaluate this pathway.

The verification soil samples collected will be analyzed for the presence of TCE by USEPA Method 8260. Analytical methods used for analysis of verification of remediation samples will be in accordance with the QAPP for the Coldwater Road site. QA/QC samples including a duplicate, equipment blank, trip blank and MS/MSD samples will also be collected and analyzed in accordance with the QAPP. The samples will be labeled, placed in a cooler with ice and shipped via overnight transport to the laboratory. Chain-of-custody documentation will accompany each shipment of samples to the laboratory. The soil samples will be analyzed by Merit Laboratories, Inc. of East Lansing, Michigan. A Level III Data package will be requested from the laboratory for the samples analyzed. The data will be independently validated by O'Brien & Gere to assess the suitability of the measurement system for providing useful analytical data.

4.3. Ground water removal

Based on the results of the ground water sample collected from monitoring well DSA MW-1 and a historical sample collected from MW-14 indicating impact, an attempt will be made to remove impacted ground water that collects in the open excavations to attain closure. The volume of water removed from the excavations will be based upon the rate of recharge and an evaluation of the water quality from the excavations. Ground water removal operations will be discontinued, when the ground water quality has improved or it is evaluated that further water removal is ineffective. A verification sample will be collected as described in Section 4.2.1 to determine if ground water entering the excavations meets the MDEQ Generic Industrial Drinking Water criteria. After pumping is complete the excavations will be filled with clean fill material.

Based on the anticipated slow recharge of the water-bearing unit in this area, the excavations may be left open for as long as several weeks to facilitate the collection and removal of ground water. If the excavations are required to remain open, the excavations will have measures taken to prevent runoff and/or rainwater from entering them. Water removed from the excavations will be contained and temporarily staged on-site pending characterization for disposal.

4.4. Ground water verification of remediation sampling

Subsequent to removing ground water from the open excavations, a ground water sample will be collected from each. The ground water sample will be collected by lowering a length of polyethylene tubing with a weight at the open end connected to a peristaltic pump. Water samples will be collected directly into laboratory supplied containers and will be analyzed for the presence of TCE and cis-1,2-dichloroethene by EPA method 8260. Analytical methods used for analysis of ground water samples will be in accordance with the QAPP and subsequent QAPP Addendum. QA/QC samples including a duplicate, equipment blank, trip blank and MS/MSD samples will also be collected and analyzed in accordance with the QAPP and QAPP Addendum. The samples will be labeled, placed in a cooler with ice and shipped via overnight transport to the laboratory. Chain-of-custody documentation will accompany each shipment of samples to the laboratory.

Merit Laboratories, Inc. of East Lansing, Michigan will analyze the ground water samples. A Level III Data package will be requested from the laboratory for the samples analyzed. The data will be independently validated by O'Brien & Gere to assess the suitability of the measurement system for providing useful analytical data.

A 24-hr analytical turnaround time will be requested from the laboratory to assess whether impacted ground water has been removed. If ground

water analytical results indicate impacted ground water remains in the excavations above MDEQ Generic Industrial Drinking Water criteria, pumping of the water will continue and a subsequent ground water sample will be collected for laboratory analysis. If concentrations of TCE and/or cis-1,2-dichloroethene are again detected above the MDEQ Generic Industrial Drinking Water criteria, an evaluation will be made whether to continue to remove the impacted ground water with subsequent sampling or that it is not feasible to remove additional volumes of impacted ground water and the excavations will be backfilled.

4.5. Closure strategy

The verification of remediation soil and ground water samples collected after completion of the IRM will be compared against MDEQ generic closure criteria. If the soil and ground water analytical results are below appropriate MDEQ generic criteria, a Closure Report for the former Drum Storage Area will be prepared and closure for the former Drum Storage Area will be requested.

If soil verification of remediation sample results are present at levels above the MDEQ generic Industrial Drinking Water Protection criteria, additional excavation will be performed, if feasible, to remove this material and the area will be re-sampled.

If ground water closure sample results indicate concentrations of TCE and /or cis-1,2-dichloroethene are present at levels above the MDEQ Generic Industrial Drinking Water criteria, an evaluation will be performed to assess potential future efforts for DSA closure. A subsequent Work Plan would be prepared to address these issues and outline potential investigation methods and strategy for addressing ground water impact. This data would likely provide the required documentation to demonstrate that acceptable conditions exist for a generic industrial site closure. Closure at the former Drum Storage Area would then be requested through the submittal of a Closure Report.

Table 1
Former Drum Storage Area
Soil Analytical Results - August 2000
Volatile Organic Compounds by USEPA Method 5035/8260 (ug/Kg)

Sample Location	GB-1	GB-2	DUP (GB-2)	GB-3	GB-4	MDEQ Part 201
						Generic Cleanup
Sample Depth	(9'-11')	(9'-11')	(9'-11')	(9'-11')	(14'-16')	Criteria
Date Collected	8/1/00	8/1/00	8/1/00	8/1/00	8/1/00	Industrial Drinking
Parameter						Water Protection
						Criteria
Benzene	50 U	50 U	50 U	50 U	50 U	100
Bromobenzene	50 U	50 U	50 U	50 U	50 U	1,500
Bromochloromethane	50 U	50 U	50 U	50 U	50 U	NA
Bromodichloromethane	50 U	50 U	50 U	50 U	50 U	2,000 {W}
Bromoform	50 U	50 U	50 U	50 U	50 U	2,000 {W}
Bromomethane	50 U	50 U	50 U	50 U	50 U	580
n-Butylbenzene	50 U	50 U	50 U	50 U	50 U	4,600
sec-Butylbenzene	50 U	50 U	50 U	50 U	50 U	4,600
tert-Butylbenzene	50 U	50 U	50 U	50 U	50 U	4,600
Carbon tetrachloride	50 U	50 U	50 U	50 U	50 U	100
Chlorobenzene	50 U	50 U	50 U	50 U	50 U	2,000
Chloroethane	50 U	50 U	50 U	50 U	50 U	34,000
Chloroform	50 U	50 U	50 U	50 U	50 U	2,000 {W}
Chloromethane	50 U	50 U	50 U	50 U	50 U	22,000
Dibromochloromethane	50 U	50 U	50 U	50 U	50 U	2,000 {W}
1,2-Dibromo-3-chloropropane	50 U	50 U	50 U	50 U	50 U	4.0 {M}
1,2-Dibromoethane	50 U	50 U	50 U	50 U	50 U	NA
Dibromomethane	50 U	50 U	50 U	50 U	50 U	4,600
1,2-Dichlorobenzene	50 U	50 U	50 U	50 U	50 U	14,000
1,3-Dichlorobenzene	50 U	50 U	50 U	50 U	50 U	480
1,4-Dichlorobenzene	50 U	50 U	50 U	50 U	50 U	1,700
Dichlorodifluoromethane	50 U	50 U	50 U	50 U	50 U	270.0E+3
1,1-Dichloroethane	50 U	50 U	50 U	50 U	50 U	50,000
1,2-Dichloroethane	50 U	50 U	50 U	50 U	50 U	100
1,1-Dichloroethylene	50 U	50 U	50 U	50 U	50 U	140
cis-1,2-Dichloroethene	820	50 U	50 U	50 U	50 U	1,400
trans-1,2-Dichloroethene	50 U	50 U	50 U	50 U	50 U	2,000
1,2-Dichloropropane	50 U	50 U	50 U	50 U	50 U	100
1,3-Dichloropropane	50 U	50 U	50 U	50 U	50 U	1,300
2,2-Dichloropropane	50 U	50 U	50 U	50 U	50 U	NA
1,1-Dichloropropene	50 U	50 U	50 U	50 U	50 U	NA
cis-1,3-Dichloropropene	50 U	50 U	50 U	50 U	50 U	NA
Ethylbenzene	50 U	50 U	50 U	50 U	50 U	1,500
Hexachlorobutadiene	50 U	50 U	50 U	50 U	50 U	72,000
Isopropylbenzene	50 U	50 U	50 U	50 U	50 U	2.60E+05
p-Isopropyltoluene	50 U	50 U	50 U	50 U	50 U	NA
Methylene Chloride	300 U	300 U	300 U	300 U	300 U	100
Naphthalene	50 U	50 U	50 U	50 U	50 U	1.0E+05
n-Propylbenzene	50 U	50 U	50 U	50 U	50 U	4,600
Styrene	50 U	50 U	50 U	50 U	50 U	2,700
1,1,1,2-Tetrachloroethane	50 U	50 U	50 U	50 U	50 U	6,400
1,1,2,2-Tetrachloroethane	50 U	50 U	50 U	50 U	50 U	700
Tetrachloroethene	50 U	50 U	50 U	50 U	50 U	100
Toluene	50 U	50 U	50 U	50 U	50 U	16,000
1,2,3-Trichlorobenzene	50 U	50 U	50 U	50 U	50 U	NA
1,2,4-Trichlorobenzene	50 U	50 U	50 U	50 U	50 U	4,200
1,1,1-Trichloroethane	50 U	50 U	50 U	50 U	50 U	4,000
Trichloroethene	6720	50 U	50 U	50 U	50 U	100
Trichlorofluoromethane	50 U	50 U	50 U	50 U	50 U	1.50E+05
1,2,3-Trichloropropane	50 U	50 U	50 U	50 U	50 U	2,400
1,2,4-Trimethylbenzene	50 U	50 U	50 U	50 U	50 U	2,100
1,3,5-Trimethylbenzene	50 U	50 U	50 U	50 U	50 U	1,800
Vinyl Chloride	50 U	50 U	50 U	50 U	50 U	40
o-Xylene	50 U	50 U	50 U	50 U	50 U	5,600
p,m-Xylene	50 U	50 U	50 U	50 U	50 U	5,600
Acetone	500 U	500 U	500 U	500 U	500 U	42,000
2-Butanone (MEK)	500 U	500 U	500 U	500 U	500 U	7.60E+05
Carbon disulfide	500 U	500 U	500 U	500 U	500 U	46,000
2-Hexanone	500 U	500 U	500 U	500 U	500 U	58,000
4-Methyl-2-pentanone (MIBK)	500 U	500 U	500 U	500 U	500 U	1.00E+05

Notes:

- 1) Results and criteria are shown in parts per billion (ug/Kg).
- 2) MDEQ Part 201 Generic Industrial Cleanup Criteria as listed in Part 201 PA 451 dated December 19, 2002.
- 3) Samples analyzed by Fire & Environmental Consulting Laboratories, Inc. of East Lansing, Michigan.
- 4) "U" denotes the analyte was analyzed for, but was not detected above the reported detection limit.
- 5) "C" Value presented is a screening level based on the chemical-specific generic soil saturation concentration.
- 6) "M" Calculated criterion is below the analytical Target Detection Limit (TDL), therefore, the criterion defaults to the TDL.
- 7) "W" Concentrations of trihalomethanes in soil must be added together to determine compliance with the DWPC of 2,000 ug/kg.
- 8) "NA" indicates criteria not available.
- 9) Bold type indicates MDEQ Generic Industrial Drinking Water Protection Criterion exceedence.
- 10) "DUP" denotes duplicate sample.

Table 1
Former Drum Storage Area
Soil Analytical Results - August 2000
Metals by USEPA methods 6020, 7197, 7471M and Cyanide by USEPA Method 9010 (ug/Kg)

Sample Location	GB-1	GB-2	DUP (GB-2)	GB-3	GB-4	MDEQ Part 201 Generic Cleanup Criteria
						Industrial Drinking Water Protection Criteria
Sample Depth	(9'-11')	(9'-11')	(9'-11')	(9'-11')	(14'-16')	
Date Collected	8/1/00	8/1/00	8/1/00	8/1/00	8/1/00	
Parameter						
Chromium VI	1000 U	1000 U	1000 U	1000 U	1000 U	30,000
Chromium III	11100 J	11900 J	12000 J	12500 J	11600 J	1.0E+9 (D)
Chromium (Total)	11100 J	11900 J	12000 J	12500 J	11600 J	1.0E+9 (D)
Lead	7,600	7,800	7,700	7,000	7,400	7.0E+05
Mercury	100 U	100 U	100 U	100 U	100 U	1,200
Cyanide	500 U	500 U	500 U	500 U	500 U	4,000 (P)

Notes:

- 1) Results and criteria are shown in parts per billion (ug/Kg).
- 2) MDEQ Part 201 Generic Industrial Cleanup Criteria as listed in Part 201 PA 451 dated December 19, 2002.
- 3) Samples analyzed by Fire & Environmental Consulting Laboratories, Inc. of East Lansing, Michigan.
- 4) "U" denotes the analyte was analyzed for, but was not detected.
- 5) "J" denotes that the concentration should be considered approximate.
- 6) "P" Amenable or Method OLA-1677 analysis are used to quantify cyanide concentrations for compliance with all groundwater criteria.
- 7) "D" Calculated criterion exceeds 100%, hence it is reduced to 100% (i.e., 1.0E+9 ppb).
- 8) "DUP" denotes duplicate sample.

Table 2
Former Drum Storage Area
Soil Analytical Results - May 2002
Volatile Organic Compounds by USEPA Method 5035/8260 (ug/Kg)

Sample Location	DSA MW-1 (24'-25')	GB-5 (14'-15')	GB-5 (19'-20')	GB-6 (14'-15')	DUP (GB-6) (14'-15')	GB-6 (19'-20')	GB-7 (14'-15')	GB-7 (19'-20')	MDEQ Part 201 Generic Cleanup Criteria
									Industrial Drinking Water Protection Criteria
Sample Depth									
Date Collected	5/10/02	5/10/02	5/10/02	5/10/02	5/10/02	5/10/02	5/10/02	5/10/02	
Parameter									
Benzene	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	100
Bromobenzene	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	1,500
Bromochloromethane	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	NA
Bromodichloromethane	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	2,000 {W}
Bromoform	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	2,000 {W}
Bromomethane	300 U	300 U	300 U	300 U	300 U	300 U	300 U	300 U	580
n-Butylbenzene	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	4,600
sec-Butylbenzene	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	4,600
tert-Butylbenzene	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	4,600
Carbon tetrachloride	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	100
Chlorobenzene	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	2,000
Chloroethane	60 UJ	60 UJ	60 UJ	60 UJ	60 UJ	60 UJ	60 UJ	60 UJ	34,000
Chloroform	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	2,000 {W}
Chloromethane	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	22,000
2-Chlorotoluene	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	NA
4-Chlorotoluene	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	NA
Dibromochloromethane	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	2,000 {W}
1,2-Dibromo-3-chloropropane	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	4.0 {M}
1,2-Dibromoethane	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	NA
Dibromomethane	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	4,600
1,2-Dichlorobenzene	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	14,000
1,3-Dichlorobenzene	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	480
1,4-Dichlorobenzene	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	1,700
Dichlorodifluoromethane	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	270.0E+3
1,1-Dichloroethane	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	50,000
1,2-Dichloroethane	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	100
1,1-Dichloroethylene	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	140
cis-1,2-Dichloroethene	60 U	60 U	60 U	60 U	60 U	60 U	300	60 U	1,400
trans-1,2-Dichloroethene	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	2,000
1,2-Dichloropropane	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	100
1,3-Dichloropropane	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	1,300
2,2-Dichloropropane	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	NA
1,1-Dichloropropene	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	NA
cis-1,3-Dichloropropene	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	NA
Ethylbenzene	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	1,500
Isopropylbenzene	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	2.60E+05
p-Isopropyltoluene	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	NA
Methylene Chloride	300 U	300 U	300 U	300 U	300 U	300 U	300 U	300 U	100
Naphthalene	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	1.0E+05
n-Propylbenzene	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	4,600
Styrene	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	2,700
1,1,1,2-Tetrachloroethane	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	6,400
1,1,2,2-Tetrachloroethane	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	700
Tetrachloroethene	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	100
Toluene	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	16,000
1,2,3-Trichlorobenzene	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	NA
1,2,4-Trichlorobenzene	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	4,200
1,1,1-Trichloroethane	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	4,000
1,1,2-Trichloroethane	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	100
Trichloroethene	60 U	60 U	60 U	60 U	60 U	60 U	1510	60 U	100
Trichlorofluoromethane	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	1.50E+05
1,2,3-Trichloropropane	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	2,400
1,2,4-Trimethylbenzene	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	2,100
1,3,5-Trimethylbenzene	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	1,800
Vinyl Chloride	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	40
o-Xylene	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	5,600
p,m-Xylene	60 U	60 U	60 U	60 U	60 U	60 U	60 U	60 U	5,600
2-Butanone (MEK)	300 U	300 U	300 U	300 U	300 U	300 U	300 U	300 U	7.60E+05

Notes:

- 1) Results and criteria are shown in parts per billion (ug/Kg).
- 2) MDEQ Part 201 Generic Industrial Cleanup Criteria as listed in Part 201 PA 451 dated December 19, 2002.
- 3) Samples analyzed by Merit Laboratories, Inc. of East Lansing, Michigan.
- 4) "U" denotes the analyte was analyzed for, but was not detected above the reported detection limit.
- 5) "M" Calculated criterion is below the analytical Target Detection Limit (TDL), therefore, the criterion defaults to the TDL.
- 6) "W" Concentrations of trihalomethanes in soil must be added together to determine compliance with the DWPC of 2,000 ug/kg.
- 7) "NA" indicates criteria not available.
- 8) Bold type indicates MDEQ Generic Industrial Drinking Water Protection Criterion exceedence.
- 9) DSA MW-1 is listed as MW-1 on the chan-of-custody document.
- 10) "UJ" denotes the analyte reporting limit should be considered approximate.

Table 3
Former Drum Storage Area
SPLP Analytical Results - May 2002
Trichloroethene SPLP by USEPA Method 8260B (ug/l)

		MDEQ Part 201 Generic Cleanup Criterion
Sample Location	GB-7	Industrial Drinking Water Criterion
Sample Depth	(14'-15')	
Date Collected	5/10/02	
Parameter		
Trichloroethene	19	5 (A)

Notes:

- 1) Result and criterion are shown in parts per billion (ug/l).
- 2) MDEQ Part 201 Generic Industrial Cleanup Criterion as listed in Part 201 PA 451 dated December 19, 2002.
- 3) Sample analyzed by Merit Laboratories, Inc. of East Lansing, Michigan.
- 4) "A" denotes the criterion is the State of Michigan Drinking Water Standard established pursuant to Section 5 of the Safe Drinking Water Act, Act No. 399 of the Public Acts of 1976.
- 5) Bold type indicates MDEQ Generic Industrial Drinking Water Criterion exceedence.

Table 4
Former Drum Storage Area
Ground Water Analytical Results - July 2002
Volatile Organic Compounds by USEPA Method 5035/8260 (ug/L)

Sample Location			MDEQ Part 201 Generic Cleanup Criteria
	DSA MW-1	DUP (DSA MW-1)	Industrial Drinking Water Criteria
Date Collected	7/23/02	7/23/02	
Parameter			
Benzene	1 U	1 U	5 (A)
Bromobenzene	1 U	1 U	50
Bromochloromethane	1 U	1 U	NA
Bromodichloromethane	1 U	1 U	100 (A,W)
Bromoform	1 U	1 U	100 (A,W)
Bromomethane	1 U	1 U	29
n-Butylbenzene	1 U	1 U	230
sec-Butylbenzene	1 U	1 U	230
tert-Butylbenzene	1 U	1 U	230
Carbon tetrachloride	1 U	1 U	5(A)
Chlorobenzene	1 U	1 U	100 (A)
Chloroethane	1 U	1 U	1,700
Chloroform	1 U	1 U	100 (A,W)
Chloromethane	1 U	1 U	1,100
2-Chlorotoluene	1 U	1 U	NA
4-Chlorotoluene	1 U	1 U	NA
1,2-Dibromoethane	1 U	1 U	NA
Dibromochloromethane	1 U	1 U	100 (A,W)
1,2-Dibromo-3-chloropropane	1 U	1 U	NA
Dibromomethane	1 U	1 U	230
1,2-Dichlorobenzene	1 U	1 U	600 (A)
1,3-Dichlorobenzene	1 U	1 U	19
1,4-Dichlorobenzene	1 U	1 U	75 (A)
Dichlorodifluoromethane	1 U	1 U	4,800
1,1-Dichloroethane	13	13	2,500
1,2-Dichloroethane	1 U	1 U	5 (A)
1,1-Dichloroethylene	3	3	7 (A)
cis-1,2-Dichloroethene	650	800	70 (A)
trans-1,2-Dichloroethene	18	19	100 (A)
1,2-Dichloropropane	1 U	1 U	5 (A)
2,2-Dichloropropane	1 U	1 U	NA
1,1-Dichloropropene	1 U	1 U	NA
cis-1,3-Dichloropropene	1 U	1 U	NA
Ethylbenzene	1 U	1 U	74 (E)
Isopropylbenzene	1 U	1 U	2,300
p-Isopropyltoluene	1 U	1 U	NA
Methylene Chloride	5 U	5 U	5 (A)
Naphthalene	1 U	1 U	1,500
n-Propylbenzene	1 U	1 U	230
Styrene	1 U	1 U	100 (A)
1,1,1,2-Tetrachloroethane	1 U	1 U	320
1,1,2,2-Tetrachloroethane	1 U	1 U	35
Tetrachloroethene	1 U	1 U	5 (A)
Toluene	1 U	1 U	790 (E)
1,1,1-Trichloroethane	1 U	1 U	200 (A)
1,1,2-Trichloroethane	1 U	1 U	5.0(A)
Trichloroethene	1420 J	1830	5 (A)
Trichlorofluoromethene	1 U	1 U	7,300
1,2,3-Trichlorobenzene	1 U	1 U	NA
1,2,4-Trichlorobenzene	1 U	1 U	70(A)
1,2,3-Trichloropropane	1 U	1 U	120
1,2,4-Trimethylbenzene	1 U	1 U	63 (E)
1,3,5-Trimethylbenzene	1 U	1 U	72 (E)
Vinyl Chloride	1 U	1 U	2 (A)
o-Xylene	1 U	1 U	280 (E)
p,m-Xylene	1 U	1 U	280 (E)
2-Butanone (MEK)	50 U	50 U	38,000

Notes:

- 1) Results and criteria are shown in parts per billion (ug/L).
- 2) MDEQ Part 201 Generic Industrial Cleanup Criteria as listed in Part 201 PA 451 dated December 19, 2002.
- 3) Samples analyzed by Merit Laboratories, Inc. of East Lansing, Michigan.
- 4) "A" denotes the criterion is the State of Michigan Drinking Water Standard established pursuant to Section 5 of the Michigan Natural Resources Protection Act.
- 5) "U" denotes the analyte was analyzed for, but was not detected above the reported detection limit.
- 6) "E" denotes criterion is the aesthetic drinking water value, as required by section 20120(1)(5)..
- 7) "W" Concentrations of trihalomethanes in soil must be added together to determine compliance with the DWPC of 2,000 ug/kg.
- 8) "NA" indicates criteria not available.
- 9) Bold type indicates MDEQ Generic Industrial Drinking Water Protection Criterion exceedence.
- 10) DSA MW-1 is listed as DSP-1 on the chain-of-custody document.
- 11) "J" denotes the analyte concentration should be considered approximate.

Table 5
Former Drum Storage Area
Soil Analytical Results - June 2002
Volatile Organic Compounds by USEPA Method 5035/8260 (ug/Kg)

Sample Location	GB-8	GB-9	GB-10	DUP (GB-10)	MDEQ Part 201 Generic Cleanup Criteria
					Industrial Drinking Water Protection Criteria
Sample Depth	(14'-15')	(14'-15')	(14'-15')	(14'-15')	
Date Collected	6/4/02	6/4/02	6/4/02	6/4/02	
Parameter					
Benzene	60 U	60 U	60 U	60 U	100
Bromobenzene	60 U	60 U	60 U	60 U	1,500
Bromochloromethane	60 U	60 U	60 U	60 U	NA
Bromodichloromethane	60 U	60 U	60 U	60 U	2,000 {W}
Bromoform	60 UJ	60 UJ	60 UJ	60 UJ	2,000 {W}
Bromomethane	300 U	300 U	300 U	300 U	580
n-Butylbenzene	60 U	60 U	60 U	60 U	4,600
sec-Butylbenzene	60 U	60 U	60 U	60 U	4,600
tert-Butylbenzene	60 U	60 U	60 U	60 U	4,600
2-Chlorotoluene	60 U	60 U	60 U	60 U	NA
4-Chlorotoluene	60 U	60 U	60 U	60 U	NA
Carbon tetrachloride	60 U	60 U	60 U	60 U	100
Chlorobenzene	60 U	60 U	60 U	60 U	2,000
Chloroethane	60 UJ	60 UJ	60 UJ	60 UJ	34,000
Chloroform	60 U	60 U	60 U	60 U	2,000 {W}
Chloromethane	60 U	60 U	60 U	60 U	22,000
Dibromochloromethane	60 U	60 U	60 U	60 U	2,000 {W}
1,2-Dibromo-3-chloropropane	60 UJ	60 UJ	60 UJ	60 UJ	4.0 {M}
1,2-Dibromoethane	60 U	60 U	60 U	60 U	NA
Dibromomethane	60 U	60 U	60 U	60 U	4,600
1,2-Dichlorobenzene	60 U	60 U	60 U	60 U	14,000
1,3-Dichlorobenzene	60 U	60 U	60 U	60 U	480
1,4-Dichlorobenzene	60 U	60 U	60 U	60 U	1,700
Dichlorodifluoromethane	60 U	60 U	60 U	60 U	270.0E+3
1,1-Dichloroethane	60 U	60 U	60 U	60 U	50,000
1,2-Dichloroethane	60 U	60 U	60 U	60 U	100
1,1-Dichloroethylene	60 U	60 U	60 U	60 U	140
cis-1,2-Dichloroethene	60 U	60 U	60 U	60 U	1,400
trans-1,2-Dichloroethene	60 U	60 U	60 U	60 U	2,000
1,2-Dichloropropane	60 U	60 U	60 U	60 U	100
1,3-Dichloropropane	60 U	60 U	60 U	60 U	1,300
2,2-Dichloropropane	60 U	60 U	60 U	60 U	NA
1,1-Dichloropropene	60 U	60 U	60 U	60 U	NA
cis-1,3-Dichloropropene	60 U	60 U	60 U	60 U	NA
Ethylbenzene	60 U	60 U	60 U	60 U	1,500
Isopropylbenzene	60 U	60 U	60 U	60 U	2.60E+05
p-Isopropyltoluene	60 U	60 U	60 U	60 U	NA
Methylene Chloride	300 U	300 U	300 U	300 U	100
Naphthalene	60 U	60 U	60 U	60 U	1.0E+05
n-Propylbenzene	60 U	60 U	60 U	60 U	4,600
Styrene	60 U	60 U	60 U	60 U	2,700
1,1,1,2-Tetrachloroethane	60 U	60 U	60 U	60 U	6,400
1,1,1,2-Tetrachloroethene	60 U	60 U	60 U	60 U	700
Tetrachloroethene	60 U	60 U	60 U	60 U	100
Toluene	60 U	60 U	60 U	60 U	16,000
1,2,3-Trichlorobenzene	60 U	60 U	60 U	60 U	NA
1,2,4-Trichlorobenzene	60 U	60 U	60 U	60 U	4,200
1,1,1-Trichloroethane	60 U	60 U	60 U	60 U	4,000
1,1,2-Trichloroethane	60 U	60 U	60 U	60 U	100
Trichloroethene	60 U	60 U	60 U	60 U	100
Trichlorofluoromethane	60 U	60 U	60 U	60 U	1.50E+05
1,2,3-Trichloropropane	60 U	60 U	60 U	60 U	2,400
1,2,4-Trimethylbenzene	60 U	60 U	60 U	60 U	2,100
1,3,5-Trimethylbenzene	60 U	60 U	60 U	60 U	1,800
Vinyl Chloride	60 U	60 U	60 U	60 U	40
o-Xylene	60 U	60 U	60 U	60 U	5,600
p,m-Xylene	60 U	60 U	60 U	60 U	5,600
2-Butanone (MEK)	300 U	300 U	300 U	300 U	7.60E+05

Notes:

- 1) Results and criteria are shown in parts per billion (ug/Kg).
- 2) MDEQ Part 201 Generic Industrial Cleanup Criteria as listed in Part 201 PA 451 dated December 19, 2002.
- 3) Samples analyzed by Merit Laboratories, Inc. of East Lansing, Michigan.
- 4) "U" denotes the analyte was analyzed for, but was not detected above the reported detection limit.
- 5) "M" Calculated criterion is below the analytical Target Detection Limit (TDL), therefore, the criterion defaults to the TDL.
- 6) "W" Concentrations of trihalomethanes in soil must be added together to determine compliance with the DWPC of 2,000 ug/kg.
- 7) "NA" indicates criteria not available.
- 8) "UJ" denotes the analyte reporting limit should be considered approximate.
- 9) "DUP" denotes duplicate sample.

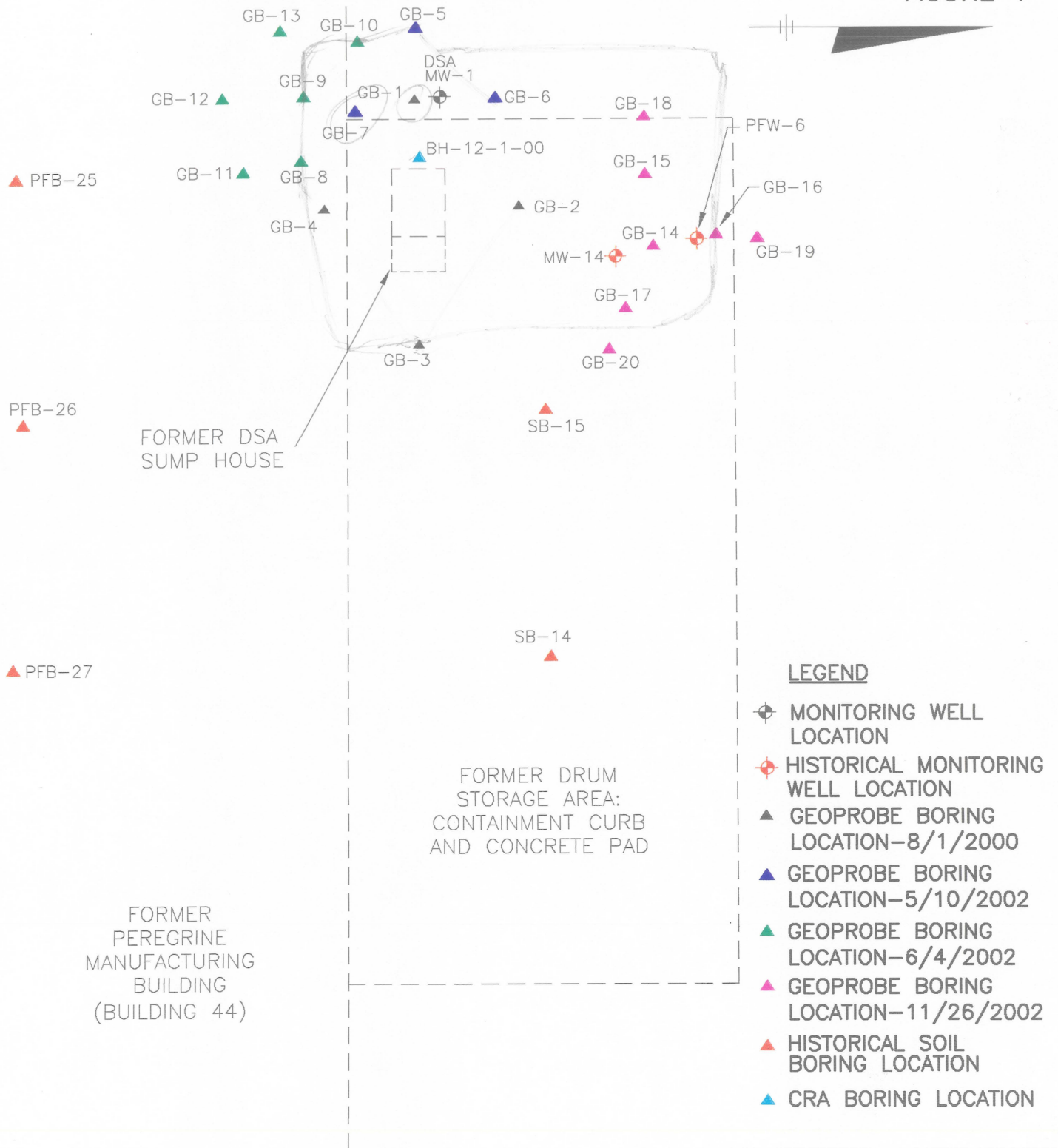
Table 6
Former Drum Storage Area
Soil Analytical Results - November 2002
TCE by USEPA Method 5035/8260 (ug/Kg)

	GB-14	DUP(GB-14)	GB-15	GB-16	GB-17	MDEQ Part 201 Generic Cleanup Criteria
Sample Location						Industrial Drinking Water Protection Criteria
Sample Depth	(10'-12')	(10'-12')	(5'-7')	(5'-7')	(5'-7')	
Date Collected	11/26/02	11/26/02	11/26/02	11/26/02	11/26/02	
Parameter						
Trichloroethene	60 U	60 U	60 U	60 U	60 U	100

Notes:

- 1) Results and criteria are shown in parts per billion (ug/Kg).
- 2) MDEQ Part 201 Generic Industrial Cleanup Criteria as listed in Part 201 PA 451 dated December 19, 2002.
- 3) Samples analyzed by Merit Laboratories, Inc. of East Lansing, Michigan.
- 4) "U" denotes the analyte was analyzed for, but was not detected above the reported detection limit.
- 5) "DUP" denotes duplicate sample.

FIGURE 1



SAMPLE LOCATION MAP
 FORMER DRUM STORAGE AREA
 COLDWATER ROAD FACILITY
 FLINT, MICHIGAN



APPENDIX A

Soil Boring Logs

Client: REALM
 Site: Coldwater Road Landfill
 Drum Storage Pad
 Proj. Loc: Flint, MI
 File No.: 4144.007

Drill Method: hydraulically driven probe
 Sampler: 4' x 2" steel sampler
 Hammer: NA
 Fall: NA

Page 1 of 1
 Location: Approx. 10 ft. west of
 sump house.
 Start Date: 8/1/00
 End Date: 8/1/00

Boring Company: Environmental Quality Laboratories

Foreman: Rob Schippert
 Drill Rig: 66DT ATV track-mounted rig
 OBG Geologist: Mike Robison

Screen =
 Riser
 Steel // Grout
 Sand Pack
 Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing	
									PID (ppm)	
0		0-2'	NA			Asphalt/gravel				
			NA			Medium brown w/ orange mottling, damp, silty CLAY	6"			0.0
			NA							
			NA							
2		2-4'	NA			Medium brown w/ orange mottling, damp, silty CLAY				0.0
			NA							
			NA							
4		4-6'	NA	NA	NA	Medium brown w/ orange mottling, moist, silty CLAY				0.0
			NA							
			NA							
6		6-8'	NA			Medium brown w/ orange mottling, moist, silty CLAY				0.0
			NA							
			NA							
8		8-10'	NA	NA	NA	Grey, moist, CLAY				0.0
			NA							
			NA							
10	2	10-12'	NA			Grey, damp, CLAY				0.0
			NA							
			NA							
12				NA	NA	EOB @ 12 fbg				

Notes:
 "" denotes top of discrete soil sample interval collected for laboratory submittal.
 Subsequent to soil sampling activities the borehole was backfilled with soil cuttings mixed with bentonite.
 5 ft hydraulic probe macro core sampler used, therefore no blow counts.
 "saa" denotes "same as above"

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG




**REPORT OF BORING
GB-3**

Client: REALM
 Site: Coldwater Road Landfill
 Drum Storage Pad
 Proj. Loc: Flint, MI
 File No.: 4144.007

Drill Method: hydraulically driven probe
 Sampler: 4' x 2" steel sampler
 Hammer: NA
 Fall: NA

Page 1 of 1
 Location: Approx. 10 ft. east of
 east sump.
 Start Date: 8/1/00
 End Date: 8/1/00

Boring Company: Environmental Quality Laboratories
 Foreman: Rob Schippert
 Drill Rig: 66DT ATV track-mounted rig
 OBG Geologist: Mike Robison

Screen =  Grout
 Riser //  Sand Pack
 Steel //  Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing	
									PID (ppm)	
0		0-2'	NA			Asphalt/gravel				
			NA			Medium brown w/ orange mottling, damp, silty CLAY	6"			0.0
			NA							
			NA							
2		2-4'	NA			Medium brown w/ orange mottling, damp, silty CLAY				0.0
			NA							
			NA							
4		4-6'	NA	NA	NA	Medium brown w/ orange mottling, moist, silty CLAY				0.0
			NA							
			NA							
6		6-8'	NA			Medium brown w/ orange mottling, moist, silty CLAY				0.0
			NA							
			NA							
8		8-10'	NA	NA	NA	Grey, moist, CLAY				0.0
			NA							
			NA							
10	2	10-12'	NA			Grey, damp, CLAY				0.0
			NA							
			NA							
12				NA	NA	EOB @ 12 fbg				

Notes:
 *** denotes top of discrete soil sample interval collected for laboratory submittal.
 Subsequent to soil sampling activities the borehole was backfilled with soil cuttings mixed with bentonite.
 5 ft hydraulic probe macro core sampler used, therefore no blow counts.
 "saa" denotes "same as above"

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

**REPORT OF BORING
GB-4**

Client: REALM
 Site: Coldwater Road Landfill
 Drum Storage Pad
 Proj. Loc: Flint, MI
 File No.:4144.007

Drill Method: hydraulically driven probe
 Sampler: 4' x 2" steel sampler
 Hammer: NA
 Fall: NA

Page 1 of 1
 Location: Approx. 10 ft west of
 sump house.
 Start Date: 8/1/00
 End Date: 8/1/00

Boring Company: Environmental Quality Laboratories
 Foreman: Rob Schippert
 Drill Rig: 66DT ATV track-mounted rig
 OBG Geologist: Mike Robison

Screen = Grout
 Riser Sand Pack
 Steel // Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing	
									PID (ppm)	
0		0-2'	NA			Concrete				
			NA			Brownish-orange, dry, fine-medium SAND (fill)	6"			0.0
			NA							
			NA							
2		2-4'	NA			Brownish-orange, dry, fine-medium SAND (fill)				0.0
			NA							
			NA							
			NA							
4		4-6'	NA	NA	NA	Brownish-orange, dry, fine-medium SAND (fill)				0.0
			NA							
	1		NA			Medium brown w/ orange mottling, damp, silty CLAY	5'			
			NA							
6		6-8'	NA			Medium brown w/ orange mottling, damp, silty CLAY				0.0
			NA							
			NA							
			NA							
8		8-10'	NA	NA	NA	Medium brown w/ orange mottling, moist, silty CLAY				0.0
			NA							
			NA							
			NA							
10	2	10-12'	NA			Medium brown w/ orange mottling, moist, silty CLAY				0.0
			NA							
			NA							
			NA							
12		12-14'	NA	NA	NA	Medium brown w/ orange mottling, moist, silty CLAY				0.0
			NA							
			NA			Grey, moist, CLAY				
			NA							
14		14-16'	NA			Grey, damp, CLAY				0.0
			NA							
	3		NA							
			NA							
16		16-18'	NA	NA	NA	Grey, damp, CLAY				0.0
			NA							
17				NA	NA	EOB @ 17 fbg				

Notes:
 "" denotes top of discrete soil sample interval collected for laboratory submittal.
 Subsequent to soil sampling activities the borehole was backfilled with soil cuttings mixed with bentonite.
 5 ft hydraulic probe macro core sampler used, therefore no blow counts.
 "saa" denotes "same as above"

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

**REPORT OF BORING
GB-5**

Client: REALM
Site: Coldwater Road Landfill
Drum Storage Area
Proj. Loc: Flint, MI
File No.:4144.007

Drill Method: hydraulic probe
Sampler: 5 ft acetate lined sampler
Hammer: NA
Fall: NA

Page 1 of 1
Location: 10 ft west of MW-1/GB-1
Start Date: 5/10/02
End Date: 5/10/02

Boring Company: PROSONIC Corp.
Foreman: Pete Goss
Drill Rig: 66DT ATV track-mounted rig
OBG Geologist: Mike Robison

Screen	=	\	Grout
Riser			Sand Pack
Steel	//		Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing PID (ppm)
0		0-2'	NA			Approx 4 ft of fill material (topsoil-grass surface) placed on top of former asphalt grade; began continuous sampling from 5 ft below grade.			
			NA						
			NA						
2		2-4'	NA						
			NA						
			NA						
4		4-6'	NA			asphalt gravel base	4'		
			NA				4.5'		
	1		NA	full	NA	Mod. yellowish brown (10 YR 5/4), damp, stiff silty CLAY, little gravel	5'		0.0
			NA						
6		6-8'	NA						
			NA						
			NA						
8		8-10'	NA						
			NA						
			NA						
10	2	10-12'	NA	full	NA	Mod. yellowish brown (5 YR 5/4), moist, silty SAND, some gravel	10'		0.0
			NA			Mod. Yellow brown (10 YR 5/4), damp, v. stiff silty CLAY, little gravel	10.5'		0.0
			NA						
12		12-14'	NA						
			NA						
			NA			Medium dark gray (N 4), damp, stiff CLAY			0.0
			NA						
14		14-16'	NA						
			NA						
	3		NA	full	NA	saa	15'		0.0
			NA						
16		16-18'	NA						
			NA						
			NA						
18		18-20'	NA						
			NA						
			NA						
20						EOB @ 20 fbg			

Notes:
 **** denotes top of discrete soil sample interval collected for laboratory submittal.
 # denotes MS/MSD also collected at this interval, as well as MDEQ split sample.
 Subsequent to soil sampling activities the borehole was backfilled with soil cuttings mixed with bentonite.
 5 ft hydraulic probe macro core sampler used, therefore no blow counts.
 "saa" denotes "same as above"




O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING GB-6
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Client: REALM Site: Coldwater Road Landfill Drum Storage Area Proj. Loc: Flint, MI File No.:4144.007	Drill Method: hydraulic probe Sampler: 5 ft acetate lined sampler Hammer: NA Fall: NA	Page 1 of 1 Location: 10 ft north of MW-1/GB-1 Start Date: 5/10/02 End Date: 5/10/02
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Boring Company: PROSONIC Corp. Foreman: Pete Goss Drill Rig: 66DT ATV track-mounted rig OBG Geologist: Mike Robison	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>Screen</td> <td style="text-align: center;">=</td> <td rowspan="3" style="vertical-align: middle;"> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%;"></td> <td style="width:50%; text-align: center;">Grout</td> </tr> <tr> <td style="text-align: center;">\</td> <td style="text-align: center;">Sand Pack</td> </tr> <tr> <td style="text-align: center;">//</td> <td style="text-align: center;">Bentonite</td> </tr> </table> </td> </tr> <tr> <td>Riser</td> <td style="text-align: center;">□</td> </tr> <tr> <td>Steel</td> <td style="text-align: center;">//</td> </tr> </table>	Screen	=	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%;"></td> <td style="width:50%; text-align: center;">Grout</td> </tr> <tr> <td style="text-align: center;">\</td> <td style="text-align: center;">Sand Pack</td> </tr> <tr> <td style="text-align: center;">//</td> <td style="text-align: center;">Bentonite</td> </tr> </table>		Grout	\	Sand Pack	//	Bentonite	Riser	□	Steel	//
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	Grout													
\	Sand Pack													
//	Bentonite													
Riser	□													
Steel	//													

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing PID (ppm)
0		0-2'	NA			Approx 4 ft of fill material (topsoil-grass surface) placed on top of former asphalt grade; began continuous sampling from 5 ft below grade.			
			NA						
			NA						
			NA						
2		2-4'	NA						
			NA						
			NA						
			NA						
4		4-6'	NA			asphalt	4'		
			NA			gravel base	4.5'		
	1		NA	full	NA	Mod. yellowish brown (10 YR 5/4), damp, stiff silty CLAY, little gravel	5'		0.0
			NA						
6		6-8'	NA						
			NA						
			NA						
			NA						
8		8-10'	NA			Medium dark gray (N 4) w/ orange mottling, damp, stiff CLAY	9'		0.0
			NA						
			NA						
10	2	10-12'	NA	full	NA	saa	10'		0.0
			NA						
			NA						
			NA						
12		12-14'	NA			saa, no orange mottling			
			NA						
			NA						
			NA						
14		14-16'	NA						
			NA						
	3		NA	full	NA	saa	15'		0.0
			NA						
16		16-18'	NA						
			NA						
			NA						
			NA						
18		18-20'	NA						
			NA						
			NA						
			NA						
20						EOB @ 20 fbg			

Notes:
 "" denotes top of discrete soil sample interval collected for laboratory submittal.
 "&" denotes field duplicate sample also collected at this interval.
 Subsequent to soil sampling activities the borehole was backfilled with soil cuttings mixed with bentonite.
 5 ft hydraulic probe macro core sampler used, therefore no blow counts.
 "saa" denotes "same as above"

O'BRIEN & GERE ENGINEERS, INC.				TEST BORING LOG				REPORT OF BORING GB-7			
Client: REALM Site: Coldwater Road Landfill Drum Storage Area Proj. Loc: Flint, MI File No.: 4144.007 Boring Company: PROSONIC Corp. Foreman: Pete Goss Drill Rig: 66DT ATV track-mounted rig OBG Geologist: Mike Robison				Drill Method: hydraulic probe Sampler: 5 ft acetate lined sampler Hammer: NA Fall: NA				Page 1 of 1 Location: 9 ft south of MW-1/GB-1 Start Date: 5/10/02 End Date: 5/10/02 Screen =  Grout Riser  Sand Pack Steel //  Bentonite			
Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	PID (ppm)	Field Testing	
0		0-2'	NA			Approx 4 ft of fill material (topsoil-grass surface) placed on top of former asphalt grade; began continuous sampling from 5 ft below grade.					
			NA								
			NA								
			NA								
2		2-4'	NA								
			NA								
			NA								
			NA								
4		4-6'	NA			asphalt	4'				
			NA			gravel base	4.5'				
	1		NA	full	NA	Mod. yellowish brown (10 YR 5/4), damp, v. stiff silty CLAY, little gravel	5'		1.2		
			NA								
6		6-8'	NA				6'		0.0		
			NA								
			NA								
			NA			Mod. yellowish brown (10 YR 5/4), damp, v. stiff silty CLAY, little gravel					
8		8-10'	NA								
			NA								
			NA								
			NA								
10	2	10-12'	NA	full	NA	Mod. yellowish brown (10 YR 5/4), damp, v. stiff silty CLAY, little gravel			0.0		
			NA								
			NA								
			NA								
12		12-14'	NA			saa, no orange mottling					
			NA								
			NA								
			NA								
14		14-16'	NA							*	
			NA								
	3		NA	full	NA	Medium dark gray (N 4), damp, stiff CLAY, trace gravel			0.0		
			NA								
16		16-18'	NA								
			NA								
			NA								
			NA								
18		18-20'	NA							*	
			NA								
			NA								
20						EOB @ 20 fbg					

Notes:
 *** denotes top of discrete soil sample interval collected for laboratory submittal.
 Subsequent to soil sampling activities the borehole was backfilled with soil cuttings mixed with bentonite.
 5 ft hydraulic probe macro core sampler used, therefore no blow counts.
 "saa" denotes "same as above"

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

**REPORT OF BORING
GB-8**

Client: REALM
Site: Coldwater Road Landfill
Drum Storage Area
Proj. Loc: Flint, MI
File No.:4144.007

Drill Method: hydraulic probe
Sampler: 5 ft acetate lined sampler
Hammer: NA
Fall: NA

Page 1 of 1
Location: southeast of MW-1/GB-1
Start Date: 6/4/2002
End Date: 6/4/2002

Boring Company: Fibertech
Foreman: Mike McCourtie
Drill Rig: 66DT ATV track-mounted rig
OBG Geologist: Tony Finch

Screen	=	
Riser		
Steel	//	

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing	
									PID (ppm)	
0		0-2'	NA			concrete w/gravel base				
			NA			medium grey (N5), damp stiff CLAY, trace silt	1'		0.0	
2		2-4'	NA						0.0	
			NA			medium grey (N5), damp stiff CLAY, trace silt				
4		4-6'	NA							
	1		NA	full	NA	medium grey (N5), damp stiff CLAY, trace silt			0.0	
6		6-8'	NA							
			NA							
8		8-10'	NA			medium grey (N5), damp stiff CLAY, trace silt			0.0	
			NA							
10	2	10-12'	NA	full	NA	moderate yellowish brown (10YR 5/4) damp stiff silty CLAY			0.0	
			NA							
12		12-14'	NA							
			NA			moderate yellowish brown (10YR 5/4) damp stiff silty CLAY			0.0	
			NA							
14		14-16'	NA							
	3		NA	full	NA	moderate yellowish brown (10YR 5/4) damp stiff silty CLAY			0.0	
16		16-18'	NA							
			NA							
18		18-20'	NA			moderate yellowish brown (10YR 5/4) damp stiff silty CLAY			0.0	
			NA							
20						EOB @ 20 fbg				

Notes:
 *** denotes top of discrete soil sample interval collected for laboratory submittal.
 Subsequent to soil sampling activities the borehole was backfilled with soil cuttings mixed with bentonite.
 5 ft hydraulic probe macro core sampler used, therefore no blow counts.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING GB-9
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Client: REALM Site: Coldwater Road Landfill Drum Storage Area Proj. Loc: Flint, MI File No.:4144.007	Drill Method: hydraulic probe Sampler: 5 ft acetate lined sampler Hammer: NA Fall: NA	Page 1 of 1 Location: 9 ft south of MW-1/GB-1 Start Date: 6/4/2002 End Date: 6/4/2002
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Boring Company: Fibertech Foreman: Mike McCourtie Drill Rig: 66DT ATV track-mounted rig OBG Geologist: Tony Finch	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>Screen</td> <td>=</td> <td style="width:20px;"></td> <td>Grout</td> </tr> <tr> <td>Riser</td> <td></td> <td style="width:20px;"></td> <td>Sand Pack</td> </tr> <tr> <td>Steel</td> <td>//</td> <td style="width:20px;"></td> <td>Bentonite</td> </tr> </table>	Screen	=		Grout	Riser			Sand Pack	Steel	//		Bentonite
Screen	=		Grout										
Riser			Sand Pack										
Steel	//		Bentonite										

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing	
									PID (ppm)	
0		0-2'	NA			concrete w/gravel base				
			NA			medium brown, damp silty CLAY				
			NA							
			NA							
2		2-4'	NA			medium brown w/orange mottling, damp silty CLAY				
			NA							
			NA							
			NA							
4		4-6'	NA			medium brown w/orange mottling, damp silty CLAY				
			NA							
	1		NA	full	NA					1.2
			NA							
6		6-8'	NA			medium brown, damp silty CLAY				0.0
			NA							
			NA							
			NA							
8		8-10'	NA			medium brown, damp silty CLAY				
			NA							
			NA							
			NA							
10	2	10-12'	NA	full	NA	medium brown, damp silty CLAY				0.0
			NA							
			NA							
			NA							
12		12-14'	NA			grey, damp CLAY little silt				
			NA							
			NA							
			NA							
14		14-16'	NA			grey, damp CLAY little silt				
			NA							
	3		NA	full	NA	Medium dark gray (N 4), damp, stiff CLAY, trace gravel				0.0
			NA							
16		16-18'	NA							
			NA							
			NA							
			NA							
18		18-20'	NA							
			NA							
			NA							
			NA							
20						EOB @ 20 fbg				

Notes:
 *** denotes top of discrete soil sample interval collected for laboratory submittal.

Subsequent to soil sampling activities the borehole was backfilled with soil cuttings mixed with bentonite.
 5 ft hydraulic probe macro core sampler used, therefore no blow counts.
 "saa" denotes "same as above"

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING GB-10
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Client: REALM Site: Coldwater Road Landfill Drum Storage Area Proj. Loc: Flint, MI File No.:4144.007	Drill Method: hydraulic probe Sampler: 5 ft acetate lined sampler Hammer: NA Fall: NA	Page 1 of 1 Location: 9 ft south of MW-1/GB-1 Start Date: 6/4/2002 End Date: 6/4/2002
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Boring Company: Fibertech Foreman: Mike McCourtie Drill Rig: 66DT ATV track-mounted rig OBG Geologist: Tony Finch	Screen = Grout Riser // Sand Pack Steel // Bentonite
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Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing PID (ppm)
0		0-2'	NA			concrete w/gravel base			
			NA			medium brown, damp silty CLAY			
2		2-4'	NA			medium brown w/orange mottling, damp silty CLAY			
			NA						
4		4-6'	NA			medium brown w/orange mottling, damp silty CLAY			
	1		NA	full	NA				1.2
6		6-8'	NA			medium brown, damp silty CLAY			0.0
			NA						
8		8-10'	NA			medium brown, damp silty CLAY			
			NA						
10	2	10-12'	NA	full	NA	medium brown, damp silty CLAY			0.0
			NA						
12		12-14'	NA			grey, damp CLAY little silt			
			NA						
14		14-16'	NA			grey, damp CLAY little silt			*
			NA						
	3		NA	full	NA	Medium dark gray (N 4), damp, stiff CLAY, trace gravel			0.0
16		16-18'	NA						
			NA						
18		18-20'	NA						*
			NA						
20						EOB @ 20 fbg			

Notes:
 *** denotes top of discrete soil sample interval collected for laboratory submittal.

Subsequent to soil sampling activities the borehole was backfilled with soil cuttings mixed with bentonite.
 5 ft hydraulic probe macro core sampler used, therefore no blow counts.
 "saa" denotes "same as above"

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

**REPORT OF BORING
GB-11**




Client: REALM
 Site: Coldwater Road Landfill
 Drum Storage Area
 Proj. Loc: Flint, MI
 File No.: 4144.007

Drill Method: hydraulic probe
 Sampler: 5 ft acetate lined sampler
 Hammer: NA
 Fall: NA

Page 1 of 1
 Location: 9 ft south of MW-1/GB-1

Start Date: 6/4/2002
 End Date: 6/4/2002

Boring Company: Fibertech
 Foreman: Mike McCourtie
 Drill Rig: 66DT ATV track-mounted rig
 OBG Geologist: Tony Finch

Screen =  Grout
 Riser  Sand Pack
 Steel //  Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing PID (ppm)
0		0-2'	NA			concrete w/gravel base			
			NA			medium brown, damp silty CLAY			
			NA						
			NA						
2		2-4'	NA			medium brown w/orange mottling, damp silty CLAY			
			NA						
			NA						
			NA						
4		4-6'	NA			medium brown w/orange mottling, damp silty CLAY			
	1		NA	full	NA				1.2
			NA						
6		6-8'	NA			medium brown, damp silty CLAY			0.0
			NA						
			NA						
			NA						
8		8-10'	NA			medium brown, damp silty CLAY			
			NA						
			NA						
			NA						
10	2	10-12'	NA	full	NA	medium brown, damp silty CLAY			0.0
			NA						
			NA						
			NA						
12		12-14'	NA			grey, damp CLAY little silt			
			NA						
			NA						
			NA						
14		14-16'	NA			grey, damp CLAY little silt			*
			NA						
	3		NA	full	NA	Medium dark gray (N 4), damp, stiff CLAY, trace gravel			0.0
			NA						
16		16-18'	NA						
			NA						
			NA						
18		18-20'	NA						
			NA						
			NA						
			NA						
20						EOB @ 20 fbg			

Notes:
 *** denotes top of discrete soil sample interval collected for laboratory submittal.
 Subsequent to soil sampling activities the borehole was backfilled with soil cuttings mixed with bentonite.
 5 ft hydraulic probe macro core sampler used, therefore no blow counts.
 "saa" denotes "same as above"

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG




**REPORT OF BORING
GB-12**

Client: REALM
Site: Coldwater Road Landfill
 Drum Storage Area
Proj. Loc: Flint, MI
File No.: 4144.007

Drill Method: hydraulic probe
Sampler: 5 ft acetate lined sampler
Hammer: NA
Fall: NA

Page 1 of 1
Location: 9 ft south of MW-1/GB-1
Start Date: 6/4/2002
End Date: 6/4/2002

Boring Company: Fibertech
Foreman: Mike McCourtie
Drill Rig: 66DT ATV track-mounted rig
OBG Geologist: Tony Finch

Screen =  **Grout**
Riser  **Sand Pack**
Steel //  **Bentonite**

Depth Below Gauge	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing	
									PID (ppm)	
0		0-2'	NA			concrete w/gravel base				
			NA			medium brown, damp silty CLAY				
			NA							
2		2-4'	NA			medium brown w/orange mottling, damp silty CLAY				
			NA							
			NA							
4		4-6'	NA			medium brown w/orange mottling, damp silty CLAY				
	1		NA	full	NA					1.2
			NA							
6		6-8'	NA			medium brown, damp silty CLAY				0.0
			NA							
			NA							
8		8-10'	NA			medium brown, damp silty CLAY				
			NA							
			NA							
10	2	10-12'	NA	full	NA	medium brown, damp silty CLAY				0.0
			NA							
			NA							
12		12-14'	NA			grey, damp CLAY little silt				
			NA							
			NA							
14		14-16'	NA			grey, damp CLAY little silt				*
			NA							
	3		NA	full	NA	Medium dark gray (N 4), damp, stiff CLAY, trace gravel				0.0
			NA							
16		16-18'	NA							
			NA							
			NA							
18		18-20'	NA							
			NA							
			NA							
20						EOB @ 20 fbg				

Notes:
 *** denotes top of discrete soil sample interval collected for laboratory submittal.
 Subsequent to soil sampling activities the borehole was backfilled with soil cuttings mixed with bentonite.
 5 ft hydraulic probe macro core sampler used, therefore no blow counts.
 "saa" denotes "same as above"

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

**REPORT OF BORING
GB-13**


Client: REALM
Site: Coldwater Road Landfill
Drum Storage Area
Proj. Loc: Flint, MI
File No.:4144.007

Drill Method: hydraulic probe
Sampler: 5 ft acetate lined sampler
Hammer: NA
Fall: NA

Page 1 of 1
Location: 9 ft south of MW-1/GB-1

Start Date: 6/4/2002
End Date: 6/4/2002

Boring Company: Fibertech
Foreman: Mike McCourtie
Drill Rig: 66DT ATV track-mounted rig
OBG Geologist: Tony Finch

Screen =  **Grout**
Riser //  **Sand Pack**
Steel //  **Bentonite**

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing	
									PID (ppm)	
0		0-2'	NA			concrete w/gravel base				
			NA			medium brown, damp silty CLAY				
			NA							
			NA							
2		2-4'	NA			medium brown w/orange mottling, damp silty CLAY				
			NA							
			NA							
			NA							
4		4-6'	NA			medium brown w/orange mottling, damp silty CLAY				
			NA							
	1		NA	full	NA					1.2
			NA							
6		6-8'	NA			medium brown, damp silty CLAY				0.0
			NA							
			NA							
			NA							
8		8-10'	NA			medium brown, damp silty CLAY				
			NA							
			NA							
			NA							
10	2	10-12'	NA	full	NA	medium brown, damp silty CLAY				0.0
			NA							
			NA							
			NA							
12		12-14'	NA			grey, damp CLAY little silt				
			NA							
			NA							
			NA							
14		14-16'	NA			grey, damp CLAY little silt				*
			NA							
	3		NA	full	NA	Medium dark gray (N 4), damp, stiff CLAY, trace gravel				0.0
			NA							
16		16-18'	NA							
			NA							
			NA							
			NA							
18		18-20'	NA							
			NA							
			NA							
			NA							
20						EOB @ 20 fbg				

Notes:
 *** denotes top of discrete soil sample interval collected for laboratory submittal.
 Subsequent to soil sampling activities the borehole was backfilled with soil cuttings mixed with bentonite.
 5 ft hydraulic probe macro core sampler used, therefore no blow counts.
 "saa" denotes "same as above"

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

**REPORT OF BORING
GB-15**

Client: REALM
 Site: Coldwater Road Landfill
 Drum Storage Area
 Proj. Loc: Flint, MI
 File No.:4144.007

Drill Method: hydraulic probe
 Sampler: 5 ft acetate lined sampler
 Hammer: NA
 Fall: NA

Page 1 of 1
 Location: NNW of GB-2
 Start Date: 11/26/2002
 End Date: 11/26/2002

Boring Company: Prosonic
 Foreman: Pete Goss
 Drill Rig: 66DT ATV track-mounted rig
 OBG Scientist: John O'Neill

Screen	=	Grout
Riser		Sand Pack
Steel	//	Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing	
									PID (ppm)	
0		0-2'6"	NA			fill				
			NA							
			NA							
			NA			asphalt over concrete	1'6"			
2			NA	NA						
		2'6"-7'6"	NA			light brown (5YR 5/6) CLAY, trace silt and pebbles	2'6"			
			NA			light brown (5YR 5/6) CLAY, trace silt and pebbles				
			NA							
4			NA							
			NA							
			NA							
			NA							
6			NA							
			NA							
	1		NA	60"/60"	NA					
		7'6"-12'6"	NA							
8			NA							
			NA							
			NA							
			NA							
10			NA							
			NA							
			NA							
			NA			same as above grading to damp medium gray (N5) CLAY				
12	2		NA	60"/60"	NA					
						EOB 12'6"				

Notes:
 """" denotes top of discrete soil sample interval collected for laboratory submittal.
 PID failure due to cold weather, observations of odors or visible staining are noted.
 Subsequent to soil sampling activities the borehole was backfilled with soil cuttings mixed with bentonite.
 5 ft hydraulic probe macro core sampler used, therefore no blow counts.
 NA denotes not applicable

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

**REPORT OF BORING
GB-16**

Client: REALM
Site: Coldwater Road Landfill
 Drum Storage Area
Proj. Loc: Flint, MI
File No.: 4144.007

Drill Method: hydraulic probe
Sampler: 5 ft acetate lined sampler
Hammer: NA
Fall: NA

Page 1 of 1
Location: NNE of GB-2
Start Date: 11/26/2002
End Date: 11/26/2002

Boring Company: Prosonic
Foreman: Pete Goss
Drill Rig: 66DT ATV track-mounted rig
OBG Scientist: John O'Neill

Screen	=	Grout
Riser		Sand Pack
Steel	//	Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing	
									PID (ppm)	
0		0-2'	NA			fill				
			NA							
			NA			asphalt over concrete	1'			
2		2-7'	NA	NA		light brown (5YR 5/6) CLAY, trace silt and pebbles	2'			
			NA			light brown (5YR 5/6) CLAY, trace silt and pebbles				
			NA							
4			NA							
			NA							
			NA							
6			NA							
	1		NA	60"/60"						
		7-12'	NA			same as above but damp				
			NA							
8			NA			same as above but dry				
			NA							
			NA							
10			NA							
			NA			same as above grading to damp medium gray (N5) CLAY				
			NA							
	2		NA	60"/60"						
12						EOB 12'				

Notes:
 "" denotes top of discrete soil sample interval collected for laboratory submittal.
 PID failure due to cold weather, observations of odors or visible staining are noted.
 Subsequent to soil sampling activities the borehole was backfilled with soil cuttings mixed with bentonite.
 5 ft hydraulic probe macro core sampler used, therefore no blow counts.
 NA denotes not applicable

O'BRIEN & GERE ENGINEERS, INC.					TEST BORING LOG			REPORT OF BORING GB-17		
Client: REALM Site: Coldwater Road Landfill Drum Storage Area Proj. Loc: Flint, MI File No.: 4144.007					Drill Method: hydraulic probe Sampler: 5 ft acetate lined sampler Hammer: NA Fall: NA			Page 1 of 1 Location: NE of GB-2 Start Date: 11/26/2002 End Date: 11/26/2002		
Boring Company: Prosonic Foreman: Pete Goss Drill Rig: 66DT ATV track-mounted rig OBG Scientist: John O'Neill					Screen = <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Riser <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Steel // <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			Grout <input type="checkbox"/> Sand Pack <input type="checkbox"/> Bentonite <input type="checkbox"/>		
Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	PID (ppm)	Field Testing
0		0-2'6"	NA			fill				
			NA							
			NA							
			NA			asphalt over concrete	1'6"			
2			NA	NA						
		2'6"-7'6"	NA			damp light brown (5YR 5/6) sandy SILT	2'6"			
			NA			light brown (5YR 5/6) CLAY, trace silt and pebbles	2'10"			
			NA							
4			NA							
			NA							
			NA							
			NA							
6			NA							
			NA							
	1		NA	60"/60"						
		7'6"-12'6"	NA							
8			NA			damp light brown (5YR 5/6) SAND, little pebbles	8'			
			NA			light brown (5YR 5/6) CLAY, trace silt	8'4"			
			NA							
			NA							
10			NA			same as above grading to damp gray (N5) CLAY				
			NA							
			NA							
12	2		NA	60"/60"						
						EOB 12'6"				

Notes:
 *** denotes top of discrete soil sample interval collected for laboratory submittal.
 PID failure due to cold weather, observations of odors or visible staining are noted.
 Subsequent to soil sampling activities the borehole was backfilled with soil cuttings mixed with bentonite.
 5 ft hydraulic probe macro core sampler used, therefore no blow counts.
 NA denotes not applicable

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

REPORT OF BORING
GB-19

Client: REALM
Site: Coldwater Road Landfill
Drum Storage Area
Proj. Loc: Flint, MI
File No.: 4144.007

Drill Method: hydraulic probe
Sampler: 5 ft acetate lined sampler
Hammer: NA
Fall: NA

Page 1 of 1
Location: NNE of GB-2
Start Date: 11/26/2002
End Date: 11/26/2002

Boring Company: Prosonic
Foreman: Pete Goss
Drill Rig: 66DT ATV track-mounted rig
OBG Scientist: John O'Neill

Screen =
Riser
Steel // Grout
Sand Pack
Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	PID (ppm)	Field Testing
0		0-1'	NA			asphalt over concrete				
		1-6'	NA			fill SAND	1'			
			NA			damp light brown (5YR 5/6) CLAY, trace silt	1'8"			
2			NA							
			NA			light brown (5YR 5/6) CLAY, trace silt and pebbles				*
			NA							
4			NA							
			NA							
	1		NA	60"/60"						
6		6-10'	NA							
			NA							
			NA							
8			NA							*
			NA							
			NA							
	2		NA	48"/48"						
10						EOB 10'				

Notes:
 *** denotes top of discrete soil sample interval collected for laboratory submittal.
 PID failure due to cold weather, observations of odors or visible staining are noted.
 Subsequent to soil sampling activities the borehole was backfilled with soil cuttings mixed with bentonite.
 5 ft hydraulic probe macro core sampler used, therefore no blow counts.
 NA denotes not applicable

O'BRIEN & GERE ENGINEERS, INC.

TEST BORING LOG

**REPORT OF BORING
GB-20**

Client: REALM
Site: Coldwater Road Landfill
Drum Storage Area
Proj. Loc: Flint, MI
File No.: 4144.007

Drill Method: hydraulic probe
Sampler: 5 ft acetate lined sampler
Hammer: NA
Fall: NA

Page 1 of 1
Location: NE of GB-2
Start Date: 11/26/2002
End Date: 11/26/2002

Boring Company: Prosonic
Foreman: Pete Goss
Drill Rig: 66DT ATV track-mounted rig
OBG Scientist: John O'Neill

Screen	=		Grout
Riser			Sand Pack
Steel	//		Bentonite

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	PID (ppm)	Field Testing
0		0-3'	NA			fill				
			NA							
			NA							
2			NA			asphalt over concrete	1'6"			
			NA	NA						
		3-5'	NA			light brown (5YR 5/6) CLAY, trace silt and pebbles	3'			
			NA							
4	1		NA	24"/0"						
		5-10'	NA			light brown (5YR 5/6) CLAY, little silt and pebbles	5'			
			NA							
6			NA							
			NA							
			NA							
8			NA							
			NA							
			NA							
	2		NA	60"/60"		yellowish/orange (10YR 7/6) medium SAND	9'10"			
10		10-15'	NA			damp light brown (5YR 5/6) CLAY, some silt	10'			
			NA			wet light brown (5YR 5/6) medium SAND	10'4"			
			NA			light brown (5YR 5/6) CLAY, some silt	10'8"			
			NA							
12			NA			stiff gray (N5) CLAY				
			NA							
			NA							
			NA							
14			NA							
	3			60"/60"						
15						EOB 15'				

Notes:
 "" denotes top of discrete soil sample interval collected for laboratory submittal.
 PID failure due to cold weather, observations of odors or visible staining are noted.
 Subsequent to soil sampling activities the borehole was backfilled with soil cuttings mixed with bentonite.
 5 ft hydraulic probe macro core sampler used, therefore no blow counts.
 NA denotes not applicable

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING DSA MW-1
---	------------------------	--------------------------------------

Client: REALM Site: Coldwater Road Landfill Drum Storage Area Proj. Loc: Flint, MI File No.:4144.007	Drill Method: hydraulic probe/HS auger Sampler: 5 ft acetate lined sampler Hammer: NA Fall: NA	Page 1 of 1 Location: at former GB-1 location Start Date: 5/10/02 End Date: 5/10/02
---	---	--

Boring Company: PROSONIC Corp. Foreman: Pete Goss Drill Rig: 66DT ATV track-mounted rig OBG Geologist: Mike Robison	Screen  Riser  Sand Pack  Bentonite  Bent/cuttings 
--	---

Depth Below Grade	No.	Depth (feet)	Blows /6"	Penetr/ Recovery	"N" Value	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing PID (ppm)
0		0-2'	NA			Approx 4 ft of fill material (topsoil-grass surface) placed on top of former asphalt grade; began continuous sampling from 5 ft below grade.			
			NA						
			NA						
			NA						
2		2-4'	NA						
			NA						
			NA						
			NA						
4		4-6'	NA			asphalt	4'		
			NA			gravel base	4.5'		
	1			full	NA	Mod. yellowish brown (10 YR 5/4), damp, stiff silty CLAY, little gravel	5'		5.1
			NA						
6		6-8'	NA						
			NA						
			NA			saa, gray mottling, very stiff	7'		9.9
			NA						
8		8-10'	NA						
			NA						
			NA						
			NA						
10	2	10-12'	NA	full	NA	Dark yellowish brown (10 YR 4/2), moist, fine-medium SAND	10'		0.4
			NA			Mod. yellowish brown (10 YR 5/4), damp, stiff CLAY, little gravel	10'8"		1.1
			NA						
			NA						
12		12-14'	NA						
			NA						
			NA						
			NA						
14		14-16'	NA						
			NA						
	3		NA	full	NA	Med. Dark gray (N 4), damp, stiff CLAY	15'		0.0
			NA						
16		16-18'	NA						
			NA						
			NA						
			NA						
18		18-20'	NA						
			NA						
			NA						
			NA						
20	4	20-22'	NA	full	NA	Med. Dark gray (N 4), damp, stiff CLAY			0.0
			NA						
			NA						
			NA						
22		22-24'	NA						
			NA						
			NA						
			NA						
24		24-26'	NA						
			NA						
						EOB @ 25 fbg			
26									

Notes:
 Subsequent to direct probe sampling, 4.25" ID hollow-stem augers were used to overdrill borehole to 25 fbg.
 """" denotes top of discrete soil sample interval collected for laboratory submittal.
 Subsequent to soil sampling activities a monitoring well was constructed of 2-inch Schedule 40 PVC, No. 10 slot screen 5 ft in length from 9.7-14.7 ft below grade.
 5 ft hydraulic probe macro core sampler used, therefore no blow counts.
 "saa" denotes "same as above"

**Data Validation Report for
August 1, 2000 Soil Samples**

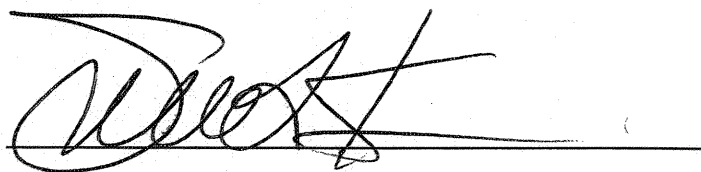
DATA VALIDATION REPORT

**Former Drum Storage Area
at the Former Peregrine, U.S., Inc. Property
at the Coldwater Road Facility
G-1245 East Coldwater Road
Flint, Michigan
(EPA I.D. No. MIR 000 020 743)**

February 2001

DATA VALIDATION REPORT SOIL SAMPLES

*Former Drum Storage Area at the
Former Peregrine U.S., Inc. Property at the
Coldwater Road Facility
Flint, Michigan
(EPA I.D. No. MIR 000 020 743)*



Swiatoslaw W. Kaczmar, Ph.D., C.I.H.
Vice President, Environmental Toxicology
and Industrial Hygiene

February 2001



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List of appendices

- A. USEPA method sample results for: Volatile Organics, Total Chromium, Total Lead, Hexavalent Chromium, Trivalent Chromium, Mercury, and Cyanide

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Executive summary

This data validation report addresses data quality for soil samples collected from the former Drum Storage Area at the Remediation and Liability Management Company, Inc. (REALM) Coldwater Road Facility, 1245 Coldwater Road, Flint, Michigan (formerly the Peregrine, U.S., Inc. property). Sample collection activities were conducted by O'Brien & Gere Engineers, Inc. (O'Brien & Gere) on 8/1/00.

The environmental samples, matrix spike, matrix spike duplicate (MS/MSD), field duplicate, equipment blank, and trip blank collected for this investigation were submitted to Fire & Environmental Consulting Laboratories, Inc. of East Lansing, Michigan for analysis of volatile organic compounds (VOCs), total chromium, total lead, mercury, hexavalent chromium, trivalent chromium, and cyanide using United States Environmental Protection Agency (USEPA) Methods. The analytical data generated for this investigation were evaluated by O'Brien & Gere using the quality assurance/quality control (QA/QC) criteria established in the USEPA Methods and the *Coldwater Road Facility Remedial Investigation, REALM, Quality Assurance Project Plan (QAPP)* (O'Brien & Gere 1999). Excursions from the QA/QC criteria were qualified based on guidance provided in the *United States Environmental Protection Agency (USEPA) Contract Laboratory Program (CLP) National Functional Guidelines For Organic Data Review* (USEPA 1994a), and the *USEPA CLP National Functional Guidelines For Inorganic Data Review* (USEPA 1994b).

As a result of the data validation process the VOCs, total chromium, total lead, mercury, hexavalent chromium, trivalent chromium, and cyanide data for the soil samples analyzed were determined to be 100% usable for qualitative and quantitative purposes.

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1. Introduction

This data validation report addresses the results of a data quality evaluation for soil samples, matrix spike, matrix spike duplicate (MS/MSD), field duplicate, equipment blank, and one trip blank collected from the former Drum Storage Area at the Remediation and Liability Management Company, Inc. (REALM) Coldwater Road Facility, 1245 Coldwater Road, Flint, Michigan (formerly the Peregrine, U.S., Inc. property). Sample collection activities were conducted by O'Brien & Gere on 8/1/00. The environmental samples, MS/MSD sample, field duplicate, equipment blank, and trip blank collected for this investigation were submitted to Fire & Environmental Consulting Laboratories, Inc. of East Lansing, Michigan for analysis of volatile organic compounds (VOCs), total chromium, total lead, mercury, hexavalent chromium, trivalent chromium, and cyanide using United States Environmental Protection Agency (USEPA) Methods listed in Table 1-1. The quantity and types of samples that were submitted for data validation are presented in Table 1-1 below.

Table 1-1. Sample cross reference list

Laboratory Package ID	Date Collected	Sample Identification		Analysis Requested	Reference
		Client ID	Laboratory ID		
S02733	8/1/00	GB-1(9-11')	S02733.01	Volatile organic compounds by 8260B Total chromium by 6020 Total lead by 6020 Hexavalent chromium by 7197 Mercury by 7471 Cyanide by 9010 Percent solids	1 1 1 1 1 1 1
		GB-2(9-11')	S02733.02	Volatile organic compounds by 8260B Total chromium by 6020 Total lead by 6020 Hexavalent chromium by 7197 Mercury by 7471 Cyanide by 9010 Percent solids	1 1 1 1 1 1 1
		Field Duplicate[GB-2(9-11')]	S02733.03	Volatile organic compounds by 8260B Total chromium by 6020 Total lead by 6020 Hexavalent chromium by 7197 Mercury by 7471 Cyanide by 9010 Percent solids	1 1 1 1 1 1 1
		GB-3(9-11'), MS, MSD	S02733.04, 05, 06	Volatile organic compounds by 8260B Total chromium by 6020 Total lead by 6020 Hexavalent chromium by 7197 Mercury by 7471 Cyanide by 9010 Percent solids	1 1 1 1 1 1 1
		GB-4(14-16')	S02733.07	Volatile organic compounds by 8260B Total chromium by 6020 Total lead by 6020 Hexavalent chromium by 7197 Mercury by 7471 Cyanide by 9010 Percent solids	1 1 1 1 1 1 1
		Equipment Blank	S02733.08	Volatile organic compounds by 8260B Total chromium by 6020 Total lead by 6020 Hexavalent chromium by 218.4 Mercury by 7471 Cyanide by 335.2 Percent solids	1 1 1 2 1 2 1
		Trip Blank	S02733.09	Volatile organic compounds by 8260B	1
		References: 1- USEPA. 1996. <i>Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846</i> , 3rd Edition. Washington D.C. 2- USEPA. 1983. <i>Methods for Chemical Analysis of Water & Wastes</i> , Cincinnati, Ohio. MS/MSD indicates matrix spike/matrix spike duplicate.			

1.1. General considerations

Validation is a process of determining the suitability of a measurement system for providing useful analytical data. Although the term is frequently used in discussing methodologies, it applies to all aspects of the system and especially to samples, their measurement, and the actual data output. Accordingly, this report outlines deviations from the applicable quality control (QC) criteria outlined in the following documents:

- USEPA. 1983. *Methods For Chemical Analysis of Water and Wastes*, Cincinnati, Ohio.

- USEPA. 1996. Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW-846), 3rd Edition. Washington DC.
- O'Brien & Gere Engineers, Inc. 1999. *Coldwater Road Facility Remedial Investigation, REALM, Quality Assurance Project Plan (QAPP)*, Syracuse, New York.

Excursions from the QA/QC criteria were qualified based on guidance provided in the following documents:

- USEPA. 1994a. *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*, EPA-540/R-94/012. Washington D.C.
- USEPA. 1994b. *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, EPA-540/R-94/013. Washington D.C.

1.2. Analytical methods

The environmental samples, MS/MSD, field duplicate, and trip blank collected for this investigation were submitted to Fire & Environmental Consulting Laboratories, Inc. of East Lansing, Michigan for analysis of VOCs, total chromium, total lead, mercury, hexavalent chromium, trivalent chromium, and cyanide using USEPA Methods listed in Table 1-1.

The following chapters of this document address distinct aspects of the validation process. Chapter 2 lists the data QA/QC protocols used to validate the sample data. Specific QA/QC deviations and qualifications performed on the sample data are discussed in Chapter 3. Finally, data completeness and usability are discussed in Chapter 4.

The annotated analytical results generated by this validation are presented in Appendix A.

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2. Data validation protocols

2.1. Sample analyses parameters

The validation of organic and inorganic analyses for this project followed the requirements presented in the analytical methodology and the data validation guidelines. Qualification of sample data was based on the validation guidelines. The following QA/QC parameters were evaluated for organic analyses where applicable:

1. Holding times and sample preservation
2. Percent solids
3. Initial calibration
4. Continuing calibration
5. Blank analysis
6. Surrogate analysis
7. MS/MSD analysis
8. Duplicate analysis
9. Laboratory control sample (LCS) analysis
10. Internal standard performance
11. Gas chromatograph/mass spectrometry (GC/MS) tune performance
12. Field duplicate sample analysis
13. Target identification
14. Compound quantitation and reported detection limit
15. System performance
16. Documentation completeness

The following QA/QC parameters were evaluated for inorganic analyses where applicable:

1. Holding Times and sample preservation
2. Percent solids
3. Calibration
4. Inductively coupled plasma (ICP)/MS tuning
5. Blank analysis
6. Internal standard performance
7. ICP interference check sample
8. MS/MSD analysis
9. Laboratory duplicate analysis
10. LCS analysis
11. ICP serial dilution analysis

12. Field duplicate sample analysis
13. Analyte quantitation and reported detection limit
14. System performance
15. Documentation completeness

The following qualifiers have been used in this data validation:

- U Indicates that the analyte was analyzed for, but was not detected. The sample-specific reporting limit is presented and adjusted for dilution, as appropriate.
- J Indicates that the concentration should be considered approximate. This qualifier indicates that the data validation process identifies a deficiency in the data generation process.

3. Data quality evaluation

3.1. Background

This chapter summarizes the quality assurance/quality control QA/QC parameters, validation criteria, and qualifications performed on the sample data when the QA/QC parameters specified in Chapter 2 did not meet criteria. Samples that required qualification are described in the following sections, and are identified by the description documented on the sample chain-of-custody records as listed in Table 1-1. The data quality evaluation resulted in only one qualifier for an individual sample result. QA/QC excursions which did not result in the qualification of a target analyte result or additional qualification if the target analyte result was previously qualified are not discussed. In a case when several qualifiers are applied to one target analyte result, the cumulative effect of the various excursions were employed in assigning the final data qualifier.

3.2. VOC analyses

3.2.1. Criteria compliance

The QA/QC parameters presented in Section 2.1 for VOCs were applied to samples listed in Table 1-1. The following QA/QC parameters were found to meet validation criteria:

- Holding times and sample preservation
- Percent solids
- Initial calibration
- Surrogate analysis
- Duplicate analysis
- LCS analysis
- Internal standard performance
- GC/MS tune performance
- Field duplicate sample analysis
- Target identification
- Compound quantitation and reported detection limit
- System performance

Deviations from QA/QC criteria presented in Section 2.1 are summarized below.

3.2.2. Blank analysis

Target compounds were not detected in the method blank analyzed for volatile organic compounds that was associated with the samples collected for this investigation. However, methylene chloride and 1,4-dichlorobenzene were detected in a wash analysis, which is typically analyzed to rinse the column after running samples that contain elevated concentrations of target analytes. This wash sample was later re-identified by the laboratory as a second method blank and was therefore used to evaluate the samples collected for this investigation. As a result of the blank contamination, for samples with methylene chloride concentrations less than or equal to ten times the concentration detected in the associated blank, and for samples with 1,4-dichlorobenzene concentrations less than or equal to five times the concentration in the associated blank, the target compounds in the affected samples were qualified as not detected (U). The samples qualified as a result of the blank contamination are summarized in the following table:

Blank ID	Analyte	Concentration	Affected sample	Action (mg/Kg)
MB-2	methylene chloride	4.84 µg/L	GB-1(9-11')	0.3U
			GB-2(9-11')	0.3U
			Field Duplicate[GB-2(9-11')]	0.3U
			GB-3(9-11')	0.3U
			GB-4(14-16')	0.3U
MB-2	1,4-dichlorobenzene	1.02 µg/L	GB-1(9-11')	0.05U
			GB-2(9-11')	0.05U
			Field Duplicate[GB-2(9-11')]	0.05U
			GB-3(9-11')	0.05U
			GB-4(14-16')	0.05U

Note: MB indicates method blank.

3.2.3. Continuing calibration analysis

The percent drift (%D) for 1,2,3-trichlorobenzene in the continuing calibration analyzed for this investigation exceeded the criteria. As a result of the continuing calibration excursion, the result for 1,2,3-trichlorobenzene in samples associated with the continuing calibration were qualified as approximate (UJ). The samples qualified as a result of the calibration excursion is summarized in the following table:

Table 3-2. Continuing calibration excursion for VOC analyses

Continuing Calibration ID	Analyte	Excursion	Affected Sample	Action
8/07/00 8:37	1,2,3-trichlorobenzene	52.7 %D	GB-1(9-11') GB-2(9-11') Field Duplicate[GB-2(9-11')] GB-3(9-11') GB-4(14-16')	UJ

Note: %D indicates percent drift.

3.2.4. MS/MSD analysis

The recovery for analytes in the matrix spike and matrix spike duplicate samples GB-1(9-11') and GB-3 (9-11') were outside of the laboratory criteria. As a result of the MS/MSD excursions, the affected analytes in the unspiked samples were qualified as approximate (UJ, J). The samples qualified as a result of the MS/MSD excursions is summarized in the following table:

Table 3-3. MS/MSD excursions for VOC analyses

MS/MSD ID	Analyte	Excursion	Affected sample	Action
GB-1 (9-11')	Trichloroethene	131 %R	GB-1(9-11')	J
	Bromomethane	23.6 %R, 21.5 %R		UJ
	Chloroethane	20.1 %R, 20.2 %R		UJ
	Trichlorofluoromethane	16.6 %R		UJ
GB-3 (9-11')	Bromomethane	17.5 %R, 18.7 %R	GB-3(9-11')	UJ
	Chloroethane	15.2 %R, 16.1 %R		UJ
	Trichlorofluoromethane	22.2 %R, 18.3 %R		UJ

Note: %R indicates percent recovery.

3.2.5. Documentation completeness

The following compounds were included in the target compound list in the QAPP (O'Brien & Gere 1999), but were not included in the sample target compound list: 2-chlorotoluene, and 4-chlorotoluene.

The detection limits listed in the data package for methylene chloride (0.3 mg/Kg) and 2-butanone (0.5 mg/Kg) exceeded the limits listed in the QAPP for methylene chloride (0.25 mg/Kg) and 2-butanone (0.25 mg/Kg).

Encore® samplers were used to collect soil samples during this sampling event and the soil samples were analyzed using the medium level soil analysis as preferred by the Michigan Department of Environmental Quality (MDEQ).

The following data package information was requested and received during the validation process since the data packages were incomplete:

- The injection logs for the initial soil calibrations for VOCs
- The evaluation of the complete target compound list for continuing calibrations for VOCs
- A revised preparation log which includes all QC samples and method blanks included in the batch for VOCs
- The evaluation of the entire list of target analytes for the MS/MSDs listed on the chain-of-custody for VOCs
- The evaluation of the entire list of target analytes for the LCS analysis for VOCs
- The raw data, including quantitation reports for the BFB analyses for VOCs
- The BFB information associated with the initial calibration for VOCs
- A correction for form 7a for the 8/07 8:37pm analysis for VOCs
- Preparation technique used for wash blank-2 and explanation of the application of the wash blank-2.

3.3. Total chromium, total lead, hexavalent chromium, trivalent chromium, mercury, cyanide analyses

3.3.1. Criteria compliance

The QA/QC parameters presented in Section 2.1 for metals, mercury, and cyanide were applied to samples listed in Table 1-1. The following QA/QC parameters were found to meet validation criteria:

- Holding Times and sample preservation
- Percent solids
- Calibration
- ICP/MS tuning
- Blank analysis
- Internal standard intensity
- ICP interference check sample
- MS/MSD analysis
- Laboratory duplicate analysis
- LCS analysis
- Field duplicate sample analysis
- Analyte quantitation and reported detection limit
- System performance
- Documentation completeness

Deviations from QA/QC criteria presented in Section 2.1 are summarized below.

3.3.2. ICP serial dilution analyses

The serial dilution recovery for total chromium in sample GB-1(9-11') was greater than the 10%D criterion for analytes with concentrations greater than 10 times the IDL. In accordance with the USEPA data validation guidelines, the results for total chromium in the associated samples were qualified as approximate (J). The ICP serial dilution excursion is summarized in the following table:

Table 3-4. ICP serial dilution excursion for metal analyses

Serial dilution ID	Analyte	Excursion	Affected samples	Action
GB-1(9-11')	Total chromium	12 %D	GB-1(9-11') GB-2(9-11') Field Duplicate [GB-2(9-11')] GB-3(9-11') GB-4(14-16')	J

Note:
%D indicates percent difference.

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4. Summary and data usability

This chapter summarizes the analytical data in terms of its completeness and usability. Data completeness is defined as the percentage of sample results that have been determined to be usable during the data validation process.

The soil samples, MS/MSD, field duplicate, equipment blank, and trip blank collected from the former Drum Storage Area at the REALM Coldwater Road Facility, were evaluated based on QA/QC criteria established by USEPA Methods as listed in Section 1-2, the QAPP (O'Brien & Gere 1999), and the USEPA National Functional data validation guidelines. Major deficiencies in the data generation process would have resulted in data being rejected, indicating that the data is considered unusable for either quantitative or qualitative purposes. Minor deficiencies in the data generation process resulted in some sample data being characterized as approximate. Identification of a data point as approximate indicates uncertainty in the reported concentration of the chemical, but not its assigned identity. The use of approximated analytical data for quantitative uses is consistent with the guidance presented in the *USEPA Risk Assessment Guidance for Superfund* (USEPA 1992).

The following paragraphs present the precision, sensitivity, accuracy, representativeness, comparability, and completeness (PSARCC) parameters used in the evaluation of the sample data.

Precision is measured through the evaluation of field duplicate samples and MS/MSD samples.

Sensitivity is established by reported detection limits, which represent measurable concentrations of analytes, which can be determined with a designated level of confidence. Sensitivity requirements were met for the sample data in this project.

Matrix spike samples, internal standard recoveries, surrogate recoveries, LCS recoveries, and initial and continuing calibration criteria indicate the accuracy of the data.

Holding times, sample preservation, blank analysis, and compound identification and quantification are indicators of the representativeness of the analytical data.

Comparability is not compromised provided that the analytical methods did not change over time. A major component of comparability is the use of standard reference materials for calibration and QC. These standards are compared to other unknowns to verify their concentrations. Since standard analytical methods and reporting procedures were consistently used by the laboratory, the comparability criteria for the analytical data were met.

As a result of the data validation process, the volatile organic, semivolatile organic, metal, and cyanide data were determined to be 100% usable for qualitative and quantitative purposes.

References

O'Brien & Gere Engineers, Inc. 1999. *Coldwater Road Facility Remedial Investigation, REALM, Quality Assurance Project Plan (QAPP)*, Syracuse, New York.

U.S. Environmental Protection Agency (USEPA). 1983. *Methods for Chemical Analysis of Water & Wastes*, Cincinnati, Ohio.

U.S. Environmental Protection Agency (USEPA). 1992. *USEPA Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A)*, 540/1-891002. Washington D.C.

U.S. Environmental Protection Agency (USEPA). 1994a. *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*, EPA-540/R-94/012. Washington D.C.

U.S. Environmental Protection Agency (USEPA). 1994b. *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, EPA-540/R-94/013. Washington D.C.

U.S. Environmental Protection Agency (USEPA). 1996. *Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW-846)*, 3rd Edition. Washington DC.

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**Summary of validated
USEPA method analytical results**



Analytical Laboratory Report

Lab Sample ID: S02733.01
 Sample Tag: GB1 (9-11)
 Collected Date/Time: 08/01/2000 08:55
 Matrix: Soil
 COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	20g EnCore	None	Yes	4	3886
1	4oz. Glass	None	Yes	4	3886

Analysis	Results	Units	MDL	Method	Date Run	Analyst	CAS #	Flags
<i>Qual</i>								
Inorganics								
Total Solids	87.6	%	1	160.3	08/04/00	TJG		
Chromium VI	Not detected	mg/kg	1	7197	08/02/00	KJT	7440-47-3	
Cyanide	Not detected	mg/kg	0.5	9010	08/08/00	JDP		3
Metals								
Digestion	Completed			varies	08/08/00	EMIL		
Chromium	11.1	mg/kg	1.0	6020	08/09/00	EMIL	7440-47-3	
Chromium III	11.1	mg/kg	1.0	6020	08/09/00	EMIL	7440-47-3	
Lead	7.6	mg/kg	1.0	6020	08/09/00	EMIL	7439-92-1	
Mercury	Not detected	mg/kg	0.10	7471M	08/08/00	EMIL	7439-97-6	
Organics								
GC/MS for Volatile Organics 5035								
Benzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	71-43-2	
Bromobenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	108-86-1	
Bromochloromethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	74-97-5	
Bromodichloromethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-27-4	
Bromoform	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-25-2	
Bromomethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	74-83-9	
n-Butylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	104-51-8	
sec-Butylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	135-98-8	
tert-Butylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	98-06-6	
Carbon tetrachloride	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	56-23-5	
Chlorobenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	108-90-7	
Chloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-00-3	
Chloroform	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	67-66-3	
Chloromethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	74-87-3	
Dibromochloromethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	124-48-1	
1,2-Dibromo-3-chloropropane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	96-12-8	
1,2-Dibromoethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	106-93-4	
Dibromomethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	74-95-3	
1,2-Dichlorobenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	95-50-1	
1,3-Dichlorobenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	541-73-1	
1,4-Dichlorobenzene	0.05	mg/kg	0.05	5035/8260	08/08/00	VFM	106-46-7	
Dichlorodifluoromethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-71-8	
1,1-Dichloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-34-3	
1,2-Dichloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	107-06-2	
1,1-Dichloroethene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-35-4	
cis-1,2-Dichloroethene	0.82	mg/kg	0.05	5035/8260	08/08/00	VFM	156-59-2	
trans-1,2-Dichloroethene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	156-60-5	
1,2-Dichloropropane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	78-87-5	

B-Compound also found in method blank.



Analytical Laboratory Report

Lab Sample ID: S02733.01 (continued)

Sample Tag: GB1 (9-11')

Analysis	Results	Units	MDL	Method	Date Run	Analyst	CAS #	Flags
<i>Qual</i>								
Organics (continued)								
GC/MS for Volatile Organics 5035 (continued)								
1,3-Dichloropropane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	142-28-9	
2,2-Dichloropropane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	594-20-7	
1,1-Dichloropropene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	563-58-6	
cis-1,3-Dichloropropene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	10061-01-5	
Ethylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	100-41-4	
Hexachlorobutadiene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	87-68-3	
Isopropylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	98-82-8	
p-Isopropyltoluene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	99-87-6	
Methylene chloride	0.3	mg/kg	0.3	5035/8260	08/08/00	VFM	75-09-2	
Naphthalene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	91-20-3	
n-Propylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	103-65-1	
Styrene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	630-20-6	
1,1,2,2-Tetrachloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	79-34-5	
Tetrachloroethene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	127-18-4	
Toluene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	108-88-3	
1,2,3-Trichlorobenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	87-61-6	
1,2,4-Trichlorobenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	120-82-1	
1,1,1-Trichloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	71-55-6	
1,1,2-Trichloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	79-00-5	
Trichloroethene	6.72	mg/kg	0.05	5035/8260	08/08/00	VFM	79-01-6	
Trichlorofluoromethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-69-4	
1,2,3-Trichloropropane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	96-18-4	
1,2,4-Trimethylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	95-63-6	
1,3,5-Trimethylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	108-67-8	
Vinyl chloride	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-01-4	
o-Xylene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	95-47-6	
p,m-Xylene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	106-42-3/108-38-3	
Acetone	Not detected	mg/kg	0.5	5035/8260	08/08/00	VFM	67-64-1	
2-Butanone (MEK)	Not detected	mg/kg	0.5	5035/8260	08/08/00	VFM	78-93-3	
Carbon disulfide	Not detected	mg/kg	0.5	5035/8260	08/08/00	VFM	75-15-0	
2-Hexanone	Not detected	mg/kg	0.5	5035/8260	08/08/00	VFM	591-78-6	
4-Methyl-2-pentanone (MIBK)	Not detected	mg/kg	0.5	5035/8260	08/08/00	VFM	108-10-1	

B-Compound also found in method blank.



Analytical Laboratory Report

Lab Sample ID: S02733.02
 Sample Tag: GB2 (9-11)
 Collected Date/Time: 08/01/2000 09:25
 Matrix: Soil
 COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	20g EnCore	None	Yes	4	3886
1	4oz. Glass	None	Yes	4	3886

Analysis *Qual* Results Units MDL Method Date Run Analyst CAS # Flags

Inorganics

Total Solids	87.7	%	1	160.3	08/04/00	TJG		
Chromium VI	Not detected	mg/kg	1	7197	08/02/00	KJT	7440-47-3	
Cyanide	Not detected	mg/kg	0.5	9010	08/08/00	JDP		

Metals

Digestion	Completed			varies	08/08/00	EMIL		
Chromium	<i>J</i> 11.9	mg/kg	1.0	6020	08/09/00	EMIL	7440-47-3	
Chromium III	11.9	mg/kg	1.0	6020	08/09/00	EMIL	7440-47-3	
Lead	7.8	mg/kg	1.0	6020	08/09/00	EMIL	7439-92-1	
Mercury	Not detected	mg/kg	0.10	7471M	08/08/00	EMIL	7439-97-6	

Organics

GC/MS for Volatile Organics 5035

Benzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	71-43-2	
Bromobenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	108-86-1	
Bromochloromethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	74-97-5	
Bromodichloromethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-27-4	
Bromoform	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-25-2	
Bromomethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	74-83-9	
n-Butylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	104-51-8	
sec-Butylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	135-98-8	
tert-Butylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	98-06-6	
Carbon tetrachloride	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	56-23-5	
Chlorobenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	108-90-7	
Chloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-00-3	
Chloroform	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	67-66-3	
Chloromethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	74-87-3	
Dibromochloromethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	124-48-1	
1,2-Dibromo-3-chloropropane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	96-12-8	
1,2-Dibromoethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	106-93-4	
Dibromomethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	74-95-3	
1,2-Dichlorobenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	95-50-1	
1,3-Dichlorobenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	541-73-1	
1,4-Dichlorobenzene	<i>u</i> 0.05	mg/kg	0.05	5035/8260	08/08/00	VFM	106-46-7	
Dichlorodifluoromethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-71-8	
1,1-Dichloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-34-3	
1,2-Dichloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	107-06-2	
1,1-Dichloroethene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-35-4	
cis-1,2-Dichloroethene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	156-59-2	
trans-1,2-Dichloroethene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	156-60-5	
1,2-Dichloropropane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	78-87-5	

B-Compound also found in method blank.



Analytical Laboratory Report

Lab Sample ID: S02733.02 (continued)

Sample Tag: GB2 (9-11')

Analysis	Results	Units	MDL	Method	Date Run	Analyst	CAS #	Flag
<i>Dual</i>								
Organics (continued)								
GC/MS for Volatile Organics 5035 (continued)								
1,3-Dichloropropane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	142-28-9	
2,2-Dichloropropane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	594-20-7	
1,1-Dichloropropene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	563-58-6	
cis-1,3-Dichloropropene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	10061-01-5	
Ethylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	100-41-4	
Hexachlorobutadiene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	87-68-3	
Isopropylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	98-82-8	
p-Isopropyltoluene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	99-87-6	
Methylene chloride	0.3	mg/kg	0.3	5035/8260	08/08/00	VFM	75-09-2	
Naphthalene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	91-20-3	
n-Propylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	103-65-1	
Styrene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	630-20-6	
1,1,2,2-Tetrachloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	79-34-5	
Tetrachloroethene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	127-18-4	
Toluene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	108-88-3	
1,2,3-Trichlorobenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	87-61-6	
1,2,4-Trichlorobenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	120-82-1	
1,1,1-Trichloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	71-55-6	
1,1,2-Trichloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	79-00-5	
Trichloroethene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	79-01-6	
Trichlorofluoromethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-69-4	
1,2,3-Trichloropropane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	96-18-4	
1,2,4-Trimethylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	95-63-6	
1,3,5-Trimethylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	108-67-8	
Vinyl chloride	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-01-4	
o-Xylene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	95-47-6	
p,m-Xylene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	106-42-3/108-38-3	
Acetone	Not detected	mg/kg	0.5	5035/8260	08/08/00	VFM	67-64-1	
2-Butanone (MEK)	Not detected	mg/kg	0.5	5035/8260	08/08/00	VFM	78-93-3	
Carbon disulfide	Not detected	mg/kg	0.5	5035/8260	08/08/00	VFM	75-15-0	
2-Hexanone	Not detected	mg/kg	0.5	5035/8260	08/08/00	VFM	591-78-6	
4-Methyl-2-pentanone (MIBK)	Not detected	mg/kg	0.5	5035/8260	08/08/00	VFM	108-10-1	

B-Compound also found in method blank.



Analytical Laboratory Report

Lab Sample ID: S02733.03
 Sample Tag: Field Dup
 Collected Date/Time: 08/01/2000 :
 Matrix: Soil
 COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	20g EnCore	None	Yes	4	3886
1	4oz. Glass	None	Yes	4	3886

Analysis	Results	Units	MDL	Method	Date Run	Analyst	CAS #	Flags
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Inorganics

Total Solids	88.3	%	1	160.3	08/04/00	TJG		
Chromium VI	Not detected	mg/kg	1	7197	08/02/00	KJT	7440-47-3	
Cyanide	Not detected	mg/kg	0.5	9010	08/08/00	JDP		

Metals

Digestion	Completed			varies	08/08/00	EMIL		
Chromium	11.6	mg/kg	1.0	6020	08/09/00	EMIL	7440-47-3	
Chromium III	11.6	mg/kg	1.0	6020	08/09/00	EMIL	7440-47-3	
Lead	7.4	mg/kg	1.0	6020	08/09/00	EMIL	7439-92-1	
Mercury	Not detected	mg/kg	0.10	7471M	08/08/00	EMIL	7439-97-6	

Organics

GC/MS for Volatile Organics 5035

Benzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	71-43-2	
Bromobenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	108-86-1	
Bromochloromethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	74-97-5	
Bromodichloromethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-27-4	
Bromoform	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-25-2	
Bromomethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	74-83-9	
n-Butylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	104-51-8	
sec-Butylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	135-98-8	
tert-Butylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	98-06-6	
Carbon tetrachloride	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	56-23-5	
Chlorobenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	108-90-7	
Chloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-00-3	
Chloroform	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	67-66-3	
Chloromethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	74-87-3	
Dibromochloromethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	124-48-1	
1,2-Dibromo-3-chloropropane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	96-12-8	
1,2-Dibromoethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	106-93-4	
Dibromomethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	74-95-3	
1,2-Dichlorobenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	95-50-1	
1,3-Dichlorobenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	541-73-1	
1,4-Dichlorobenzene	0.05	mg/kg	0.05	5035/8260	08/08/00	VFM	106-46-7	
Dichlorodifluoromethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-71-8	
1,1-Dichloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-34-3	
1,2-Dichloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	107-06-2	
1,1-Dichloroethene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-35-4	
cis-1,2-Dichloroethene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	156-59-2	
trans-1,2-Dichloroethene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	156-60-5	
1,2-Dichloropropane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	78-87-5	

B-Compound also found in method blank.



Analytical Laboratory Report

Lab Sample ID: S02733.03 (continued)

Sample Tag: Field Dup

Deal

Analysis	Results	Units	MDL	Method	Date Run	Analyst	CAS #	Flag
Organics (continued)								
GC/MS for Volatile Organics 5035 (continued)								
1,3-Dichloropropane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	142-28-9	
2,2-Dichloropropane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	594-20-7	
1,1-Dichloropropene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	563-58-6	
cis-1,3-Dichloropropene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	10061-01-5	
Ethylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	100-41-4	
Hexachlorobutadiene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	87-68-3	
Isopropylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	98-82-8	
p-Isopropyltoluene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	99-87-6	
Methylene chloride	<i>u</i> 0.3	mg/kg	0.3	5035/8260	08/08/00	VFM	75-09-2	<i>B</i>
Naphthalene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	91-20-3	
n-Propylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	103-65-1	
Styrene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	630-20-6	
1,1,2,2-Tetrachloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	79-34-5	
Tetrachloroethene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	127-18-4	
Toluene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	108-88-3	
1,2,3-Trichlorobenzene	<i>u</i> Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	87-61-6	
1,2,4-Trichlorobenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	120-82-1	
1,1,1-Trichloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	71-55-6	
1,1,2-Trichloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	79-00-5	
Trichloroethene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	79-01-6	
Trichlorofluoromethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-69-4	
1,2,3-Trichloropropane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	96-18-4	
1,2,4-Trimethylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	95-63-6	
1,3,5-Trimethylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	108-67-8	
Vinyl chloride	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-01-4	
o-Xylene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	95-47-6	
p,m-Xylene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	106-42-3/108-38-3	
Acetone	Not detected	mg/kg	0.5	5035/8260	08/08/00	VFM	67-64-1	
2-Butanone (MEK)	Not detected	mg/kg	0.5	5035/8260	08/08/00	VFM	78-93-3	
Carbon disulfide	Not detected	mg/kg	0.5	5035/8260	08/08/00	VFM	75-15-0	
2-Hexanone	Not detected	mg/kg	0.5	5035/8260	08/08/00	VFM	591-78-6	
4-Methyl-2-pentanone (MIBK)	Not detected	mg/kg	0.5	5035/8260	08/08/00	VFM	108-10-1	

B-Compound also found in method blank.



Analytical Laboratory Report

Lab Sample ID: S02733.04
 Sample Tag: GB3 (9-11)
 Collected Date/Time: 08/01/2000 10:05
 Matrix: Soil
 COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	20g EnCore	None	Yes	4	3886
1	4oz. Glass	None	Yes	4	3886

Analysis	Results	Units	MDL	Method	Date Run	Analyst	CAS #	Flags
Inorganics								
Total Solids	88.2	%	1	160.3	08/04/00	TJG		
Chromium VI	Not detected	mg/kg	1	7197	08/02/00	KJT	7440-47-3	
Cyanide	Not detected	mg/kg	0.5	9010	08/08/00	JDP		
Metals								
Digestion	Completed			varies	08/08/00	EMIL		
Chromium	12.0	mg/kg	1.0	6020	08/09/00	EMIL	7440-47-3	
Chromium III	12.0	mg/kg	1.0	6020	08/09/00	EMIL	7440-47-3	
Lead	7.7	mg/kg	1.0	6020	08/09/00	EMIL	7439-92-1	
Mercury	Not detected	mg/kg	0.10	7471M	08/08/00	EMIL	7439-97-6	
Organics								
GC/MS for Volatile Organics 5035								
Benzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	71-43-2	
Bromobenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	108-86-1	
Bromochloromethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	74-97-5	
Bromodichloromethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-27-4	
Bromoform	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-25-2	
Bromomethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	74-83-9	
n-Butylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	104-51-8	
sec-Butylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	135-98-8	
tert-Butylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	98-06-6	
Carbon tetrachloride	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	56-23-5	
Chlorobenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	108-90-7	
Chloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-00-3	
Chloroform	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	67-66-3	
Chloromethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	74-87-3	
Dibromochloromethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	124-48-1	
1,2-Dibromo-3-chloropropane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	96-12-8	
1,2-Dibromoethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	106-93-4	
Dibromomethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	74-95-3	
1,2-Dichlorobenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	95-50-1	
1,3-Dichlorobenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	541-73-1	
1,4-Dichlorobenzene	0.05	mg/kg	0.05	5035/8260	08/08/00	VFM	106-46-7	
Dichlorodifluoromethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-71-8	
1,1-Dichloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-34-3	
1,2-Dichloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	107-06-2	
1,1-Dichloroethene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-35-4	
cis-1,2-Dichloroethene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	156-59-2	
trans-1,2-Dichloroethene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	156-60-5	
1,2-Dichloropropane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	78-87-5	

B-Compound also found in method blank.



Analytical Laboratory Report

Lab Sample ID: S02733.04 (continued)

Sample Tag: GB3 (9-11')

Analysis	Results	Units	MDL	Method	Date Run	Analyst	CAS #	Flags
<i>Deal</i>								
Organics (continued)								
GC/MS for Volatile Organics 5035 (continued)								
1,3-Dichloropropane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	142-28-9	
2,2-Dichloropropane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	594-20-7	
1,1-Dichloropropene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	563-58-6	
cis-1,3-Dichloropropene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	10061-01-5	
Ethylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	100-41-4	
Hexachlorobutadiene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	87-68-3	
Isopropylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	98-82-8	
p-Isopropyltoluene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	99-87-6	
Methylene chloride	0.3	mg/kg	0.3	5035/8260	08/08/00	VFM	75-09-2	<i>u</i>
Naphthalene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	91-20-3	<i>B</i>
n-Propylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	103-65-1	
Styrene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	630-20-6	
1,1,2,2-Tetrachloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	79-34-5	
Tetrachloroethene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	127-18-4	
Toluene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	108-88-3	
1,2,3-Trichlorobenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	87-61-6	<i>u</i>
1,2,4-Trichlorobenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	120-82-1	
1,1,1-Trichloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	71-55-6	
1,1,2-Trichloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	79-00-5	
Trichloroethene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	79-01-6	
Trichlorofluoromethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-69-4	<i>u</i>
1,2,3-Trichloropropane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	96-18-4	
1,2,4-Trimethylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	95-63-6	
1,3,5-Trimethylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	108-67-8	
Vinyl chloride	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-01-4	
o-Xylene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	95-47-6	
p,m-Xylene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	106-42-3/108-38-3	
Acetone	Not detected	mg/kg	0.5	5035/8260	08/08/00	VFM	67-64-1	
2-Butanone (MEK)	Not detected	mg/kg	0.5	5035/8260	08/08/00	VFM	78-93-3	
Carbon disulfide	Not detected	mg/kg	0.5	5035/8260	08/08/00	VFM	75-15-0	
2-Hexanone	Not detected	mg/kg	0.5	5035/8260	08/08/00	VFM	591-78-6	
4-Methyl-2-pentanone (MIBK)	Not detected	mg/kg	0.5	5035/8260	08/08/00	VFM	108-10-1	

B-Compound also found in method blank.



Analytical Laboratory Report

Lab Sample ID: S02733.07
 Sample Tag: GB4 (14-16)
 Collected Date/Time: 08/01/2000 11:30
 Matrix: Soil
 COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	20g EnCore	None	Yes	4	3886
1	4oz. Glass	None	Yes	4	3886

Analysis	Results	Units	MDL	Method	Date Run	Analyst	CAS #	Flags
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Inorganics

Total Solids	87.3	%	1	160.3	08/04/00	TJG		
Chromium VI	Not detected	mg/kg	1	7197	08/02/00	KJT	7440-47-3	
Cyanide	Not detected	mg/kg	0.5	9010	08/08/00	JDP		

Metals

Digestion	Completed			varies	08/08/00	EMIL		
Chromium	12.5	mg/kg	1.0	6020	08/09/00	EMIL	7440-47-3	
Chromium III	12.5	mg/kg	1.0	6020	08/09/00	EMIL	7440-47-3	
Lead	7.0	mg/kg	1.0	6020	08/09/00	EMIL	7439-92-1	
Mercury	Not detected	mg/kg	0.10	7471M	08/08/00	EMIL	7439-97-6	

Organics

GC/MS for Volatile Organics 5035

Benzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	71-43-2	
Bromobenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	108-86-1	
Bromochloromethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	74-97-5	
Bromodichloromethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-27-4	
Bromoform	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-25-2	
Bromomethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	74-83-9	
n-Butylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	104-51-8	
sec-Butylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	135-98-8	
tert-Butylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	98-06-6	
Carbon tetrachloride	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	56-23-5	
Chlorobenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	108-90-7	
Chloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-00-3	
Chloroform	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	67-66-3	
Chloromethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	74-87-3	
Dibromochloromethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	124-48-1	
1,2-Dibromo-3-chloropropane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	96-12-8	
1,2-Dibromoethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	106-93-4	
Dibromomethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	74-95-3	
1,2-Dichlorobenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	95-50-1	
1,3-Dichlorobenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	541-73-1	
1,4-Dichlorobenzene	0.05	mg/kg	0.05	5035/8260	08/08/00	VFM	106-46-7	
Dichlorodifluoromethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-71-8	
1,1-Dichloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-34-3	
1,2-Dichloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	107-06-2	
1,1-Dichloroethene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-35-4	
cis-1,2-Dichloroethene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	156-59-2	
trans-1,2-Dichloroethene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	156-60-5	
1,2-Dichloropropane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	78-87-5	

B-Compound also found in method blank.



Analytical Laboratory Report

Lab Sample ID: S02733.07 (continued)

Sample Tag: GB4 (14-16')

Analysis	Results	Units	MDL	Method	Date Run	Analyst	CAS #	Flag
<i>Deal</i>								
Organics (continued)								
GC/MS for Volatile Organics 5035 (continued)								
1,3-Dichloropropane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	142-28-9	
2,2-Dichloropropane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	594-20-7	
1,1-Dichloropropene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	563-58-6	
cis-1,3-Dichloropropene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	10061-01-5	
Ethylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	100-41-4	
Hexachlorobutadiene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	87-68-3	
Isopropylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	98-82-8	
p-Isopropyltoluene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	99-87-6	
Methylene chloride	<i>u</i> 0.3	mg/kg	0.3	5035/8260	08/08/00	VFM	75-09-2	<i>B</i>
Naphthalene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	91-20-3	
n-Propylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	103-65-1	
Styrene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	630-20-6	
1,1,2,2-Tetrachloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	79-34-5	
Tetrachloroethene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	127-18-4	
Toluene	<i>u</i> Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	108-88-3	
1,2,3-Trichlorobenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	87-61-6	
1,2,4-Trichlorobenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	120-82-1	
1,1,1-Trichloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	71-55-6	
1,1,2-Trichloroethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	79-00-5	
Trichloroethene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	79-01-6	
Trichlorofluoromethane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-69-4	
1,2,3-Trichloropropane	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	96-18-4	
1,2,4-Trimethylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	95-63-6	
1,3,5-Trimethylbenzene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	108-67-8	
Vinyl chloride	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	75-01-4	
o-Xylene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	95-47-6	
p,m-Xylene	Not detected	mg/kg	0.05	5035/8260	08/08/00	VFM	106-42-3/108-38-3	
Acetone	Not detected	mg/kg	0.5	5035/8260	08/08/00	VFM	67-64-1	
2-Butanone (MEK)	Not detected	mg/kg	0.5	5035/8260	08/08/00	VFM	78-93-3	
Carbon disulfide	Not detected	mg/kg	0.5	5035/8260	08/08/00	VFM	75-15-0	
2-Hexanone	Not detected	mg/kg	0.5	5035/8260	08/08/00	VFM	591-78-6	
4-Methyl-2-pentanone (MIBK)	Not detected	mg/kg	0.5	5035/8260	08/08/00	VFM	108-10-1	

B-Compound also found in method blank.

Office: NOV
Address: 39830 GRAND RIVER
Phone: 248-426-8970
MTN: MIKE ROBISON

CHAIN OF CUSTODY
* LEVEL III DATA DELIVERABLE

*↓
DRUM STORAGE PAD

CLIENT: GM REALM		COLLECTED BY: MIKE ROBISON / CHAD KRISTEER				
LOCATION: COLDWATER RD		(Signature)				
SAMPLE DESCRIPTION	Date	Time	Sample Matrix ¹	Sample Type ²	No. of Containers	ANALYSIS REQUESTED
GB1 (9'-11')	8/1/00	0855	SOIL	GRAB	2	VOCS 8260, CN-9010, LEAD 6020, HEX CHROM
GB2 (9'-11')	8/1/00	0925	SOIL	GRAB	2	MERCURY 7471, 3060A/7116
FIELD DUP	8/1/00		SOIL/QC	GRAB	2	+ TRIVALENT CHROM
GB3 (9'-11')	8/1/00	1005	SOIL	GRAB	2	SAME AS GB2
MS / MSD (MATRIX SPILE)	8/1/00	1005	SOIL/QC	GRAB	2	AS
MSD (MATRIX SPILE DUP)	8/1/00	1005	SOIL/QC	GRAB	2	ABOVE
GB4 (9'-16')	8/1/00	1130	SOIL	GRAB	2	" "
EB (EQUIPMENT BLANK)	8/1/00	1200	DI H2O/QC	QA/QC	5	" "
TRIP BLANK	7/11/00		LAB DI H2O	QA/QC	1	✓ ✓
						* ATTN: MARYA MUSHAK
						LEVEL III DATA
						DELIVERABLE,
						NORMAL TAT

¹ Matrix = water, wastewater, air, sludge, sediment, etc.

² Type = grab, composite

Relinquished by: <u>M. Robison</u>	Date: <u>8/1/00</u>	Time: <u>1205</u>	Received by: <u>Chad Kristeer</u>	Date: <u>8-1-00</u>	Time: <u>1:00</u>
of: <u>O'BRIEN & GERE</u>			of: <u>FECI</u>		
Relinquished by: <u>Chad Kristeer</u>	Date: <u>8/1/00</u>	Time: <u>2:30</u>	Received by: <u>NA</u>	Date:	Time: <u>11:30</u>
of: <u>FECI</u>			of: <u>FECI</u>		
Relinquished by: _____	Date:	Time:	Received by: _____	Date:	Time:
of: _____			of: _____		
Use this space if shipped via courier (e.g., Fed Ex)			Courier Name: _____	Date:	Time:
Relinquished by: _____	Date:	Time:	* Attach delivery/courier receipt to Chain of Custody		
of: _____					
Relinquished by: _____	Date:	Time:	Received by: _____	Date:	Time:
of: _____			of: _____		

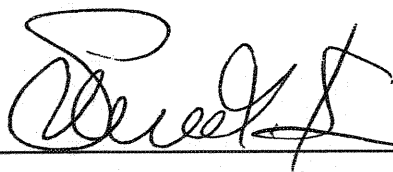
DATA VALIDATION REPORT

**Former Drum Storage Area
at the Former Peregrine, U.S. Inc.
Property at the Coldwater Road
Facility G-1245 East Coldwater Road
Flint, Michigan
(EPA I.D. No. MIR 000 020 743)**

September 2002

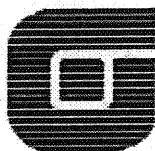
DATA VALIDATION REPORT

Soil Samples Collected May 2002
Former Drum Storage Area at the Former Peregrine U.S., Inc.
Property at the Coldwater Road Facility Flint, Michigan
(EPA I.D. No. MIR 000 020 743)



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O'BRIEN & GERE
ENGINEERS, INC.

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Executive summary

This data validation report addresses data quality for soil samples collected from the former Drum Storage Area at the Remediation and Liability Management Company, Inc. (REALM) Coldwater Road Facility, 1245 Coldwater Road, Flint, Michigan (formerly the Peregrine, U.S., Inc. property). Sample collection activities were conducted by O'Brien & Gere Engineers, Inc. (O'Brien & Gere) on 5/10/02.

The environmental samples, matrix spike, matrix spike duplicate (MS/MSD), field duplicate, equipment blank, and trip blank collected for this investigation were submitted to Merit Laboratories, Inc. of East Lansing, Michigan for analysis of volatile organic compounds (VOCs) using United States Environmental Protection Agency (USEPA) Methods. The analytical data generated for this investigation were evaluated by O'Brien & Gere using the quality assurance/quality control (QA/QC) criteria established in the following documents:

- United States Environmental Protection Agency (USEPA) Methods
- Coldwater Road Facility Remedial Investigation, REALM, Quality Assurance Project Plan (QAPP) (O'Brien & Gere 1999).

Excursions from the QA/QC criteria were qualified based on guidance provided in the following document:

- United States Environmental Protection Agency (USEPA) Contract Laboratory Program (CLP) National Functional Guidelines For Organic Data Review, EPA-540/R-96/008 (USEPA 1999).

As a result of the data validation process the VOCs data for the soil samples analyzed were determined to be 100% usable for qualitative and quantitative purposes.

REALM Coldwater Road Investigation

The first step in the investigation was to identify the location of the coldwater road. This was done by reviewing the site plan and the aerial photographs. The road was found to be located in the northwestern corner of the site. The road was approximately 100 feet wide and 200 feet long. The road was paved with asphalt and had a concrete curb on the north side. The road was found to be in good condition and was used for access to the site.

The second step in the investigation was to identify the location of the coldwater road. This was done by reviewing the site plan and the aerial photographs. The road was found to be located in the northwestern corner of the site. The road was approximately 100 feet wide and 200 feet long. The road was paved with asphalt and had a concrete curb on the north side. The road was found to be in good condition and was used for access to the site.

The third step in the investigation was to identify the location of the coldwater road. This was done by reviewing the site plan and the aerial photographs. The road was found to be located in the northwestern corner of the site. The road was approximately 100 feet wide and 200 feet long. The road was paved with asphalt and had a concrete curb on the north side. The road was found to be in good condition and was used for access to the site.

The fourth step in the investigation was to identify the location of the coldwater road. This was done by reviewing the site plan and the aerial photographs. The road was found to be located in the northwestern corner of the site. The road was approximately 100 feet wide and 200 feet long. The road was paved with asphalt and had a concrete curb on the north side. The road was found to be in good condition and was used for access to the site.

The fifth step in the investigation was to identify the location of the coldwater road. This was done by reviewing the site plan and the aerial photographs. The road was found to be located in the northwestern corner of the site. The road was approximately 100 feet wide and 200 feet long. The road was paved with asphalt and had a concrete curb on the north side. The road was found to be in good condition and was used for access to the site.

1. Introduction

1.1. Program summary

This data validation report addresses the results of a data quality evaluation for soil samples, matrix spike, matrix spike duplicate (MS/MSD), field duplicate, equipment blank, and one trip blank collected from the former Drum Storage Area at the Remediation and Liability Management Company, Inc. (REALM) Coldwater Road Facility, 1245 Coldwater Road, Flint, Michigan (formerly the Peregrine, U.S., Inc. property). Sample collection activities were conducted by O'Brien & Gere on 5/10/02. The environmental samples, MS/MSD sample, field duplicate, equipment blank, and trip blank collected for this investigation were submitted to Merit Laboratories, Inc. of East Lansing, Michigan for analysis of volatile organic compounds (VOCs) using United States Environmental Protection Agency (USEPA) Methods listed in Table 1-1. The quantity and types of samples that were submitted for data validation are presented in Table 1-1 below.

Table 1-1. Sample cross reference list

Laboratory Package ID	Date Collected	Sample Identification		Analysis Requested	Reference
		Client ID	Laboratory ID		
S09131	5/10/02	DSA MW-1 (24'-25')	S09131.01	Volatile organic compounds by 8260B	1
		GB-5 (14'-15')	S09131.02	Volatile organic compounds by 8260B	1
		MS	S09131.04		
		MSD	S09131.05		
		GB-5 (19'-20')	S09131.03	Volatile organic compounds by 8260B	1
		GB-6 (14'-15')	S09131.06	Volatile organic compounds by 8260B	1
		GB-6 (19'-20')	S09131.07	Volatile organic compounds by 8260B	1
		GB-7 (14'-15')	S09131.08	Volatile organic compounds by 8260B	1
		GB-7 (19'-20')	S09131.09	Volatile organic compounds by 8260B	1
		Duplicate [GB-6 (14'-15')]	S09131.10	Volatile organic compounds by 8260B	1
		Equipment Blank	S09131.12	Volatile organic compounds by 8260B	1
Trip Blank	S09131.11	Volatile organic compounds by 8260B	1		
DSA MW-1 (8'-10')	*	Volatile organic compounds by 8260B	1		

Note:

MS indicates matrix spike sample.

MSD indicates matrix spike duplicate sample.

The sample identification in brackets indicates the field duplicate sampling location.

* indicates that the sample was placed on hold by the Project Manager.

Reference:

- USEPA. 1996. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846*, 3rd Edition. Washington D.C.

1.2. Data validation protocols

Validation is a process of determining the suitability of a measurement system for providing useful analytical data. Data validation is essentially a three-step process in which the analytical data's quality assurance/quality control (QA/QC) information is first compared to a series of QA/QC criteria. Based on the results of this comparison, the analytical data are then assigned qualifiers, which provide an indication of the data's usability. Finally, an overall evaluation of the data's usability is performed. These three steps are described in the following sections.

1.2.1. Comparison to QA/QC criteria

In this report, the analytical data's QA/QC information is compared to the applicable QA/QC criteria provided in the following documents:

- USEPA. 1996. Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW-846), 3rd Edition. Washington DC.
- O'Brien & Gere Engineers, Inc. 1999. Coldwater Road Facility Remedial Investigation, REALM, Quality Assurance Project Plan (QAPP), Syracuse, New York.

Full data validation was performed on the soil sample data. Full data validation consists of a review of data summary forms and raw analytical data that were provided in the data packages. The following QA/QC information was included in the review for VOC analyses:

- Chain-of-custody records
- Holding times, sample preservation, and percent solids
- Calibrations
- Blank analysis
- Matrix spike/matrix spike duplicate (MS/MSD) analysis
- Laboratory control sample (LCS) analysis
- Field duplicate analysis
- Surrogate recovery
- Internal standards performance
- Gas chromatography/mass spectrometry (GC/MS) instrument performance check
- Target analyte quantitation, identification, and reported detection limits
- System performance
- Documentation completeness, and
- Overall data assessment.

1.2.2. Assignment of qualifiers

Excursions from the QA/QC criteria were qualified based on guidance provided in the following document:

- USEPA 1999. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA-540/R-96/008. Washington D.C.

In accordance with the USEPA guidance, the following qualifiers are used in data validation:

- J Indicates that the analyte concentration should be considered approximate. This qualifier is used when the data validation process identifies a minor deficiency in the data generation process.
- UJ Indicates that the analyte reporting limit should be considered approximate. This qualifier is used when the data validation process identifies a minor deficiency in the data generation process.

The following guidelines are used regarding the assignment of qualifiers and the use of qualified data:

The data quality evaluation results in only one qualifier for each analyte; in a case when several qualifiers are applicable to the same analyte, the cumulative effect of the various QA/QC excursions is employed in assigning the final data qualifiers.

QA/QC excursions which do not result in the qualification of an analyte, or which result in additional qualification if the analyte was previously qualified, are not discussed.

The quantitative use of approximated analytical data is consistent with the guidance presented in the USEPA Risk Assessment Guidance for Superfund (USEPA 1992).

1.2.3. Data usability evaluation

Based on the QA/QC information review and the qualifiers assigned to the analytical data, an overall evaluation of the data's usability is performed. This evaluation considers the data parameters of precision, sensitivity, accuracy, representativeness, comparability, and completeness (known as PSARCC parameters), which are described as follows:

- Precision is evaluated through the review of field duplicate samples and MS/MSD samples.

- Sensitivity is evaluated through the review of reported detection limits.
- Accuracy is evaluated through the review of MS/MSD samples, internal standards, surrogate recoveries, LCS recoveries, calibration, and instrument performance check.
- Representativeness is evaluated through the review of holding times, sample preservation and preparation, blank analysis and target compound identification and quantification.
- Comparability is evaluated through the review of the analytical methods and reporting procedures for consistency.
- Completeness is defined as the percentage of sample results that are determined to be usable.

1.2.4. Analytical methods

The soil samples collected for this investigation were analyzed by Merit Laboratories, Inc. (Merit Labs) of East Lansing, Michigan for volatile organic compounds (VOCs) using the methods presented in Table 1-2.

Table 1-2. Analytical method reference

Parameter	Method	Reference
VOCs	USEPA Method 5030B/5035/8260B	1

Note:

1. USEPA. 1996 *Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW-846)*, 3rd Edition. Washington DC.

VOC indicates volatile organic compounds.

The following chapters of this document address distinct aspects of the validation process. Specific QA/QC excursions and qualifications performed on the sample data are discussed in Section 2. Data completeness and usability are discussed in Section 3.

The annotated analytical results generated by this validation are presented in Appendix A.

2. Data quality evaluation

2.1. Soil samples

2.1.1. Documentation completeness

- The chain-of-custody associated with soil samples collected 5/10/02 was incomplete. The preservation code, refrigeration requirement and bottle type were not completed on the document. The Project Manager confirmed that Encore® samplers were used to collect soil samples during this sampling event, refrigeration was required and preservation was not added to the soil samples. Preservation was added to the trip blank and equipment blank.
- The soil detection limits listed in the data package for methylene chloride (0.3 mg/Kg), 2-butanone (0.5 mg/Kg), and bromomethane (0.3 mg/Kg) exceeded the limits listed in the QAPP for methylene chloride (0.25 mg/Kg), 2-butanone (0.25 mg/Kg), and bromomethane (0.05 mg/Kg). The aqueous detection limits listed in the data package for methylene chloride (0.005 mg/L) exceeded the limit listed in the QAPP for methylene chloride (0.001 mg/L).

Encore® samplers were used to collect soil samples during this sampling event and the soil samples were analyzed using the medium level soil analysis as preferred by the Michigan Department of Environmental Quality (MDEQ).

The following data package information was requested and received during the validation process since the data packages were incomplete:

- Revised sample result sheets which included correction for percent solids
- The evaluation of the entire list of target analytes for the calibrations
- Initial calibration curves
- Correction for LCS recovery results
- MS summary forms
- Bar graph spectra for instrument performance checks
- Mass spectra for a method blank
- Explanation of the spike traceability information

2.1.2. VOC analyses of soil samples by GC/MS

Criteria compliance

The following QA/QC parameters met validation criteria or did not result in additional qualification of sample results:

- Chain-of-custody records
- Holding times, sample preservation, and percent solids
- Calibrations
- Blank analysis
- Field duplicate analysis
- Surrogate recovery
- Internal standards performance
- GC/MS instrument performance check
- Target analyte quantitation, identification, and reported detection limits, and
- System performance

Excursions from QA/QC criteria presented in Section 1.2 and additional observations are summarized below.

MS/MSD analysis

The percent recovery for chloroethane in MS/MSD field sample GB-5 (14'-15') analyzed for this investigation was less than the lower laboratory control limit, indicating matrix influence or low instrument response. Analysis of the laboratory batch MS/MSD sample (GB-5 (14'-15')) confirmed the recovery results. As a result of the MS/MSD excursions, the result in the unspiked sample was qualified as approximate (UJ) to indicate a minor recovery excursion. The following table presents the sample qualified as a result of the MS/MSD excursions:

Table 2.3 MD/MSD excursions for VOC analyses of soil samples

MS/MSD ID		Excursion	Affected Samples	Action
GB-5 (14'-15')	Chloroethane	27.9%R, 27.7%R	GB-5 (14'-15')	UJ

Note: %R indicates percent recovery.

LCS analysis

The percent recovery for chloroethane in the LCS analyses performed for this sampling event was outside of the laboratory control limits. Since the recovery for chloromethane in LCS analysis 5/11/02 was less than the lower control limit, the results for chloromethane in samples associated with the LCS were qualified as approximate (UJ), indicating a minor recovery excursion. The LCS excursions are summarized in the following table:

Table 2-4. LCS excursion for VOC analyses of soil samples

LCS ID	Analyte	Excursion	Affected Samples	Action
LCS 5/11/02	Chloroethane	21.6 %R	DSA MW-1 (24'-25') GB-5 (14'-15') GB-5 (19'-20') GB-6 (14'-15') GB-6 (19'-20') GB-7 (14'-15') GB-7 (19'-20') Duplicate [GB-6 (14'-15')] Equipment Blank Trip Blank	UJ

Note:

%R indicates percent recovery.

3. Summary and data usability

This chapter summarizes the analytical data in terms of its completeness and usability. Data completeness is defined as the percentage of sample results that have been determined to be usable during the data validation process.

The soil samples, MS/MSD, field duplicate, equipment blank, and trip blank collected from the former Drum Storage Area at the REALM Coldwater Road Facility, were evaluated based on QA/QC criteria established by USEPA Methods as listed in Section 1.2, the QAPP (O'Brien & Gere 1999), and the USEPA National Functional data validation guidelines. Major deficiencies in the data generation process would have resulted in data being rejected, indicating that the data is considered unusable for either quantitative or qualitative purposes. Minor deficiencies in the data generation process resulted in some sample data being characterized as approximate. Identification of a data point as approximate indicates uncertainty in the reported concentration of the chemical, but not its assigned identity. The use of approximated analytical data for quantitative uses is consistent with the guidance presented in the USEPA Risk Assessment Guidance for Superfund (USEPA 1992).

A discussion of the data quality with regard to the parameters follows:

Precision: Data usability with respect to precision is 100 percent for volatile organic compound soil data.

For the soil samples, none of the data were rejected for precision excursions.

Sensitivity: With the exceptions of the elevated detection limits noted in Section 2, sensitivity requirements were met for the sample data in this project.

Accuracy: Data usability with respect to accuracy is 100 percent for volatile organic compound soil data.

For the soil samples, none of the data were rejected for accuracy excursions.

Representativeness: Data usability with respect to representativeness is 100 percent for volatile organic compound soil data.

For the soil samples, none of the data were rejected for representativeness excursions.

Comparability: Data usability with respect to comparability is 100 percent, as standardized analytical methods, reporting limits, reference materials, and data deliverables were used throughout the data generation process for this project.

Completeness: Overall, 100 percent of the volatile organic compound soil data were determined to be usable for qualitative and quantitative purposes. Therefore, the completeness objective of 90 percent for this investigation, as presented in the QAPP, was met.

References

O'Brien & Gere Engineers, Inc. 1999. Coldwater Road Facility Remedial Investigation, REALM, Quality Assurance Project Plan (QAPP), Syracuse, New York.

United States Environmental Protection Agency (USEPA). 1992. USEPA Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A), 540/1-891002. Washington D.C.

United States Environmental Protection Agency (USEPA). 1996. Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW-846), 3rd Edition. Washington DC.

United States Environmental Protection Agency (USEPA). 1999. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA-540/R-96/008. Washington D.C.

APPENDIX A

**A summary of validated
analytical results**



Analytical Laboratory Report

Revised Report (#2)

Lab Sample ID: S09131.01

Sample Tag: MW-1 (24-25) *DSA MW-1 (24-25)*

Collected Date/Time: 05/10/2002 09:45

Matrix: Soil

COC Reference: 007157

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	20g EnCore	None	Yes	4	4025
1	4oz. Glass	None	Yes	4	4025

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Inorganics								
Total Solids	87.9	%	1	160.3	05/13/02	BRP		
Organics								
Volatile Organics								
2-Butanone (MEK)	Not detected	mg/kg	0.3	5035/8260B	05/11/02	JGH	78-93-3	
Benzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	71-43-2	
n-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	104-51-8	
Bromobenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	108-86-1	
Bromochloromethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	74-97-5	
Bromodichloromethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	75-27-4	
Bromoform	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	75-25-2	
Bromomethane	Not detected	mg/kg	0.3	5035/8260B	05/11/02	JGH	74-83-9	
sec-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	135-98-8	
tert-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	98-06-6	
2-Chlorotoluene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	95-49-8	
4-Chlorotoluene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	106-43-4	
Carbon tetrachloride	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	56-23-5	
Chlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	108-90-7	
Chloroethane <i>WJ</i>	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	75-00-3	
Chloroform	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	67-66-3	
Chloromethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	74-87-3	
1,1-Dichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	75-34-3	
1,1-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	75-35-4	
1,1-Dichloropropene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	563-58-6	
1,2-Dibromo-3-chloropropane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	96-12-8	
1,2-Dibromoethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	106-93-4	
1,2-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	95-50-1	
1,2-Dichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	107-06-2	
1,2-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	78-87-5	
1,3-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	541-73-1	
1,3-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	142-28-9	
1,4-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	106-46-7	
2,2-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	594-20-7	
cis-1,2-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	156-59-2	
cis-1,3-Dichloropropene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	10061-01-5	
Dibromochloromethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	124-48-1	
Dibromomethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	74-95-3	
Dichlorodifluoromethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	75-71-8	
trans-1,2-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	156-60-5	
Ethylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	100-41-4	
p-Isopropyltoluene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	99-87-6	
Isopropylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	98-82-8	

Quality



Analytical Laboratory Report

Revised Report (#2)

Lab Sample ID: S09131.01 (continued)

Sample Tag: ~~MW-1 (24-25)~~ DSA MW-1 (24-25)

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flag
Organics (continued)								
Volatile Organics (continued)								
Methylene chloride	Not detected	mg/kg	0.3	5035/8260B	05/11/02	JGH	75-09-2	
Naphthalene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	91-20-3	
n-Propylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	103-65-1	
Styrene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	630-20-6	
1,1,1-Trichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	79-34-5	
1,1,2-Trichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	79-00-5	
1,2,3-Trichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	87-61-6	
1,2,3-Trichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	96-18-4	
1,2,4-Trichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	120-82-1	
1,2,4-Trimethylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	95-63-6	
1,3,5-Trimethylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	108-67-8	
Tetrachloroethene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	127-18-4	
Toluene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	108-88-3	
Trichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	79-01-6	
Trichlorofluoromethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	75-69-4	
Vinyl chloride	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	75-01-4	
o-Xylene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	95-47-6	
p,m-Xylene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	106-42-3	



Analytical Laboratory Report

Revised Report (#2)

Lab Sample ID: S09131.02
Sample Tag: GB5 (14'-15')
Collected Date/Time: 05/10/2002 12:00
Matrix: Soil
COC Reference: 007157

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	20g EnCore	None	Yes	4	4025
1	4oz. Glass	None	Yes	4	4025

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Inorganics								
Total Solids	87.4	%	1	160.3	05/13/02	BRP		
Organics								
Volatile Organics								
2-Butanone (MEK)	Not detected	mg/kg	0.3	5035/8260B	05/11/02	JGH	78-93-3	
Benzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	71-43-2	
n-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	104-51-8	
Bromobenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	108-86-1	
Bromochloromethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	74-97-5	
Bromodichloromethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	75-27-4	
Bromoform	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	75-25-2	
Bromomethane	Not detected	mg/kg	0.3	5035/8260B	05/11/02	JGH	74-83-9	
sec-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	135-98-8	
tert-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	98-06-6	
2-Chlorotoluene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	95-49-8	
4-Chlorotoluene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	106-43-4	
Carbon tetrachloride	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	56-23-5	
Chlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	108-90-7	
Chloroethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	75-00-3	
Chloroform	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	67-66-3	
Chloromethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	74-87-3	
1,1-Dichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	75-34-3	
1,1-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	75-35-4	
1,1-Dichloropropene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	563-58-6	
1,2-Dibromo-3-chloropropane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	96-12-8	
1,2-Dibromoethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	106-93-4	
1,2-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	95-50-1	
1,2-Dichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	107-06-2	
1,2-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	78-87-5	
1,3-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	541-73-1	
1,3-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	142-28-9	
1,4-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	106-46-7	
2,2-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	594-20-7	
cis-1,2-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	156-59-2	
cis-1,3-Dichloropropene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	10061-01-5	
Dibromochloromethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	124-48-1	
Dibromomethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	74-95-3	
Dichlorodifluoromethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	75-71-8	
trans-1,2-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	156-60-5	
Ethylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	100-41-4	
p-Isopropyltoluene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	99-87-6	
Isopropylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	98-82-8	



Analytical Laboratory Report

Revised Report (#2)

Lab Sample ID: S09131.02 (continued)

Sample Tag: GB5 (14'-15')

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flag
Organics (continued)								
Volatile Organics (continued)								
Methylene chloride	Not detected	mg/kg	0.3	5035/8260B	05/11/02	JGH	75-09-2	
Naphthalene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	91-20-3	
n-Propylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	103-65-1	
Styrene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	630-20-6	
1,1,1-Trichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	79-34-5	
1,1,2-Trichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	79-00-5	
1,2,3-Trichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	87-61-6	
1,2,3-Trichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	96-18-4	
1,2,4-Trichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	120-82-1	
1,2,4-Trimethylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	95-63-6	
1,3,5-Trimethylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	108-67-8	
Tetrachloroethene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	127-18-4	
Toluene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	108-88-3	
Trichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	79-01-6	
Trichlorofluoromethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	75-69-4	
Vinyl chloride	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	75-01-4	
o-Xylene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	95-47-6	
p,m-Xylene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	106-42-3	



Analytical Laboratory Report

Revised Report (#2)

Lab Sample ID: S09131.03
 Sample Tag: GB5 (19'-20')
 Collected Date/Time: 05/10/2002 12:15
 Matrix: Soil
 COC Reference: 007157

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	20g EnCore	None	Yes	4	4025
1	4oz. Glass	None	Yes	4	4025

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Inorganics								
Total Solids	88.1	%	1	160.3	05/13/02	BRP		
Organics								
Volatile Organics								
2-Butanone (MEK)	Not detected	mg/kg	0.3	5035/8260B	05/11/02	JGH	78-93-3	
Benzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	71-43-2	
n-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	104-51-8	
Bromobenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	108-86-1	
Bromochloromethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	74-97-5	
Bromodichloromethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	75-27-4	
Bromoform	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	75-25-2	
Bromomethane	Not detected	mg/kg	0.3	5035/8260B	05/11/02	JGH	74-83-9	
sec-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	135-98-8	
tert-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	98-06-6	
2-Chlorotoluene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	95-49-8	
4-Chlorotoluene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	106-43-4	
Carbon tetrachloride	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	56-23-5	
Chlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	108-90-7	
Chloroethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	75-00-3	
Chloroform	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	67-66-3	
Chloromethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	74-87-3	
1,1-Dichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	75-34-3	
1,1-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	75-35-4	
1,1-Dichloropropene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	563-58-6	
1,2-Dibromo-3-chloropropane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	96-12-8	
1,2-Dibromoethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	106-93-4	
1,2-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	95-50-1	
1,2-Dichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	107-06-2	
1,2-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	78-87-5	
1,3-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	541-73-1	
1,3-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	142-28-9	
1,4-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	106-46-7	
2,2-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	594-20-7	
cis-1,2-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	156-59-2	
cis-1,3-Dichloropropene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	10061-01-5	
Dibromochloromethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	124-48-1	
Dibromomethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	74-95-3	
Dichlorodifluoromethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	75-71-8	
trans-1,2-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	156-60-5	
Ethylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	100-41-4	
p-Isopropyltoluene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	99-87-6	
Isopropylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	98-82-8	

Qual

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Analytical Laboratory Report

Revised Report (#)

Lab Sample ID: S09131.03 (continued)

Sample Tag: GB5 (19'-20')

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Fla
Organics (continued)								
Volatile Organics (continued)								
Methylene chloride	Not detected	mg/kg	0.3	5035/8260B	05/11/02	JGH	75-09-2	
Naphthalene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	91-20-3	
n-Propylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	103-65-1	
Styrene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	630-20-6	
1,1,1-Trichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	79-34-5	
1,1,2-Trichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	79-00-5	
1,2,3-Trichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	87-61-6	
1,2,3-Trichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	96-18-4	
1,2,4-Trichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	120-82-1	
1,2,4-Trimethylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	95-63-6	
1,3,5-Trimethylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	108-67-8	
Tetrachloroethene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	127-18-4	
Toluene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	108-88-3	
Trichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	79-01-6	
Trichlorofluoromethane	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	75-69-4	
Vinyl chloride	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	75-01-4	
o-Xylene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	95-47-6	
p,m-Xylene	Not detected	mg/kg	0.06	5035/8260B	05/11/02	JGH	106-42-3	



Analytical Laboratory Report

Revised Report (#2)

Lab Sample ID: S09131.01
 Sample Tag: MS (GB5 14'-15')
 Collected Date/Time: 05/10/2002 12:00
 Matrix: Soil
 COC Reference: 007157

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	20g EnCore	None	Yes	4	4025
1	4oz. Glass	None	Yes	4	4025

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Inorganics								
Total Solids	87.5	%	1	160.3	05/13/02	BRP		
Organics								
Volatile Organics								
2-Butanone (MEK)	1.5	mg/kg	0.3	5035/8260B	05/11/02	JGH	78-93-3	1N
Benzene	1.60	mg/kg	0.05	5035/8260B	05/11/02	JGH	71-43-2	1N
n-Butylbenzene	1.73	mg/kg	0.05	5035/8260B	05/11/02	JGH	104-51-8	1N
Bromobenzene	1.38	mg/kg	0.05	5035/8260B	05/11/02	JGH	108-86-1	1N
Bromochloromethane	1.50	mg/kg	0.05	5035/8260B	05/11/02	JGH	74-97-5	1N
Bromodichloromethane	1.44	mg/kg	0.05	5035/8260B	05/11/02	JGH	75-27-4	1N
Bromoform	0.97	mg/kg	0.05	5035/8260B	05/11/02	JGH	75-25-2	1N
Bromomethane	1.2	mg/kg	0.3	5035/8260B	05/11/02	JGH	74-83-9	1N
sec-Butylbenzene	1.74	mg/kg	0.05	5035/8260B	05/11/02	JGH	135-98-8	1N
tert-Butylbenzene	1.64	mg/kg	0.05	5035/8260B	05/11/02	JGH	98-06-6	1N
2-Chlorotoluene	1.63	mg/kg	0.05	5035/8260B	05/11/02	JGH	95-49-8	1N
4-Chlorotoluene	1.56	mg/kg	0.05	5035/8260B	05/11/02	JGH	106-43-4	1N
Carbon tetrachloride	1.40	mg/kg	0.05	5035/8260B	05/11/02	JGH	56-23-5	1N
Chlorobenzene	1.51	mg/kg	0.05	5035/8260B	05/11/02	JGH	108-90-7	1N
Chloroethane	0.35	mg/kg	0.05	5035/8260B	05/11/02	JGH	75-00-3	1N
Chloroform	1.65	mg/kg	0.05	5035/8260B	05/11/02	JGH	67-66-3	1N
Chloromethane	1.96	mg/kg	0.05	5035/8260B	05/11/02	JGH	74-87-3	1N
1,1-Dichloroethane	1.58	mg/kg	0.05	5035/8260B	05/11/02	JGH	75-34-3	1N
1,1-Dichloroethene	1.60	mg/kg	0.05	5035/8260B	05/11/02	JGH	75-35-4	1N
1,1-Dichloropropene	1.73	mg/kg	0.05	5035/8260B	05/11/02	JGH	563-58-6	1N
1,2-Dibromo-3-chloropropane	1.08	mg/kg	0.05	5035/8260B	05/11/02	JGH	96-12-8	1N
1,2-Dibromoethane	1.36	mg/kg	0.05	5035/8260B	05/11/02	JGH	106-93-4	1N
1,2-Dichlorobenzene	1.55	mg/kg	0.05	5035/8260B	05/11/02	JGH	95-50-1	1N
1,2-Dichloroethane	1.67	mg/kg	0.05	5035/8260B	05/11/02	JGH	107-06-2	1N
1,2-Dichloropropane	1.56	mg/kg	0.05	5035/8260B	05/11/02	JGH	78-87-5	1N
1,3-Dichlorobenzene	1.44	mg/kg	0.05	5035/8260B	05/11/02	JGH	541-73-1	1N
1,3-Dichloropropane	1.70	mg/kg	0.05	5035/8260B	05/11/02	JGH	142-28-9	1N
1,4-Dichlorobenzene	1.55	mg/kg	0.05	5035/8260B	05/11/02	JGH	106-46-7	1N
2,2-Dichloropropane	1.73	mg/kg	0.05	5035/8260B	05/11/02	JGH	594-20-7	1N
cis-1,2-Dichloroethene	1.68	mg/kg	0.05	5035/8260B	05/11/02	JGH	156-59-2	1N
cis-1,3-Dichloropropene	1.56	mg/kg	0.05	5035/8260B	05/11/02	JGH	10061-01-5	1N
Dibromochloromethane	1.18	mg/kg	0.05	5035/8260B	05/11/02	JGH	124-48-1	1N
Dibromomethane	1.39	mg/kg	0.05	5035/8260B	05/11/02	JGH	74-95-3	1N
Dichlorodifluoromethane	2.21	mg/kg	0.05	5035/8260B	05/11/02	JGH	75-71-8	1N
trans-1,2-Dichloroethene	1.57	mg/kg	0.05	5035/8260B	05/11/02	JGH	156-60-5	1N
Ethylbenzene	1.48	mg/kg	0.05	5035/8260B	05/11/02	JGH	100-41-4	1N
p-Isopropyltoluene	1.76	mg/kg	0.05	5035/8260B	05/11/02	JGH	99-87-6	1N

1-spiked at 25ppb * 50 (dilution factor) N-No correction for total solids.



Analytical Laboratory Report

Revised Report (#)

Lab Sample ID: S09131.04 (continued)

Sample Tag: MS (GB5 14'-15')

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Fla
Organics (continued)								
Volatile Organics (continued)								
Isopropylbenzene	1.59	mg/kg	0.05	5035/8260B	05/11/02	JGH	98-82-8	1N
Methylene chloride	1.6	mg/kg	0.3	5035/8260B	05/11/02	JGH	75-09-2	1N
Naphthalene	1.07	mg/kg	0.05	5035/8260B	05/11/02	JGH	91-20-3	1N
n-Propylbenzene	1.61	mg/kg	0.05	5035/8260B	05/11/02	JGH	103-65-1	1N
Styrene	1.65	mg/kg	0.05	5035/8260B	05/11/02	JGH	100-42-5	1N
1,1,1,2-Tetrachloroethane	1.30	mg/kg	0.05	5035/8260B	05/11/02	JGH	630-20-6	1N
1,1,1-Trichloroethane	1.65	mg/kg	0.05	5035/8260B	05/11/02	JGH	71-55-6	1N
1,1,2,2-Tetrachloroethane	1.39	mg/kg	0.05	5035/8260B	05/11/02	JGH	79-34-5	1N
1,1,2-Trichloroethane	1.63	mg/kg	0.05	5035/8260B	05/11/02	JGH	79-00-5	1N
1,2,3-Trichlorobenzene	0.88	mg/kg	0.05	5035/8260B	05/11/02	JGH	87-61-6	1N
1,2,3-Trichloropropane	1.34	mg/kg	0.05	5035/8260B	05/11/02	JGH	96-18-4	1N
1,2,4-Trichlorobenzene	1.13	mg/kg	0.05	5035/8260B	05/11/02	JGH	120-82-1	1N
1,2,4-Trimethylbenzene	1.51	mg/kg	0.05	5035/8260B	05/11/02	JGH	95-63-6	1N
1,3,5-Trimethylbenzene	1.62	mg/kg	0.05	5035/8260B	05/11/02	JGH	108-67-8	1N
Tetrachloroethene	1.37	mg/kg	0.05	5035/8260B	05/11/02	JGH	127-18-4	1N
Toluene	1.66	mg/kg	0.05	5035/8260B	05/11/02	JGH	108-88-3	1N
Trichloroethene	1.52	mg/kg	0.05	5035/8260B	05/11/02	JGH	79-01-6	1N
Trichlorofluoromethane	1.73	mg/kg	0.05	5035/8260B	05/11/02	JGH	75-69-4	1N
Vinyl chloride	1.88	mg/kg	0.05	5035/8260B	05/11/02	JGH	75-01-4	1N
o-Xylene	1.73	mg/kg	0.05	5035/8260B	05/11/02	JGH	95-47-6	1N
p,m-Xylene	3.38	mg/kg	0.05	5035/8260B	05/11/02	JGH	106-42-3	1N

1-spiked at 25ppb * 50 (dilution factor) N-No correction for total solids.



Analytical Laboratory Report

Revised Report (#2)

Lab Sample ID: S09131.05
 Sample Tag: MSD (GB5) 14'-15'
 Collected Date/Time: 05/10/2002 12:00
 Matrix: Soil
 COC Reference: 007157

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	20g EnCore	None	Yes	4	4025
1	4oz. Glass	None	Yes	4	4025

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Inorganics								
Total Solids	87.3	%	1	160.3	05/13/02	BRP		
Organics								
Volatile Organics								
2-Butanone (MEK)	1.2	mg/kg	0.3	5035/8260B	05/11/02	JGH	78-93-3	1N
Benzene	1.52	mg/kg	0.05	5035/8260B	05/11/02	JGH	71-43-2	1N
n-Butylbenzene	1.73	mg/kg	0.05	5035/8260B	05/11/02	JGH	104-51-8	1N
Bromobenzene	1.22	mg/kg	0.05	5035/8260B	05/11/02	JGH	108-86-1	1N
Bromochloromethane	1.35	mg/kg	0.05	5035/8260B	05/11/02	JGH	74-97-5	1N
Bromodichloromethane	1.23	mg/kg	0.05	5035/8260B	05/11/02	JGH	75-27-4	1N
Bromoform	0.84	mg/kg	0.05	5035/8260B	05/11/02	JGH	75-25-2	1N
Bromomethane	1.1	mg/kg	0.3	5035/8260B	05/11/02	JGH	74-83-9	1N
sec-Butylbenzene	1.70	mg/kg	0.05	5035/8260B	05/11/02	JGH	135-98-8	1N
tert-Butylbenzene	1.57	mg/kg	0.05	5035/8260B	05/11/02	JGH	98-06-6	1N
2-Chlorotoluene	1.50	mg/kg	0.05	5035/8260B	05/11/02	JGH	95-49-8	1N
4-Chlorotoluene	1.49	mg/kg	0.05	5035/8260B	05/11/02	JGH	106-43-4	1N
Carbon tetrachloride	1.36	mg/kg	0.05	5035/8260B	05/11/02	JGH	56-23-5	1N
Chlorobenzene	1.38	mg/kg	0.05	5035/8260B	05/11/02	JGH	108-90-7	1N
Chloroethane	0.35	mg/kg	0.05	5035/8260B	05/11/02	JGH	75-00-3	1N
Chloroform	1.50	mg/kg	0.05	5035/8260B	05/11/02	JGH	67-66-3	1N
Chloromethane	1.82	mg/kg	0.05	5035/8260B	05/11/02	JGH	74-87-3	1N
1,1-Dichloroethane	1.50	mg/kg	0.05	5035/8260B	05/11/02	JGH	75-34-3	1N
1,1-Dichloroethene	1.54	mg/kg	0.05	5035/8260B	05/11/02	JGH	75-35-4	1N
1,1-Dichloropropene	1.65	mg/kg	0.05	5035/8260B	05/11/02	JGH	563-58-6	1N
1,2-Dibromo-3-chloropropane	0.98	mg/kg	0.05	5035/8260B	05/11/02	JGH	96-12-8	1N
1,2-Dibromoethane	1.17	mg/kg	0.05	5035/8260B	05/11/02	JGH	106-93-4	1N
1,2-Dichlorobenzene	1.48	mg/kg	0.05	5035/8260B	05/11/02	JGH	95-50-1	1N
1,2-Dichloroethane	1.48	mg/kg	0.05	5035/8260B	05/11/02	JGH	107-06-2	1N
1,2-Dichloropropane	1.41	mg/kg	0.05	5035/8260B	05/11/02	JGH	78-87-5	1N
1,3-Dichlorobenzene	1.39	mg/kg	0.05	5035/8260B	05/11/02	JGH	541-73-1	1N
1,3-Dichloropropane	1.41	mg/kg	0.05	5035/8260B	05/11/02	JGH	142-28-9	1N
1,4-Dichlorobenzene	1.50	mg/kg	0.05	5035/8260B	05/11/02	JGH	106-46-7	1N
2,2-Dichloropropane	1.62	mg/kg	0.05	5035/8260B	05/11/02	JGH	594-20-7	1N
cis-1,2-Dichloroethene	1.56	mg/kg	0.05	5035/8260B	05/11/02	JGH	156-59-2	1N
cis-1,3-Dichloropropene	1.34	mg/kg	0.05	5035/8260B	05/11/02	JGH	10061-01-5	1N
Dibromochloromethane	0.98	mg/kg	0.05	5035/8260B	05/11/02	JGH	124-48-1	1N
Dibromomethane	1.08	mg/kg	0.05	5035/8260B	05/11/02	JGH	74-95-3	1N
Dichlorodifluoromethane	2.02	mg/kg	0.05	5035/8260B	05/11/02	JGH	75-71-8	1N
trans-1,2-Dichloroethene	1.51	mg/kg	0.05	5035/8260B	05/11/02	JGH	156-60-5	1N
Ethylbenzene	1.41	mg/kg	0.05	5035/8260B	05/11/02	JGH	100-41-4	1N
p-Isopropyltoluene	1.74	mg/kg	0.05	5035/8260B	05/11/02	JGH	99-87-6	1N

1-spiked at 25ppb * 50 (dilution factor) N-No correction for total solids.



Analytical Laboratory Report

Revised Report (#2)

Lab Sample ID: S09131.05 (continued)

Sample Tag: MSD (GB5 14'-15')

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flag
Organics (continued)								
Volatile Organics (continued)								
Isopropylbenzene	1.48	mg/kg	0.05	5035/8260B	05/11/02	JGH	98-82-8	1N
Methylene chloride	1.5	mg/kg	0.3	5035/8260B	05/11/02	JGH	75-09-2	1N
Naphthalene	1.09	mg/kg	0.05	5035/8260B	05/11/02	JGH	91-20-3	1N
n-Propylbenzene	1.51	mg/kg	0.05	5035/8260B	05/11/02	JGH	103-65-1	1N
Styrene	1.52	mg/kg	0.05	5035/8260B	05/11/02	JGH	100-42-5	1N
1,1,1,2-Tetrachloroethane	1.13	mg/kg	0.05	5035/8260B	05/11/02	JGH	630-20-6	1N
1,1,1-Trichloroethane	1.57	mg/kg	0.05	5035/8260B	05/11/02	JGH	71-55-6	1N
1,1,2,2-Tetrachloroethane	1.20	mg/kg	0.05	5035/8260B	05/11/02	JGH	79-34-5	1N
1,1,2-Trichloroethane	1.34	mg/kg	0.05	5035/8260B	05/11/02	JGH	79-00-5	1N
1,2,3-Trichlorobenzene	0.92	mg/kg	0.05	5035/8260B	05/11/02	JGH	87-61-6	1N
1,2,3-Trichloropropane	1.14	mg/kg	0.05	5035/8260B	05/11/02	JGH	96-18-4	1N
1,2,4-Trichlorobenzene	1.10	mg/kg	0.05	5035/8260B	05/11/02	JGH	120-82-1	1N
1,2,4-Trimethylbenzene	1.47	mg/kg	0.05	5035/8260B	05/11/02	JGH	95-63-6	1N
1,3,5-Trimethylbenzene	1.54	mg/kg	0.05	5035/8260B	05/11/02	JGH	108-67-8	1N
Tetrachloroethene	1.32	mg/kg	0.05	5035/8260B	05/11/02	JGH	127-18-4	1N
Toluene	1.53	mg/kg	0.05	5035/8260B	05/11/02	JGH	108-88-3	1N
Trichloroethene	1.40	mg/kg	0.05	5035/8260B	05/11/02	JGH	79-01-6	1N
Trichlorofluoromethane	1.65	mg/kg	0.05	5035/8260B	05/11/02	JGH	75-69-4	1N
Vinyl chloride	1.88	mg/kg	0.05	5035/8260B	05/11/02	JGH	75-01-4	1N
o-Xylene	1.56	mg/kg	0.05	5035/8260B	05/11/02	JGH	95-47-6	1N
p,m-Xylene	3.15	mg/kg	0.05	5035/8260B	05/11/02	JGH	106-42-3	1N

1-spiked at 25ppb * 50 (dilution factor) N-No correction for total solids.



Analytical Laboratory Report

Revised Report (#2)

Lab Sample ID: S09131.06
Sample Tag: GB6 (14'-15')
Collected Date/Time: 05/10/2002 13:00
Matrix: Soil
COC Reference: 007157

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	20g EnCore	None	Yes	4	4025
1	4oz. Glass	None	Yes	4	4025

Analysis

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Inorganics								
Total Solids	86.5	%	1	160.3	05/13/02	BRP		

Organics

Volatile Organics

2-Butanone (MEK)	Not detected	mg/kg	0.3	5035/8260B	05/12/02	JGH	78-93-3	
Benzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	71-43-2	
n-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	104-51-8	
Bromobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	108-86-1	
Bromochloromethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	74-97-5	
Bromodichloromethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-27-4	
Bromoform	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-25-2	
Bromomethane	Not detected	mg/kg	0.3	5035/8260B	05/12/02	JGH	74-83-9	
sec-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	135-98-8	
tert-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	98-06-6	
2-Chlorotoluene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	95-49-8	
4-Chlorotoluene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	106-43-4	
Carbon tetrachloride	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	56-23-5	
Chlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	108-90-7	
Chloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-00-3	
Chloroform	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	67-66-3	
Chloromethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	74-87-3	
1,1-Dichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-34-3	
1,1-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-35-4	
1,1-Dichloropropene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	563-58-6	
1,2-Dibromo-3-chloropropane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	96-12-8	
1,2-Dibromoethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	106-93-4	
1,2-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	95-50-1	
1,2-Dichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	107-06-2	
1,2-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	78-87-5	
1,3-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	541-73-1	
1,3-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	142-28-9	
1,4-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	106-46-7	
2,2-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	594-20-7	
cis-1,2-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	156-59-2	
cis-1,3-Dichloropropene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	10061-01-5	
Dibromochloromethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	124-48-1	
Dibromomethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	74-95-3	
Dichlorodifluoromethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-71-8	
trans-1,2-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	156-60-5	
Ethylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	100-41-4	
p-Isopropyltoluene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	99-87-6	
Isopropylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	98-82-8	



Analytical Laboratory Report

Revised Report (#)

Lab Sample ID: S09131.06 (continued)

Sample Tag: GB6 (14'-15')

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Fla
Organics (continued)								
Volatile Organics (continued)								
Methylene chloride	Not detected	mg/kg	0.3	5035/8260B	05/12/02	JGH	75-09-2	
Naphthalene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	91-20-3	
n-Propylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	103-65-1	
Styrene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	630-20-6	
1,1,1-Trichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	79-34-5	
1,1,2-Trichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	79-00-5	
1,2,3-Trichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	87-61-6	
1,2,3-Trichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	96-18-4	
1,2,4-Trichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	120-82-1	
1,2,4-Trimethylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	95-63-6	
1,3,5-Trimethylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	108-67-8	
Tetrachloroethene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	127-18-4	
Toluene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	108-88-3	
Trichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	79-01-6	
Trichlorofluoromethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-69-4	
Vinyl chloride	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-01-4	
o-Xylene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	95-47-6	
p,m-Xylene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	106-42-3	



Analytical Laboratory Report

Revised Report (#2)

Lab Sample ID: S09131.07
 Sample Tag: GB6 (19'-20')
 Collected Date/Time: 05/10/2002 13:15
 Matrix: Soil
 COC Reference: 007157

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	20g EnCore	None	Yes	4	4025
1	4oz. Glass	None	Yes	4	4025

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Inorganics								
Total Solids	86.1	%	1	160.3	05/13/02	BRP		
Organics								
Volatile Organics								
2-Butanone (MEK)	Not detected	mg/kg	0.3	5035/8260B	05/12/02	JGH	78-93-3	
Benzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	71-43-2	
n-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	104-51-8	
Bromobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	108-86-1	
Bromochloromethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	74-97-5	
Bromodichloromethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-27-4	
Bromoform	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-25-2	
Bromomethane	Not detected	mg/kg	0.3	5035/8260B	05/12/02	JGH	74-83-9	
sec-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	135-98-8	
tert-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	98-06-6	
2-Chlorotoluene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	95-49-8	
4-Chlorotoluene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	106-43-4	
Carbon tetrachloride	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	56-23-5	
Chlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	108-90-7	
Chloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-00-3	
Chloroform	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	67-66-3	
Chloromethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	74-87-3	
1,1-Dichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-34-3	
1,1-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-35-4	
1,1-Dichloropropene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	563-58-6	
1,2-Dibromo-3-chloropropane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	96-12-8	
1,2-Dibromoethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	106-93-4	
1,2-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	95-50-1	
1,2-Dichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	107-06-2	
1,2-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	78-87-5	
1,3-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	541-73-1	
1,3-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	142-28-9	
1,4-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	106-46-7	
2,2-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	594-20-7	
cis-1,2-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	156-59-2	
cis-1,3-Dichloropropene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	10061-01-5	
Dibromochloromethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	124-48-1	
Dibromomethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	74-95-3	
Dichlorodifluoromethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-71-8	
trans-1,2-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	156-60-5	
Ethylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	100-41-4	
p-Isopropyltoluene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	99-87-6	
Isopropylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	98-82-8	



Analytical Laboratory Report

Revised Report (#2)

Lab Sample ID: S09131.07 (continued)

Sample Tag: GB6 (19'-20')

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flag
Organics (continued)								
Volatile Organics (continued)								
Methylene chloride	Not detected	mg/kg	0.3	5035/8260B	05/12/02	JGH	75-09-2	
Naphthalene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	91-20-3	
n-Propylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	103-65-1	
Styrene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	630-20-6	
1,1,1-Trichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	79-34-5	
1,1,2-Trichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	79-00-5	
1,2,3-Trichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	87-61-6	
1,2,3-Trichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	96-18-4	
1,2,4-Trichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	120-82-1	
1,2,4-Trimethylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	95-63-6	
1,3,5-Trimethylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	108-67-8	
Tetrachloroethene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	127-18-4	
Toluene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	108-88-3	
Trichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	79-01-6	
Trichlorofluoromethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-69-4	
Vinyl chloride	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-01-4	
o-Xylene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	95-47-6	
p,m-Xylene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	106-42-3	



Analytical Laboratory Report

Revised Report (#2)

Lab Sample ID: S09131.08
Sample Tag: GB7 (14'-15')
Collected Date/Time: 05/10/2002 14:00
Matrix: Soil
COC Reference: 007157

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	20g EnCore	None	Yes	4	4025
1	4oz. Glass	None	Yes	4	4025

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Extraction / Prep.								
Acid Rain Zero Headspace Extract	Completed			1312	05/17/02	ARH		
Acid Rain Zero Headspace Extract (Replicate 01)	Completed			1312	05/22/02	ARH		

Inorganics

Total Solids	85.2	%	1	160.3	05/13/02	BRP		
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Organics

Trichloroethene	0.019	mg/L	0.001	8260B	05/23/02	JGH	79-01-6	
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Volatile Organics

2-Butanone (MEK)	Not detected	mg/kg	0.3	5035/8260B	05/12/02	JGH	78-93-3	
Benzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	71-43-2	
n-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	104-51-8	
Bromobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	108-86-1	
Bromochloromethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	74-97-5	
Bromodichloromethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-27-4	
Bromoform	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-25-2	
Bromomethane	Not detected	mg/kg	0.3	5035/8260B	05/12/02	JGH	74-83-9	
sec-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	135-98-8	
tert-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	98-06-6	
2-Chlorotoluene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	95-49-8	
4-Chlorotoluene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	106-43-4	
Carbon tetrachloride	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	56-23-5	
Chlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	108-90-7	
Chloroethane <i>UJ</i>	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-00-3	
Chloroform	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	67-66-3	
Chloromethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	74-87-3	
1,1-Dichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-34-3	
1,1-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-35-4	
1,1-Dichloropropene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	563-58-6	
1,2-Dibromo-3-chloropropane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	96-12-8	
1,2-Dibromoethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	106-93-4	
1,2-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	95-50-1	
1,2-Dichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	107-06-2	
1,2-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	78-87-5	
1,3-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	541-73-1	
1,3-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	142-28-9	
1,4-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	106-46-7	
2,2-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	594-20-7	
cis-1,2-Dichloroethene	0.30	mg/kg	0.06	5035/8260B	05/12/02	JGH	156-59-2	
cis-1,3-Dichloropropene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	10061-01-5	
Dibromochloromethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	124-48-1	



Analytical Laboratory Report

Revised Report (#2)

Lab Sample ID: S09131.08 (continued)

Sample Tag: GB7 (14'-15')

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flag
Organics (continued)								
Volatile Organics (continued)								
Dibromomethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	74-95-3	
Dichlorodifluoromethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-71-8	
trans-1,2-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	156-60-5	
Ethylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	100-41-4	
p-Isopropyltoluene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	99-87-6	
Isopropylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	98-82-8	
Methylene chloride	Not detected	mg/kg	0.3	5035/8260B	05/12/02	JGH	75-09-2	
Naphthalene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	91-20-3	
n-Propylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	103-65-1	
Styrene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	630-20-6	
1,1,1-Trichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	79-34-5	
1,1,2-Trichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	79-00-5	
1,2,3-Trichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	87-61-6	
1,2,3-Trichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	96-18-4	
1,2,4-Trichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	120-82-1	
1,2,4-Trimethylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	95-63-6	
1,3,5-Trimethylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	108-67-8	
Tetrachloroethene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	127-18-4	
Toluene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	108-88-3	
Trichloroethene	1.51	mg/kg	0.06	5035/8260B	05/12/02	JGH	79-01-6	
Trichlorofluoromethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-69-4	
Vinyl chloride	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-01-4	
o-Xylene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	95-47-6	
p,m-Xylene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	106-42-3	
Volatile Organics (Replicate 01)								
2-Butanone (MEK)	Not detected	mg/kg	0.3	5035/8260B	05/13/02	JGH	78-93-3	
Benzene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	71-43-2	
n-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	104-51-8	
Bromobenzene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	108-86-1	
Bromochloromethane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	74-97-5	
Bromodichloromethane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	75-27-4	
Bromoform	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	75-25-2	
Bromomethane	Not detected	mg/kg	0.3	5035/8260B	05/13/02	JGH	74-83-9	
sec-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	135-98-8	
tert-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	98-06-6	
2-Chlorotoluene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	95-49-8	
4-Chlorotoluene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	106-43-4	
Carbon tetrachloride	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	56-23-5	
Chlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	108-90-7	
Chloroethane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	75-00-3	
Chloroform	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	67-66-3	
Chloromethane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	74-87-3	
1,1-Dichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	75-34-3	
1,1-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	75-35-4	
1,1-Dichloropropene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	563-58-6	
1,2-Dibromo-3-chloropropane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	96-12-8	



Analytical Laboratory Report

Revised Report (#2)

Lab Sample ID: S09131.08 (continued)

Sample Tag: GB7 (14'-15')

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Organics (continued)								
Volatile Organics (Replicate 01) (continued)								
1,2-Dibromoethane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	106-93-4	
1,2-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	95-50-1	
1,2-Dichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	107-06-2	
1,2-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	78-87-5	
1,3-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	541-73-1	
1,3-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	142-28-9	
1,4-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	106-46-7	
2,2-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	594-20-7	
cis-1,2-Dichloroethene	0.37	mg/kg	0.06	5035/8260B	05/13/02	JGH	156-59-2	
cis-1,3-Dichloropropene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	10061-01-5	
Dibromochloromethane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	124-48-1	
Dibromomethane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	74-95-3	
Dichlorodifluoromethane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	75-71-8	
trans-1,2-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	156-60-5	
Ethylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	100-41-4	
p-Isopropyltoluene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	99-87-6	
Isopropylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	98-82-8	
Methylene chloride	Not detected	mg/kg	0.3	5035/8260B	05/13/02	JGH	75-09-2	
Naphthalene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	91-20-3	
n-Propylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	103-65-1	
Styrene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	630-20-6	
1,1,1-Trichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	79-34-5	
1,1,2-Trichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	79-00-5	
1,2,3-Trichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	87-61-6	
1,2,3-Trichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	96-18-4	
1,2,4-Trichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	120-82-1	
1,2,4-Trimethylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	95-63-6	
1,3,5-Trimethylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	108-67-8	
Tetrachloroethene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	127-18-4	
Toluene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	108-88-3	
Trichloroethene	1.95	mg/kg	0.06	5035/8260B	05/13/02	JGH	79-01-6	
Trichlorofluoromethane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	75-69-4	
Vinyl chloride	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	75-01-4	
o-Xylene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	95-47-6	
p,m-Xylene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	106-42-3	



Analytical Laboratory Report

Revised Report (#

Lab Sample ID: S09131.09
Sample Tag: GB7 (19'-20')
Collected Date/Time: 05/10/2002 14:15
Matrix: Soil
COC Reference: 007157

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	20g EnCore	None	Yes	4	4025
1	4oz. Glass	None	Yes	4	4025

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Inorganics								
Total Solids	88.2	%	1	160.3	05/13/02	BRP		
Organics								
Volatile Organics								
2-Butanone (MEK)	Not detected	mg/kg	0.3	5035/8260B	05/12/02	JGH	78-93-3	
Benzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	71-43-2	
n-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	104-51-8	
Bromobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	108-86-1	
Bromochloromethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	74-97-5	
Bromodichloromethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-27-4	
Bromoform	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-25-2	
Bromomethane	Not detected	mg/kg	0.3	5035/8260B	05/12/02	JGH	74-83-9	
sec-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	135-98-8	
tert-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	98-06-6	
2-Chlorotoluene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	95-49-8	
4-Chlorotoluene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	106-43-4	
Carbon tetrachloride	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	56-23-5	
Chlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	108-90-7	
Chloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-00-3	
Chloroform	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	67-66-3	
Chloromethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	74-87-3	
1,1-Dichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-34-3	
1,1-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-35-4	
1,1-Dichloropropene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	563-58-6	
1,2-Dibromo-3-chloropropane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	96-12-8	
1,2-Dibromoethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	106-93-4	
1,2-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	95-50-1	
1,2-Dichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	107-06-2	
1,2-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	78-87-5	
1,3-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	541-73-1	
1,3-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	142-28-9	
1,4-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	106-46-7	
2,2-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	594-20-7	
cis-1,2-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	156-59-2	
cis-1,3-Dichloropropene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	10061-01-5	
Dibromochloromethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	124-48-1	
Dibromomethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	74-95-3	
Dichlorodifluoromethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-71-8	
trans-1,2-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	156-60-5	
Ethylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	100-41-4	
p-Isopropyltoluene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	99-87-6	
Isopropylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	98-82-8	



Analytical Laboratory Report

Revised Report (#2)

Lab Sample ID: S09131.09 (continued)

Sample Tag: GB7 (19'-20')

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Organics (continued)								
Volatile Organics (continued)								
Methylene chloride	Not detected	mg/kg	0.3	5035/8260B	05/12/02	JGH	75-09-2	
Naphthalene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	91-20-3	
n-Propylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	103-65-1	
Styrene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	630-20-6	
1,1,1-Trichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	79-34-5	
1,1,2-Trichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	79-00-5	
1,2,3-Trichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	87-61-6	
1,2,3-Trichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	96-18-4	
1,2,4-Trichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	120-82-1	
1,2,4-Trimethylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	95-63-6	
1,3,5-Trimethylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	108-67-8	
Tetrachloroethene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	127-18-4	
Toluene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	108-88-3	
Trichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	79-01-6	
Trichlorofluoromethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-69-4	
Vinyl chloride	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-01-4	
o-Xylene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	95-47-6	
p,m-Xylene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	106-42-3	
Volatile Organics (Replicate 01)								
2-Butanone (MEK)	Not detected	mg/kg	0.3	5035/8260B	05/13/02	JGH	78-93-3	
Benzene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	71-43-2	
n-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	104-51-8	
Bromobenzene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	108-86-1	
Bromochloromethane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	74-97-5	
Bromodichloromethane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	75-27-4	
Bromoform	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	75-25-2	
Bromomethane	Not detected	mg/kg	0.3	5035/8260B	05/13/02	JGH	74-83-9	
sec-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	135-98-8	
tert-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	98-06-6	
2-Chlorotoluene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	95-49-8	
4-Chlorotoluene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	106-43-4	
Carbon tetrachloride	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	56-23-5	
Chlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	108-90-7	
Chloroethane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	75-00-3	
Chloroform	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	67-66-3	
Chloromethane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	74-87-3	
1,1-Dichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	75-34-3	
1,1-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	75-35-4	
1,1-Dichloropropene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	563-58-6	
1,2-Dibromo-3-chloropropane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	96-12-8	
1,2-Dibromoethane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	106-93-4	
1,2-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	95-50-1	
1,2-Dichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	107-06-2	
1,2-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	78-87-5	
1,3-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	541-73-1	
1,3-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	142-28-9	



Analytical Laboratory Report

Revised Report (#

Lab Sample ID: S09131.09 (continued)

Sample Tag: GB7 (19'-20')

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Fla
Organics (continued)								
Volatile Organics (Replicate 01) (continued)								
1,4-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	106-46-7	
2,2-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	594-20-7	
cis-1,2-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	156-59-2	
cis-1,3-Dichloropropene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	10061-01-5	
Dibromochloromethane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	124-48-1	
Dibromomethane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	74-95-3	
Dichlorodifluoromethane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	75-71-8	
trans-1,2-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	156-60-5	
Ethylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	100-41-4	
p-Isopropyltoluene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	99-87-6	
Isopropylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	98-82-8	
Methylene chloride	Not detected	mg/kg	0.3	5035/8260B	05/13/02	JGH	75-09-2	
Naphthalene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	91-20-3	
n-Propylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	103-65-1	
Styrene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	630-20-6	
1,1,1-Trichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	79-34-5	
1,1,2-Trichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	79-00-5	
1,2,3-Trichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	87-61-6	
1,2,3-Trichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	96-18-4	
1,2,4-Trichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	120-82-1	
1,2,4-Trimethylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	95-63-6	
1,3,5-Trimethylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	108-67-8	
Tetrachloroethene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	127-18-4	
Toluene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	108-88-3	
Trichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	79-01-6	
Trichlorofluoromethane	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	75-69-4	
Vinyl chloride	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	75-01-4	
o-Xylene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	95-47-6	
p,m-Xylene	Not detected	mg/kg	0.06	5035/8260B	05/13/02	JGH	106-42-3	



Analytical Laboratory Report

Revised Report (#2)

Lab Sample ID: S09131.10
 Sample Tag: Dup
 Collected Date/Time: 05/10/2002 :
 Matrix: Soil
 COC Reference: 007157

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	20g EnCore	None	Yes	4	4025
1	4oz. Glass	None	Yes	4	4025

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Inorganics								
Total Solids	86.8	%	1	160.3	05/13/02	BRP		
Organics								
Volatile Organics								
2-Butanone (MEK)	Not detected	mg/kg	0.3	5035/8260B	05/12/02	JGH	78-93-3	
Benzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	71-43-2	
n-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	104-51-8	
Bromobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	108-86-1	
Bromochloromethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	74-97-5	
Bromodichloromethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-27-4	
Bromoform	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-25-2	
Bromomethane	Not detected	mg/kg	0.3	5035/8260B	05/12/02	JGH	74-83-9	
sec-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	135-98-8	
tert-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	98-06-6	
2-Chlorotoluene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	95-49-8	
4-Chlorotoluene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	106-43-4	
Carbon tetrachloride	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	56-23-5	
Chlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	108-90-7	
Chloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-00-3	
Chloroform	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	67-66-3	
Chloromethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	74-87-3	
1,1-Dichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-34-3	
1,1-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-35-4	
1,1-Dichloropropene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	563-58-6	
1,2-Dibromo-3-chloropropane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	96-12-8	
1,2-Dibromoethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	106-93-4	
1,2-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	95-50-1	
1,2-Dichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	107-06-2	
1,2-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	78-87-5	
1,3-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	541-73-1	
1,3-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	142-28-9	
1,4-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	106-46-7	
2,2-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	594-20-7	
cis-1,2-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	156-59-2	
cis-1,3-Dichloropropene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	10061-01-5	
Dibromochloromethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	124-48-1	
Dibromomethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	74-95-3	
Dichlorodifluoromethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-71-8	
trans-1,2-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	156-60-5	
Ethylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	100-41-4	
p-Isopropyltoluene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	99-87-6	
Isopropylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	98-82-8	



Analytical Laboratory Report

Revised Report (#2)

Lab Sample ID: S09131.10 (continued)

Sample Tag: Dup

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flag
Organics (continued)								
Volatile Organics (continued)								
Methylene chloride	Not detected	mg/kg	0.3	5035/8260B	05/12/02	JGH	75-09-2	
Naphthalene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	91-20-3	
n-Propylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	103-65-1	
Styrene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	630-20-6	
1,1,1-Trichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	79-34-5	
1,1,2-Trichloroethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	79-00-5	
1,2,3-Trichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	87-61-6	
1,2,3-Trichloropropane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	96-18-4	
1,2,4-Trichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	120-82-1	
1,2,4-Trimethylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	95-63-6	
1,3,5-Trimethylbenzene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	108-67-8	
Tetrachloroethene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	127-18-4	
Toluene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	108-88-3	
Trichloroethene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	79-01-6	
Trichlorofluoromethane	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-69-4	
Vinyl chloride	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	75-01-4	
o-Xylene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	95-47-6	
p,m-Xylene	Not detected	mg/kg	0.06	5035/8260B	05/12/02	JGH	106-42-3	



Analytical Laboratory Report

Revised Report (#2)

Lab Sample ID: S09131.11
Sample Tag: Trip Blank
Collected Date/Time: 05/06/2002 :
Matrix: Liquid
COC Reference: 007157

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40 ml Glass	HCL	Yes	4	4025

Handwritten signature

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Organics								
Volatile Organics								
2-Butanone (MEK)	Not detected	mg/L	0.05	8260B	05/12/02	JGH	78-93-3	
Benzene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	71-43-2	
n-Butylbenzene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	104-51-8	
Bromobenzene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	108-86-1	
Bromochloromethane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	74-97-5	
Bromodichloromethane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	75-27-4	
Bromoform	Not detected	mg/L	0.001	8260B	05/12/02	JGH	75-25-2	
Bromomethane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	74-83-9	
sec-Butylbenzene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	135-98-8	
tert-Butylbenzene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	98-06-6	
2-Chlorotoluene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	95-49-8	
4-Chlorotoluene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	106-43-4	
Carbon tetrachloride	Not detected	mg/L	0.001	8260B	05/12/02	JGH	56-23-5	
Chlorobenzene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	108-90-7	
Chloroethane <i>WJ</i>	Not detected	mg/L	0.001	8260B	05/12/02	JGH	75-00-3	
Chloroform	Not detected	mg/L	0.001	8260B	05/12/02	JGH	67-66-3	
Chloromethane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	74-87-3	
1,1-Dichloroethane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	75-34-3	
1,1-Dichloroethene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	75-35-4	
1,1-Dichloropropene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	563-58-6	
1,2-Dibromo-3-chloropropane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	96-12-8	
1,2-Dibromoethane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	106-93-4	
1,2-Dichlorobenzene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	95-50-1	
1,2-Dichloroethane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	107-06-2	
1,2-Dichloropropane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	78-87-5	
1,3-Dichlorobenzene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	541-73-1	
1,3-Dichloropropane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	142-28-9	
1,4-Dichlorobenzene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	106-46-7	
2,2-Dichloropropane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	594-20-7	
cis-1,2-Dichloroethene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	156-59-2	
cis-1,3-Dichloropropene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	10061-01-5	
Dibromochloromethane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	124-48-1	
Dibromomethane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	74-95-3	
Dichlorodifluoromethane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	75-71-8	
trans-1,2-Dichloroethene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	156-60-5	
Ethylbenzene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	100-41-4	
p-Isopropyltoluene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	99-87-6	
Isopropylbenzene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	98-82-8	
Methylene chloride	Not detected	mg/L	0.005	8260B	05/12/02	JGH	75-09-2	
Naphthalene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	91-20-3	
n-Propylbenzene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	103-65-1	
Styrene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	100-42-5	



Analytical Laboratory Report

Revised Report (#

Lab Sample ID: S09131.11 (continued)

Sample Tag: Trip Blank

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Fla
Organics (continued)								
Volatile Organics (continued)								
1,1,1,2-Tetrachloroethane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	630-20-6	
1,1,1-Trichloroethane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	79-34-5	
1,1,2-Trichloroethane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	79-00-5	
1,2,3-Trichlorobenzene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	87-61-6	
1,2,3-Trichloropropane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	96-18-4	
1,2,4-Trichlorobenzene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	120-82-1	
1,2,4-Trimethylbenzene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	95-63-6	
1,3,5-Trimethylbenzene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	108-67-8	
Tetrachloroethene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	127-18-4	
Toluene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	108-88-3	
Trichloroethene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	79-01-6	
Trichlorofluoromethane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	75-69-4	
Vinyl chloride	Not detected	mg/L	0.001	8260B	05/12/02	JGH	75-01-4	
o-Xylene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	95-47-6	
p,m-Xylene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	106-42-3	



Analytical Laboratory Report

Revised Report (#2)

Lab Sample ID: S09131.12
Sample Tag: EB
Collected Date/Time: 05/10/2002 14:30
Matrix: Liquid
COC Reference: 007157

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40 ml Glass	HCL	Yes	4	4025

Handwritten signature

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Organics								
Volatile Organics								
2-Butanone (MEK)	Not detected	mg/L	0.05	8260B	05/12/02	JGH	78-93-3	
Benzene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	71-43-2	
n-Butylbenzene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	104-51-8	
Bromobenzene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	108-86-1	
Bromochloromethane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	74-97-5	
Bromodichloromethane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	75-27-4	
Bromoform	Not detected	mg/L	0.001	8260B	05/12/02	JGH	75-25-2	
Bromomethane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	74-83-9	
sec-Butylbenzene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	135-98-8	
tert-Butylbenzene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	98-06-6	
2-Chlorotoluene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	95-49-8	
4-Chlorotoluene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	106-43-4	
Carbon tetrachloride	Not detected	mg/L	0.001	8260B	05/12/02	JGH	56-23-5	
Chlorobenzene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	108-90-7	
Chloroethane <i>W</i>	Not detected	mg/L	0.001	8260B	05/12/02	JGH	75-00-3	
Chloroform	Not detected	mg/L	0.001	8260B	05/12/02	JGH	67-66-3	
Chloromethane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	74-87-3	
1,1-Dichloroethane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	75-34-3	
1,1-Dichloroethene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	75-35-4	
1,1-Dichloropropene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	563-58-6	
1,2-Dibromo-3-chloropropane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	96-12-8	
1,2-Dibromoethane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	106-93-4	
1,2-Dichlorobenzene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	95-50-1	
1,2-Dichloroethane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	107-06-2	
1,2-Dichloropropane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	78-87-5	
1,3-Dichlorobenzene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	541-73-1	
1,3-Dichloropropane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	142-28-9	
1,4-Dichlorobenzene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	106-46-7	
2,2-Dichloropropane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	594-20-7	
cis-1,2-Dichloroethene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	156-59-2	
cis-1,3-Dichloropropene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	10061-01-5	
Dibromochloromethane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	124-48-1	
Dibromomethane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	74-95-3	
Dichlorodifluoromethane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	75-71-8	
trans-1,2-Dichloroethene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	156-60-5	
Ethylbenzene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	100-41-4	
p-Isopropyltoluene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	99-87-6	
Isopropylbenzene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	98-82-8	
Methylene chloride	Not detected	mg/L	0.005	8260B	05/12/02	JGH	75-09-2	
Naphthalene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	91-20-3	
n-Propylbenzene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	103-65-1	
Styrene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	100-42-5	



Analytical Laboratory Report

Revised Report (#)

Lab Sample ID: S09131.12 (continued)

Sample Tag: EB

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	File
Organics (continued)								
Volatile Organics (continued)								
1,1,1,2-Tetrachloroethane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	630-20-6	
1,1,1-Trichloroethane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	71-55-6	
1,1,2-Tetrachloroethane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	79-34-5	
1,1,2-Trichloroethane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	79-00-5	
1,2,3-Trichlorobenzene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	87-61-6	
1,2,3-Trichloropropane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	96-18-4	
1,2,4-Trichlorobenzene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	120-82-1	
1,2,4-Trimethylbenzene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	95-63-6	
1,3,5-Trimethylbenzene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	108-67-8	
Tetrachloroethene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	127-18-4	
Toluene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	108-88-3	
Trichloroethene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	79-01-6	
Trichlorofluoromethane	Not detected	mg/L	0.001	8260B	05/12/02	JGH	75-69-4	
Vinyl chloride	Not detected	mg/L	0.001	8260B	05/12/02	JGH	75-01-4	
o-Xylene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	95-47-6	
p,m-Xylene	Not detected	mg/L	0.001	8260B	05/12/02	JGH	106-42-3	

**Data Validation Report for
May 23, 2002 SPLP Analysis**

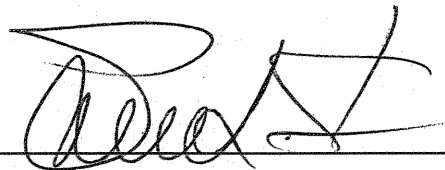
DATA VALIDATION REPORT

**Former Drum Storage Area
at the Former Peregrine, U.S. Inc.
Property at the Coldwater Road
Facility G-1245 East Coldwater Road
Flint, Michigan
(EPA I.D. No. MIR 000 020 743)**

September 2002

DATA VALIDATION REPORT

Spoil SPLP Sample Collected May 2002
Former Drum Storage Area at the Former Peregrine U.S., Inc.
Property at the Coldwater Road Facility Flint, Michigan
(EPA I.D. No. MIR 000 020 743)



Swiatoslav W. Kaczmar, Ph.D., C.I.H.
Vice President, Environmental Toxicology
and Industrial Hygiene

September 2002



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A USEPA Method 8260B sample result for trichloroethene

Executive summary

This data validation report addresses data quality for one soil sample collected from the former Drum Storage Area at the Remediation and Liability Management Company, Inc. (REALM) Coldwater Road Facility, 1245 Coldwater Road, Flint, Michigan (formerly the Peregrine, U.S., Inc. property). Sample collection activities were conducted by O'Brien & Gere Engineers, Inc. (O'Brien & Gere) on 5/10/02.

The environmental sample collected for this investigation was submitted to Merit Laboratories, Inc. of East Lansing, Michigan for preparation by synthetic precipitation leaching procedure (SPLP) and consequent analysis for trichloroethene using United States Environmental Protection Agency (USEPA) Methods. The analytical data generated for this investigation were evaluated by O'Brien & Gere using the quality assurance/quality control (QA/QC) criteria established in the following documents:

- United States Environmental Protection Agency (USEPA) Methods
- Coldwater Road Facility Remedial Investigation, REALM, Quality Assurance Project Plan (QAPP) (O'Brien & Gere 2000).
- Remedial Investigation Coldwater Road Facility, REALM, Quality Assurance Project Plan (QAPP) Addendum (O'Brien & Gere 2002).

Excursions from the QA/QC criteria were qualified based on guidance provided in the following document:

- United States Environmental Protection Agency (USEPA) Contract Laboratory Program (CLP) National Functional Guidelines For Organic Data Review, EPA-540/R-96/008 (USEPA 1999).

As a result of the data validation process the trichloroethene data for the soil sample analyzed was determined to be 100% usable for qualitative and quantitative purposes.

The first section of the report discusses the background information regarding the REALM project and the specific location of the Coldwater road. It provides a general overview of the project's goals and objectives, as well as the scope of the investigation.

The second section of the report details the methodology used for the investigation. This includes a description of the data collection methods, the analysis techniques employed, and the criteria used to evaluate the results. The authors explain how they ensured the accuracy and reliability of the data.

The third section of the report presents the findings of the investigation. This section includes a detailed analysis of the data collected, highlighting the key results and trends. The authors discuss the implications of these findings and how they relate to the project's objectives.

The fourth section of the report discusses the conclusions drawn from the investigation. This section summarizes the main findings and provides recommendations for future research and action. The authors also discuss the limitations of the study and the potential for further investigation.

The fifth section of the report provides a summary of the report's contents. This section includes a list of the key findings and conclusions, as well as a list of the references cited in the report. The authors also provide a list of the appendices and a list of the figures and tables included in the report.

The sixth section of the report provides a list of the references cited in the report. This section includes a list of the books, articles, and other sources used in the report. The authors provide a list of the references in a standard format, making it easy for readers to locate the sources.

1. Introduction

1.1. Program summary

This data validation report addresses the results of a data quality evaluation for one soil sample collected from the former Drum Storage Area at the Remediation and Liability Management Company, Inc. (REALM) Coldwater Road Facility, 1245 Coldwater Road, Flint, Michigan (formerly the Peregrine, U.S., Inc. property). Sample collection activities were conducted by O'Brien & Gere Engineers, Inc. (O'Brien & Gere) on 5/10/02. The environmental sample collected for this investigation was submitted to Merit Laboratories, Inc. of East Lansing, Michigan for analysis of trichloroethene using United States Environmental Protection Agency (USEPA) Methods listed in Table 1-2. The sample that was submitted for data validation is presented in Table 1-1 below.

Table 1-1. Sample cross reference list

Laboratory Package ID	Date Collected	Sample Identification		Analysis Requested	Reference
		Client ID	Laboratory ID		
S09131	5/10/02	GB-7 (14'-15')	S09131.08	Trichloroethene by SPLP	1

Reference:
1- USEPA. 1996. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846*, 3rd Edition. Washington D.C.

1.2. Data validation protocols

Validation is a process of determining the suitability of a measurement system for providing useful analytical data. Data validation is essentially a three-step process in which the analytical data's quality assurance/quality control (QA/QC) information is first compared to a series of QA/QC criteria. Based on the results of this comparison, the analytical data are then assigned qualifiers, which provide an indication of the data's usability. Finally, an overall evaluation of the data's usability is performed. These three steps are described in the following sections.

1.2.1. Comparison to QA/QC criteria

In this report, the analytical data's QA/QC information is compared to the applicable QA/QC criteria provided in the following documents:

- USEPA. 1996. Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW-846), 3rd Edition. Washington DC.
- O'Brien & Gere Engineers, Inc. 1999. Coldwater Road Facility Remedial Investigation, REALM, Quality Assurance Project Plan (QAPP), Syracuse, New York.
- O'Brien & Gere Engineers, Inc. 2002. Remedial Investigation Coldwater Road Facility, REALM, Quality Assurance Project Plan (QAPP) Addendum, Syracuse, New York.

Full data validation was performed on the soil sample data. Full data validation consists of a review of data summary forms and raw analytical data that were provided in the data packages. The following QA/QC information was included in the review for trichloroethene analyses:

- Chain-of-custody records
- Holding times and sample preservation
- Calibrations
- Blank analysis
- Matrix spike/matrix spike duplicate (MS/MSD) analysis
- Laboratory control sample (LCS) analysis
- Field duplicate analysis
- Surrogate recovery
- Internal standards performance
- Gas chromatography/mass spectrometry (GC/MS) instrument performance check
- Target analyte quantitation, identification, and reported detection limits
- System performance
- Documentation completeness, and
- Overall data assessment.

1.2.2. Assignment of qualifiers

Excursions from the QA/QC criteria were qualified based on guidance provided in the following document:

- USEPA 1999. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA-540/R-94/012. Washington D.C.

In accordance with the USEPA guidance, the following qualifiers are used in data validation:

- J Indicates that the analyte concentration should be considered approximate. This qualifier is used when the data validation process identifies a minor deficiency in the data generation process.
- UJ Indicates that the analyte reporting limit should be considered approximate. This qualifier is used when the data validation process identifies a minor deficiency in the data generation process.

The following guidelines are used regarding the assignment of qualifiers and the use of qualified data:

The data quality evaluation results in only one qualifier for each analyte; in a case when several qualifiers are applicable to the same analyte, the cumulative effect of the various QA/QC excursions is employed in assigning the final data qualifiers.

QA/QC excursions which do not result in the qualification of an analyte, or which result in additional qualification if the analyte was previously qualified, are not discussed.

The quantitative use of approximated analytical data is consistent with the guidance presented in the USEPA Risk Assessment Guidance for Superfund (USEPA 1992).

1.2.3. Data usability evaluation

Based on the QA/QC information review and the qualifiers assigned to the analytical data, an overall evaluation of the data's usability is performed. This evaluation considers the data parameters of precision, sensitivity, accuracy, representativeness, comparability, and completeness (known as PSARCC parameters), which are described as follows:

- Precision is evaluated through the review of field duplicate samples and MS/MSD samples.
- Sensitivity is evaluated through the review of reported detection limits.
- Accuracy is evaluated through the review of MS/MSD samples, internal standards, surrogate recoveries, LCS recoveries, calibration, and instrument performance check.
- Representativeness is evaluated through the review of holding times, sample preservation and preparation, blank analysis and target compound identification and quantification.

- Comparability is evaluated through the review of the analytical methods and reporting procedures for consistency.
- Completeness is defined as the percentage of sample results that are determined to be usable.

1.2.4. Analytical methods

The soil sample collected for this investigation was analyzed by Merit Laboratories, Inc. (Merit Labs) of East Lansing, Michigan for trichloroethene using the methods presented in Table 1-2.

Table 1-2. Analytical method reference

Parameter	Method	Reference
Trichloroethene	USEPA Methods 1312/5030B/8260B	1

Note:

1. USEPA. 1996 *Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW-846)*, 3rd Edition. Washington DC.

The following chapters of this document address distinct aspects of the validation process. Specific QA/QC issues are discussed in Section 2. Data completeness and usability are discussed in Section 3.

The annotated analytical results generated by this validation are presented in Appendix A.

2. Data quality evaluation

2.1. Soil sample

2.1.1. Documentation completeness

Encore® samplers were used to collect the soil sample during this sampling event.

The following data package information was requested and received during the validation process since the data packages were incomplete:

- The evaluation of the target analyte for the calibrations
- Initial calibration curves
- Bar graph spectra for instrument performance checks
- Explanation of the spike traceability information

2.1.2. Trichloroethene analyses of SPLP soil sample by GC/MS

Criteria compliance

The following QA/QC parameters met validation criteria or did not result in additional qualification of sample results:

- Chain-of-custody records
- Holding times and sample preservation
- Calibrations
- Blank analysis
- MS/MSD analysis
- LCS analysis
- Field duplicate analysis
- Surrogate recovery
- Internal standards performance
- GC/MS instrument performance check
- Target analyte quantitation, identification, and reported detection limits
- System performance

Excursions from QA/QC criteria presented in Section 1.2 were not detected in the data presented for this sample. Therefore, qualification of sample data was not required.

3. Summary and data usability

This chapter summarizes the analytical data in terms of its completeness and usability. Data completeness is defined as the percentage of sample results that have been determined to be usable during the data validation process.

The soil sample collected from the former Drum Storage Area at the REALM Coldwater Road Facility, was evaluated based on QA/QC criteria established by USEPA Methods as listed in Section 1.2, the QAPP (O'Brien & Gere 2002), and the USEPA National Functional data validation guidelines. Major deficiencies in the data generation process would have resulted in data being rejected, indicating that the data is considered unusable for either quantitative or qualitative purposes. Minor deficiencies in the data generation process would have resulted in some sample data being characterized as approximate.

A discussion of the data quality with regard to the parameters follows:

Precision: Data usability with respect to precision is 100 percent for volatile organic compound soil data.

For the soil sample, none of the data were rejected for precision excursions.

Sensitivity: With the exceptions of the elevated detection limits noted in Section 2, sensitivity requirements were met for the sample data in this project.

Accuracy: Data usability with respect to accuracy is 100 percent for volatile organic compound soil data.

For the soil sample, none of the data were rejected for accuracy excursions.

Representativeness: Data usability with respect to representativeness is 100 percent for volatile organic compound soil data.

For the soil sample, none of the data were rejected for representativeness excursions.

Comparability: Data usability with respect to comparability is 100 percent, as standardized analytical methods, reporting limits, reference materials, and data deliverables were used throughout the data generation process for this project.

Completeness: Overall, 100 percent of the trichloroethene soil data were determined to be usable for qualitative and quantitative purposes. Therefore, the completeness objective of 90 percent for this investigation, as presented in the QAPP, was met.

References

O'Brien & Gere Engineers, Inc. 1999. Coldwater Road Facility Remedial Investigation, REALM, Quality Assurance Project Plan (QAPP), Syracuse, New York.

O'Brien & Gere Engineers, Inc. 2002. Remedial Investigation Coldwater Road Facility, REALM, Quality Assurance Project Plan (QAPP) Addendum, Syracuse, New York.

United States Environmental Protection Agency (USEPA). 1996. Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW-846), 3rd Edition. Washington DC.

United States Environmental Protection Agency (USEPA). 1999. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA-540/R-96/008. Washington D.C.



Analytical Laboratory Report

Supplemental Report

Lab Sample ID: S09131.08
Sample Tag: GB7 (14'-15')
Collected Date/Time: 05/10/2002 14:00
Matrix: Soil
COC Reference: 007157

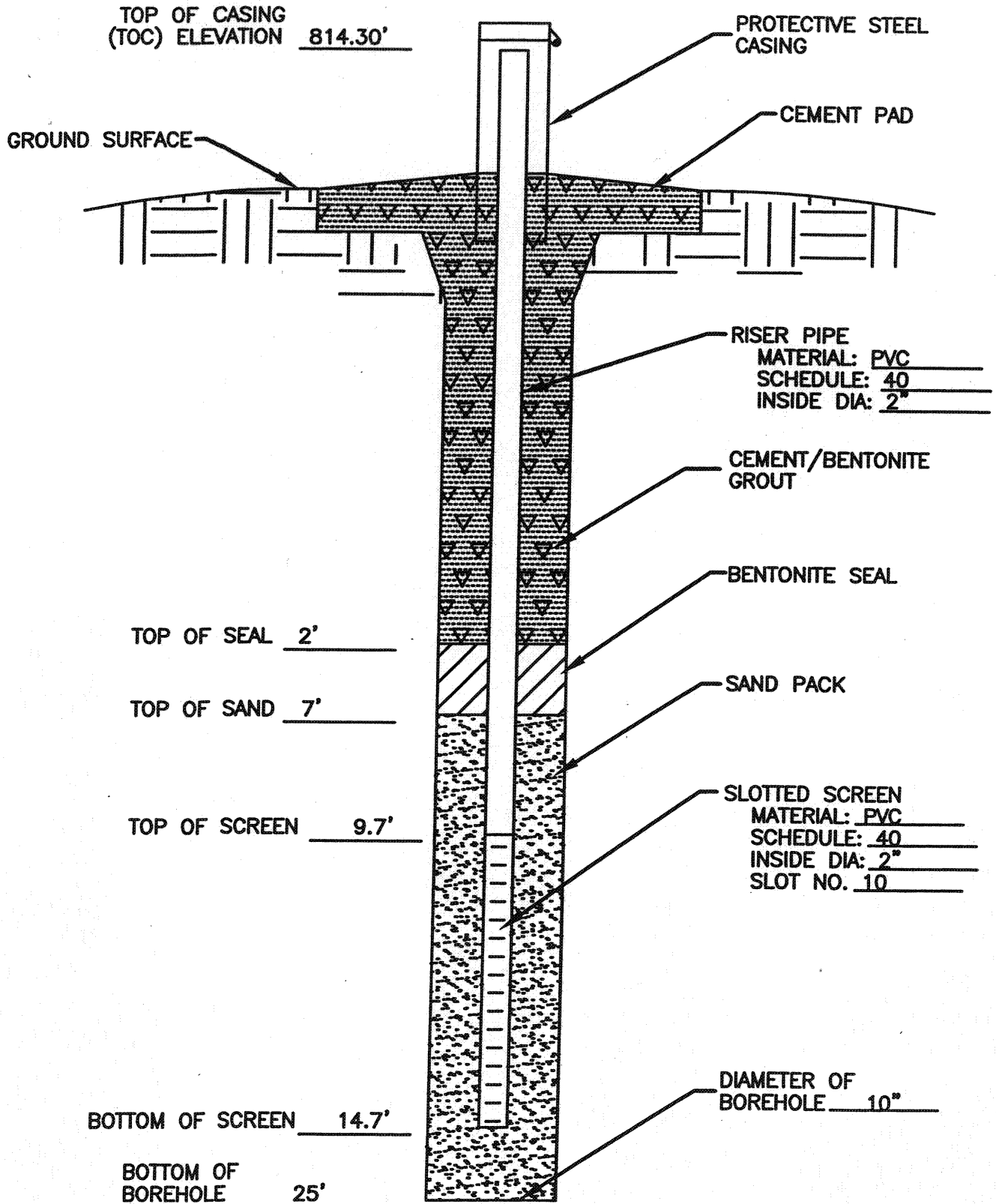
Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	20g EnCore	None	Yes	4	4025
1	4oz. Glass	None	Yes	4	4025

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Extraction / Prep.								
Acid Rain Zero Headspace Extract	Completed			1312	05/17/02	ARH		
Acid Rain Zero Headspace Extract (Replicate 01)	Completed			1312	05/22/02	ARH		
Organics, SPLP								
Trichloroethene	0.019	mg/L	0.001	8260B	05/23/02	JGH	79-01-6	

APPENDIX E

**Monitoring Well
Construction Details**



REALM-Coldwater Road
Flint, Michigan
MONITORING WELL DSA MW-1

**Data Validation Report for O'Brien
& Gere July 23, 2002
Ground Water Samples**

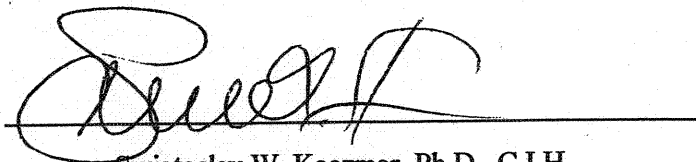
DATA VALIDATION REPORT

**Former Drum Storage Area
at the Former Peregrine, U.S. Inc.
Property at the Coldwater Road
Facility G-1245 East Coldwater Road
Flint, Michigan
(EPA I.D. No. MIR 000 020 743)**

September 2002

DATA VALIDATION REPORT

Water Samples Collected July 2002
Former Drum Storage Area at the Former Peregrine U.S., Inc.
Property at the Coldwater Road Facility Flint, Michigan
(EPA I.D. No. MIR 000 020 743)



Swiatoslav W. Kaczmar, Ph.D., C.I.H.
Vice President, Environmental Toxicology
and Industrial Hygiene

September 2002



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- A USEPA Method 8260B sample results for volatile organic compounds

01/10/02

Executive summary

This data validation report addresses data quality for water samples collected from the former Drum Storage Area at the Remediation and Liability Management Company, Inc. (REALM) Coldwater Road Facility, 1245 Coldwater Road, Flint, Michigan (formerly the Peregrine, U.S., Inc. property). Sample collection activities were conducted by O'Brien & Gere Engineers, Inc. (O'Brien & Gere) on 7/23/02.

The environmental samples, matrix spike, matrix spike duplicate (MS/MSD), field duplicate, equipment blank, and trip blank collected for this investigation were submitted to Merit Laboratories, Inc. of East Lansing, Michigan for analysis of volatile organic compounds (VOCs) using United States Environmental Protection Agency (USEPA) Methods. The analytical data generated for this investigation were evaluated by O'Brien & Gere using the quality assurance/quality control (QA/QC) criteria established in the following documents:

- United States Environmental Protection Agency (USEPA) Methods
- Coldwater Road Facility Remedial Investigation, REALM, Quality Assurance Project Plan (QAPP) (O'Brien & Gere 1999).

Excursions from the QA/QC criteria were qualified based on guidance provided in the following document:

- United States Environmental Protection Agency (USEPA) Contract Laboratory Program (CLP) National Functional Guidelines For Organic Data Review, EPA-540/R-96/008 (USEPA 1999).

As a result of the data validation process the VOCs data for the water samples analyzed were determined to be 100% usable for qualitative and quantitative purposes.

The first visit to the site was on 10/10/01. The site was visited to collect samples for the analysis of the water quality. The site was visited to collect samples for the analysis of the water quality. The site was visited to collect samples for the analysis of the water quality.

The second visit to the site was on 10/17/01. The site was visited to collect samples for the analysis of the water quality. The site was visited to collect samples for the analysis of the water quality. The site was visited to collect samples for the analysis of the water quality.

The third visit to the site was on 10/24/01. The site was visited to collect samples for the analysis of the water quality. The site was visited to collect samples for the analysis of the water quality. The site was visited to collect samples for the analysis of the water quality.

The fourth visit to the site was on 10/31/01. The site was visited to collect samples for the analysis of the water quality. The site was visited to collect samples for the analysis of the water quality. The site was visited to collect samples for the analysis of the water quality.

The fifth visit to the site was on 11/07/01. The site was visited to collect samples for the analysis of the water quality. The site was visited to collect samples for the analysis of the water quality. The site was visited to collect samples for the analysis of the water quality.

The sixth visit to the site was on 11/14/01. The site was visited to collect samples for the analysis of the water quality. The site was visited to collect samples for the analysis of the water quality. The site was visited to collect samples for the analysis of the water quality.

1. Introduction

1.1. Program summary

This data validation report addresses the results of a data quality evaluation for water samples, matrix spike, matrix spike duplicate (MS/MSD), field duplicate, equipment blank, and one trip blank collected from the former Drum Storage Area at the Remediation and Liability Management Company, Inc. (REALM) Coldwater Road Facility, 1245 Coldwater Road, Flint, Michigan (formerly the Peregrine, U.S., Inc. property). Sample collection activities were conducted by O'Brien & Gere on 7/23/02. The environmental samples, MS/MSD sample, field duplicate, equipment blank, and trip blank collected for this investigation were submitted to Merit Laboratories, Inc. of East Lansing, Michigan for analysis of volatile organic compounds (VOCs) using United States Environmental Protection Agency (USEPA) Methods listed in Table 1-2. The quantity and types of samples that were submitted for data validation are presented in Table 1-1 below.

Table 1-1. Sample cross reference list

Laboratory Package ID	Date Collected	Sample Identification		Analysis Requested	Reference
		Client ID	Laboratory ID		
S09904	7/23/02	DSA MW-1	S09904.01	Volatile organic compounds by 8260B	1
		MS	S09904.02		
		MSD	S09904.03		
		Duplicate [DSA MW-1]	S09094.04	Volatile organic compounds by 8260B	1
		Equipment Blank	S09904.05	Volatile organic compounds by 8260B	1
Trip Blank	S09904.06	Volatile organic compounds by 8260B	1		

Note:

MS indicates matrix spike sample.

MSD indicates matrix spike duplicate sample.

The sample identification in brackets indicates the field duplicate sampling location.

Reference:

- 1- USEPA. 1996. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846*, 3rd Edition. Washington D.C.

1.2. Data validation protocols

Validation is a process of determining the suitability of a measurement system for providing useful analytical data. Data validation is essentially a three-step process in which the analytical data's quality assurance/quality control (QA/QC) information is first compared to a

series of QA/QC criteria. Based on the results of this comparison, the analytical data are then assigned qualifiers, which provide an indication of the data's usability. Finally, an overall evaluation of the data's usability is performed. These three steps are described in the following sections.

1.2.1. Comparison to QA/QC criteria

In this report, the analytical data's QA/QC information is compared to the applicable QA/QC criteria provided in the following documents:

- USEPA. 1996. Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW-846), 3rd Edition. Washington DC.
- O'Brien & Gere Engineers, Inc. 1999. Coldwater Road Facility Remedial Investigation, REALM, Quality Assurance Project Plan (QAPP), Syracuse, New York.

Full data validation was performed on the water sample data. Full data validation consists of a review of data summary forms and raw analytical data that were provided in the data packages. The following QA/QC information was included in the review for VOC analyses:

- Chain-of-custody records
- Holding times and sample preservation
- Calibrations
- Blank analysis
- Matrix spike/matrix spike duplicate (MS/MSD) analysis
- Laboratory control sample (LCS) analysis
- Field duplicate analysis
- Surrogate recovery
- Internal standards performance
- Gas chromatography/mass spectrometry (GC/MS) instrument performance check
- Target analyte quantitation, identification, and reported detection limits
- System performance
- Documentation completeness, and
- Overall data assessment.

1.2.2. Assignment of qualifiers

Excursions from the QA/QC criteria were qualified based on guidance provided in the following document:

- USEPA 1999. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA-540/R-96/008. Washington D.C.

In accordance with the USEPA guidance, the following qualifiers are used in data validation:

- J Indicates that the analyte concentration should be considered approximate. This qualifier is used when the data validation process identifies a minor deficiency in the data generation process.
- UJ Indicates that the analyte reporting limit should be considered approximate. This qualifier is used when the data validation process identifies a minor deficiency in the data generation process.

The following guidelines are used regarding the assignment of qualifiers and the use of qualified data:

The data quality evaluation results in only one qualifier for each analyte; in a case when several qualifiers are applicable to the same analyte, the cumulative effect of the various QA/QC excursions is employed in assigning the final data qualifiers.

QA/QC excursions which do not result in the qualification of an analyte, or which result in additional qualification if the analyte was previously qualified, are not discussed.

The quantitative use of approximated analytical data is consistent with the guidance presented in the USEPA Risk Assessment Guidance for Superfund (USEPA 1992).

1.2.3. Data usability evaluation

Based on the QA/QC information review and the qualifiers assigned to the analytical data, an overall evaluation of the data's usability is performed. This evaluation considers the data parameters of precision, sensitivity, accuracy, representativeness, comparability, and completeness (known as PSARCC parameters), which are described as follows:

- Precision is evaluated through the review of field duplicate samples and MS/MSD samples.
- Sensitivity is evaluated through the review of reported detection limits.
- Accuracy is evaluated through the review of MS/MSD samples, internal standards, surrogate recoveries, LCS recoveries, calibration, and instrument performance check.

- Representativeness is evaluated through the review of holding times, sample preservation and preparation, blank analysis and target compound identification and quantification.
- Comparability is evaluated through the review of the analytical methods and reporting procedures for consistency.
- Completeness is defined as the percentage of sample results that are determined to be usable.

1.2.4. Analytical methods

The water samples collected for this investigation were analyzed by Merit Laboratories, Inc. (Merit Labs) of East Lansing, Michigan for volatile organic compounds (VOCs) using the methods presented in Table 1-2.

Table 1-2. Analytical method reference

Parameter	Method	Reference
VOCs	USEPA Method 5030B/5035/8260B	1

Note:

1. USEPA. 1996 *Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW-846)*, 3rd Edition. Washington DC.

VOC indicates volatile organic compounds.

The following chapters of this document address distinct aspects of the validation process. Specific QA/QC excursions and qualifications performed on the sample data are discussed in Section 2. Data completeness and usability are discussed in Section 3.

The annotated analytical results generated by this validation are presented in Appendix A.

2. Data quality evaluation

2.1. Water samples

2.1.1. Documentation completeness

- The aqueous detection limits listed in the data package for methylene chloride (0.005 mg/L) exceeded the limit listed in the QAPP for methylene chloride (0.001 mg/L).

The following data package information was requested and received during the validation process since the data packages were incomplete:

- The evaluation of the entire list of target analytes for the calibrations
- Initial calibration curves
- MS summary forms
- Bar graph spectra for instrument performance checks
- Explanation of the spike traceability information

2.1.2. VOC analyses of water samples by GC/MS

Criteria compliance

The following QA/QC parameters met validation criteria or did not result in additional qualification of sample results:

- Chain-of-custody records
- Holding times and sample preservation
- Calibrations
- Blank analysis
- LCS analysis
- Field duplicate analysis
- Surrogate recovery
- Internal standards performance
- GC/MS instrument performance check, and
- Target analyte quantitation and identification

Excursions from QA/QC criteria presented in Section 1.2 and additional observations are summarized below.

MS/MSD analysis

The percent recovery for trichloroethene in the dilution analysis of MS/MSD field sample DSA MW-1 analyzed for this investigation was

greater than the upper laboratory control limit, indicating matrix influence or high instrument response. As a result of the MS/MSD excursions, the result in the unspiked sample was qualified as approximate (J) to indicate a minor recovery excursion. The following table presents the sample qualified as a result of the MS/MSD excursions:

Table 2.3. MS/MSD excursions for VOC analyses of ground water samples

MS/MSD ID		Excursion	Affected Samples	Action
DSA MW-1	Trichloroethene	168.7%R, 1239%R	DSA MW-1	J
Note: %R indicates percent recovery.				

Target analyte reported detection limits and system performance

Since concentrations of trichloroethene and cis-1,2-dichloroethene that were greater than the upper calibration range were detected during the initial analysis of the water samples, a 1:20 dilution analysis was performed. The results from the dilution analysis for trichloroethene and cis-1,2-dichloroethene and the undiluted results for the remaining analytes were reported.

The laboratory reported that, during the initial analysis, laboratory contamination of the LCS was detected. Therefore, a re-analysis of the associated quality control samples, equipment blank and trip blank was performed and the results reported from the re-analyses.

3. Summary and data usability

This chapter summarizes the analytical data in terms of its completeness and usability. Data completeness is defined as the percentage of sample results that have been determined to be usable during the data validation process.

The water samples, MS/MSD, field duplicate, equipment blank, and trip blank collected from the former Drum Storage Area at the REALM Coldwater Road Facility, were evaluated based on QA/QC criteria established by USEPA Methods as listed in Section 1.2, the QAPP (O'Brien & Gere 1999), and the USEPA National Functional data validation guidelines. Major deficiencies in the data generation process would have resulted in data being rejected, indicating that the data is considered unusable for either quantitative or qualitative purposes. Minor deficiencies in the data generation process resulted in some sample data being characterized as approximate. Identification of a data point as approximate indicates uncertainty in the reported concentration of the chemical, but not its assigned identity. The use of approximated analytical data for quantitative uses is consistent with the guidance presented in the USEPA Risk Assessment Guidance for Superfund (USEPA 1992).

A discussion of the data quality with regard to the parameters follows:

Precision: Data usability with respect to precision is 100 percent for volatile organic compound water data.

For the water samples, none of the data were rejected for precision excursions.

Sensitivity: With the exceptions of the elevated detection limits noted in Section 2, sensitivity requirements were met for the sample data in this project.

Accuracy: Data usability with respect to accuracy is 100 percent for volatile organic compound water data.

For the water samples, none of the data were rejected for accuracy excursions.

Representativeness: Data usability with respect to representativeness is 100 percent for volatile organic compound water data.

For the water samples, none of the data were rejected for representativeness excursions.

Comparability: Data usability with respect to comparability is 100 percent, as standardized analytical methods, reporting limits, reference materials, and data deliverables were used throughout the data generation process for this project.

Completeness: Overall, 100 percent of the volatile organic compound water data were determined to be usable for qualitative and quantitative purposes. Therefore, the completeness objective of 90 percent for this investigation, as presented in the QAPP, was met.

References

O'Brien & Gere Engineers, Inc. 1999. Coldwater Road Facility Remedial Investigation, REALM, Quality Assurance Project Plan (QAPP), Syracuse, New York.

United States Environmental Protection Agency (USEPA). 1992. USEPA Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A), 540/1-891002. Washington D.C.

United States Environmental Protection Agency (USEPA). 1996. Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW-846), 3rd Edition. Washington DC.

United States Environmental Protection Agency (USEPA). 1999. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA-540/R-96/008. Washington D.C.

APPENDIX A

**A summary of validated
analytical results**



Analytical Laboratory Report

Revised Report

Lab Sample ID: S09904.01
 Sample Tag: ~~DSE-4~~ DSA MW-1
 Collected Date/Time: 07/23/2002 08:45
 Matrix: Groundwater
 COC Reference: 010676

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40 ml VOAs	HCl	Yes	4	5462

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
<i>Dual</i>								
Organics								
Volatile Organics								
2-Butanone (MEK)	Not detected	mg/L	0.05	8260B	08/01/02	JGH	78-93-3	
Benzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	71-43-2	
n-Butylbenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	104-51-8	
Bromobenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	108-86-1	
Bromochloromethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	74-97-5	
Bromodichloromethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	75-27-4	
Bromoform	Not detected	mg/L	0.001	8260B	08/01/02	JGH	75-25-2	
Bromomethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	74-83-9	
sec-Butylbenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	135-98-8	
tert-Butylbenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	98-06-6	
2-Chlorotoluene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	95-49-8	
4-Chlorotoluene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	106-43-4	
Carbon tetrachloride	Not detected	mg/L	0.001	8260B	08/01/02	JGH	56-23-5	
Chlorobenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	108-90-7	
Chloroethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	75-00-3	
Chloroform	Not detected	mg/L	0.001	8260B	08/01/02	JGH	67-66-3	
Chloromethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	74-87-3	
1,1-Dichloroethane	0.013	mg/L	0.001	8260B	08/01/02	JGH	75-34-3	
1,1-Dichloroethene	0.003	mg/L	0.001	8260B	08/01/02	JGH	75-35-4	
1,1-Dichloropropene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	563-58-6	
1,2-Dibromo-3-chloropropane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	96-12-8	
1,2-Dibromoethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	106-93-4	
1,2-Dichlorobenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	95-50-1	
1,2-Dichloroethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	107-06-2	
1,2-Dichloropropane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	78-87-5	
1,3-Dichlorobenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	541-73-1	
1,3-Dichloropropane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	142-28-9	
1,4-Dichlorobenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	106-46-7	
2,2-Dichloropropane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	594-20-7	
cis-1,2-Dichloroethene	0.65 0.528	mg/L	0.001	8260B	08/01/02	JGH	156-59-2	
cis-1,3-Dichloropropene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	10061-01-5	
Dibromochloromethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	124-48-1	
Dibromomethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	74-95-3	
Dichlorodifluoromethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	75-71-8	
trans-1,2-Dichloroethene	0.018	mg/L	0.001	8260B	08/01/02	JGH	156-60-5	
Ethylbenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	100-41-4	
p-Isopropyltoluene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	99-87-6	
Isopropylbenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	98-82-8	
Methylene chloride	Not detected	mg/L	0.005	8260B	08/01/02	JGH	75-09-2	
Naphthalene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	91-20-3	
n-Propylbenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	103-65-1	

E-Target value estimated due to exceeding calibration range.



Analytical Laboratory Report

Revised Report

Lab Sample ID: S09904.01 (continued)

Sample Tag: ~~BSE4~~

DA MW1
Dual

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Organics (continued)								
Volatile Organics (continued)								
Styrene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	630-20-6	
1,1,1-Trichloroethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	79-34-5	
1,1,2-Trichloroethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	79-00-5	
1,2,3-Trichlorobenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	87-61-6	
1,2,3-Trichloropropane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	96-18-4	
1,2,4-Trichlorobenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	120-82-1	
1,2,4-Trimethylbenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	95-63-6	
1,3,5-Trimethylbenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	108-67-8	
Tetrachloroethene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	127-18-4	
Toluene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	108-88-3	
Trichloroethene	<i>J/42</i> 0.809	mg/L	0.001	8260B	08/01/02	JGH	79-01-6	<i>E</i>
Trichlorofluoromethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	75-69-4	
Vinyl chloride	Not detected	mg/L	0.001	8260B	08/01/02	JGH	75-01-4	
o-Xylene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	95-47-6	
p,m-Xylene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	106-42-3	
Volatile Organics (Replicate 01)								
2-Butanone (MEK)	Not detected	mg/L	1	8260B	08/01/02	JGH	78-93-3	C
Benzene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	71-43-2	C
n-Butylbenzene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	104-51-8	C
Bromobenzene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	108-86-1	C
Bromochloromethane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	74-97-5	C
Bromodichloromethane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	75-27-4	C
Bromoform	Not detected	mg/L	0.02	8260B	08/01/02	JGH	75-25-2	C
Bromomethane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	74-83-9	C
sec-Butylbenzene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	135-98-8	C
tert-Butylbenzene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	98-06-6	C
2-Chlorotoluene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	95-49-8	C
4-Chlorotoluene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	106-43-4	C
Carbon tetrachloride	Not detected	mg/L	0.02	8260B	08/01/02	JGH	56-23-5	C
Chlorobenzene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	108-90-7	C
Chloroethane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	75-00-3	C
Chloroform	Not detected	mg/L	0.02	8260B	08/01/02	JGH	67-66-3	C
Chloromethane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	74-87-3	C
1,1-Dichloroethane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	75-34-3	C
1,1-Dichloroethene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	75-35-4	C
1,1-Dichloropropene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	563-58-6	C
1,2-Dibromo-3-chloropropane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	96-12-8	C
1,2-Dibromoethane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	106-93-4	C
1,2-Dichlorobenzene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	95-50-1	C
1,2-Dichloroethane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	107-06-2	C
1,2-Dichloropropane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	78-87-5	C
1,3-Dichlorobenzene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	541-73-1	C
1,3-Dichloropropane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	142-28-9	C
1,4-Dichlorobenzene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	106-46-7	C

E-Target value estimated due to exceeding calibration range.

C-Higher detection limit due to high target concentration.



Analytical Laboratory Report

Revised Report

Lab Sample ID: S09904.01 (continued)

Sample Tag: ~~DSP-1~~

DSA M01
Deal

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Organics (continued)								
Volatile Organics (Replicate 01) (continued)								
2,2-Dichloropropane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	594-20-7	C
cis-1,2-Dichloroethene	0.65	mg/L	0.02	8260B	08/01/02	JGH	156-59-2	C
cis-1,3-Dichloropropene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	10061-01-5	C
Dibromochloromethane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	124-48-1	C
Dibromomethane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	74-95-3	C
Dichlorodifluoromethane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	75-71-8	C
trans-1,2-Dichloroethene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	156-60-5	C
Ethylbenzene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	100-41-4	C
p-Isopropyltoluene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	99-87-6	C
Isopropylbenzene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	98-82-8	C
Methylene chloride	Not detected	mg/L	0.1	8260B	08/01/02	JGH	75-09-2	C
Naphthalene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	91-20-3	C
n-Propylbenzene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	103-65-1	C
Styrene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	100-42-5	C
1,1,1,2-Tetrachloroethane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	630-20-6	C
1,1,1-Trichloroethane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	71-55-6	C
1,1,2,2-Tetrachloroethane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	79-34-5	C
1,1,2-Trichloroethane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	79-00-5	C
1,2,3-Trichlorobenzene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	87-61-6	C
1,2,3-Trichloropropane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	96-18-4	C
1,2,4-Trichlorobenzene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	120-82-1	C
1,2,4-Trimethylbenzene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	95-63-6	C
1,3,5-Trimethylbenzene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	108-67-8	C
Tetrachloroethene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	127-18-4	C
Toluene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	108-88-3	C
Trichloroethene	1.42	mg/L	0.02	8260B	08/01/02	JGH	79-01-6	C
Trichlorofluoromethane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	75-69-4	C
Vinyl chloride	Not detected	mg/L	0.02	8260B	08/01/02	JGH	75-01-4	C
o-Xylene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	95-47-6	C
p,m-Xylene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	106-42-3	C

C-Higher detection limit due to high target concentration.



Analytical Laboratory Report

Revised Report

Lab Sample ID: S09904.02
 Sample Tag: MS
 Collected Date/Time: 07/23/2002 08:45
 Matrix: Groundwater
 COC Reference: 010676

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40 ml VOAs	HCl	Yes	4	5462

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Organics								
Volatile Organics								
2-Butanone (MEK)	0.026	mg/L	0.05	8260B	08/01/02	JGH	78-93-3	1J
Benzene	0.029	mg/L	0.001	8260B	08/01/02	JGH	71-43-2	1
n-Butylbenzene	0.029	mg/L	0.001	8260B	08/01/02	JGH	104-51-8	1
Bromobenzene	0.026	mg/L	0.001	8260B	08/01/02	JGH	108-86-1	1
Bromochloromethane	0.026	mg/L	0.001	8260B	08/01/02	JGH	74-97-5	1
Bromodichloromethane	0.028	mg/L	0.001	8260B	08/01/02	JGH	75-27-4	1
Bromoform	0.024	mg/L	0.001	8260B	08/01/02	JGH	75-25-2	1
Bromomethane	0.035	mg/L	0.001	8260B	08/01/02	JGH	74-83-9	1
sec-Butylbenzene	0.027	mg/L	0.001	8260B	08/01/02	JGH	135-98-8	1
tert-Butylbenzene	0.026	mg/L	0.001	8260B	08/01/02	JGH	98-06-6	1
2-Chlorotoluene	0.026	mg/L	0.001	8260B	08/01/02	JGH	95-49-8	1
4-Chlorotoluene	0.025	mg/L	0.001	8260B	08/01/02	JGH	106-43-4	1
Carbon tetrachloride	0.026	mg/L	0.001	8260B	08/01/02	JGH	56-23-5	1
Chlorobenzene	0.030	mg/L	0.001	8260B	08/01/02	JGH	108-90-7	1
Chloroethane	0.029	mg/L	0.001	8260B	08/01/02	JGH	75-00-3	1
Chloroform	0.029	mg/L	0.001	8260B	08/01/02	JGH	67-66-3	1
Chloromethane	0.028	mg/L	0.001	8260B	08/01/02	JGH	74-87-3	1
1,1-Dichloroethane	0.038	mg/L	0.001	8260B	08/01/02	JGH	75-34-3	1
1,1-Dichloroethene	0.029	mg/L	0.001	8260B	08/01/02	JGH	75-35-4	1
1,1-Dichloropropene	0.028	mg/L	0.001	8260B	08/01/02	JGH	563-58-6	1
1,2-Dibromo-3-chloropropane	0.026	mg/L	0.001	8260B	08/01/02	JGH	96-12-8	1
1,2-Dibromoethane	0.026	mg/L	0.001	8260B	08/01/02	JGH	106-93-4	1
1,2-Dichlorobenzene	0.031	mg/L	0.001	8260B	08/01/02	JGH	95-50-1	1
1,2-Dichloroethane	0.029	mg/L	0.001	8260B	08/01/02	JGH	107-06-2	1
1,2-Dichloropropane	0.027	mg/L	0.001	8260B	08/01/02	JGH	78-87-5	1
1,3-Dichlorobenzene	0.028	mg/L	0.001	8260B	08/01/02	JGH	541-73-1	1
1,3-Dichloropropane	0.029	mg/L	0.001	8260B	08/01/02	JGH	142-28-9	1
1,4-Dichlorobenzene	0.029	mg/L	0.001	8260B	08/01/02	JGH	106-46-7	1
2,2-Dichloropropane	0.023	mg/L	0.001	8260B	08/01/02	JGH	594-20-7	1
cis-1,2-Dichloroethene	0.539	mg/L	0.001	8260B	08/01/02	JGH	156-59-2	1E
cis-1,3-Dichloropropene	0.027	mg/L	0.001	8260B	08/01/02	JGH	10061-01-5	1
Dibromochloromethane	0.025	mg/L	0.001	8260B	08/01/02	JGH	124-48-1	1
Dibromomethane	0.029	mg/L	0.001	8260B	08/01/02	JGH	74-95-3	1
Dichlorodifluoromethane	0.027	mg/L	0.001	8260B	08/01/02	JGH	75-71-8	1
trans-1,2-Dichloroethene	0.043	mg/L	0.001	8260B	08/01/02	JGH	156-60-5	1
Ethylbenzene	0.025	mg/L	0.001	8260B	08/01/02	JGH	100-41-4	1
p-Isopropyltoluene	0.029	mg/L	0.001	8260B	08/01/02	JGH	99-87-6	1
Isopropylbenzene	0.026	mg/L	0.001	8260B	08/01/02	JGH	98-82-8	1
Methylene chloride	0.026	mg/L	0.005	8260B	08/01/02	JGH	75-09-2	1
Naphthalene	0.033	mg/L	0.001	8260B	08/01/02	JGH	91-20-3	1

1-Spiked at 25ppb J-Value detected below reporting limit.
 E-Target value estimated due to exceeding calibration range.



Analytical Laboratory Report

Revised Report

Lab Sample ID: S09904.02 (continued)

Sample Tag: MS

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Organics (continued)								
Volatile Organics (continued)								
n-Propylbenzene	0.025	mg/L	0.001	8260B	08/01/02	JGH	103-65-1	1
Styrene	0.027	mg/L	0.001	8260B	08/01/02	JGH	100-42-5	1
1,1,1,2-Tetrachloroethane	0.027	mg/L	0.001	8260B	08/01/02	JGH	630-20-6	1
1,1,1-Trichloroethane	0.028	mg/L	0.001	8260B	08/01/02	JGH	71-55-6	1
1,1,2,2-Tetrachloroethane	0.027	mg/L	0.001	8260B	08/01/02	JGH	79-34-5	1
1,1,2-Trichloroethane	0.031	mg/L	0.001	8260B	08/01/02	JGH	79-00-5	1
1,2,3-Trichlorobenzene	0.031	mg/L	0.001	8260B	08/01/02	JGH	87-61-6	1
1,2,3-Trichloropropane	0.028	mg/L	0.001	8260B	08/01/02	JGH	96-18-4	1
1,2,4-Trichlorobenzene	0.031	mg/L	0.001	8260B	08/01/02	JGH	120-82-1	1
1,2,4-Trimethylbenzene	0.027	mg/L	0.001	8260B	08/01/02	JGH	95-63-6	1
1,3,5-Trimethylbenzene	0.027	mg/L	0.001	8260B	08/01/02	JGH	108-67-8	1
Tetrachloroethene	0.028	mg/L	0.001	8260B	08/01/02	JGH	127-18-4	1
Toluene	0.029	mg/L	0.001	8260B	08/01/02	JGH	108-88-3	1
Trichloroethene	0.815	mg/L	0.001	8260B	08/01/02	JGH	79-01-6	1E
Trichlorofluoromethane	0.028	mg/L	0.001	8260B	08/01/02	JGH	75-69-4	1
Vinyl chloride	0.026	mg/L	0.001	8260B	08/01/02	JGH	75-01-4	1
o-Xylene	0.026	mg/L	0.001	8260B	08/01/02	JGH	95-47-6	1
p,m-Xylene	0.051	mg/L	0.001	8260B	08/01/02	JGH	106-42-3	1
Volatile Organics (Replicate 01)								
2-Butanone (MEK)	0.62	mg/L	1	8260B	08/01/02	JGH	78-93-3	2CJ
Benzene	0.58	mg/L	0.02	8260B	08/01/02	JGH	71-43-2	2C
n-Butylbenzene	0.61	mg/L	0.02	8260B	08/01/02	JGH	104-51-8	2C
Bromobenzene	0.61	mg/L	0.02	8260B	08/01/02	JGH	108-86-1	2C
Bromochloromethane	0.54	mg/L	0.02	8260B	08/01/02	JGH	74-97-5	2C
Bromodichloromethane	0.56	mg/L	0.02	8260B	08/01/02	JGH	75-27-4	2C
Bromoform	0.54	mg/L	0.02	8260B	08/01/02	JGH	75-25-2	2C
Bromomethane	0.52	mg/L	0.02	8260B	08/01/02	JGH	74-83-9	2C
sec-Butylbenzene	0.56	mg/L	0.02	8260B	08/01/02	JGH	135-98-8	2C
tert-Butylbenzene	0.60	mg/L	0.02	8260B	08/01/02	JGH	98-06-6	2C
2-Chlorotoluene	0.61	mg/L	0.02	8260B	08/01/02	JGH	95-49-8	2C
4-Chlorotoluene	0.58	mg/L	0.02	8260B	08/01/02	JGH	106-43-4	2C
Carbon tetrachloride	0.52	mg/L	0.02	8260B	08/01/02	JGH	56-23-5	2C
Chlorobenzene	0.63	mg/L	0.02	8260B	08/01/02	JGH	108-90-7	2C
Chloroethane	0.52	mg/L	0.02	8260B	08/01/02	JGH	75-00-3	2C
Chloroform	0.60	mg/L	0.02	8260B	08/01/02	JGH	67-66-3	2C
Chloromethane	0.52	mg/L	0.02	8260B	08/01/02	JGH	74-87-3	2C
1,1-Dichloroethane	0.55	mg/L	0.02	8260B	08/01/02	JGH	75-34-3	2C
1,1-Dichloroethene	0.53	mg/L	0.02	8260B	08/01/02	JGH	75-35-4	2C
1,1-Dichloropropene	0.57	mg/L	0.02	8260B	08/01/02	JGH	563-58-6	2C
1,2-Dibromo-3-chloropropane	0.60	mg/L	0.02	8260B	08/01/02	JGH	96-12-8	2C
1,2-Dibromoethane	0.53	mg/L	0.02	8260B	08/01/02	JGH	106-93-4	2C
1,2-Dichlorobenzene	0.68	mg/L	0.02	8260B	08/01/02	JGH	95-50-1	2C
1,2-Dichloroethane	0.58	mg/L	0.02	8260B	08/01/02	JGH	107-06-2	2C
1,2-Dichloropropane	0.56	mg/L	0.02	8260B	08/01/02	JGH	78-87-5	2C
1,3-Dichlorobenzene	0.61	mg/L	0.02	8260B	08/01/02	JGH	541-73-1	2C

1-Spiked at 25ppb

E-Target value estimated due to exceeding calibration range.

2-Spiked at 25ppb * 20 (Dilution Factor) C-Higher detection limit due to high target concentration. J-Value detected below reporting limit.



Analytical Laboratory Report

Revised Report

Lab Sample ID: S09904.02 (continued)

Sample Tag: MS

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
<i>Organics (continued)</i>								
<i>Volatile Organics (Replicate 01) (continued)</i>								
1,3-Dichloropropane	0.59	mg/L	0.02	8260B	08/01/02	JGH	142-28-9	1C
1,4-Dichlorobenzene	0.63	mg/L	0.02	8260B	08/01/02	JGH	106-46-7	1C
2,2-Dichloropropane	0.56	mg/L	0.02	8260B	08/01/02	JGH	594-20-7	1C
cis-1,2-Dichloroethene	1.34	mg/L	0.02	8260B	08/01/02	JGH	156-59-2	1C
cis-1,3-Dichloropropene	0.54	mg/L	0.02	8260B	08/01/02	JGH	10061-01-5	1C
Dibromochloromethane	0.52	mg/L	0.02	8260B	08/01/02	JGH	124-48-1	1C
Dibromomethane	0.57	mg/L	0.02	8260B	08/01/02	JGH	74-95-3	1C
Dichlorodifluoromethane	0.45	mg/L	0.02	8260B	08/01/02	JGH	75-71-8	1C
trans-1,2-Dichloroethene	0.56	mg/L	0.02	8260B	08/01/02	JGH	156-60-5	1C
Ethylbenzene	0.54	mg/L	0.02	8260B	08/01/02	JGH	100-41-4	1C
p-Isopropyltoluene	0.60	mg/L	0.02	8260B	08/01/02	JGH	99-87-6	1C
Isopropylbenzene	0.58	mg/L	0.02	8260B	08/01/02	JGH	98-82-8	1C
Methylene chloride	0.5	mg/L	0.1	8260B	08/01/02	JGH	75-09-2	1C
Naphthalene	0.68	mg/L	0.02	8260B	08/01/02	JGH	91-20-3	1C
n-Propylbenzene	0.57	mg/L	0.02	8260B	08/01/02	JGH	103-65-1	1C
Styrene	0.64	mg/L	0.02	8260B	08/01/02	JGH	100-42-5	1C
1,1,1,2-Tetrachloroethane	0.57	mg/L	0.02	8260B	08/01/02	JGH	630-20-6	1C
1,1,1-Trichloroethane	0.57	mg/L	0.02	8260B	08/01/02	JGH	71-55-6	1C
1,1,2,2-Tetrachloroethane	0.65	mg/L	0.02	8260B	08/01/02	JGH	79-34-5	1C
1,1,2-Trichloroethane	0.65	mg/L	0.02	8260B	08/01/02	JGH	79-00-5	1C
1,2,3-Trichlorobenzene	0.63	mg/L	0.02	8260B	08/01/02	JGH	87-61-6	1C
1,2,3-Trichloropropane	0.64	mg/L	0.02	8260B	08/01/02	JGH	96-18-4	1C
1,2,4-Trichlorobenzene	0.65	mg/L	0.02	8260B	08/01/02	JGH	120-82-1	1C
1,2,4-Trimethylbenzene	0.62	mg/L	0.02	8260B	08/01/02	JGH	95-63-6	1C
1,3,5-Trimethylbenzene	0.60	mg/L	0.02	8260B	08/01/02	JGH	108-67-8	1C
Tetrachloroethene	0.57	mg/L	0.02	8260B	08/01/02	JGH	127-18-4	1C
Toluene	0.58	mg/L	0.02	8260B	08/01/02	JGH	108-88-3	1C
Trichloroethene	2.26	mg/L	0.02	8260B	08/01/02	JGH	79-01-6	1C
Trichlorofluoromethane	0.54	mg/L	0.02	8260B	08/01/02	JGH	75-69-4	1C
Vinyl chloride	0.50	mg/L	0.02	8260B	08/01/02	JGH	75-01-4	1C
o-Xylene	0.60	mg/L	0.02	8260B	08/01/02	JGH	95-47-6	1C
p,m-Xylene	1.15	mg/L	0.02	8260B	08/01/02	JGH	106-42-3	1C

1-Spiked at 25ppb * 20 (Dilution Factor) C-Higher detection limit due to high target concentration.



Analytical Laboratory Report

Revised Report

Lab Sample ID: S09904.03
 Sample Tag: MSD
 Collected Date/Time: 07/23/2002 08:45
 Matrix: Groundwater
 COC Reference: 010676

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40 ml VOAs	HCl	Yes	4	5462

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Organics								
Volatile Organics								
2-Butanone (MEK)	0.025	mg/L	0.05	8260B	08/01/02	JGH	78-93-3	1J
Benzene	0.028	mg/L	0.001	8260B	08/01/02	JGH	71-43-2	1
n-Butylbenzene	0.026	mg/L	0.001	8260B	08/01/02	JGH	104-51-8	1
Bromobenzene	0.025	mg/L	0.001	8260B	08/01/02	JGH	108-86-1	1
Bromochloromethane	0.026	mg/L	0.001	8260B	08/01/02	JGH	74-97-5	1
Bromodichloromethane	0.027	mg/L	0.001	8260B	08/01/02	JGH	75-27-4	1
Bromoform	0.024	mg/L	0.001	8260B	08/01/02	JGH	75-25-2	1
Bromomethane	0.034	mg/L	0.001	8260B	08/01/02	JGH	74-83-9	1
sec-Butylbenzene	0.025	mg/L	0.001	8260B	08/01/02	JGH	135-98-8	1
tert-Butylbenzene	0.025	mg/L	0.001	8260B	08/01/02	JGH	98-06-6	1
2-Chlorotoluene	0.025	mg/L	0.001	8260B	08/01/02	JGH	95-49-8	1
4-Chlorotoluene	0.025	mg/L	0.001	8260B	08/01/02	JGH	106-43-4	1
Carbon tetrachloride	0.026	mg/L	0.001	8260B	08/01/02	JGH	56-23-5	1
Chlorobenzene	0.029	mg/L	0.001	8260B	08/01/02	JGH	108-90-7	1
Chloroethane	0.029	mg/L	0.001	8260B	08/01/02	JGH	75-00-3	1
Chloroform	0.028	mg/L	0.001	8260B	08/01/02	JGH	67-66-3	1
Chloromethane	0.027	mg/L	0.001	8260B	08/01/02	JGH	74-87-3	1
1,1-Dichloroethane	0.037	mg/L	0.001	8260B	08/01/02	JGH	75-34-3	1
1,1-Dichloroethene	0.028	mg/L	0.001	8260B	08/01/02	JGH	75-35-4	1
1,1-Dichloropropene	0.027	mg/L	0.001	8260B	08/01/02	JGH	563-58-6	1
1,2-Dibromo-3-chloropropane	0.026	mg/L	0.001	8260B	08/01/02	JGH	96-12-8	1
1,2-Dibromoethane	0.026	mg/L	0.001	8260B	08/01/02	JGH	106-93-4	1
1,2-Dichlorobenzene	0.029	mg/L	0.001	8260B	08/01/02	JGH	95-50-1	1
1,2-Dichloroethane	0.028	mg/L	0.001	8260B	08/01/02	JGH	107-06-2	1
1,2-Dichloropropane	0.027	mg/L	0.001	8260B	08/01/02	JGH	78-87-5	1
1,3-Dichlorobenzene	0.027	mg/L	0.001	8260B	08/01/02	JGH	541-73-1	1
1,3-Dichloropropane	0.028	mg/L	0.001	8260B	08/01/02	JGH	142-28-9	1
1,4-Dichlorobenzene	0.027	mg/L	0.001	8260B	08/01/02	JGH	106-46-7	1
2,2-Dichloropropane	0.022	mg/L	0.001	8260B	08/01/02	JGH	594-20-7	1
cis-1,2-Dichloroethene	0.498	mg/L	0.001	8260B	08/01/02	JGH	156-59-2	1E
cis-1,3-Dichloropropene	0.026	mg/L	0.001	8260B	08/01/02	JGH	10061-01-5	1
Dibromochloromethane	0.025	mg/L	0.001	8260B	08/01/02	JGH	124-48-1	1
Dibromomethane	0.027	mg/L	0.001	8260B	08/01/02	JGH	74-95-3	1
Dichlorodifluoromethane	0.026	mg/L	0.001	8260B	08/01/02	JGH	75-71-8	1
trans-1,2-Dichloroethene	0.042	mg/L	0.001	8260B	08/01/02	JGH	156-60-5	1
Ethylbenzene	0.024	mg/L	0.001	8260B	08/01/02	JGH	100-41-4	1
p-Isopropyltoluene	0.027	mg/L	0.001	8260B	08/01/02	JGH	99-87-6	1
Isopropylbenzene	0.025	mg/L	0.001	8260B	08/01/02	JGH	98-82-8	1
Methylene chloride	0.026	mg/L	0.005	8260B	08/01/02	JGH	75-09-2	1
Naphthalene	0.031	mg/L	0.001	8260B	08/01/02	JGH	91-20-3	1

1-Spiked at 25ppb J-Value detected below reporting limit.
 E-Target value estimated due to exceeding calibration range.



Analytical Laboratory Report

Revised Report

Lab Sample ID: S09904.03 (continued)

Sample Tag: MSD

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Organics (continued)								
Volatile Organics (continued)								
n-Propylbenzene	0.022	mg/L	0.001	8260B	08/01/02	JGH	103-65-1	1
Styrene	0.026	mg/L	0.001	8260B	08/01/02	JGH	100-42-5	1
1,1,1,2-Tetrachloroethane	0.026	mg/L	0.001	8260B	08/01/02	JGH	630-20-6	1
1,1,1-Trichloroethane	0.028	mg/L	0.001	8260B	08/01/02	JGH	71-55-6	1
1,1,2,2-Tetrachloroethane	0.028	mg/L	0.001	8260B	08/01/02	JGH	79-34-5	1
1,1,2-Trichloroethane	0.030	mg/L	0.001	8260B	08/01/02	JGH	79-00-5	1
1,2,3-Trichlorobenzene	0.029	mg/L	0.001	8260B	08/01/02	JGH	87-61-6	1
1,2,3-Trichloropropane	0.027	mg/L	0.001	8260B	08/01/02	JGH	96-18-4	1
1,2,4-Trichlorobenzene	0.027	mg/L	0.001	8260B	08/01/02	JGH	120-82-1	1
1,2,4-Trimethylbenzene	0.025	mg/L	0.001	8260B	08/01/02	JGH	95-63-6	1
1,3,5-Trimethylbenzene	0.025	mg/L	0.001	8260B	08/01/02	JGH	108-67-8	1
Tetrachloroethene	0.027	mg/L	0.001	8260B	08/01/02	JGH	127-18-4	1
Toluene	0.027	mg/L	0.001	8260B	08/01/02	JGH	108-88-3	1
Trichloroethene	0.768	mg/L	0.001	8260B	08/01/02	JGH	79-01-6	1E
Trichlorofluoromethane	0.027	mg/L	0.001	8260B	08/01/02	JGH	75-69-4	1
Vinyl chloride	0.026	mg/L	0.001	8260B	08/01/02	JGH	75-01-4	1
o-Xylene	0.025	mg/L	0.001	8260B	08/01/02	JGH	95-47-6	1
p,m-Xylene	0.049	mg/L	0.001	8260B	08/01/02	JGH	106-42-3	1
Volatile Organics (Replicate 01)								
2-Butanone (MEK)	0.51	mg/L	1	8260B	08/01/02	JGH	78-93-3	2CJ
Benzene	0.55	mg/L	0.02	8260B	08/01/02	JGH	71-43-2	2C
n-Butylbenzene	0.54	mg/L	0.02	8260B	08/01/02	JGH	104-51-8	2C
Bromobenzene	0.52	mg/L	0.02	8260B	08/01/02	JGH	108-86-1	2C
Bromochloromethane	0.49	mg/L	0.02	8260B	08/01/02	JGH	74-97-5	2C
Bromodichloromethane	0.51	mg/L	0.02	8260B	08/01/02	JGH	75-27-4	2C
Bromoform	0.44	mg/L	0.02	8260B	08/01/02	JGH	75-25-2	2C
Bromomethane	0.50	mg/L	0.02	8260B	08/01/02	JGH	74-83-9	2C
sec-Butylbenzene	0.51	mg/L	0.02	8260B	08/01/02	JGH	135-98-8	2C
tert-Butylbenzene	0.52	mg/L	0.02	8260B	08/01/02	JGH	98-06-6	2C
2-Chlorotoluene	0.54	mg/L	0.02	8260B	08/01/02	JGH	95-49-8	2C
4-Chlorotoluene	0.53	mg/L	0.02	8260B	08/01/02	JGH	106-43-4	2C
Carbon tetrachloride	0.49	mg/L	0.02	8260B	08/01/02	JGH	56-23-5	2C
Chlorobenzene	0.57	mg/L	0.02	8260B	08/01/02	JGH	108-90-7	2C
Chloroethane	0.50	mg/L	0.02	8260B	08/01/02	JGH	75-00-3	2C
Chloroform	0.56	mg/L	0.02	8260B	08/01/02	JGH	67-66-3	2C
Chloromethane	0.46	mg/L	0.02	8260B	08/01/02	JGH	74-87-3	2C
1,1-Dichloroethane	0.50	mg/L	0.02	8260B	08/01/02	JGH	75-34-3	2C
1,1-Dichloroethene	0.50	mg/L	0.02	8260B	08/01/02	JGH	75-35-4	2C
1,1-Dichloropropene	0.53	mg/L	0.02	8260B	08/01/02	JGH	563-58-6	2C
1,2-Dibromo-3-chloropropane	0.46	mg/L	0.02	8260B	08/01/02	JGH	96-12-8	2C
1,2-Dibromoethane	0.48	mg/L	0.02	8260B	08/01/02	JGH	106-93-4	2C
1,2-Dichlorobenzene	0.59	mg/L	0.02	8260B	08/01/02	JGH	95-50-1	2C
1,2-Dichloroethane	0.54	mg/L	0.02	8260B	08/01/02	JGH	107-06-2	2C
1,2-Dichloropropane	0.51	mg/L	0.02	8260B	08/01/02	JGH	78-87-5	2C
1,3-Dichlorobenzene	0.53	mg/L	0.02	8260B	08/01/02	JGH	541-73-1	2C

1-Spiked at 25ppb

E-Target value estimated due to exceeding calibration range.

2-Spiked at 25ppb * 20 (Dilution Factor) C-Higher detection limit due to high target concentration. J-Value detected below reporting limit.



Analytical Laboratory Report

Revised Report

Lab Sample ID: S09904.03 (continued)

Sample Tag: MSD

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Organics (continued)								
Volatile Organics (Replicate 01) (continued)								
1,3-Dichloropropane	0.54	mg/L	0.02	8260B	08/01/02	JGH	142-28-9	1C
1,4-Dichlorobenzene	0.56	mg/L	0.02	8260B	08/01/02	JGH	106-46-7	1C
2,2-Dichloropropane	0.53	mg/L	0.02	8260B	08/01/02	JGH	594-20-7	1C
cis-1,2-Dichloroethene	1.19	mg/L	0.02	8260B	08/01/02	JGH	156-59-2	1C
cis-1,3-Dichloropropene	0.50	mg/L	0.02	8260B	08/01/02	JGH	10061-01-5	1C
Dibromochloromethane	0.45	mg/L	0.02	8260B	08/01/02	JGH	124-48-1	1C
Dibromomethane	0.51	mg/L	0.02	8260B	08/01/02	JGH	74-95-3	1C
Dichlorodifluoromethane	0.41	mg/L	0.02	8260B	08/01/02	JGH	75-71-8	1C
trans-1,2-Dichloroethene	0.52	mg/L	0.02	8260B	08/01/02	JGH	156-60-5	1C
Ethylbenzene	0.50	mg/L	0.02	8260B	08/01/02	JGH	100-41-4	1C
p-Isopropyltoluene	0.54	mg/L	0.02	8260B	08/01/02	JGH	99-87-6	1C
Isopropylbenzene	0.52	mg/L	0.02	8260B	08/01/02	JGH	98-82-8	1C
Methylene chloride	0.5	mg/L	0.1	8260B	08/01/02	JGH	75-09-2	1C
Naphthalene	0.55	mg/L	0.02	8260B	08/01/02	JGH	91-20-3	1C
n-Propylbenzene	0.50	mg/L	0.02	8260B	08/01/02	JGH	103-65-1	1C
Styrene	0.57	mg/L	0.02	8260B	08/01/02	JGH	100-42-5	1C
1,1,1,2-Tetrachloroethane	0.50	mg/L	0.02	8260B	08/01/02	JGH	630-20-6	1C
1,1,1-Trichloroethane	0.54	mg/L	0.02	8260B	08/01/02	JGH	71-55-6	1C
1,1,2,2-Tetrachloroethane	0.50	mg/L	0.02	8260B	08/01/02	JGH	79-34-5	1C
1,1,2-Trichloroethane	0.56	mg/L	0.02	8260B	08/01/02	JGH	79-00-5	1C
1,2,3-Trichlorobenzene	0.52	mg/L	0.02	8260B	08/01/02	JGH	87-61-6	1C
1,2,3-Trichloropropane	0.50	mg/L	0.02	8260B	08/01/02	JGH	96-18-4	1C
1,2,4-Trichlorobenzene	0.54	mg/L	0.02	8260B	08/01/02	JGH	120-82-1	1C
1,2,4-Trimethylbenzene	0.54	mg/L	0.02	8260B	08/01/02	JGH	95-63-6	1C
1,3,5-Trimethylbenzene	0.54	mg/L	0.02	8260B	08/01/02	JGH	108-67-8	1C
Tetrachloroethene	0.54	mg/L	0.02	8260B	08/01/02	JGH	127-18-4	1C
Toluene	0.55	mg/L	0.02	8260B	08/01/02	JGH	108-88-3	1C
Trichloroethene	2.04	mg/L	0.02	8260B	08/01/02	JGH	79-01-6	1C
Trichlorofluoromethane	0.51	mg/L	0.02	8260B	08/01/02	JGH	75-69-4	1C
Vinyl chloride	0.45	mg/L	0.02	8260B	08/01/02	JGH	75-01-4	1C
o-Xylene	0.53	mg/L	0.02	8260B	08/01/02	JGH	95-47-6	1C
p,m-Xylene	1.06	mg/L	0.02	8260B	08/01/02	JGH	106-42-3	1C

1-Spiked at 25ppb * 20 (Dilution Factor) C-Higher detection limit due to high target concentration.



Analytical Laboratory Report

Revised Report

Lab Sample ID: S09904.04
 Sample Tag: DUP
 Collected Date/Time: 07/23/2002 08:45
 Matrix: Groundwater
 COC Reference: 010676

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40 ml VOAs	HCl	Yes	4	5462

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Organics								
Volatile Organics								
2-Butanone (MEK)	Not detected	mg/L	0.05	8260B	08/01/02	JGH	78-93-3	
Benzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	71-43-2	
n-Butylbenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	104-51-8	
Bromobenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	108-86-1	
Bromochloromethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	74-97-5	
Bromodichloromethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	75-27-4	
Bromoform	Not detected	mg/L	0.001	8260B	08/01/02	JGH	75-25-2	
Bromomethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	74-83-9	
sec-Butylbenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	135-98-8	
tert-Butylbenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	98-06-6	
2-Chlorotoluene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	95-49-8	
4-Chlorotoluene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	106-43-4	
Carbon tetrachloride	Not detected	mg/L	0.001	8260B	08/01/02	JGH	56-23-5	
Chlorobenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	108-90-7	
Chloroethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	75-00-3	
Chloroform	Not detected	mg/L	0.001	8260B	08/01/02	JGH	67-66-3	
Chloromethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	74-87-3	
1,1-Dichloroethane	0.013	mg/L	0.001	8260B	08/01/02	JGH	75-34-3	
1,1-Dichloroethene	0.003	mg/L	0.001	8260B	08/01/02	JGH	75-35-4	
1,1-Dichloropropene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	563-58-6	
1,2-Dibromo-3-chloropropane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	96-12-8	
1,2-Dibromoethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	106-93-4	
1,2-Dichlorobenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	95-50-1	
1,2-Dichloroethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	107-06-2	
1,2-Dichloropropane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	78-87-5	
1,3-Dichlorobenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	541-73-1	
1,3-Dichloropropane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	142-28-9	
1,4-Dichlorobenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	106-46-7	
2,2-Dichloropropane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	594-20-7	
cis-1,2-Dichloroethene	0.544	mg/L	0.001	8260B	08/01/02	JGH	156-59-2	E
cis-1,3-Dichloropropene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	10061-01-5	
Dibromochloromethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	124-48-1	
Dibromomethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	74-95-3	
Dichlorodifluoromethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	75-71-8	
trans-1,2-Dichloroethene	0.019	mg/L	0.001	8260B	08/01/02	JGH	156-60-5	
Ethylbenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	100-41-4	
p-Isopropyltoluene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	99-87-6	
Isopropylbenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	98-82-8	
Methylene chloride	Not detected	mg/L	0.005	8260B	08/01/02	JGH	75-09-2	
Naphthalene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	91-20-3	
n-Propylbenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	103-65-1	

E-Target value estimated due to exceeding calibration range.



Analytical Laboratory Report

Revised Report

Lab Sample ID: S09904.04 (continued)

Sample Tag: DUP

DUP

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Organics (continued)								
Volatile Organics (continued)								
Styrene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	630-20-6	
1,1,1-Trichloroethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	79-34-5	
1,1,2-Trichloroethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	79-00-5	
1,2,3-Trichlorobenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	87-61-6	
1,2,3-Trichloropropane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	96-18-4	
1,2,4-Trichlorobenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	120-82-1	
1,2,4-Trimethylbenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	95-63-6	
1,3,5-Trimethylbenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	108-67-8	
Tetrachloroethene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	127-18-4	
Toluene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	108-88-3	
Trichloroethene	<i>1.83</i> 0.001	mg/L	<i>0.001</i>	8260B	08/01/02	JGH	79-01-6	<i>E</i>
Trichlorofluoromethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	75-69-4	
Vinyl chloride	Not detected	mg/L	0.001	8260B	08/01/02	JGH	75-01-4	
o-Xylene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	95-47-6	
p,m-Xylene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	106-42-3	
Volatile Organics (Replicate 01)								
2-Butanone (MEK)	Not detected	mg/L	1	8260B	08/01/02	JGH	78-93-3	C
Benzene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	71-43-2	C
n-Butylbenzene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	104-51-8	C
Bromobenzene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	108-86-1	C
Bromochloromethane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	74-97-5	C
Bromodichloromethane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	75-27-4	C
Bromoform	Not detected	mg/L	0.02	8260B	08/01/02	JGH	75-25-2	C
Bromomethane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	74-83-9	C
sec-Butylbenzene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	135-98-8	C
tert-Butylbenzene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	98-06-6	C
2-Chlorotoluene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	95-49-8	C
4-Chlorotoluene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	106-43-4	C
Carbon tetrachloride	Not detected	mg/L	0.02	8260B	08/01/02	JGH	56-23-5	C
Chlorobenzene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	108-90-7	C
Chloroethane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	75-00-3	C
Chloroform	Not detected	mg/L	0.02	8260B	08/01/02	JGH	67-66-3	C
Chloromethane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	74-87-3	C
1,1-Dichloroethane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	75-34-3	C
1,1-Dichloroethene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	75-35-4	C
1,1-Dichloropropene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	563-58-6	C
1,2-Dibromo-3-chloropropane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	96-12-8	C
1,2-Dibromoethane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	106-93-4	C
1,2-Dichlorobenzene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	95-50-1	C
1,2-Dichloroethane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	107-06-2	C
1,2-Dichloropropane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	78-87-5	C
1,3-Dichlorobenzene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	541-73-1	C
1,3-Dichloropropane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	142-28-9	C
1,4-Dichlorobenzene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	106-46-7	C

E-Target value estimated due to exceeding calibration range.
C-Higher detection limit due to high target concentration.



Analytical Laboratory Report

Revised Report

Lab Sample ID: S09904.04 (continued)

Sample Tag: DUP

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Organics (continued)								
Volatile Organics (Replicate 01) (continued)								
2,2-Dichloropropane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	594-20-7	C
cis-1,2-Dichloroethene	0.80	mg/L	0.02	8260B	08/01/02	JGH	156-59-2	C
cis-1,3-Dichloropropene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	10061-01-5	C
Dibromochloromethane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	124-48-1	C
Dibromomethane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	74-95-3	C
Dichlorodifluoromethane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	75-71-8	C
trans-1,2-Dichloroethene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	156-60-5	C
Ethylbenzene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	100-41-4	C
p-Isopropyltoluene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	99-87-6	C
Isopropylbenzene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	98-82-8	C
Methylene chloride	Not detected	mg/L	0.1	8260B	08/01/02	JGH	75-09-2	C
Naphthalene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	91-20-3	C
n-Propylbenzene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	103-65-1	C
Styrene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	100-42-5	C
1,1,1,2-Tetrachloroethane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	630-20-6	C
1,1,1-Trichloroethane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	71-55-6	C
1,1,2,2-Tetrachloroethane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	79-34-5	C
1,1,2-Trichloroethane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	79-00-5	C
1,2,3-Trichlorobenzene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	87-61-6	C
1,2,3-Trichloropropane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	96-18-4	C
1,2,4-Trichlorobenzene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	120-82-1	C
1,2,4-Trimethylbenzene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	95-63-6	C
1,3,5-Trimethylbenzene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	108-67-8	C
Tetrachloroethene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	127-18-4	C
Toluene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	108-88-3	C
Trichloroethene	1.83	mg/L	0.02	8260B	08/01/02	JGH	79-01-6	C
Trichlorofluoromethane	Not detected	mg/L	0.02	8260B	08/01/02	JGH	75-69-4	C
Vinyl chloride	Not detected	mg/L	0.02	8260B	08/01/02	JGH	75-01-4	C
o-Xylene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	95-47-6	C
p,m-Xylene	Not detected	mg/L	0.02	8260B	08/01/02	JGH	106-42-3	C

C-Higher detection limit due to high target concentration.



Analytical Laboratory Report

Revised Report

Lab Sample ID: S09904.05
 Sample Tag: Equipment Blank
 Collected Date/Time: 07/23/2002 08:45
 Matrix: Groundwater
 COC Reference: 010676

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40 ml VOAs	HCl	Yes	4	5462

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Organics								
Volatile Organics								
2-Butanone (MEK)	Not detected	mg/L	0.05	8260B	08/01/02	JGH	78-93-3	
Benzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	71-43-2	
n-Butylbenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	104-51-8	
Bromobenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	108-86-1	
Bromochloromethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	74-97-5	
Bromodichloromethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	75-27-4	
Bromoform	Not detected	mg/L	0.001	8260B	08/01/02	JGH	75-25-2	
Bromomethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	74-83-9	
sec-Butylbenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	135-98-8	
tert-Butylbenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	98-06-6	
2-Chlorotoluene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	95-49-8	
4-Chlorotoluene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	106-43-4	
Carbon tetrachloride	Not detected	mg/L	0.001	8260B	08/01/02	JGH	56-23-5	
Chlorobenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	108-90-7	
Chloroethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	75-00-3	
Chloroform	Not detected	mg/L	0.001	8260B	08/01/02	JGH	67-66-3	
Chloromethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	74-87-3	
1,1-Dichloroethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	75-34-3	
1,1-Dichloroethene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	75-35-4	
1,1-Dichloropropene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	563-58-6	
1,2-Dibromo-3-chloropropane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	96-12-8	
1,2-Dibromoethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	106-93-4	
1,2-Dichlorobenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	95-50-1	
1,2-Dichloroethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	107-06-2	
1,2-Dichloropropane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	78-87-5	
1,3-Dichlorobenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	541-73-1	
1,3-Dichloropropane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	142-28-9	
1,4-Dichlorobenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	106-46-7	
2,2-Dichloropropane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	594-20-7	
cis-1,2-Dichloroethene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	156-59-2	
cis-1,3-Dichloropropene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	10061-01-5	
Dibromochloromethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	124-48-1	
Dibromomethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	74-95-3	
Dichlorodifluoromethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	75-71-8	
trans-1,2-Dichloroethene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	156-60-5	
Ethylbenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	100-41-4	
p-Isopropyltoluene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	99-87-6	
Isopropylbenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	98-82-8	
Methylene chloride	Not detected	mg/L	0.005	8260B	08/01/02	JGH	75-09-2	
Naphthalene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	91-20-3	
n-Propylbenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	103-65-1	
Styrene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	100-42-5	



Analytical Laboratory Report

Revised Report

Lab Sample ID: S09904.05 (continued)

Sample Tag: Equipment Blank

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Organics (continued)								
Volatile Organics (continued)								
1,1,1,2-Tetrachloroethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	630-20-6	
1,1,1-Trichloroethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	79-34-5	
1,1,2-Trichloroethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	79-00-5	
1,2,3-Trichlorobenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	87-61-6	
1,2,3-Trichloropropane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	96-18-4	
1,2,4-Trichlorobenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	120-82-1	
1,2,4-Trimethylbenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	95-63-6	
1,3,5-Trimethylbenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	108-67-8	
Tetrachloroethene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	127-18-4	
Toluene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	108-88-3	
Trichloroethene	0.003	mg/L	0.001	8260B	08/01/02	JGH	79-01-6	
Trichlorofluoromethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	75-69-4	
Vinyl chloride	Not detected	mg/L	0.001	8260B	08/01/02	JGH	75-01-4	
o-Xylene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	95-47-6	
p,m-Xylene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	106-42-3	



Analytical Laboratory Report

Revised Report

Lab Sample ID: S09904.06
 Sample Tag: Trip Blank
 Collected Date/Time: 07/23/2002 08:45
 Matrix: Groundwater
 COC Reference: 010676

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40 ml VOAs	HCl	Yes	4	5462

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Organics								
Volatile Organics								
2-Butanone (MEK)	Not detected	mg/L	0.05	8260B	08/01/02	JGH	78-93-3	
Benzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	71-43-2	
n-Butylbenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	104-51-8	
Bromobenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	108-86-1	
Bromochloromethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	74-97-5	
Bromodichloromethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	75-27-4	
Bromoform	Not detected	mg/L	0.001	8260B	08/01/02	JGH	75-25-2	
Bromomethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	74-83-9	
sec-Butylbenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	135-98-8	
tert-Butylbenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	98-06-6	
2-Chlorotoluene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	95-49-8	
4-Chlorotoluene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	106-43-4	
Carbon tetrachloride	Not detected	mg/L	0.001	8260B	08/01/02	JGH	56-23-5	
Chlorobenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	108-90-7	
Chloroethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	75-00-3	
Chloroform	Not detected	mg/L	0.001	8260B	08/01/02	JGH	67-66-3	
Chloromethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	74-87-3	
1,1-Dichloroethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	75-34-3	
1,1-Dichloroethene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	75-35-4	
1,1-Dichloropropene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	563-58-6	
1,2-Dibromo-3-chloropropane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	96-12-8	
1,2-Dibromoethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	106-93-4	
1,2-Dichlorobenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	95-50-1	
1,2-Dichloroethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	107-06-2	
1,2-Dichloropropane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	78-87-5	
1,3-Dichlorobenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	541-73-1	
1,3-Dichloropropane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	142-28-9	
1,4-Dichlorobenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	106-46-7	
2,2-Dichloropropane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	594-20-7	
cis-1,2-Dichloroethene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	156-59-2	
cis-1,3-Dichloropropene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	10061-01-5	
Dibromochloromethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	124-48-1	
Dibromomethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	74-95-3	
Dichlorodifluoromethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	75-71-8	
trans-1,2-Dichloroethene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	156-60-5	
Ethylbenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	100-41-4	
p-Isopropyltoluene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	99-87-6	
Isopropylbenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	98-82-8	
Methylene chloride	Not detected	mg/L	0.005	8260B	08/01/02	JGH	75-09-2	
Naphthalene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	91-20-3	
n-Propylbenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	103-65-1	
Styrene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	100-42-5	



Analytical Laboratory Report

Revised Report

Lab Sample ID: S09904.06 (continued)

Sample Tag: Trip Blank

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Organics (continued)								
Volatile Organics (continued)								
1,1,1,2-Tetrachloroethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	630-20-6	
1,1,1-Trichloroethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	79-34-5	
1,1,2-Trichloroethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	79-00-5	
1,2,3-Trichlorobenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	87-61-6	
1,2,3-Trichloropropane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	96-18-4	
1,2,4-Trichlorobenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	120-82-1	
1,2,4-Trimethylbenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	95-63-6	
1,3,5-Trimethylbenzene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	108-67-8	
Tetrachloroethene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	127-18-4	
Toluene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	108-88-3	
Trichloroethene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	79-01-6	
Trichlorofluoromethane	Not detected	mg/L	0.001	8260B	08/01/02	JGH	75-69-4	
Vinyl chloride	Not detected	mg/L	0.001	8260B	08/01/02	JGH	75-01-4	
o-Xylene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	95-47-6	
p,m-Xylene	Not detected	mg/L	0.001	8260B	08/01/02	JGH	106-42-3	

**MDEQ WMD Ground Water
Analytical Data Sheets-
July 23, 2002**

**MDEQ ENVIRONMENTAL LABORATORY
ANALYTICAL REPORT**

Work Order #: 0207235-01POX

Date Collected: 7/23/2002

Test Code: WPS
 Test Name: 8260 Plus - Water
 Sample ID: DRUM STORAGE AREA

Date Analyzed: 7/26/2002 by KCL

CAS #	COMPOUND	RESULTS ug/L	REMARK	REPORTING LIMIT	DILUTION FACTOR
75-71-8	Dichlorodifluoromethane	ND		5.0	1
74-87-3	Chloromethane	ND		5.0	1
75-01-4	Vinyl chloride	ND		1.0	1
74-83-9	Bromomethane	ND		5.0	1
75-00-3	Chloroethane	ND		5.0	1
75-69-4	Trichlorofluoromethane	ND		1.0	1
67-64-1	Acetone	ND		20	1
60-29-7	Diethyl ether	ND		5.0	1
75-35-4	1,1-Dichloroethylene	3.0		1.0	1
74-88-4	Methyl iodide	ND		1.0	1
107-13-1	Acrylonitrile	ND		5.0	1
75-09-2	Methylene chloride	ND		5.0	1
75-15-0	Carbon disulfide	ND		1.0	1
156-60-5	trans-1,2-Dichloroethylene	19		1.0	1
1634-04-4	Methylterbutylether (MTBE)	ND		1.0	1
75-34-3	1,1-Dichloroethane	13		1.0	1
78-93-3	2-Butanone (MEK)	ND		5.0	1
156-59-2	cis-1,2-Dichloroethylene	920		50	50
67-66-3	Chloroform	ND		1.0	1
109-99-9	Tetrahydrofuran	ND		5.0	1
74-97-5	Bromochloromethane	ND		1.0	1
71-55-6	1,1,1-Trichloroethane	ND		1.0	1
107-06-2	1,2-Dichloroethane	ND		1.0	1
71-43-2	Benzene	ND		1.0	1
56-23-5	Carbon tetrachloride	ND		1.0	1
78-87-5	1,2-Dichloropropane	ND		1.0	1
79-01-6	Trichloroethylene	2200		50	50
74-95-3	Dibromomethane	ND		1.0	1
75-27-4	Bromodichloromethane	ND		1.0	1
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		5.0	1
10061-01-5	cis-1,3-Dichloropropene	ND		1.0	1
10061-02-6	trans-1,3-Dichloropropene	ND		1.0	1
108-88-3	Toluene	ND		1.0	1
79-00-5	1,1,2-Trichloroethane	ND		1.0	1
591-78-6	2-Hexanone	ND		5.0	1

Workorder 0207235. Page 2 of 3

Printed 8/7/02 8:09 AM

**Data Validation Report for
June 4, 2002 Soil Samples**

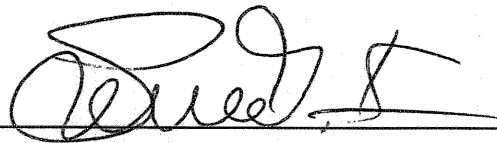
DATA VALIDATION REPORT

**Former Drum Storage Area
at the Former Peregrine, U.S. Inc.
Property at the Coldwater Road
Facility G-1245 East Coldwater Road
Flint, Michigan
(EPA I.D. No. MIR 000 020 743)**

September 2002

DATA VALIDATION REPORT

Soil Samples Collected June 2002
Former Drum Storage Area at the Former Peregrine U.S., Inc.
Property at the Coldwater Road Facility Flint, Michigan
(EPA I.D. No. MIR 000 020 743)



Swiatoslav W. Kaczmar, Ph.D., C.I.H.
Vice President, Environmental Toxicology
and Industrial Hygiene

September 2002



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- A USEPA Method 8260B sample results for volatile organic compounds

Executive summary

This data validation report addresses data quality for soil samples collected from the former Drum Storage Area at the Remediation and Liability Management Company, Inc. (REALM) Coldwater Road Facility, 1245 Coldwater Road, Flint, Michigan (formerly the Peregrine, U.S., Inc. property). Sample collection activities were conducted by O'Brien & Gere Engineers, Inc. (O'Brien & Gere) on 6/4/02.

The environmental samples, matrix spike, matrix spike duplicate (MS/MSD), field duplicate, equipment blank, and trip blank collected for this investigation were submitted to Merit Laboratories, Inc. of East Lansing, Michigan for analysis of volatile organic compounds (VOCs) using United States Environmental Protection Agency (USEPA) Methods. The analytical data generated for this investigation were evaluated by O'Brien & Gere using the quality assurance/quality control (QA/QC) criteria established in the following documents:

- United States Environmental Protection Agency (USEPA) Methods
- Coldwater Road Facility Remedial Investigation, REALM, Quality Assurance Project Plan (QAPP) (O'Brien & Gere 1999).

Excursions from the QA/QC criteria were qualified based on guidance provided in the following document:

- United States Environmental Protection Agency (USEPA) Contract Laboratory Program (CLP) National Functional Guidelines For Organic Data Review, EPA-540/R-96/008 (USEPA 1999).

As a result of the data validation process the VOCs data for the soil samples analyzed were determined to be 100% usable for qualitative and quantitative purposes.

The investigation was conducted in accordance with the REALM (Roadway Environmental Assessment Method) procedure. The REALM procedure is a standardized method for assessing the potential impacts of proposed roadway projects on the environment. The REALM procedure consists of several steps, including: 1) project description, 2) identification of potential impacts, 3) assessment of potential impacts, 4) development of mitigation measures, and 5) preparation of a REALM report. The REALM report provides a summary of the findings of the investigation and recommendations for mitigation measures.

The REALM procedure is a standardized method for assessing the potential impacts of proposed roadway projects on the environment. The REALM procedure consists of several steps, including: 1) project description, 2) identification of potential impacts, 3) assessment of potential impacts, 4) development of mitigation measures, and 5) preparation of a REALM report. The REALM report provides a summary of the findings of the investigation and recommendations for mitigation measures.

The REALM procedure is a standardized method for assessing the potential impacts of proposed roadway projects on the environment. The REALM procedure consists of several steps, including: 1) project description, 2) identification of potential impacts, 3) assessment of potential impacts, 4) development of mitigation measures, and 5) preparation of a REALM report. The REALM report provides a summary of the findings of the investigation and recommendations for mitigation measures.

The REALM procedure is a standardized method for assessing the potential impacts of proposed roadway projects on the environment. The REALM procedure consists of several steps, including: 1) project description, 2) identification of potential impacts, 3) assessment of potential impacts, 4) development of mitigation measures, and 5) preparation of a REALM report. The REALM report provides a summary of the findings of the investigation and recommendations for mitigation measures.

The REALM procedure is a standardized method for assessing the potential impacts of proposed roadway projects on the environment. The REALM procedure consists of several steps, including: 1) project description, 2) identification of potential impacts, 3) assessment of potential impacts, 4) development of mitigation measures, and 5) preparation of a REALM report. The REALM report provides a summary of the findings of the investigation and recommendations for mitigation measures.

The REALM procedure is a standardized method for assessing the potential impacts of proposed roadway projects on the environment. The REALM procedure consists of several steps, including: 1) project description, 2) identification of potential impacts, 3) assessment of potential impacts, 4) development of mitigation measures, and 5) preparation of a REALM report. The REALM report provides a summary of the findings of the investigation and recommendations for mitigation measures.

1. Introduction

1.1. Program summary

This data validation report addresses the results of a data quality evaluation for soil samples, matrix spike, matrix spike duplicate (MS/MSD), field duplicate, equipment blank, and one trip blank collected from the former Drum Storage Area at the Remediation and Liability Management Company, Inc. (REALM) Coldwater Road Facility, 1245 Coldwater Road, Flint, Michigan (formerly the Peregrine, U.S., Inc. property). Sample collection activities were conducted by O'Brien & Gere on 6/4/02. The environmental samples, MS/MSD sample, field duplicate, equipment blank, and trip blank collected for this investigation were submitted to Merit Laboratories, Inc. of East Lansing, Michigan for analysis of volatile organic compounds (VOCs) using United States Environmental Protection Agency (USEPA) Methods listed in Table 1-2. The quantity and types of samples that were submitted for data validation are presented in Table 1-1 below.

Table 1-1. Sample cross reference list

Laboratory Package ID	Date Collected	Sample Identification		Analysis Requested	Reference
		Client ID	Laboratory ID		
S09369	6/4/02	GB-8 (14'-15')	S09369.01	Volatile organic compounds by 8260B	1
		GB-9 (14'-15') MS MSD	S09369.02 S09369.04 S09369.05	Volatile organic compounds by 8260B	1
		GB-10 (14'-15')	S09369.03	Volatile organic compounds by 8260B	1
		GB-11 (14'-15')	*	Volatile organic compounds by 8260B	1
		GB-12 (14'-15')	*	Volatile organic compounds by 8260B	1
		GB-13 (14'-15')	*	Volatile organic compounds by 8260B	1
		Duplicate [GB-10 (14'-15')]	S09369.06	Volatile organic compounds by 8260B	1
		Equipment Blank	S09369.07	Volatile organic compounds by 8260B	1
		Trip Blank	S09369.08	Volatile organic compounds by 8260B	1

Note:

MS indicates matrix spike sample.

MSD indicates matrix spike duplicate sample.

The sample identification in brackets indicates the field duplicate sampling location.

* indicates that the sample was placed on hold by the Project Manager.

Reference:

- USEPA. 1996. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846*, 3rd Edition. Washington D.C.

1.2. Data validation protocols

Validation is a process of determining the suitability of a measurement system for providing useful analytical data. Data validation is essentially a three-step process in which the analytical data's quality assurance/quality control (QA/QC) information is first compared to a series of QA/QC criteria. Based on the results of this comparison, the analytical data are then assigned qualifiers, which provide an indication of the data's usability. Finally, an overall evaluation of the data's usability is performed. These three steps are described in the following sections.

1.2.1. Comparison to QA/QC criteria

In this report, the analytical data's QA/QC information is compared to the applicable QA/QC criteria provided in the following documents:

- USEPA. 1996. Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW-846), 3rd Edition. Washington DC.
- O'Brien & Gere Engineers, Inc. 1999. Coldwater Road Facility Remedial Investigation, REALM, Quality Assurance Project Plan (QAPP), Syracuse, New York.

Full data validation was performed on the soil sample data. Full data validation consists of a review of data summary forms and raw analytical data that were provided in the data packages. The following QA/QC information was included in the review for VOC analyses:

- Chain-of-custody records
- Holding times, sample preservation, and percent solids
- Calibrations
- Blank analysis
- Matrix spike/matrix spike duplicate (MS/MSD) analysis
- Laboratory control sample (LCS) analysis
- Field duplicate analysis
- Surrogate recovery
- Internal standards performance
- Gas chromatography/mass spectrometry (GC/MS) instrument performance check
- Target analyte quantitation, identification, and reported detection limits
- System performance
- Documentation completeness, and
- Overall data assessment.

1.2.2. Assignment of qualifiers

Excursions from the QA/QC criteria were qualified based on guidance provided in the following document:

- USEPA 1999. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA-540/R-96/008. Washington D.C.

In accordance with the USEPA guidance, the following qualifiers are used in data validation:

- J Indicates that the analyte concentration should be considered approximate. This qualifier is used when the data validation process identifies a minor deficiency in the data generation process.
- UJ Indicates that the analyte reporting limit should be considered approximate. This qualifier is used when the data validation process identifies a minor deficiency in the data generation process.

The following guidelines are used regarding the assignment of qualifiers and the use of qualified data:

The data quality evaluation results in only one qualifier for each analyte; in a case when several qualifiers are applicable to the same analyte, the cumulative effect of the various QA/QC excursions is employed in assigning the final data qualifiers.

QA/QC excursions which do not result in the qualification of an analyte, or which result in additional qualification if the analyte was previously qualified, are not discussed.

The quantitative use of approximated analytical data is consistent with the guidance presented in the USEPA Risk Assessment Guidance for Superfund (USEPA 1992).

1.2.3. Data usability evaluation

Based on the QA/QC information review and the qualifiers assigned to the analytical data, an overall evaluation of the data's usability is performed. This evaluation considers the data parameters of precision, sensitivity, accuracy, representativeness, comparability, and completeness (known as PSARCC parameters), which are described as follows:

- Precision is evaluated through the review of field duplicate samples and MS/MSD samples.
- Sensitivity is evaluated through the review of reported detection limits.
- Accuracy is evaluated through the review of MS/MSD samples, internal standards, surrogate recoveries, LCS recoveries, calibration, and instrument performance check.
- Representativeness is evaluated through the review of holding times, sample preservation and preparation, blank analysis and target compound identification and quantification.
- Comparability is evaluated through the review of the analytical methods and reporting procedures for consistency.
- Completeness is defined as the percentage of sample results that are determined to be usable.

1.2.4. Analytical methods

The soil samples collected for this investigation were analyzed by Merit Laboratories, Inc. (Merit Labs) of East Lansing, Michigan for volatile organic compounds (VOCs) using the methods presented in Table 1-2.

Table 1-2. Analytical method reference

Parameter	Method	Reference
VOCs	USEPA Method 5030B/5035/8260B	1

Note:

1. USEPA. 1996 *Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW-846)*, 3rd Edition. Washington DC.

VOC indicates volatile organic compounds.

The following chapters of this document address distinct aspects of the validation process. Specific QA/QC excursions and qualifications performed on the sample data are discussed in Section 2. Data completeness and usability are discussed in Section 3.

The annotated analytical results generated by this validation are presented in Appendix A.

2. Data quality evaluation

2.1. Soil samples

2.1.1. Documentation completeness

- The soil detection limits listed in the data package for methylene chloride (0.3 mg/Kg), 2-butanone (0.5 mg/Kg), and bromomethane (0.3 mg/Kg) exceeded the limits listed in the QAPP for methylene chloride (0.25 mg/Kg), 2-butanone (0.25 mg/Kg), and bromomethane (0.05 mg/Kg). The aqueous detection limits listed in the data package for methylene chloride (0.005 mg/L) exceeded the limit listed in the QAPP for methylene chloride (0.001 mg/L).

Encore® samplers were used to collect soil samples during this sampling event and the soil samples were analyzed using the medium level soil analysis as preferred by the Michigan Department of Environmental Quality (MDEQ).

The following data package information was requested and received during the validation process since the data packages were incomplete:

- Revised sample result sheets which included correction for percent solids
- The evaluation of the entire list of target analytes for the calibrations
- Initial calibration curves
- Explanation of the change in sample preparation technique
- Correction for LCS recovery results
- MS summary forms
- Bar graph spectra for instrument performance checks
- Explanation of the spike traceability information

2.1.2. VOC analyses of soil samples by GC/MS

Criteria compliance

The following QA/QC parameters met validation criteria or did not result in additional qualification of sample results:

- Chain-of-custody records
- Holding times, sample preservation, and percent solids
- Calibrations
- Blank analysis

- Field duplicate analysis
- Surrogate recovery
- Internal standards performance
- GC/MS instrument performance check
- Target analyte quantitation, identification, and reported detection limits, and
- System performance

Excursions from QA/QC criteria presented in Section 1.2.2 and additional observations are summarized below.

MS/MSD analysis

The percent recovery for chloroethane in MS/MSD field sample GB-9 (14'-15') analyzed for this investigation was less than the lower laboratory control limit, indicating matrix influence or low instrument response. As a result of the MS/MSD excursions, the result in the unspiked sample was qualified as approximate (UJ) to indicate a minor recovery excursion. The following table presents the sample qualified as a result of the MS/MSD excursions:

Table 2-3. MS/MSD excursions for VOC analysis of soil samples

MS/MSD ID	Analyte	Excursion	Affected Samples	Action
GB-9 (14'-15')	Chloroethane	19.6%R, 17.7%R	GB-9 (14'-15')	UJ

Note: %R indicates percent recovery.

LCS analysis

The percent recoveries for chloroethane, bromoform, and 1,2-dibromo-3-chloropropane in the LCS analyses performed for this sampling event were outside of the laboratory control limits. Since the recoveries were less than the lower control limits, the results for the analytes in samples associated with the LCSs were qualified as approximate (UJ), indicating minor recovery excursions. The LCS excursions are summarized in the following table:

Table 2-4. LCS excursion for VOC analyses of soil samples

LCS ID	Analyte	Excursion	Affected Samples	Action
LCS 6/11/02	Chloroethane	17.1 %R	GB-8 (14'-15')	UJ
	Bromoform	49.1 %R	GB-9 (14'-15')	
	1,2-Dibromo-3-chloropropane	45.5 %R	GB-10 (14'-15')	
			Duplicate [GB-10 (14'-15')]	

Note:
%R indicates percent recovery.

3. Summary and data usability

This chapter summarizes the analytical data in terms of its completeness and usability. Data completeness is defined as the percentage of sample results that have been determined to be usable during the data validation process.

The soil samples, MS/MSD, field duplicate, equipment blank, and trip blank collected from the former Drum Storage Area at the REALM Coldwater Road Facility, were evaluated based on QA/QC criteria established by USEPA Methods as listed in Section 1.2, the QAPP (O'Brien & Gere 1999), and the USEPA National Functional data validation guidelines. Major deficiencies in the data generation process would have resulted in data being rejected, indicating that the data is considered unusable for either quantitative or qualitative purposes. Minor deficiencies in the data generation process resulted in some sample data being characterized as approximate. Identification of a data point as approximate indicates uncertainty in the reported concentration of the chemical, but not its assigned identity. The use of approximated analytical data for quantitative uses is consistent with the guidance presented in the *USEPA Risk Assessment Guidance for Superfund* (USEPA 1992).

A discussion of the data quality with regard to the parameters follows:

Precision: Data usability with respect to precision is 100 percent for volatile organic compound soil data.

For the soil samples, none of the data were rejected for precision excursions.

Sensitivity: With the exceptions of the elevated detection limits noted in Section 2, sensitivity requirements were met for the sample data in this project.

Accuracy: Data usability with respect to accuracy is 100 percent for volatile organic compound soil data.

For the soil samples, none of the data were rejected for accuracy excursions.

Representativeness: Data usability with respect to representativeness is 100 percent for volatile organic compound soil data.

For the soil samples, none of the data were rejected for representativeness excursions.

Comparability: Data usability with respect to comparability is 100 percent, as standardized analytical methods, reporting limits, reference materials, and data deliverables were used throughout the data generation process for this project.

Completeness: Overall, 100 percent of the volatile organic compound soil data were determined to be usable for qualitative and quantitative purposes. Therefore, the completeness objective of 90 percent for this investigation, as presented in the QAPP, was met.

References

O'Brien & Gere Engineers, Inc. 1999. *Coldwater Road Facility Remedial Investigation, REALM, Quality Assurance Project Plan (QAPP)*, Syracuse, New York.

United States Environmental Protection Agency (USEPA). 1992. *USEPA Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A)*, 540/1-891002. Washington D.C.

United States Environmental Protection Agency (USEPA). 1996. *Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW-846)*, 3rd Edition. Washington DC.

United States Environmental Protection Agency (USEPA). 1999. *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*, EPA-540/R-96/008. Washington D.C.

APPENDIX A

**A summary of validated
analytical results**



Analytical Laboratory Report

Revised Report (#2)

Lab Sample ID: S09369.01
 Sample Tag: GB-8 (14-15')
 Collected Date/Time: 06/04/2002 09:10
 Matrix: Soil
 COC Reference: 008217

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	20g EnCore	None	Yes	4	4025
1	4oz. Glass	None	Yes	4	4025

Analysis

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
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Inorganics

Total Solids	86.5	%	1	160.3	06/06/02	MKH		
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Organics

Volatile Organics

2-Butanone (MEK)	Not detected	mg/kg	0.3	5035/8260B	06/12/02	JGH	78-93-3	
Benzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	71-43-2	
n-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	104-51-8	
Bromobenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	108-86-1	
Bromochloromethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	74-97-5	
Bromodichloromethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	75-27-4	
Bromoform	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	75-25-2	
Bromomethane	Not detected	mg/kg	0.3	5035/8260B	06/12/02	JGH	74-83-9	
sec-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	135-98-8	
tert-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	98-06-6	
2-Chlorotoluene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	95-49-8	
4-Chlorotoluene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	106-43-4	
Carbon tetrachloride	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	56-23-5	
Chlorobenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	108-90-7	
Chloroethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	75-00-3	
Chloroform	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	67-66-3	
Chloromethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	74-87-3	
1,1-Dichloroethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	75-34-3	
1,1-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	75-35-4	
1,1-Dichloropropene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	563-58-6	
1,2-Dibromo-3-chloropropane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	96-12-8	
1,2-Dibromoethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	106-93-4	
1,2-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	95-50-1	
1,2-Dichloroethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	107-06-2	
1,2-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	78-87-5	
1,3-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	541-73-1	
1,3-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	142-28-9	
1,4-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	106-46-7	
2,2-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	594-20-7	
cis-1,2-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	156-59-2	
cis-1,3-Dichloropropene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	10061-01-5	
Dibromochloromethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	124-48-1	
Dibromomethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	74-95-3	
Dichlorodifluoromethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	75-71-8	
trans-1,2-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	156-60-5	
Ethylbenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	100-41-4	
p-Isopropyltoluene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	99-87-6	
Isopropylbenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	98-82-8	



Analytical Laboratory Report

Revised Report (#)

Lab Sample ID: S09369.01 (continued)

Sample Tag: GB-8 (14-15')

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Fla
Organics (continued)								
Volatile Organics (continued)								
Methylene chloride	Not detected	mg/kg	0.3	5035/8260B	06/12/02	JGH	75-09-2	
Naphthalene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	91-20-3	
n-Propylbenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	103-65-1	
Styrene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	630-20-6	
1,1,1-Trichloroethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	79-34-5	
1,1,2-Trichloroethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	79-00-5	
1,2,3-Trichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	87-61-6	
1,2,3-Trichloropropane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	96-18-4	
1,2,4-Trichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	120-82-1	
1,2,4-Trimethylbenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	95-63-6	
1,3,5-Trimethylbenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	108-67-8	
Tetrachloroethene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	127-18-4	
Toluene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	108-88-3	
Trichloroethene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	79-01-6	
Trichlorofluoromethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	75-69-4	
Vinyl chloride	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	75-01-4	
o-Xylene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	95-47-6	
p,m-Xylene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	106-42-3	



Analytical Laboratory Report

Revised Report (#2)

Lab Sample ID: S09369.02
 Sample Tag: GB-9 (14-15')
 Collected Date/Time: 06/04/2002 09:40
 Matrix: Soil
 COC Reference: 008217

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	20g EnCore	None	Yes	4	4025
1	4oz. Glass	None	Yes	4	4025

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Inorganics								
Total Solids	88.1	%	1	160.3	06/06/02	MKH		
Organics								
Volatile Organics								
2-Butanone (MEK)	Not detected	mg/kg	0.3	5035/8260B	06/12/02	JGH	78-93-3	
Benzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	71-43-2	
n-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	104-51-8	
Bromobenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	108-86-1	
Bromochloromethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	74-97-5	
Bromodichloromethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	75-27-4	
Bromoform	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	75-25-2	
Bromomethane	Not detected	mg/kg	0.3	5035/8260B	06/12/02	JGH	74-83-9	
sec-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	135-98-8	
tert-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	98-06-6	
2-Chlorotoluene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	95-49-8	
4-Chlorotoluene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	106-43-4	
Carbon tetrachloride	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	56-23-5	
Chlorobenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	108-90-7	
Chloroethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	75-00-3	
Chloroform	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	67-66-3	
Chloromethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	74-87-3	
1,1-Dichloroethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	75-34-3	
1,1-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	75-35-4	
1,1-Dichloropropene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	563-58-6	
1,2-Dibromo-3-chloropropane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	96-12-8	
1,2-Dibromoethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	106-93-4	
1,2-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	95-50-1	
1,2-Dichloroethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	107-06-2	
1,2-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	78-87-5	
1,3-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	541-73-1	
1,3-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	142-28-9	
1,4-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	106-46-7	
2,2-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	594-20-7	
cis-1,2-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	156-59-2	
cis-1,3-Dichloropropene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	10061-01-5	
Dibromochloromethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	124-48-1	
Dibromomethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	74-95-3	
Dichlorodifluoromethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	75-71-8	
trans-1,2-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	156-60-5	
Ethylbenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	100-41-4	
p-Isopropyltoluene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	99-87-6	
Isopropylbenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	98-82-8	



Analytical Laboratory Report

Revised Report (#)

Lab Sample ID: S09369.02 (continued)

Sample Tag: GB-9 (14-15')

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Fla
Organics (continued)								
Volatile Organics (continued)								
Methylene chloride	Not detected	mg/kg	0.3	5035/8260B	06/12/02	JGH	75-09-2	
Naphthalene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	91-20-3	
n-Propylbenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	103-65-1	
Styrene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	630-20-6	
1,1,1-Trichloroethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	79-34-5	
1,1,2-Trichloroethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	79-00-5	
1,2,3-Trichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	87-61-6	
1,2,3-Trichloropropane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	96-18-4	
1,2,4-Trichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	120-82-1	
1,2,4-Trimethylbenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	95-63-6	
1,3,5-Trimethylbenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	108-67-8	
Tetrachloroethene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	127-18-4	
Toluene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	108-88-3	
Trichloroethene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	79-01-6	
Trichlorofluoromethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	75-69-4	
Vinyl chloride	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	75-01-4	
o-Xylene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	95-47-6	
p,m-Xylene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	106-42-3	



Analytical Laboratory Report

Revised Report (#2)

Lab Sample ID: S09369.03
Sample Tag: GB-10 (14-15')
Collected Date/Time: 06/04/2002 10:10
Matrix: Soil
COC Reference: 008217

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	20g EnCore	None	Yes	4	4025
1	4oz. Glass	None	Yes	4	4025

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Inorganics								
Total Solids	87.7	%	1	160.3	06/06/02	MKH		
Organics								
Volatile Organics								
2-Butanone (MEK)	Not detected	mg/kg	0.3	5035/8260B	06/12/02	JGH	78-93-3	
Benzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	71-43-2	
n-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	104-51-8	
Bromobenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	108-86-1	
Bromochloromethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	74-97-5	
Bromodichloromethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	75-27-4	
Bromoform	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	75-25-2	
Bromomethane	Not detected	mg/kg	0.3	5035/8260B	06/12/02	JGH	74-83-9	
sec-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	135-98-8	
tert-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	98-06-6	
2-Chlorotoluene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	95-49-8	
4-Chlorotoluene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	106-43-4	
Carbon tetrachloride	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	56-23-5	
Chlorobenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	108-90-7	
Chloroethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	75-00-3	
Chloroform	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	67-66-3	
Chloromethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	74-87-3	
1,1-Dichloroethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	75-34-3	
1,1-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	75-35-4	
1,1-Dichloropropene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	563-58-6	
1,2-Dibromo-3-chloropropane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	96-12-8	
1,2-Dibromoethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	106-93-4	
1,2-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	95-50-1	
1,2-Dichloroethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	107-06-2	
1,2-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	78-87-5	
1,3-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	541-73-1	
1,3-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	142-28-9	
1,4-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	106-46-7	
2,2-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	594-20-7	
cis-1,2-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	156-59-2	
cis-1,3-Dichloropropene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	10061-01-5	
Dibromochloromethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	124-48-1	
Dibromomethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	74-95-3	
Dichlorodifluoromethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	75-71-8	
trans-1,2-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	156-60-5	
Ethylbenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	100-41-4	
p-Isopropyltoluene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	99-87-6	
Isopropylbenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	98-82-8	



Analytical Laboratory Report

Revised Report (#

Lab Sample ID: S09369.03 (continued)

Sample Tag: GB-10 (14-15')

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Organics (continued)								
Volatile Organics (continued)								
Methylene chloride	Not detected	mg/kg	0.3	5035/8260B	06/12/02	JGH	75-09-2	
Naphthalene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	91-20-3	
n-Propylbenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	103-65-1	
Styrene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	630-20-6	
1,1,1-Trichloroethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	79-34-5	
1,1,2-Trichloroethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	79-00-5	
1,2,3-Trichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	87-61-6	
1,2,3-Trichloropropane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	96-18-4	
1,2,4-Trichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	120-82-1	
1,2,4-Trimethylbenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	95-63-6	
1,3,5-Trimethylbenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	108-67-8	
Tetrachloroethene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	127-18-4	
Toluene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	108-88-3	
Trichloroethene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	79-01-6	
Trichlorofluoromethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	75-69-4	
Vinyl chloride	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	75-01-4	
o-Xylene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	95-47-6	
p,m-Xylene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	106-42-3	



Analytical Laboratory Report

Revised Report (#2)

Lab Sample ID: S09369.04
 Sample Tag: MS (GB-9 14-15')
 Collected Date/Time: 06/04/2002 09:40
 Matrix: Soil
 COC Reference: 008217

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	20g EnCore	None	Yes	4	4025
1	4oz. Glass	None	Yes	4	4025

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Inorganics								
Total Solids	88.8	%	1	160.3	06/06/02	MKH		
Organics								
Volatile Organics								
2-Butanone (MEK)	1.1	mg/kg	0.3	5035/8260B	06/11/02	JGH	78-93-3	1N
Benzene	1.32	mg/kg	0.05	5035/8260B	06/11/02	JGH	71-43-2	1N
n-Butylbenzene	1.81	mg/kg	0.05	5035/8260B	06/11/02	JGH	104-51-8	1N
Bromobenzene	1.14	mg/kg	0.05	5035/8260B	06/11/02	JGH	108-86-1	1N
Bromochloromethane	1.23	mg/kg	0.05	5035/8260B	06/11/02	JGH	74-97-5	1N
Bromodichloromethane	1.14	mg/kg	0.05	5035/8260B	06/11/02	JGH	75-27-4	1N
Bromoform	0.75	mg/kg	0.05	5035/8260B	06/11/02	JGH	75-25-2	1N
Bromomethane	1.1	mg/kg	0.3	5035/8260B	06/11/02	JGH	74-83-9	1N
sec-Butylbenzene	1.74	mg/kg	0.05	5035/8260B	06/11/02	JGH	135-98-8	1N
tert-Butylbenzene	1.53	mg/kg	0.05	5035/8260B	06/11/02	JGH	98-06-6	1N
2-Chlorotoluene	1.38	mg/kg	0.05	5035/8260B	06/11/02	JGH	95-49-8	1N
4-Chlorotoluene	1.33	mg/kg	0.05	5035/8260B	06/11/02	JGH	106-43-4	1N
Carbon tetrachloride	1.23	mg/kg	0.05	5035/8260B	06/11/02	JGH	56-23-5	1N
Chlorobenzene	1.31	mg/kg	0.05	5035/8260B	06/11/02	JGH	108-90-7	1N
Chloroethane	0.25	mg/kg	0.05	5035/8260B	06/11/02	JGH	75-00-3	1N
Chloroform	1.41	mg/kg	0.05	5035/8260B	06/11/02	JGH	67-66-3	1N
Chloromethane	1.51	mg/kg	0.05	5035/8260B	06/11/02	JGH	74-87-3	1N
1,1-Dichloroethane	1.39	mg/kg	0.05	5035/8260B	06/11/02	JGH	75-34-3	1N
1,1-Dichloroethene	1.38	mg/kg	0.05	5035/8260B	06/11/02	JGH	75-35-4	1N
1,1-Dichloropropene	1.53	mg/kg	0.05	5035/8260B	06/11/02	JGH	563-58-6	1N
1,2-Dibromo-3-chloropropane	0.72	mg/kg	0.05	5035/8260B	06/11/02	JGH	96-12-8	1N
1,2-Dibromoethane	1.20	mg/kg	0.05	5035/8260B	06/11/02	JGH	106-93-4	1N
1,2-Dichlorobenzene	1.39	mg/kg	0.05	5035/8260B	06/11/02	JGH	95-50-1	1N
1,2-Dichloroethane	1.32	mg/kg	0.05	5035/8260B	06/11/02	JGH	107-06-2	1N
1,2-Dichloropropane	1.31	mg/kg	0.05	5035/8260B	06/11/02	JGH	78-87-5	1N
1,3-Dichlorobenzene	1.38	mg/kg	0.05	5035/8260B	06/11/02	JGH	541-73-1	1N
1,3-Dichloropropane	1.26	mg/kg	0.05	5035/8260B	06/11/02	JGH	142-28-9	1N
1,4-Dichlorobenzene	1.37	mg/kg	0.05	5035/8260B	06/11/02	JGH	106-46-7	1N
2,2-Dichloropropane	1.44	mg/kg	0.05	5035/8260B	06/11/02	JGH	594-20-7	1N
cis-1,2-Dichloroethene	1.44	mg/kg	0.05	5035/8260B	06/11/02	JGH	156-59-2	1N
cis-1,3-Dichloropropene	1.13	mg/kg	0.05	5035/8260B	06/11/02	JGH	10061-01-5	1N
Dibromochloromethane	0.98	mg/kg	0.05	5035/8260B	06/11/02	JGH	124-48-1	1N
Dibromomethane	1.03	mg/kg	0.05	5035/8260B	06/11/02	JGH	74-95-3	1N
Dichlorodifluoromethane	1.82	mg/kg	0.05	5035/8260B	06/11/02	JGH	75-71-8	1N
trans-1,2-Dichloroethene	1.43	mg/kg	0.05	5035/8260B	06/11/02	JGH	156-60-5	1N
Ethylbenzene	1.35	mg/kg	0.05	5035/8260B	06/11/02	JGH	100-41-4	1N
p-Isopropyltoluene	1.77	mg/kg	0.05	5035/8260B	06/11/02	JGH	99-87-6	1N

1-spiked at 25ppb * 50 (dilution factor) N-No correction for total solids.



Analytical Laboratory Report

Revised Report (#

Lab Sample ID: S09369.04 (continued)

Sample Tag: MS (GB-9 14-15')

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Fl
Organics (continued)								
Volatile Organics (continued)								
Isopropylbenzene	1.44	mg/kg	0.05	5035/8260B	06/11/02	JGH	98-82-8	1N
Methylene chloride	1.3	mg/kg	0.3	5035/8260B	06/11/02	JGH	75-09-2	1N
Naphthalene	1.15	mg/kg	0.05	5035/8260B	06/11/02	JGH	91-20-3	1N
n-Propylbenzene	1.48	mg/kg	0.05	5035/8260B	06/11/02	JGH	103-65-1	1N
Styrene	1.41	mg/kg	0.05	5035/8260B	06/11/02	JGH	100-42-5	1N
1,1,1,2-Tetrachloroethane	1.05	mg/kg	0.05	5035/8260B	06/11/02	JGH	630-20-6	1N
1,1,1-Trichloroethane	1.44	mg/kg	0.05	5035/8260B	06/11/02	JGH	71-55-6	1N
1,1,2,2-Tetrachloroethane	1.10	mg/kg	0.05	5035/8260B	06/11/02	JGH	79-34-5	1N
1,1,2-Trichloroethane	1.17	mg/kg	0.05	5035/8260B	06/11/02	JGH	79-00-5	1N
1,2,3-Trichlorobenzene	0.96	mg/kg	0.05	5035/8260B	06/11/02	JGH	87-61-6	1N
1,2,3-Trichloropropane	1.10	mg/kg	0.05	5035/8260B	06/11/02	JGH	96-18-4	1N
1,2,4-Trichlorobenzene	1.13	mg/kg	0.05	5035/8260B	06/11/02	JGH	120-82-1	1N
1,2,4-Trimethylbenzene	1.43	mg/kg	0.05	5035/8260B	06/11/02	JGH	95-63-6	1N
1,3,5-Trimethylbenzene	1.51	mg/kg	0.05	5035/8260B	06/11/02	JGH	108-67-8	1N
Tetrachloroethene	1.10	mg/kg	0.05	5035/8260B	06/11/02	JGH	127-18-4	1N
Toluene	1.31	mg/kg	0.05	5035/8260B	06/11/02	JGH	108-88-3	1N
Trichloroethene	1.29	mg/kg	0.05	5035/8260B	06/11/02	JGH	79-01-6	1N
Trichlorofluoromethane	1.37	mg/kg	0.05	5035/8260B	06/11/02	JGH	75-69-4	1N
Vinyl chloride	1.64	mg/kg	0.05	5035/8260B	06/11/02	JGH	75-01-4	1N
o-Xylene	1.45	mg/kg	0.05	5035/8260B	06/11/02	JGH	95-47-6	1N
p,m-Xylene	2.91	mg/kg	0.05	5035/8260B	06/11/02	JGH	106-42-3	1N

1-spiked at 25ppb * 50 (dilution factor) N-No correction for total solids.



Analytical Laboratory Report

Revised Report (#2)

Lab Sample ID: S09369.05
 Sample Tag: MSD (GE 9 14-15')
 Collected Date/Time: 06/04/2002 09:40
 Matrix: Soil
 COC Reference: 008217

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	20g EnCore	None	Yes	4	4025
1	4oz. Glass	None	Yes	4	4025

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Inorganics								
Total Solids	86.7	%	1	160.3	06/06/02	MKH		
Organics								
Volatile Organics								
2-Butanone (MEK)	1.2	mg/kg	0.3	5035/8260B	06/11/02	JGH	78-93-3	1N
Benzene	1.26	mg/kg	0.05	5035/8260B	06/11/02	JGH	71-43-2	1N
n-Butylbenzene	1.67	mg/kg	0.05	5035/8260B	06/11/02	JGH	104-51-8	1N
Bromobenzene	1.07	mg/kg	0.05	5035/8260B	06/11/02	JGH	108-86-1	1N
Bromochloromethane	1.27	mg/kg	0.05	5035/8260B	06/11/02	JGH	74-97-5	1N
Bromodichloromethane	1.08	mg/kg	0.05	5035/8260B	06/11/02	JGH	75-27-4	1N
Bromoform	0.68	mg/kg	0.05	5035/8260B	06/11/02	JGH	75-25-2	1N
Bromomethane	1.1	mg/kg	0.3	5035/8260B	06/11/02	JGH	74-83-9	1N
sec-Butylbenzene	1.60	mg/kg	0.05	5035/8260B	06/11/02	JGH	135-98-8	1N
tert-Butylbenzene	1.42	mg/kg	0.05	5035/8260B	06/11/02	JGH	98-06-6	1N
2-Chlorotoluene	1.27	mg/kg	0.05	5035/8260B	06/11/02	JGH	95-49-8	1N
4-Chlorotoluene	1.24	mg/kg	0.05	5035/8260B	06/11/02	JGH	106-43-4	1N
Carbon tetrachloride	1.12	mg/kg	0.05	5035/8260B	06/11/02	JGH	56-23-5	1N
Chlorobenzene	1.17	mg/kg	0.05	5035/8260B	06/11/02	JGH	108-90-7	1N
Chloroethane	0.22	mg/kg	0.05	5035/8260B	06/11/02	JGH	75-00-3	1N
Chloroform	1.41	mg/kg	0.05	5035/8260B	06/11/02	JGH	67-66-3	1N
Chloromethane	1.51	mg/kg	0.05	5035/8260B	06/11/02	JGH	74-87-3	1N
1,1-Dichloroethane	1.36	mg/kg	0.05	5035/8260B	06/11/02	JGH	75-34-3	1N
1,1-Dichloroethene	1.32	mg/kg	0.05	5035/8260B	06/11/02	JGH	75-35-4	1N
1,1-Dichloropropene	1.46	mg/kg	0.05	5035/8260B	06/11/02	JGH	563-58-6	1N
1,2-Dibromo-3-chloropropane	0.67	mg/kg	0.05	5035/8260B	06/11/02	JGH	96-12-8	1N
1,2-Dibromoethane	1.05	mg/kg	0.05	5035/8260B	06/11/02	JGH	106-93-4	1N
1,2-Dichlorobenzene	1.32	mg/kg	0.05	5035/8260B	06/11/02	JGH	95-50-1	1N
1,2-Dichloroethane	1.25	mg/kg	0.05	5035/8260B	06/11/02	JGH	107-06-2	1N
1,2-Dichloropropane	1.27	mg/kg	0.05	5035/8260B	06/11/02	JGH	78-87-5	1N
1,3-Dichlorobenzene	1.31	mg/kg	0.05	5035/8260B	06/11/02	JGH	541-73-1	1N
1,3-Dichloropropane	1.19	mg/kg	0.05	5035/8260B	06/11/02	JGH	142-28-9	1N
1,4-Dichlorobenzene	1.27	mg/kg	0.05	5035/8260B	06/11/02	JGH	106-46-7	1N
2,2-Dichloropropane	1.43	mg/kg	0.05	5035/8260B	06/11/02	JGH	594-20-7	1N
cis-1,2-Dichloroethene	1.45	mg/kg	0.05	5035/8260B	06/11/02	JGH	156-59-2	1N
cis-1,3-Dichloropropene	1.09	mg/kg	0.05	5035/8260B	06/11/02	JGH	10061-01-5	1N
Dibromochloromethane	0.88	mg/kg	0.05	5035/8260B	06/11/02	JGH	124-48-1	1N
Dibromomethane	0.96	mg/kg	0.05	5035/8260B	06/11/02	JGH	74-95-3	1N
Dichlorodifluoromethane	1.65	mg/kg	0.05	5035/8260B	06/11/02	JGH	75-71-8	1N
trans-1,2-Dichloroethene	1.42	mg/kg	0.05	5035/8260B	06/11/02	JGH	156-60-5	1N
Ethylbenzene	1.22	mg/kg	0.05	5035/8260B	06/11/02	JGH	100-41-4	1N
p-Isopropyltoluene	1.61	mg/kg	0.05	5035/8260B	06/11/02	JGH	99-87-6	1N

1-spiked at 25ppb * 50 (dilution factor) N-No correction for total solids.



Analytical Laboratory Report

Revised Report (#

Lab Sample ID: S09369.05 (continued)

Sample Tag: MSD (GB-9 14-15')

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Fla
Organics (continued)								
Volatile Organics (continued)								
Isopropylbenzene	1.34	mg/kg	0.05	5035/8260B	06/11/02	JGH	98-82-8	1N
Methylene chloride	1.3	mg/kg	0.3	5035/8260B	06/11/02	JGH	75-09-2	1N
Naphthalene	1.06	mg/kg	0.05	5035/8260B	06/11/02	JGH	91-20-3	1N
n-Propylbenzene	1.37	mg/kg	0.05	5035/8260B	06/11/02	JGH	103-65-1	1N
Styrene	1.32	mg/kg	0.05	5035/8260B	06/11/02	JGH	100-42-5	1N
1,1,1,2-Tetrachloroethane	0.97	mg/kg	0.05	5035/8260B	06/11/02	JGH	630-20-6	1N
1,1,1-Trichloroethane	1.42	mg/kg	0.05	5035/8260B	06/11/02	JGH	71-55-6	1N
1,1,2,2-Tetrachloroethane	1.03	mg/kg	0.05	5035/8260B	06/11/02	JGH	79-34-5	1N
1,1,2-Trichloroethane	1.09	mg/kg	0.05	5035/8260B	06/11/02	JGH	79-00-5	1N
1,2,3-Trichlorobenzene	0.87	mg/kg	0.05	5035/8260B	06/11/02	JGH	87-61-6	1N
1,2,3-Trichloropropane	0.98	mg/kg	0.05	5035/8260B	06/11/02	JGH	96-18-4	1N
1,2,4-Trichlorobenzene	1.02	mg/kg	0.05	5035/8260B	06/11/02	JGH	120-82-1	1N
1,2,4-Trimethylbenzene	1.33	mg/kg	0.05	5035/8260B	06/11/02	JGH	95-63-6	1N
1,3,5-Trimethylbenzene	1.39	mg/kg	0.05	5035/8260B	06/11/02	JGH	108-67-8	1N
Tetrachloroethene	1.05	mg/kg	0.05	5035/8260B	06/11/02	JGH	127-18-4	1N
Toluene	1.24	mg/kg	0.05	5035/8260B	06/11/02	JGH	108-88-3	1N
Trichloroethene	1.21	mg/kg	0.05	5035/8260B	06/11/02	JGH	79-01-6	1N
Trichlorofluoromethane	1.28	mg/kg	0.05	5035/8260B	06/11/02	JGH	75-69-4	1N
Vinyl chloride	1.50	mg/kg	0.05	5035/8260B	06/11/02	JGH	75-01-4	1N
o-Xylene	1.36	mg/kg	0.05	5035/8260B	06/11/02	JGH	95-47-6	1N
p,m-Xylene	2.68	mg/kg	0.05	5035/8260B	06/11/02	JGH	106-42-3	1N

1-spiked at 25ppb * 50 (dilution factor) N-No correction for total solids.



Analytical Laboratory Report

Revised Report (#2)

Lab Sample ID: S09369.06
Sample Tag: DUP
Collected Date/Time: 06/04/2002 :
Matrix: Soil
COC Reference: 008217

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	20g EnCore	None	Yes	4	4025
1	4oz. Glass	None	Yes	4	4025

Analysis

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Inorganics								
Total Solids	88.0	%	1	160.3	06/06/02	MKH		

Organics

Volatile Organics

2-Butanone (MEK)	Not detected	mg/kg	0.3	5035/8260B	06/12/02	JGH	78-93-3	
Benzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	71-43-2	
n-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	104-51-8	
Bromobenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	108-86-1	
Bromochloromethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	74-97-5	
Bromodichloromethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	75-27-4	
Bromoform	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	75-25-2	
Bromomethane	Not detected	mg/kg	0.3	5035/8260B	06/12/02	JGH	74-83-9	
sec-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	135-98-8	
tert-Butylbenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	98-06-6	
2-Chlorotoluene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	95-49-8	
4-Chlorotoluene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	106-43-4	
Carbon tetrachloride	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	56-23-5	
Chlorobenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	108-90-7	
Chloroethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	75-00-3	
Chloroform	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	67-66-3	
Chloromethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	74-87-3	
1,1-Dichloroethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	75-34-3	
1,1-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	75-35-4	
1,1-Dichloropropene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	563-58-6	
1,2-Dibromo-3-chloropropane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	96-12-8	
1,2-Dibromoethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	106-93-4	
1,2-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	95-50-1	
1,2-Dichloroethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	107-06-2	
1,2-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	78-87-5	
1,3-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	541-73-1	
1,3-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	142-28-9	
1,4-Dichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	106-46-7	
2,2-Dichloropropane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	594-20-7	
cis-1,2-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	156-59-2	
cis-1,3-Dichloropropene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	10061-01-5	
Dibromochloromethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	124-48-1	
Dibromomethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	74-95-3	
Dichlorodifluoromethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	75-71-8	
trans-1,2-Dichloroethene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	156-60-5	
Ethylbenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	100-41-4	
p-Isopropyltoluene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	99-87-6	
Isopropylbenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	98-82-8	



Analytical Laboratory Report

Revised Report (#

Lab Sample ID: S09369.06 (continued)

Sample Tag: DUP

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	File
Organics (continued)								
Volatile Organics (continued)								
Methylene chloride	Not detected	mg/kg	0.3	5035/8260B	06/12/02	JGH	75-09-2	
Naphthalene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	91-20-3	
n-Propylbenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	103-65-1	
Styrene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	630-20-6	
1,1,1-Trichloroethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	79-34-5	
1,1,2-Trichloroethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	79-00-5	
1,2,3-Trichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	87-61-6	
1,2,3-Trichloropropane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	96-18-4	
1,2,4-Trichlorobenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	120-82-1	
1,2,4-Trimethylbenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	95-63-6	
1,3,5-Trimethylbenzene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	108-67-8	
Tetrachloroethene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	127-18-4	
Toluene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	108-88-3	
Trichloroethene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	79-01-6	
Trichlorofluoromethane	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	75-69-4	
Vinyl chloride	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	75-01-4	
o-Xylene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	95-47-6	
p,m-Xylene	Not detected	mg/kg	0.06	5035/8260B	06/12/02	JGH	106-42-3	



Analytical Laboratory Report

Revised Report (#2)

Lab Sample ID: S09369.07
 Sample Tag: EB
 Collected Date/Time: 06/04/2002 12:00
 Matrix: Liquid
 COC Reference: 008217

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40 ml Glass	HCL	Yes	4	4025

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Organics								
Volatile Organics								
2-Butanone (MEK)	Not detected	mg/L	0.05	8260B	06/12/02	JGH	78-93-3	
Benzene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	71-43-2	
n-Butylbenzene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	104-51-8	
Bromobenzene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	108-86-1	
Bromochloromethane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	74-97-5	
Bromodichloromethane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	75-27-4	
Bromoform	Not detected	mg/L	0.001	8260B	06/12/02	JGH	75-25-2	
Bromomethane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	74-83-9	
sec-Butylbenzene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	135-98-8	
tert-Butylbenzene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	98-06-6	
2-Chlorotoluene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	95-49-8	
4-Chlorotoluene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	106-43-4	
Carbon tetrachloride	Not detected	mg/L	0.001	8260B	06/12/02	JGH	56-23-5	
Chlorobenzene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	108-90-7	
Chloroethane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	75-00-3	
Chloroform	Not detected	mg/L	0.001	8260B	06/12/02	JGH	67-66-3	
Chloromethane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	74-87-3	
1,1-Dichloroethane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	75-34-3	
1,1-Dichloroethene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	75-35-4	
1,1-Dichloropropene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	563-58-6	
1,2-Dibromo-3-chloropropane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	96-12-8	
1,2-Dibromoethane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	106-93-4	
1,2-Dichlorobenzene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	95-50-1	
1,2-Dichloroethane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	107-06-2	
1,2-Dichloropropane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	78-87-5	
1,3-Dichlorobenzene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	541-73-1	
1,3-Dichloropropane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	142-28-9	
1,4-Dichlorobenzene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	106-46-7	
2,2-Dichloropropane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	594-20-7	
cis-1,2-Dichloroethene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	156-59-2	
cis-1,3-Dichloropropene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	10061-01-5	
Dibromochloromethane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	124-48-1	
Dibromomethane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	74-95-3	
Dichlorodifluoromethane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	75-71-8	
trans-1,2-Dichloroethene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	156-60-5	
Ethylbenzene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	100-41-4	
p-Isopropyltoluene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	99-87-6	
Isopropylbenzene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	98-82-8	
Methylene chloride	Not detected	mg/L	0.005	8260B	06/12/02	JGH	75-09-2	
Naphthalene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	91-20-3	
n-Propylbenzene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	103-65-1	
Styrene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	100-42-5	



Analytical Laboratory Report

Revised Report ()

Lab Sample ID: S09369.07 (continued)

Sample Tag: EB

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Fl
Organics (continued)								
Volatile Organics (continued)								
1,1,1,2-Tetrachloroethane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	630-20-6	
1,1,1-Trichloroethane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	79-34-5	
1,1,2-Trichloroethane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	79-00-5	
1,2,3-Trichlorobenzene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	87-61-6	
1,2,3-Trichloropropane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	96-18-4	
1,2,4-Trichlorobenzene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	120-82-1	
1,2,4-Trimethylbenzene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	95-63-6	
1,3,5-Trimethylbenzene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	108-67-8	
Tetrachloroethene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	127-18-4	
Toluene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	108-88-3	
Trichloroethene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	79-01-6	
Trichlorofluoromethane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	75-69-4	
Vinyl chloride	Not detected	mg/L	0.001	8260B	06/12/02	JGH	75-01-4	
o-Xylene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	95-47-6	
p,m-Xylene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	106-42-3	



Analytical Laboratory Report

Revised Report (#2)

Lab Sample ID: S09369.08
 Sample Tag: TB
 Collected Date/Time: 06/04/2002 :
 Matrix: Liquid
 COC Reference: 008217

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40 ml Glass	HCL	Yes	4	4025

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Organics								
Volatile Organics								
2-Butanone (MEK)	Not detected	mg/L	0.05	8260B	06/12/02	JGH	78-93-3	
Benzene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	71-43-2	
n-Butylbenzene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	104-51-8	
Bromobenzene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	108-86-1	
Bromochloromethane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	74-97-5	
Bromodichloromethane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	75-27-4	
Bromoform	Not detected	mg/L	0.001	8260B	06/12/02	JGH	75-25-2	
Bromomethane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	74-83-9	
sec-Butylbenzene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	135-98-8	
tert-Butylbenzene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	98-06-6	
2-Chlorotoluene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	95-49-8	
4-Chlorotoluene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	106-43-4	
Carbon tetrachloride	Not detected	mg/L	0.001	8260B	06/12/02	JGH	56-23-5	
Chlorobenzene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	108-90-7	
Chloroethane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	75-00-3	
Chloroform	Not detected	mg/L	0.001	8260B	06/12/02	JGH	67-66-3	
Chloromethane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	74-87-3	
1,1-Dichloroethane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	75-34-3	
1,1-Dichloroethene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	75-35-4	
1,1-Dichloropropene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	563-58-6	
1,2-Dibromo-3-chloropropane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	96-12-8	
1,2-Dibromoethane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	106-93-4	
1,2-Dichlorobenzene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	95-50-1	
1,2-Dichloroethane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	107-06-2	
1,2-Dichloropropane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	78-87-5	
1,3-Dichlorobenzene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	541-73-1	
1,3-Dichloropropane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	142-28-9	
1,4-Dichlorobenzene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	106-46-7	
2,2-Dichloropropane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	594-20-7	
cis-1,2-Dichloroethene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	156-59-2	
cis-1,3-Dichloropropene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	10061-01-5	
Dibromochloromethane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	124-48-1	
Dibromomethane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	74-95-3	
Dichlorodifluoromethane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	75-71-8	
trans-1,2-Dichloroethene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	156-60-5	
Ethylbenzene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	100-41-4	
p-Isopropyltoluene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	99-87-6	
Isopropylbenzene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	98-82-8	
Methylene chloride	Not detected	mg/L	0.005	8260B	06/12/02	JGH	75-09-2	
Naphthalene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	91-20-3	
n-Propylbenzene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	103-65-1	
Styrene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	100-42-5	



Analytical Laboratory Report

Revised Report (#

Lab Sample ID: S09369.08 (continued)

Sample Tag: TB

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	File
Organics (continued)								
Volatile Organics (continued)								
1,1,1,2-Tetrachloroethane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	630-20-6	
1,1,1-Trichloroethane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	79-34-5	
1,1,2-Trichloroethane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	79-00-5	
1,2,3-Trichlorobenzene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	87-61-6	
1,2,3-Trichloropropane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	96-18-4	
1,2,4-Trichlorobenzene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	120-82-1	
1,2,4-Trimethylbenzene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	95-63-6	
1,3,5-Trimethylbenzene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	108-67-8	
Tetrachloroethene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	127-18-4	
Toluene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	108-88-3	
Trichloroethene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	79-01-6	
Trichlorofluoromethane	Not detected	mg/L	0.001	8260B	06/12/02	JGH	75-69-4	
Vinyl chloride	Not detected	mg/L	0.001	8260B	06/12/02	JGH	75-01-4	
o-Xylene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	95-47-6	
p,m-Xylene	Not detected	mg/L	0.001	8260B	06/12/02	JGH	106-42-3	

**Data Validation Report for
November 26, 2002 Soil Samples**

DATA VALIDATION REPORT

**Former Drum Storage Area at the
Former Peregrine, U.S., Inc. Property
at the Coldwater Road Facility
G-1245 East Coldwater Road
Flint, Michigan
(EPA I.D. No. MIR 000 020 743)**

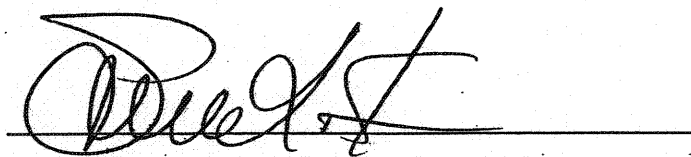
**Remediation and Liability Management
Company , Inc.**

January 2003

DATA VALIDATION REPORT

Soil Samples Collected November 2002
Former Drum Storage Area at the
Former Peregrine U.S., Inc. Property at the
Coldwater Road Facility
Flint, Michigan
(EPA I.D. No. MIR 000 020 743)

General Motors



Swiatoslaw W. Kaczmar, Ph.D., C.I.H.
Vice President

January 2003



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Executive summary

This data validation report addresses data quality for soil samples collected from the former Drum Storage Area at the Remediation and Liability Management Company, Inc. (REALM) Coldwater Road Facility, 1245 Coldwater Road, Flint, Michigan (formerly the Peregrine, U.S., Inc. property). Sample collection activities were conducted by O'Brien & Gere Engineers, Inc. (O'Brien & Gere) on 11/26/02.

The environmental samples, matrix spike, matrix spike duplicate (MS/MSD), field duplicate, equipment blank, and trip blank collected for this investigation were submitted to Merit Laboratories, Inc. of East Lansing, Michigan for analysis of volatile organic compounds (VOCs) using United States Environmental Protection Agency (USEPA) Methods. The analytical data generated for this investigation were evaluated by O'Brien & Gere using the quality assurance/quality control (QA/QC) criteria established in the following documents:

- United States Environmental Protection Agency (USEPA) Methods
- Coldwater Road Facility Remedial Investigation, REALM, Quality Assurance Project Plan (QAPP) (O'Brien & Gere 2000).

Excursions from the QA/QC criteria were qualified based on guidance provided in the following document:

- United States Environmental Protection Agency (USEPA) Contract Laboratory Program (CLP) National Functional Guidelines For Organic Data Review, EPA-540/R-96/008 (USEPA 1999).

As a result of the data validation process the VOCs data for the soil samples analyzed were determined to be 100% usable for qualitative and quantitative purposes.

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1. Introduction

1.1. Program summary

This data validation report addresses the results of a data quality evaluation for soil samples, matrix spike, matrix spike duplicate (MS/MSD), field duplicate, equipment blank, and one trip blank collected from the former Drum Storage Area at the Remediation and Liability Management Company, Inc. (REALM) Coldwater Road Facility, 1245 Coldwater Road, Flint, Michigan (formerly the Peregrine, U.S., Inc. property). Sample collection activities were conducted by O'Brien & Gere on 11/26/02. The environmental samples, MS/MSD sample, field duplicate, equipment blank, and trip blank collected for this investigation were submitted to Merit Laboratories, Inc. of East Lansing, Michigan for analysis of volatile organic compounds (VOCs) using United States Environmental Protection Agency (USEPA) Methods listed in Table 1-1. The samples that were submitted for data validation are presented in Table 1-1 below.

Table 1-1. Sample cross reference list

Laboratory Package ID	Date Collected	Client ID	Sample Identification Laboratory ID	Analysis Requested	Reference
S11215.01	11/26/02	GB-14 (10-12')	11215.01	Trichloroethene by 8260B	1
		GB-15 (5-7)	11215.02	Trichloroethene by 8260B	1
		GB-16 (5-7), MS, MSD	11215.03, .06, .07	Trichloroethene by 8260B	1
		GB-17 (5-7)	11215.04	Trichloroethene by 8260B	1
		Duplicate [GB-14(10-12')]	11215.05	Trichloroethene by 8260B	1
		Equipment Blank	11215.08	Trichloroethene by 8260B	1
		Trip Blank	11215.09	Trichloroethene by 8260B	1

Note:

MS indicates matrix spike sample.

MSD indicates matrix spike duplicate sample.

The sample identification in brackets indicates the field duplicate sampling location.

Reference:

1 USEPA. 1996. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846*, 3rd Edition. Washington D.C.

1.2. Data validation protocols

Validation is a process of determining the suitability of a measurement system for providing useful analytical data. Data validation is essentially a three-step process in which the analytical data's quality assurance/quality control (QA/QC) information is first compared to a series of QA/QC criteria. Based on the results of this comparison, the analytical data are then assigned qualifiers, which provide an indication of the data's usability. Finally, an overall evaluation of the data's usability is performed. These three steps are described in the following sections.

1.2.1. Comparison to QA/QC criteria

In this report, the analytical data's QA/QC information is compared to the applicable QA/QC criteria provided in the following documents:

- USEPA. 1996. Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW-846), 3rd Edition. Washington DC.
- O'Brien & Gere Engineers, Inc. 1999. Coldwater Road Facility Remedial Investigation, REALM, Quality Assurance Project Plan (QAPP), Syracuse, New York.

Full data validation was performed on the soil sample data. Full data validation consists of a review of data summary forms and raw analytical data that were provided in the data packages. The following QA/QC information was included in the review for VOC analyses:

- Chain-of-custody records
- Holding times and sample preservation
- Calibrations
- Blank analysis
- Matrix spike/matrix spike duplicate (MS/MSD) analysis
- Laboratory control sample (LCS) analysis
- Field duplicate analysis
- Surrogate recovery
- Internal standards performance
- Gas chromatography/mass spectrometry (GC/MS) instrument performance check
- Target analyte quantitation, identification, and reported detection limits
- System performance
- Documentation completeness, and
- Overall data assessment.

1.2.2. Assignment of qualifiers

Excursions from the QA/QC criteria were qualified based on guidance provided in the following document:

- USEPA 1999. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA-540/R-94/012. Washington D.C.

In accordance with the USEPA guidance, the following qualifiers are used in this type of data validation:

- J Indicates that the analyte concentration should be considered approximate. This qualifier is used when the data validation process identifies a minor deficiency in the data generation process.
- UJ Indicates that the analyte reporting limit should be considered approximate. This qualifier is used when the data validation process identifies a minor deficiency in the data generation process.

The following guidelines are used regarding the assignment of qualifiers and the use of qualified data:

The data quality evaluation results in only one qualifier for each analyte; in a case when several qualifiers are applicable to the same analyte, the cumulative effect of the various QA/QC excursions is employed in assigning the final data qualifiers.

QA/QC excursions which do not result in the qualification of an analyte, or which result in additional qualification if the analyte was previously qualified, are not discussed.

The quantitative use of approximated analytical data is consistent with the guidance presented in the USEPA Risk Assessment Guidance for Superfund (USEPA 1992).

1.2.3. Data usability evaluation

Based on the QA/QC information review and the qualifiers assigned to the analytical data, an overall evaluation of the data's usability is performed. This evaluation considers the data parameters of precision, sensitivity, accuracy, representativeness, comparability, and completeness (known as PSARCC parameters), which are described as follows:

- Precision is evaluated through the review of field duplicate samples and MS/MSD samples.

- Sensitivity is evaluated through the review of reported detection limits.
- Accuracy is evaluated through the review of MS/MSD samples, internal standards, surrogate recoveries, LCS recoveries, calibration, and instrument performance check.
- Representativeness is evaluated through the review of holding times, sample preservation and preparation, blank analysis and target compound identification and quantification.
- Comparability is evaluated through the review of the analytical methods and reporting procedures for consistency.
- Completeness is defined as the percentage of sample results that are determined to be usable.

1.2.4. Analytical methods

The soil samples collected for this investigation were analyzed by Merit Laboratories, Inc. (Merit Labs) of East Lansing, Michigan for volatile organic compounds (VOCs) using the method presented in Table 1-2.

Table 1-2. Analytical method reference

Parameter	Method	Reference
Trichloroethene	USEPA Method 5030B/5035/8260B	1

Note:

1. USEPA. 1996 *Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW-846)*, 3rd Edition. Washington DC.

The following chapters of this document address distinct aspects of the validation process. Specific QA/QC excursions and qualifications performed on the sample data are discussed in Section 2. Data completeness and usability are discussed in Section 3.

The annotated analytical results generated by this validation are presented in Appendix A.

2. Data quality evaluation

2.1. Soil samples

2.1.1. VOC analysis of soil samples by GM/MS

Criteria compliance

The following QA/QC parameters met validation criteria or did not result in additional qualification of sample results:

- Chain-of-custody records
- Holding times and sample preservation
- Calibrations
- Blank analysis
- MS/MSD analysis
- LCS analysis
- Field duplicate analysis
- Surrogate recovery
- Internal standards performance
- GC/MS instrument performance check
- Target analyte quantitation, identification, and reported detection limits
- System performance
- Documentation completeness, and
- Overall data assessment.

Excursions from QA/QC criteria presented in Section 1.2.2 were not noted during the validation process. Therefore, sample data were not qualified.

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3. Summary and data usability

This chapter summarizes the analytical data in terms of its completeness and usability. Data completeness is defined as the percentage of sample results that have been determined to be usable during the data validation process.

The soil samples, MS/MSD, field duplicate, equipment blank, and trip blank collected from the former Drum Storage Area at the REALM Coldwater Road Facility, were evaluated based on QA/QC criteria established by USEPA Methods as listed in Section 1.2, the QAPP (O'Brien & Gere 1999), and the USEPA National Functional data validation guidelines. Major deficiencies in the data generation process would have resulted in data being rejected, indicating that the data is considered unusable for either quantitative or qualitative purposes. Minor deficiencies in the data generation process would have resulted in some sample data being characterized as approximate. Identification of a data point as approximate indicates uncertainty in the reported concentration of the chemical, but not its assigned identity. The use of approximated analytical data for quantitative uses is consistent with the guidance presented in the USEPA Risk Assessment Guidance for Superfund (USEPA 1992).

A discussion of the data quality with regard to the parameters follows:

Precision: Data usability with respect to precision is 100 percent for volatile organic compound soil data.

For the soil samples, none of the data were rejected for precision excursions.

Sensitivity: With the exceptions of the elevated detection limits noted in Section 2, sensitivity requirements were met for the sample data in this project.

Accuracy: Data usability with respect to accuracy is 100 percent for volatile organic compound soil data.

For the soil samples, none of the data were rejected for accuracy excursions.

Representativeness: Data usability with respect to representativeness is 100 percent for volatile organic compound soil data.

For the soil samples, none of the data were rejected for representativeness excursions.

Comparability: Data usability with respect to comparability is 100 percent, as standardized analytical methods, reporting limits, reference materials, and data deliverables were used throughout the data generation process for this project.

Completeness: Overall, 100 percent of the trichloroethene soil data were determined to be usable for qualitative and quantitative purposes. Therefore, the completeness objective of 90 percent for this investigation, as presented in the QAPP, was met.

References

O'Brien & Gere Engineers, Inc. 1999. Coldwater Road Facility Remedial Investigation, REALM, Quality Assurance Project Plan (QAPP), Syracuse, New York.

United States Environmental Protection Agency (USEPA). 1992. USEPA Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A), 540/1-891002. Washington D.C.

United States Environmental Protection Agency (USEPA). 1996. Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW-846), 3rd Edition. Washington DC.

United States Environmental Protection Agency (USEPA). 1999. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA-540/R-96/008. Washington D.C.

APPENDIX A

**A summary of validated
analytical results**



Analytical Laboratory Report

Report ID: S11215.01(01)
Generated on 12/04/2002

Report to

Attention: Mr. Tony Finch
O'Brien & Gere Engineers, Inc.
33469 West 14 Mile Road Suite 150
Farmington Hills, Michigan 48331

Phone: 248-661-3745 X 14 FAX: 248-661-4057

Report produced by

Merit
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S11215.01-S11215.09
Project: Realm Coldwater Rd., DSA
Submitted Date/Time: 11/26/2002 18:30
Sampled by: AF/JON
P.O. #:

Report Notes

Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
Results relate only to items tested.
Report shall not be reproduced except in full, without the written approval of Merit.

Violetta F. Murshak
Laboratory Director



Analytical Laboratory Report

Lab Sample ID: S11215.01
Sample Tag: GB-14 (10-12')
Collected Date/Time: 11/26/2002 09:50
Matrix: Soil
COC Reference: 013838

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	20g EnCore	None	Yes	4	4025
1	4oz. Glass	None	Yes	4	4025

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Inorganics								
Total Solids	86.9	%	1	160.3	12/01/02	MKH		
Organics								
Trichloroethene	Not detected	ug/kg	60	8260B	12/03/02	JGH	79-01-6	



Analytical Laboratory Report

Lab Sample ID: S11215.02
Sample Tag: GB-15 (5-7)
Collected Date/Time: 11/26/2002 10:10
Matrix: Soil
COC Reference: 013838

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	20g EnCore	None	Yes	4	4025
1	4oz. Glass	None	Yes	4	4025

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Inorganics								
Total Solids	87.5	%	1	160.3	12/01/02	MKH		
Organics								
Trichloroethene	Not detected	ug/kg	60	8260B	12/04/02	JGH	79-01-6	



Analytical Laboratory Report

Lab Sample ID: S11215.03
Sample Tag: GB-16 (5-7)
Collected Date/Time: 11/26/2002 10:30
Matrix: Soil
COC Reference: 013838

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	20g EnCore	None	Yes	4	4025
1	4oz. Glass	None	Yes	4	4025

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Inorganics								
Total Solids	87.5	%	1	160.3	12/01/02	MKH		
Organics								
Trichloroethene	Not detected	ug/kg	60	8260B	12/04/02	JGH	79-01-6	



Analytical Laboratory Report

Lab Sample ID: S11215.04
Sample Tag: GB-17 (5-7)
Collected Date/Time: 11/26/2002 11:10
Matrix: Soil
COC Reference: 013838

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	20g EnCore	None	Yes	4	4025
1	4oz. Glass	None	Yes	4	4025

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Inorganics								
Total Solids	86.7	%	1	160.3	12/01/02	MKH		
Organics								
Trichloroethene	Not detected	ug/kg	60	8260B	12/04/02	JGH	79-01-6	



Analytical Laboratory Report

Lab Sample ID: S11215.05
 Sample Tag: Dup
 Collected Date/Time: 11/26/2002 :
 Matrix: Soil
 COC Reference: 013838

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	20g EnCore	None	Yes	4	4025
1	4oz. Glass	None	Yes	4	4025

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Inorganics								
Total Solids	87.3	%	1	160.3	12/01/02	MKH		
Organics								
Trichloroethene	Not detected	ug/kg	60	8260B	12/04/02	JGH	79-01-6	



Analytical Laboratory Report



Lab Sample ID: S11215.06
 Sample Tag: MS [GB-16 (5-7)]
 Collected Date/Time: 11/26/2002 10:30
 Matrix: Soil
 COC Reference: 013839

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	20g EnCore	None	Yes	4	4025
1	4oz. Glass	None	Yes	4	4025

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Inorganics								
Total Solids	86.5	%	1	160.3	12/01/02	MKH		
Organics								
Trichloroethene	1180	ug/kg	60	8260B	12/04/02	JGH	79-01-6	1N

1-Spiked at 25ppb * 50 (dilution factor) N-No correction for total solids.



Analytical Laboratory Report

Lab Sample ID: S11215.07
Sample Tag: MSD [GB-16 (5-7)]
Collected Date/Time: 11/26/2002 10:30
Matrix: Soil
COC Reference: 013839

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	20g EnCore	None	Yes	4	4025
1	4oz. Glass	None	Yes	4	4025

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Inorganics								
Total Solids	87.3	%	1	160.3	12/01/02	MKH		
Organics								
Trichloroethene	1100	ug/kg	60	8260B	12/04/02	JGH	79-01-6	1N

1-Spiked at 25ppb * 50 (dilution factor) N-No correction for total solids.



Analytical Laboratory Report

Lab Sample ID: S11215.08
Sample Tag: EB
Collected Date/Time: 11/26/2002 15:15
Matrix: Liquid
COC Reference: 013839

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40 ml Glass	HCL	Yes	4	4025

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Organics								
Trichloroethene	Not detected	ug/l	1	8260B	12/04/02	JGH	79-01-6	



Analytical Laboratory Report

Lab Sample ID: S11215.09
Sample Tag: TB
Collected Date/Time: 11/26/2002 :
Matrix: Liquid
COC Reference: 013839

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40 ml Glass	HCL	Yes	4	4025

Analysis	Results	Units	RDL	Method	Date Run	Analyst	CAS #	Flags
Organics								
Trichloroethene	Not detected	ug/l	1	8260B	12/04/02	JGH	79-01-6	