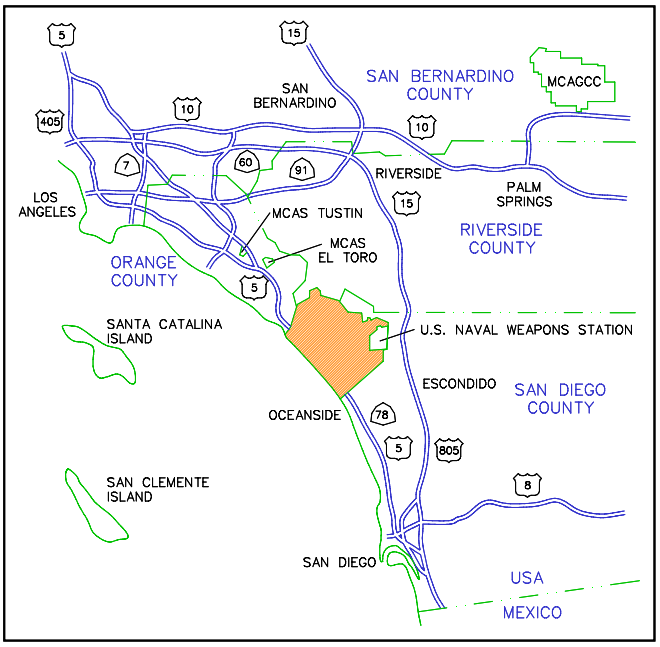
Semiannual Groundwater Monitoring Report (Includes: Documentation of Additional Site Assessment Activities)
for UST Site 1413
Marine Corps Base Camp Pendleton



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March 2006

SEMIANNUAL GROUNDWATER MONITORING REPORT (INCLUDES: DOCUMENTATION OF ADDITIONAL SITE ASSESSMENT ACTIVITIES) FOR UST SITE 1413 MARINE CORPS BASE CAMP PENDLETON

Contract No. N47408-01-D-8207
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March 31, 2006

Semiannual
Groundwater Monitoring Report
(Includes: Documentation of
Additional Site Assessment Activities)
for UST Site 1413
Marine Corps Base Camp Pendleton

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ABBREVIATIONS AND ACRONYMS

amsl	above mean sea level
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and total xylenes
btoc	below top of casing
CAP	Corrective Action Plan
DEH	(San Diego County) Department of Environmental Health
DHS	(California) Department of Health Services
DO	dissolved oxygen
ER	equipment rinsate
FB	field blank
ID	identification
MCB	Marine Corps Base
MCL	maximum contaminant level
MNA	monitored natural attenuation
mS/cm	millisiemens per centimeter
MTBE	methyl-*tert*-butyl ether
mV	millivolt
MW	monitoring well
NA	not analyzed / not applicable
NFESC	Naval Facilities Engineering Service Center
NPWC	Navy Public Works Center
NS	not sampled
NTU	nephelometric turbidity units
ORP	oxidation-reduction potential
PAH	polynuclear aromatic hydrocarbon
QA	quality assurance
QC	quality control
RWQCB	Regional Water Quality Control Board, San Diego Region
SAM	Site Assessment and Mitigation
SB	soil boring
TB	trip blank
TDS	total dissolved solids
TMB	trimethylbenzene
TOC	total organic carbon

TOT	taste and odor threshold
TPH-E	total petroleum hydrocarbons extractable
TPH-D	total petroleum hydrocarbons extractable as diesel
TPH-JF	total petroleum hydrocarbons extractable as jet fuel
TPH-MO	total petroleum hydrocarbons extractable as motor oil
U.S. EPA	United States Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound

Section 1.0: INTRODUCTION AND SITE DESCRIPTION

This semiannual report contains groundwater monitoring data collected from Site 1413, Marine Corps Base (MCB) Camp Pendleton, during the two most recent quarterly groundwater sampling events (October 2005 and January 2006) and includes historical data from all previous groundwater monitoring events. In addition, this report also describes and presents results from the additional site assessment activities conducted at Site 1413 during September 2005. This task was initiated under Task Order No. 0102 for the Naval Facilities Engineering Service Center (NFESC) Contract No. N47408-01-D-8207.

Site 1413, which consists of the region beneath and surrounding the area that formerly contained underground storage tank (UST) 1413, is located within the southern portion of MCB Camp Pendleton 14 Area on 16th Street, approximately 250 ft southwest of the 16th Street and E Street intersection. Figures 1 and 2a show the location of Site 1413 within MCB Camp Pendleton, and the location of the former UST area in relation to Building 1413, respectively. Prior to removal on October 18, 1996, Site 1413 contained one (1) 1,000-gallon, reinforced concrete tank with approximately 15 ft of single-wall, steel, 1-inch supply-and-return piping used to store and transfer diesel fuel. The tank was 7 ft in height (extending 12 inches above ground) and 6 ft in diameter. The UST had a single-wall, steel, underground remote-fill pipe, 27 ft in length and 3 inches in diameter. Excavation dimensions were 10 ft by 12 ft and approximately 7.5 ft in depth. The 1-inch supply-and-return pipelines extended approximately 11 ft below ground surface (bgs) to the building and extended another 4 ft in length beneath the foundation of the boiler room. The information presented above was obtained from the Navy Public Works Center (NPWC) UST removal report (NPWC, 1997).

Site 1413 is located in the foothills of the Peninsular Ranges. The site itself is relatively flat and is partially covered with asphalt pavement. A hill with approximately 40 ft of vertical relief is located on the southern boundary of the site and is graded towards the site. A small tributary of Pilgrim Creek, which is a tributary of the San Luis Rey River, is located approximately 700 ft to the north of the site. According to the *Water Quality Control Plan for the San Diego Basin* (RWQCB, 1994), Site 1413 is located within the Mission Hydrologic Subarea of the Lower San Luis Hydrologic Area in the San Luis Rey Hydrologic Unit. Groundwater in this area has supply uses beneficial to municipal and domestic supply, agricultural supply, industrial process supply, and industrial service supply. However, no groundwater supply wells are located within approximately 1.6 miles (8,430 ft) of the site.

The geology at Site 1413 consists primarily of fine-grained silty and clayey sands. These lithologies are of the Middle-Eocene Santiago Formation. Historical records indicate that groundwater flow at Site 1413 is typically towards the east/southeast at a direction ranging between N65°E and S15°E with a hydraulic gradient between 0.002 and 0.03 ft/ft. This flow direction is consistent with those presented by Ninyo and Moore (1999) for neighboring Sites 1223 and 14013. Groundwater elevations encountered in this area (the southwest corner of Vandegrift Boulevard and 16th Street) range in elevation from approximately 282 to 330 ft above mean sea level (amsl) (see Figures 2a and 2b). Groundwater generally occurs at approximately 319 ft amsl at Site 1413. For a complete description of the initial site investigation conducted by Battelle at Site 1413, as well as soil and groundwater analytical results from that investigation, refer to the *Final Site Assessment Report for Former UST Site 1413* (Battelle, 1999a).

Section 2.0: ADDITIONAL SITE ASSESSMENT ACTIVITIES

This section presents information regarding additional site assessment activities conducted at former UST Site 1413 during September 2005.

2.1 Regulatory Correspondence

A revised final Corrective Action Plan (CAP) which documents soil excavation activities that were undertaken at Site 1413 was submitted in December 2002 (Battelle, 2002). Comments on the revised final CAP were provided by the San Diego Regional Water Quality Control Board on December 3, 2004 (RWQCB, 2004), and requested that additional groundwater monitoring wells and soil borings be installed to further delineate both the dissolved-phase plume and soil contaminant plume at Site 1413. In response to these comments, the following document was submitted to the Navy on April 15, 2005: *Letter Work Plan for Additional Groundwater Monitoring Well Installations and Assessment at Former Underground Storage Tank Site 1413, Marine Corps Base Camp Pendleton* (Battelle, 2005). This letter work plan, which was subsequently approved by the RWQCB on August 11, 2005 (RWQCB, 2005), outlines the procedures for and rationale behind additional site characterization activities at former UST Site 1413, and is provided in this report as Attachment 1.

2.2 Soil and Groundwater Investigation

Following approval from the RWQCB, additional site assessment activities were conducted by Battelle at Site 1413 between September 8 and September 16, 2005. During this time, three continuously cored soil borings were placed to the northwest (1413-SB14), southwest (1413-SB08), and east (1413-SB12) of the former UST area and excavation. Four additional soil borings were advanced and converted to groundwater monitoring wells. The four additional groundwater monitoring wells were installed to the northeast (1413-SB11/MW08), southeast (1413-SB10/MW07), and west (1413-SB09/MW06) of the former UST and excavation area, as well as within the former UST and excavation area (1413-SB13/MW09). Soil samples were collected from each of the soil borings at depths ranging from 7 to 20 ft bgs and analyzed for total petroleum hydrocarbons extractable (TPH-E) constituents. Soil boring 1413-SB13 was not sampled during this effort, because this region within the former UST and excavation area was adequately characterized during the initial site assessment activities (Battelle, 1999a).

No TPH-E constituents were detected in the continuous core soil borings designed to address existing data gaps and complete soil plume delineation at former UST Site 1413. In addition, no TPH-E constituents were measured in soil samples collected from soil borings intended for additional groundwater monitoring well installations. These data indicate that the soil plume at former UST Site 1413 has been completely defined, and is limited in extent to the area surrounding the former UST. Furthermore, the majority of contaminated soils identified during the initial site assessment (Battelle, 1999a) have since been excavated (Battelle, 2002). Table 1 presents soil analytical results collected at Site 1413 in September 2005. Figures 3a and 3b present soil data collected from previous site assessment activities at Site 1413, as well as from additional site assessment activities conducted during September 2005, respectively. Figure 4 is a site map illustrating the locations of all new soil borings and groundwater monitoring wells installed during September 2005, along with previously existing site wells 1413-MW04 and 1413-MW05. Site survey data and logs for soil borings advanced during September 2005 are provided in Appendix A. Furthermore, soil analytical data laboratory reports and laboratory data validation reports also are provided in Appendix A.

Groundwater monitoring wells installed as part of this investigation were developed on September 23, 2005 and the associated well development logs can be found in Appendix A. Sampling of the upgraded well network at Site 1413 was initiated during the October 2005 and January 2006 quarterly

groundwater monitoring events for former UST Site 1413, and is discussed in detail during subsequent sections of this report. In summary, the expanded groundwater monitoring well network has served to fully delineate the extent of the dissolved-phase hydrocarbon plume at the site. Results from these sampling events are presented in Table 2. Groundwater monitoring well completion diagrams for wells installed in September 2005 are presented in Appendix A.

2.3 Monitoring Well Destruction Activities

As part of the additional site assessment activities conducted by Battelle during September 2005, groundwater monitoring well 1413-MW03 was destroyed. The rationale behind the destruction of 1413-MW03 is summarized below.

On October 18, 2004, a 2-inch-wide, 36-inch-long selectively absorbent SoakEase™ sock was installed in the well. Before the recovery system was installed in this well, 0.32 ft of free product was detected (see Table 3). During each of the subsequent monthly free product recovery events conducted between October 2004 and August 2005, it was noted that the product in the well had been reduced to a sheen. The recorded volumes of product removed by the absorbent socks in well 1413-MW03 can be found in Table 3.

Free product found within well 1413-MW03, which was located upgradient of the source area, likely was due to the lateral migration of free product along thin, sandy laminae from the source zone. Sixteen previous quarters of groundwater monitoring showed that the localized groundwater contamination at Site 1413 was stable and only fluctuated slightly, which may have been attributed to seasonal changes in groundwater levels. In communication with RWQCB personnel (see Attachment 1), it was determined that groundwater monitoring well 1413-MW03 created a conduit for continued free product migration to groundwater. Therefore, well 1413-MW03 was over-drilled and backfilled with bentonite chips on September 8, 2005. The destruction documentation for well 1413-MW03 is presented in Appendix A.

Section 3.0: WATER-LEVEL MEASUREMENTS AND GROUNDWATER SAMPLING

The two existing site groundwater monitoring wells (1413-MW04 and 1413-MW05), as well as the newly installed groundwater monitoring wells at former UST Site 1413 during September 2005 (1413-MW06, 1413-MW07, 1413-MW08, and 1413-MW09), were sampled during the October 2005 and January 2006 sampling events. Well 1413-MW03 was destroyed on September 8, 2005, and therefore has been removed from the monitoring well network at Site 1413. Monitoring wells 1413-MW01 and 1413-MW02 were destroyed during the interim remedial activities (i.e., excavation) conducted at Site 1413 (Battelle, 2002) and are no longer part of the groundwater monitoring well network at the site.

Groundwater samples were collected using the low-flow sampling technique during both the October 2005 and January 2006 sampling events. A portable micropurge pump was used to purge and sample each well. Following a complete round of groundwater level measurements at the site, the pump inlet tubing was carefully lowered to the middle of the screened interval of each well a minimum of two hours prior to the initiation of purging (this process minimizes turbidity within the well). Following the initiation of purging, the water level in each well was measured during drawdown to help determine the most appropriate flowrate for the well.

Prior to the acquisition of groundwater samples, the depth to groundwater was measured and recorded in each of the wells. Analyses for the groundwater samples included on-site water quality parameter readings, as well as analyses for various organic and inorganic compounds by a stationary laboratory. The following subsections describe procedures followed in the field, as well as the various analyses performed on groundwater samples collected from Site 1413.

3.1 Field Data Collection

3.1.1 Water-Level Measurements. Water-level measurements were collected in accordance with the procedures provided in the *Final Project Plan/Sampling and Analysis Plan for Remediation of Various Former UST Sites in Areas 13, 14, 15, and 21 at MCB Camp Pendleton* (Battelle, 1999b). All data were recorded in a field logbook dedicated to Site 1413. Hard copies of the logbook sheets containing the field data collected during the October 2005 and January 2006 sampling events are included in Appendix B of this report. An oil-water interface probe was used to monitor the depth to groundwater and to check for the presence of free product.

Water-level data collected from monitoring wells 1413-MW04, 1413-MW05, 1413-MW06, 1413-MW07, and 1413-MW08 were used to determine groundwater flow direction and the hydraulic gradient at Site 1413. Well 1413-MW09 was not used because it is screened through the gravel excavation backfill, which does not represent the natural hydrogeologic conditions of the site. Based on the water levels collected over the past two sampling events, three-point calculations indicated a groundwater flow direction of approximately S60°E with an average hydraulic gradient of 0.012 ft/ft in October 2005, and a groundwater flow direction of approximately S55°E with an average hydraulic gradient of 0.011 ft/ft in January 2006. These hydraulic gradient and flow direction values are fairly consistent with historical measurements.

However, with the expansion of the monitoring well network at Site 1413, a change in hydraulic gradient was observed at the eastern portion of the site. Groundwater elevations recorded in 1413-MW08 are much lower than expected and have resulted in a steeper hydraulic gradient at the eastern portion of the site. A site map showing groundwater elevations measured during October 2005, as well as the calculated groundwater flow direction for each of the six previous quarterly sampling events is presented in Figure 2a. Figure 2b is a site map showing the groundwater elevations measured during January 2006 and the calculated groundwater flow direction for each of the six previous quarterly

sampling events. Water-level and free product measurements were taken each quarter from the top of casing, and the results are presented in Table 4.

3.1.2 Free Product Recovery Activities. On October 18, 2004, a 2-inch-wide, 36-inch-long selectively absorbent SoakEase™ sock was installed in well 1413-MW03. Free product recovery activities continued in 1413-MW03 through September 2005. However, after communication with RWQCB personnel, it was determined that well 1413-MW03 presented a conduit for free product migration to groundwater. Therefore, well 1413-MW03 was destroyed on September 8, 2005. Recorded volumes of product removed by the absorbent socks in well 1413-MW03 are listed in Table 3.

Groundwater monitoring well 1413-MW09, which was installed on September 16, 2005, is located approximately 20 ft downgradient from former well 1413-MW03 and is screened through the former tank cavity excavation gravel backfill. 1413-MW09 currently is being monitored monthly for the presence of free product. Over the course of four months of monitoring (October 2005 through January 2006), no measurable amount of free product has been detected in 1413-MW09. Only a light product sheen and hydrocarbon odor was observed in this well during the October 2005 and January 2006 groundwater monitoring events.

Monthly free product monitoring will continue at well 1413-MW09 over the next two quarterly groundwater monitoring events. If measurable free product is detected in 1413-MW09, the findings will be reported and corrective action (i.e., product bailing/installation of a product recovery sock) will be initiated.

3.1.3 Water Quality Parameters. Water quality parameters, including temperature, pH, conductivity, dissolved oxygen (DO), turbidity, salinity, and oxidation-reduction potential (ORP), were collected throughout the purging process.

The groundwater monitoring network sampled at Site 1413 during the October 2005 and January 2006 sampling events were first micropurged, which involves pumping at much lower rates than traditional purging methods. The objective of micropurging is to minimize the stress to the groundwater system by decreasing drawdown caused by pumping. Pumping at low flowrates effectively isolates the screened interval from the overlying (stagnant) casing water, thereby sampling water from the screened interval only. Typically, flowrates on the order of 0.1 to 0.5 L/min are used during micropurging. Water is purged from the well until the field measurements of pH, temperature, DO, ORP, specific conductivity, and turbidity stabilize. Groundwater samples are collected immediately following parameter stabilization.

Table 2 provides the final field parameter readings collected immediately prior to sample collection, during all quarterly groundwater sampling events. Copies of the original field data collection log sheets for the October 2005 and January 2006 quarterly sampling events are provided in Appendix B.

3.2 Analytical Results

Groundwater samples were collected at former UST Site 1413 during October 2005 and January 2006 in accordance with requirements in the *Site Assessment and Mitigation (SAM) Manual* (DEH, 2004). Table 5 provides a summary of groundwater sampling methods, analytes, requirements, and analytical methods for the two most recent groundwater monitoring events. All samples were shipped via an overnight courier under chain-of-custody documentation to Alpha Analytical, Inc., of Sparks, NV, for organic analyses. Alpha Analytical, Inc., is a California Department of Health Services (DHS)-certified laboratory. The samples were analyzed for the parameters listed below:

- Total petroleum hydrocarbons extractable (TPH-E) as diesel (-D), and motor oil (-MO)
- Volatile organic compounds (VOCs)
- Benzene, toluene, ethylbenzene, and xylenes (BTEX)/methyl-*tert*-butyl ether (MTBE)
- Polynuclear aromatic hydrocarbons (PAHs)
- Monitored natural attenuation (MNA) parameters:
  - Total organic carbon (TOC)
  - Methane
  - Nitrate/nitrite/sulfate
  - Manganese/lead/iron
  - Alkalinity/total dissolved solids (TDS).

No groundwater MCLs were exceeded at former UST Site 1413 during the October 2005 sampling event. However, groundwater samples indicated that TPH-D was present at low levels in the following groundwater monitoring wells: 1413-MW04 (0.072 mg/L), 1413-MW05 (0.2 mg/L), 1413-MW08 (0.052 mg/L), and 1413-MW09 (0.44 mg/L). TPH-D concentrations detected in groundwater monitoring wells 1413-MW05 and 1413-MW09 slightly exceed the Water Quality Criterion (taste and odor threshold) for TPH-D of 0.10 mg/L outlined in the amended Water Quality Control Plan for the San Diego Basin (9) (RWQCB, 1994). In addition, benzene was detected in groundwater monitoring well 1413-MW05 at a concentration of 0.39J μg/L (the J is associated with the following laboratory note: "the analyte was positively identified and the result is less than the reporting limit but greater than the method detection limit"). This benzene concentration does not exceed the maximum contaminant level (MCL) for benzene of 1 μg/L. 1,2,4-trimethylbenzene (TMB) was detected in well 1413-MW09 at a concentration of 2.5 μg/L. All other TPH and VOC constituents and all PAHs were below detectable levels during the October 2005 sampling event.

Again, no groundwater MCLs were exceeded at former UST Site 1413 during the January 2006 sampling event. However, groundwater samples showed a continued presence of TPH-D constituents in groundwater monitoring wells 1413-MW04 (0.15 mg/L), 1413-MW05 (0.24 mg/L), 1413-MW08 (0.081 mg/L), and 1413-MW09 (0.36 mg/L). TPH-D concentrations in groundwater monitoring wells 1413-MW04, 1413-MW05, and 1413-MW09 slightly exceed the taste and odor threshold for TPH-D of 0.10 mg/L. In addition, benzene was detected in one site well (1413-MW05) at a concentration of 0.54 μg/L, which is below the MCL for benzene. All other TPH and VOC constituents and all PAHs were below detectable levels during the January 2006 sampling event.

Based on the groundwater analytical results from October 2005 and January 2006, which were collected from the expanded groundwater monitoring well network at former UST Site 1413, the dissolved-phase groundwater plume at the site appears to be well delineated. Therefore, it can be concluded that the additional groundwater monitoring well activities conducted during September 2005 were successful in eliminating existing data gaps for dissolved-phase petroleum hydrocarbon constituents in groundwater at the site.

Groundwater analytical results from the October 2005 and January 2006 sampling events, as well as historical groundwater sampling data from former UST Site 1413, are presented in Table 2. Copies of the laboratory analytical reports for the most recent quarterly sampling event are provided in Appendix C. Figure 5 shows all hydrocarbon contaminant concentrations measured in the groundwater during the four most recent quarterly sampling events for wells 1413-MW04 through 1413-MW09. Figure 6 presents historical TPH, BTEX, naphthalene, and TMB concentrations for wells 1413-MW04, 1413-MW05, 1413-MW06, 1413-MW07, 1413-MW08, and 1413-MW09. Note that contaminants measured at nondetectable levels during a particular sampling event were included on the historical plots as zero, although detection limits varied from sampling event to sampling event. Figure 6 indicates

fluctuating low-level concentrations of TPH-D in 1413-MW04 and 1413-MW05, and low levels of TPH-D over the past two sampling quarters for wells 1413-MW08 and 1413-MW09.

3.3 Evaluation of Biological Indicator Parameters

Specific chemical indicators of biodegradation were measured during the October 2005 and January 2006 sampling events at Site 1413 in order to monitor biological processes that contribute to natural attenuation of hydrocarbon-based fuels. These parameters include electron acceptors (DO, nitrate, and sulfate), metabolic byproducts (methane, ferrous iron, and manganese), and general indicators of biological activity (alkalinity and ORP). When these parameters are involved in biological reactions that result in degradation of contaminants, predictable changes in the concentrations of these parameters result. Electron acceptors are consumed during biodegradation, resulting in lower concentrations of these compounds in the contaminated area. Metabolic byproducts are produced, resulting in increased concentrations of these compounds in the contaminated area. Results from these analyses for each of the quarterly sampling events conducted at Site 1413 are presented in Table 2.

The following paragraphs describe reported concentrations from the most recent sampling events in wells 1413-MW04, 1413-MW05, 1413-MW06, 1413-MW07, 1413-MW08, and 1413-MW09.

Dissolved oxygen concentrations were relatively low in all groundwater monitoring wells across Site 1413 in October 2005/January 2006, with values ranging from 0 to 3.6 mg/L in October 2005, and 0 to 2.69 mg/L in January 2006. However, higher dissolved oxygen concentrations generally were observed in groundwater monitoring wells with lower levels of petroleum constituents or those located further from the source area, which would be expected.

Nitrate levels during the October 2005 sampling event were measured at 1.3, <0.25, 1.6, 3.6, 1.5, and <0.25 mg/L in groundwater monitoring wells 1413-MW04, 1413-MW05, 1413-MW06, 1413-MW07, 1413-MW08, and 1413-MW09, respectively. During the January 2006 event, nitrate levels in 1413-MW04, 1413-MW05, 1413-MW06, 1413-MW07, 1413-MW08, and 1413-MW09 exhibited similar concentrations of 1.1J, <0.25, 1.5J, 4.5J, 1.5J, and <0.25 mg/L, respectively. Nitrate was depleted in groundwater monitoring wells 1413-MW05 and 1413-MW09, which exhibit the highest hydrocarbon concentrations in groundwater at the site.

Sulfate concentrations during the October 2005 sampling event ranged from 87 mg/L in well 1413-MW09 to 910J mg/L in 1413-MW08. In January 2006, the levels ranged from 100J mg/L in 1413-MW09 to 850 mg/L in 1413-MW08. As expected, lower sulfate concentrations were observed in the source area (1413-MW09) as compared to downgradient well 1413-MW08 and other sentry groundwater monitoring wells at the site.

Reduced iron (Fe^{2+}) concentrations were measured at concentrations below analytical detection limits (<0.050 mg/L) in all wells except 1413-MW04 (0.059 mg/L) during the October 2005 sampling event. In January 2006, reduced iron was detected in wells 1413-MW05, 1413-MW07, and 1413-MW09 at concentrations of 0.11, 0.061, and 0.22 mg/L, respectively. Although no significant relationships were observed with respect to elevated hydrocarbon concentrations and elevated reduced iron concentrations across the site, the highest level of reduced iron was observed in source area well 1413-MW09 where the highest concentrations of TPH were measured.

Reduced manganese (Mn^{2+}) concentrations during the October 2005 and January 2006 sampling events were similar in all wells ranging from 0.084 to 0.55 mg/L. This parameter did not exhibit predictable trends (i.e., elevated concentrations in areas of higher contamination). However, this may be a result of the relatively low levels of hydrocarbon concentrations in the groundwater at Site 1413.

Methane was detected in wells 1413-MW04, 1413-MW05, and 1413-MW09 in October 2005 at concentrations of 37, 520, and 420 µg/L, respectively. In January 2006, methane was detected in these same three wells at concentrations of 79, 480, and 570 µg/L, respectively. Methane was not detected (<10 µg/L) in wells 1413-MW06, -MW07, and -MW08 during the October 2005 and January 2006 sampling events. In summary, the highest levels of methane were observed in the source area and in wells containing the highest concentrations of petroleum constituents, which would be expected.

Alkalinity concentrations during the October 2005 sampling event ranged from 290 mg/L in 1413-MW04 to 410 mg/L in 1413-MW05. During January 2006, alkalinity measurements ranged from 270 mg/L in 1413-MW04 to 400 mg/L in 1413-MW06.

Oxidation-reduction potential values in the October 2005 sampling event ranged from -9.7 millivolts (mV) in well 1413-MW09 to 186.7 mV in well 1413-MW06. During January 2006, these values ranged from -38 mV in well 1413-MW09 to 236 mV in well 1413-MW06.

Prior to the installation of the expanded groundwater monitoring well network during September 2005 at former UST Site 1413, the limited extent of the previous monitoring well network at Site 1413 made it difficult to evaluate biological indicator parameters at the site. However, since the installation of groundwater monitoring wells 1413-MW06, 1413-MW07, 1413-MW08, and 1413-MW09, groundwater samples collected at the site have indicated that, in general, electron acceptors are depleted in the source area and in wells with higher levels of petroleum constituents. Conversely, metabolic byproducts of hydrocarbon mineralization are elevated in the source area, as well as in wells with higher hydrocarbon levels. These trends would be expected, and provide evidence that natural attenuation of petroleum constituents in groundwater may be occurring at former UST Site 1413.

Section 4.0: QUALITY ASSURANCE/QUALITY CONTROL

All groundwater samples were collected and analyzed in accordance with the United States Environmental Protection Agency (U.S. EPA) methods stated in the *Final Project Plan/Sampling and Analysis Plan for Remediation of Various Former UST Sites in Areas 13, 14, 15, and 21 at MCB Camp Pendleton* (Battelle, 1999b), as summarized in Table 5. All organic samples were analyzed within the analytical holding times. The analytical laboratory was required to maintain certification from the State of California DHS for the analytical methods performed on the samples. Alpha Analytical, Inc. analyzed all organic groundwater samples. Samples were analyzed according to the *Quality Assurance Plan for Alpha Analytical, Inc.* (Alpha Analytical, 2004).

Laboratory quality control (QC) summaries for the most recent quarterly sampling events are provided as Appendix D. The laboratory's quality assurance (QA) oversight involved the performance of a first-level screening of the data being provided and an indication of any deviations from their precision, accuracy, detection limit, or laboratory QA/QC criteria. A representative from the laboratory signed the data sheets, ensuring that this screening described above had been completed. Subsequently, Battelle completed data review by comparing the chain-of-custody and field notebook entries with the data for each sample. This was done by comparing hard copies of analytical reports to electronically entered data within Battelle. Review of these summaries confirmed that data quality objectives were met. Additionally, the analytical data, along with the associated laboratory QC information, was forwarded to an independent data validation service for data validation.

A U.S. EPA Level III data validation was performed on 90% of the groundwater samples; the remaining 10% of the samples underwent a Level IV data validation. The results indicated that the data generally met all analytical criteria. Two exceptions to the analytical criteria were noted in the laboratory data validation reports:

- The relative percent difference (RPD) value for the matrix spike/matrix spike duplicate (MS/MSD) samples for sulfate during the October 2005 sampling event was slightly higher than the acceptance criteria.
- The RPD values for the MS/MSD samples for nitrate, nitrite and sulfate during the January 2006 sampling event were slightly higher than the acceptance criteria.

All exceptions to the analytical criteria resulted in the assignment of "J" flags to the results by Laboratory Data Consultants, Inc. (Carlsbad, CA). The "J" flag indicates that the result is an estimated value. The laboratory data validation reports for the samples are included in Appendix E.

QA/QC measurements were taken in the field to ensure that meaningful and representative data sets were generated at Site 1413. Field duplicate samples were collected at a rate of >10% of the total number of groundwater monitoring wells sampled at Site 1413. These samples were collected to ensure the consistency and integrity of sample collection methods. A duplicate sample was collected at Site 1413 during the October 2005 sampling event from monitoring well 1413-MW09, and from monitoring well 1413-MW05 in January 2006. Results from the duplicate sample were consistent with the primary sample collected from this well (see Table 2).

Field blanks were collected daily to detect any possible contamination of the sample from airborne hydrocarbons during the sample collection process. Trip blanks were sent with every shipment of samples to ensure that no contamination occurred during transportation. The field and trip blanks were analyzed only if VOCs were detected in the groundwater. In addition to the field blanks, bailer and/or

pump rinsate blanks also were collected in the field and analyzed for TPH-E and VOCs to ensure that the sampling devices were not a source of contamination for the samples.

TPH-E was not detected in the equipment blanks collected in October 2005 and January 2006. Furthermore, no VOCs were detected in any of the QA/QC samples collected in January 2006. The only contaminant found in the October 2005 QA/QC samples was toluene, which was detected in the field blank and equipment rinsate blank at concentrations just above laboratory analytical detection limits of 0.58 μg/L and 0.57 μg/L, respectively. However, toluene has never been detected in the groundwater at Site 1413. Therefore, it was concluded that the toluene detections likely were the result of laboratory contamination.

Refer to Table 6 for the results of the October 2005/January 2006 field QA/QC analyses. Appendix C provides the laboratory data sheets for the field QA/QC samples. Chain-of-custody documentation is provided in Appendix F.

Section 5.0: WASTE MANAGEMENT

Approximately 17 L of purged groundwater and water used to decontaminate the field equipment were generated at Site 1413 during the October 2005 sampling event and approximately 22 L were generated in January 2006. This water was contained in polyethylene holding tanks and mixed with purged groundwater and equipment rinsate water generated from groundwater sampling at other MCB Camp Pendleton sites. Following analysis by a stationary analytical laboratory, EFR Environmental Services of Alpine, CA, transported the water for nonhazardous disposal. A copy of the manifests for waste removal during the two most recent quarterly sampling events is provided in Appendix G. In addition, manifests for investigation-derived waste generated during additional site assessment activities conducted at Site 1413 during September 2005 are provided in Appendix G, along with manifests for historical free product removal. No free product/groundwater waste was derived from Site 1413 over the last two quarters, as the new source area well (1413-MW09) does not contain measurable free product.

Section 6.0: CONCLUSIONS

This semiannual report contains groundwater monitoring data collected from Site 1413, MCB Camp Pendleton, during the two most recent quarterly groundwater sampling events (October 2005 and January 2006) and includes data from all previous groundwater monitoring events. In addition, this report describes the additional site assessment activities conducted at Site 1413 in September 2005. The groundwater monitoring program that has been implemented at Site 1413 is designed to evaluate the occurrence of dissolved-phase petroleum hydrocarbon constituents in the groundwater, as well as monitor the stability of the plume.

The groundwater monitoring well network at former UST Site 1413 was expanded during September 2005 from three to six wells, to include one upgradient well, two additional downgradient wells, and the reinstallation of a source area well. Also, due to the historic presence of free product in well 1413-MW03, the well was destroyed. As part of these additional site assessment activities, three additional continuous core soil borings were advanced for the sole purpose of additional delineation of the soil contaminant plume. A total of twenty (20) soil samples were collected during the additional site assessment activities and analyzed for TPH-E constituents. Based on the analytical results, no petroleum hydrocarbon contaminants were detected in any of the soil samples, indicating that the soil plume has been completely defined with no remaining data gaps.

Following expansion of the groundwater monitoring well network at former UST Site 1413, quarterly monitoring activities took place in October 2005 and January 2006. During the October 2005 sampling event, laboratory results indicated that TPH-D was detected in four wells: 1413-MW04 (0.072 mg/L), 1413-MW05 (0.2 mg/L), 1413-MW08 (0.052 mg/L), and 1413-MW09 (0.44).

In January 2006, TPH-D was detected in these same four wells at similar concentrations: 1413-MW04 (0.15 mg/L), 1413-MW05 (0.24 mg/L), 1413-MW08 (0.081 mg/L), and 1413-MW09 (0.36 mg/L). Of the TPH-E detections from October 2005 and January 2006, the Water Quality Criterion (taste and odor threshold concentration) for TPH-D set at 0.10 mg/L (RWQCB, 1994) was slightly exceeded in 1413-MW04 and 1413-MW05. In 1413-MW09, which is located in the source area, the taste and odor threshold also was exceeded with a maximum measured concentration of 0.44 mg/L. In addition to TPH, benzene was detected in 1413-MW05 at concentrations of 0.39J μg/L in October 2005, and 0.54 μg/L in January 2006. None of the benzene detections observed at Site 1413 over the last two quarters of sampling exceeded its MCL of 1 μg/L. Furthermore, no MCLs have ever been exceeded in wells that comprise the existing groundwater monitoring well network. According to the historic analytical records provided for Site 1413, MTBE has never been detected at the site. All other TPH, VOC, and PAH constituents measured in the groundwater were below detectable levels at Site 1413 during the October 2005 and January 2006 sampling events.

Monitoring well 1413-MW09 (installed on September 16, 2005), located approximately 20 ft downgradient from former well 1413-MW03, is screened through the former tank cavity gravel backfill. It is currently being monitored monthly for the presence of free product. Over four months (October 2005 through January 2006) of monitoring, no measurable amount of free product has been detected in well 1413-MW09. A light product sheen and hydrocarbon odor was noted in the purge log for well 1413-MW09 from the October 2005 sampling event. Only a hydrocarbon odor was noted in this well during the January 2006 sampling event.

Groundwater monitoring is scheduled to continue at former UST Site 1413 over the next two quarters. However, based on the findings from the additional site assessment activities conducted by Battelle during September 2005, as well as subsequent quarterly groundwater monitoring activities

conducted during October 2005 and January 2006, Site 1413 should be considered for closure and no further action as a low-risk groundwater case as defined by the RWQCB (1996) for the following reasons:

- The leak and sources have been removed to the extent practicable (the former UST has been removed, contaminated soils have been excavated to the extent practical [Battelle, 2002], and free product is no longer observed at the site).

- The site has been adequately characterized and the soil and dissolved-phase plume is now well-defined.

- TPH levels are only slightly above the TOT for TPH of 0.10 mg/L. The maximum TPH concentration detected at the site over the past year is 0.44 mg/L and is located in the former UST region. No VOC or PAH constituents exceed their respective MCLs.

- The dissolved-phase plume appears to be stable, and newly installed upgradient and downgradient groundwater monitoring wells do not exhibit detectable levels of TPH (with the exception of 1413-MW08, which has low-level TPH constituents that are below the TOT for TPH of 0.10 mg/L).

- Based on recent results from biological indicator parameters collected at the site, biodegradation of petroleum constituents appears to be occurring by processes associated with natural attenuation.

- Finally, Site 1413 is located further than 1.5 miles from any potable drinking water wells in the vicinity.

Section 7.0: REFERENCES

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TABLES

Table 1. Site 1413 September 2005 Soil Analytical Results

Sample ID	Date	TPH-E (as diesel) (mg/kg)	TPH-E (as motor oil) (mg/kg)
1413-SB08-12	9/8/2005	<5.0	<10
1413-SB08-15	9/8/2005	<5.0	<10
1413-SB08-17.5	9/8/2005	<5.0	<10
1413-SB08-20	9/8/2005	<5.0	<10
1413-SB09-15	9/8/2005	<5.0	<10
1413-SB09-17.5	9/8/2005	<5.0	<10
1413-SB09-20	9/8/2005	<5.0	<10
1413-SB10-15	9/9/2005	<5.0	<10
1413-SB10-17.5	9/9/2005	<5.0	<10
1413-SB10-20	9/9/2005	<5.0	<10
1413-SB11-15	9/9/2005	<5.0	<10
1413-SB11-17.5	9/9/2005	<5.0	<10
1413-SB11-20	9/9/2005	<5.0	<10
1413-SB12-7	9/16/2005	<5.0	<10
1413-SB12-10.5	9/16/2005	<5.0	<10
1413-SB12-12	9/16/2005	<5.0	<10
1413-SB12-15	9/16/2005	<5.0	<10
1413-SB14-12	9/16/2005	<5.0	<10
1413-SB14-15	9/16/2005	<5.0	<10
1413-SB14-17.5	9/16/2005	<5.0	<10

Table 2. Analytical Results and Water Quality Parameters for Groundwater at Site 1413

Analyte	Units	1413-MW01[f]				1413-MW02[f]			
		10/31/98[a]	10/06/99[b]	01/16/00[b]	04/06/00[b]	10/31/98[a]	10/6/99	1/15/00	4/6/00
Organics									
TPH-JF	mg/L	<0.50	<0.050	<0.050	<0.050	<0.50	NS	NS	NS
TPH-D	mg/L	3.8	3.9	1.7	2.1	42	NS	NS	NS
TPH-MO	mg/L	<0.50	<0.50	<0.50	<0.50	<0.50	NS	NS	NS
Benzene	µg/L	<2.5	<10	<2.0	<10	1.1	NS	NS	NS
Toluene	µg/L	<2.5	<10	<2.0	<10	<0.50	NS	NS	NS
Ethylbenzene	µg/L	<2.5	<10	<2.0	<10	2.6	NS	NS	NS
Total Xylenes	µg/L	<5.0	<20	<4.0	<20	2.88	NS	NS	NS
MTBE	µg/L	<2.5	<10	<2.0	<10	<0.50	NS	NS	NS
TBA	µg/L	NA	NA	NA	<200	NA	NS	NS	NS
DIPE	µg/L	NA	NA	NA	<20	NA	NS	NS	NS
ETBE	µg/L	NA	NA	NA	<20	NA	NS	NS	NS
TAME	µg/L	NA	NA	NA	<20	NA	NS	NS	NS
1,3,5-TMB	µg/L	<5.0	<25	<5.0	<20	4.3	NS	NS	NS
1,2,4-TMB	µg/L	<5.0	<25	<5.0	<20	4.3	NS	NS	NS
Naphthalene	µg/L	<10	<100	<20	<40	17	NS	NS	NS
TOC	mg/L	NA	44	5.6	40	NA	NS	NS	NS
Methane	µg/L	NA	280	140	84	NA	NS	NS	NS
Inorganics									
Nitrate	mg/L	NA	NS	7.5	<0.3	NA	NS	NS	NS
Nitrite	mg/L	NA	NS	NS	<0.5	NA	NS	NS	NS
Sulfate	mg/L	NA	NS	NS	220	NA	NS	NS	NS
Manganese	mg/L	NA	NS	NS	0.39	NA	NS	NS	NS
Iron	mg/L	NA	NS	NS	1.7	NA	NS	NS	NS
Lead	mg/L	NA	NS	NS	<0.002	NA	NS	NS	NS
Groundwater Quality Parameters									
Alkalinity	mg/L as	NA	NS	NS	580	NA	NS	NS	NS
TDS	mg/L	NA	NS	NS	1,627	NA	NS	NS	NS
pH	units	6.76	6.36	6.33	6.74	6.23	NS	NS	NS
Conductivity	mS/cm	7.58	6.94	8.87	1.71	13	NS	NS	NS
DO	mg/L	0.28	0	0.78	0.36	0.16	NS	NS	NS
Turbidity	NTU	178	23	28.9	13	200	NS	NS	NS
Temperature	°C	20.3	21.3	20.6	19.6	20.9	NS	NS	NS
Salinity	%	0.4	0.37	0.5	0.09	0.74	NS	NS	NS
ORP	mV	-82	-163	6	-233	-230	NS	NS	NS

Table 2. Analytical Results and Water Quality Parameters for Groundwater at Site 1413 (continued)

Analyte	Units	1413-MW03																
		10/31/98[a]	10/6/99	1/15/00	4/6/00	7/11/00	10/10/00	1/12/01	4/4/01	8/10/01	10/31/01	1/8/02	5/10/02	7/22/02	4/14/04	10/18/04	4/14/05	7/7/05
Organics																		
TPH-JF	mg/L	<0.50	NS	NS	NS	NS	<0.050	<0.050	<0.050	NS	NS	NS	NS	NS	NS	NS	NS	NS
TPH-D	mg/L	<0.50	NS	NS	NS	NS	73	46	4	NS	NS	NS	NS	NS	NS	NS	NS	NS
TPH-MO	mg/L	<0.50	NS	NS	NS	NS	6.8 G	<0.50	<0.50	NS	NS	NS	NS	NS	NS	NS	NS	NS
Benzene	µg/L	<0.50	NS	NS	NS	NS	<0.50	<0.50	<0.63J	NS	NS	NS	NS	NS	NS	NS	NS	NS
Toluene	µg/L	<0.50	NS	NS	NS	NS	<0.50	<0.50	<1.3	NS	NS	NS	NS	NS	NS	NS	NS	NS
Ethylbenzene	µg/L	<0.50	NS	NS	NS	NS	<0.50	<0.50	<1.3	NS	NS	NS	NS	NS	NS	NS	NS	NS
Total Xylenes	µg/L	0.72	NS	NS	NS	NS	<1.00	<1.00	<2.6	NS	NS	NS	NS	NS	NS	NS	NS	NS
MTBE	µg/L	<0.50	NS	NS	NS	NS	<0.50	<0.50	<1.3	NS	NS	NS	NS	NS	NS	NS	NS	NS
TBA	µg/L	NA	NS	NS	NS	NS	NA	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS
DIPE	µg/L	NA	NS	NS	NS	NS	NA	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS
ETBE	µg/L	NA	NS	NS	NS	NS	NA	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS
TAME	µg/L	NA	NS	NS	NS	NS	NA	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS
1,3,5-TMB	µg/L	<1.0	NS	NS	NS	NS	<1.0	<1.0	<2.5	NS	NS	NS	NS	NS	NS	NS	NS	NS
1,2,4-TMB	µg/L	<1.0	NS	NS	NS	NS	<1.0	<1.0	<2.5	NS	NS	NS	NS	NS	NS	NS	NS	NS
Naphthalene	µg/L	<2.0	NS	NS	NS	NS	<2.0	<2.0	<10	NS	NS	NS	NS	NS	NS	NS	NS	NS
TOC	mg/L	NA	NS	NS	NS	NS	14	11	37	NS	NS	NS	NS	NS	NS	NS	NS	NS
Methane	µg/L	NA	NS	NS	NS	NS	97	45	360	NS	NS	NS	NS	NS	NS	NS	NS	NS
Inorganics																		
Nitrate	mg/L	NA	NS	NS	NS	NS	5.1	2.7	<2.5	NS	NS	NS	NS	NS	NS	NS	NS	NS
Nitrite	mg/L	NA	NS	NS	NS	NS	<2.3	<0.9	<2.5	NS	NS	NS	NS	NS	NS	NS	NS	NS
Sulfate	mg/L	NA	NS	NS	NS	NS	430	380	370	NS	NS	NS	NS	NS	NS	NS	NS	NS
Manganese	mg/L	NA	NS	NS	NS	NS	0.099	0.065	0.2	NS	NS	NS	NS	NS	NS	NS	NS	NS
Iron	mg/L	NA	NS	NS	NS	NS	0.12	<0.1	<0.1	NS	NS	NS	NS	NS	NS	NS	NS	NS
Lead	mg/L	NA	NS	NS	NS	NS	<0.02	<0.005	<0.005	NS	NS	NS	NS	NS	NS	NS	NS	NS
Groundwater Quality Parameters																		
Alkalinity	mg/L	NA	NS	NS	NS	NS	180	190	280	NS	NS	NS	NS	NS	NS	NS	NS	NS
TDS	mg/L	NA	NS	NS	NS	NS	4,700	4,900	4,000	NS	NS	NS	NS	NS	NS	NS	NS	NS
pH	units	6.25	NS	NS	NS	NS	5.83	6.09	9.08	NS	NS	NS	NS	NS	NS	NS	NS	NS
Conductivity	mS/cm	11.5	NS	NS	NS	NS	8.18	9.2	7.72	NS	NS	NS	NS	NS	NS	NS	NS	NS
DO	mg/L	1.25	NS	NS	NS	NS	2.02	1.66	2.19	NS	NS	NS	NS	NS	NS	NS	NS	NS
Turbidity	NTU	295	NS	NS	NS	NS	8	35	0	NS	NS	NS	NS	NS	NS	NS	NS	NS
Temperature	°C	21.5	NS	NS	NS	NS	22.1	21.3	20.1	NS	NS	NS	NS	NS	NS	NS	NS	NS
Salinity	%	0.65	NS	NS	NS	NS	0.44	0.51	0.42	NS	NS	NS	NS	NS	NS	NS	NS	NS
ORP	mV	79	NS	NS	NS	NS	176	96	-133	NS	NS	NS	NS	NS	NS	NS	NS	NS

Table 2. Analytical Results and Water Quality Parameters for Groundwater at Site 1413 (continued)

Analyte	Units	1413-MW04																		
		10/31/98[a][c]	10/06/99[c]	1/15/00	4/6/00	7/11/00	10/10/00	1/12/01	4/4/01	8/10/01	10/31/01	1/8/02	5/10/02	7/22/02	4/14/04**	10/18/04**	4/14/05**	7/7/05**	10/27/05**	1/17/06**
Organics																				
TPH-JF	mg/L	<0.50/<0.50	<0.050/<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.050	<0.050	<0.10*	<0.050	<0.050	<0.050	NA	NA	NA	NA	NA	NA
TPH-D	mg/L	<0.50/<0.50	<0.050/<0.050	<0.050	0.064E	<0.050	<0.050	<0.10	0.23	0.092	<0.10*	<0.050	0.12	0.13[e]	0.26	0.14	0.15	<0.10	0.072	0.15
TPH-MO	mg/L	<0.50/<0.50	<0.50/<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Benzene	µg/L	<0.50/<0.50	<0.50/<0.50	<0.50	<2.5	<0.50	<0.50	<0.50	<0.63J	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	µg/L	<0.50/<0.50	<0.50/<0.50	<0.50	<2.5	<0.50	<0.50	<0.50	<1.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Ethylbenzene	µg/L	<0.50/<0.50	<0.50/<0.50	<0.50	<2.5	<0.50	<0.50	<0.50	<1.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Total Xylenes	µg/L	0.58/0.53	<1.00/<1.00	<1.00	<5.0	<1.00	<1.00	<1.00	<2.6	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
MTBE	µg/L	<0.50/<0.50	<0.50/<0.50	<0.50	<2.5	<0.50	<0.50	<0.50	<1.3	<0.50	NA	<0.50	NA	NA	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
TBA	µg/L	NA	NA / NA	NA	<50	<20	NA	NA	NA	NA	NA	NA	NA	NA	<20	<10	NA	NA	NA	NA
DIPE	µg/L	NA	NA / NA	NA	<5.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	<1.0	<1.0	NA	NA	NA	NA
ETBE	µg/L	NA	NA / NA	NA	<5.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	<1.0	<1.0	NA	NA	NA	NA
TAME	µg/L	NA	NA / NA	NA	<5.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	<1.0	<1.0	NA	NA	NA	NA
1,3,5-TMB	µg/L	<1.0/<1.0	<1.0/<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-TMB	µg/L	<1.0/<1.0	<1.0/<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene	µg/L	<2.0/<2.0	<4.0/<4.0	<2.0	<10	<4.0	<2.0	<2.0	<10	<2.0	<2.0	<2.0	<2.0	<2.0	<4.0	<4.0	<10	<10	<2.0	<2.0
TOC	mg/L	NA/NA	7.7/9.1	23	12	16	14	7.3	7	7.9	NA	NA	NA	NA	31	10	15	14	11	8.1
Methane	µg/L	NA/NA	23/16	12	12	6.9	13	<5.0	11	49	NA	NA	NA	NA	290	390	260	19J / 16J	37	79
Inorganics																				
Nitrate	mg/L	NA/NA	3.4/3.2	2.4	2.3	2.7	3.2	3.7	<2.5	2.6	NA	NA	NA	NA	0.82	1.2	1.3	1.7	1.3	1.1J
Nitrite	mg/L	NA/NA	<1/<1	<2.3	<2.3	<2.3	<2.3	<2.3	<2.5	<0.5	NA	NA	NA	NA	<2.5 (g)	<0.25	<0.25	<0.25	<0.25	<0.25
Sulfate	mg/L	NA/NA	750/770	920	950	1,000	820	760	620	720	NA	NA	NA	NA	310	350	290	320	270J	250J
Manganese	mg/L	NA/NA	1.2/1.2	1.3	1.4	1.9	1.6	1.3	0.8	1.1	NA	NA	NA	NA	0.35	0.87	0.8	0.13	0.13	0.29
Iron	mg/L	NA/NA	<0.1/<0.1	<0.05	0.2	<0.21	<0.1	<0.1	<0.1	<0.1	NA	NA	NA	NA	<0.050	<0.050	<0.050	<0.050	0.059	<0.050
Lead	mg/L	NA/NA	<0.002/<0.002	<0.005	<0.002	<0.005	<0.02	<0.005	<0.005	<0.005	NA	NA	NA	NA	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Groundwater Quality Parameters																				
Alkalinity	mg/L as $CaCO_3$	NA/NA	184/179	150	125	110	110	110	180	170	NA	NA	NA	NA	280	260	390	340	290	270
TDS	mg/L	NA/NA	5,131/5,103	5,359	6,046	6,500	5,800	5,900	3,900	4,800	NA	NA	NA	NA	2,400	3,000	2,200	2,700	2,500	2,900
pH	Units	5.98	5.7	5.6	5.75	5.92	5.45	5.62	6.12	5.87	5.56	6.08	6.27	6.22	6.66	6.31	7.11	6.4	7.2	6.36
Conductivity	mS/cm	8.53	8.45	9.19	8.95	8.96	9.43	9.87	6.94	7.85	8.42	5.52	7.02	6.7	4.42	5.29	4.1	4.86	4.9	5.13
DO	mg/L	1.66	0.13	0.2	0.58	0.58	0.98	0.2	0.56	0.26	0.2	0.79	0.17	0.4	0	0.03	0	0.22	0.8	0
Turbidity	NTU	21	23	9	8	3	-10	0	0	0	0	-10	10	-10	10	0	0	0	54	-0.2
Temperature	°C	21.8	21.8	22.5	22.4	21.9	22.2	21.1	21.8	23	22.3	21	21.1	24.2	22.2	22.1	21.3	21.6	21	22.5
Salinity	%	0.47	0.46	0.52	0.49	0.49	0.51	0.54	0.37	0.43	0.46	0.29	0.38	0.36	0.22	0.27	0.21	0.25	0.3	0.3
ORP	mV	184	143	152	50	195	220	162	14	175.5	156	220	159.3	122.7	111.3	225	199	98.1	94.8	109

Table 2. Analytical Results and Water Quality Parameters for Groundwater at Site 1413 (continued)

Analyte	Units	1413-MW05															
		04/06/2000[b]	07/11/2000[b]	10/10/00[b]	01/12/01[b]	04/04/01[b]	08/10/01[b]	10/31/01[b]	1/8/02	5/10/02	7/22/02	4/14/04**	10/18/04**	4/14/05**	7/7/05**	10/27/05**	1/17/06**
Organics																	
TPH-JF	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10*	<0.050	<0.050	<0.050	NA	NA/NA	NA	NA	NA	NA
TPH-D	mg/L	0.26	0.24	0.15	0.087	0.21[d]	0.19	<0.10*	0.077	0.23 [d]	0.26[e]	0.62	0.64/0.63	<0.050	<0.050	0.2	0.23/0.24
TPH-MO	mg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50/<0.50	<0.50	<0.50	<0.50	<0.50/<0.50
Benzene	µg/L	<2.5	<0.50	<0.50	<0.5J	<0.63J	<0.50	<0.50	<0.50	<0.50	0.44 J	0.64 J	1.0/0.99J	<0.50	<0.50/<0.50	0.39 J	0.54/0.52
Toluene	µg/L	<2.5	<0.50	<0.50	<1.0	<1.3	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0/<1.0	<0.50	<0.50/<0.50	<0.50	<0.50/<0.50
Ethylbenzene	µg/L	<2.5	<0.50	<0.50	<1.0	<1.3	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0/<1.0	<0.50	<0.50/<0.50	<0.50	<0.50/<0.50
Total Xylenes	µg/L	<5.0	<1.00	<1.00	<2.0	<2.6	<1.00	<1.00	<1.00	<1.00	<1.00	<2.0	<2.0/<2.0	<1.00	<1.00/<1.00	<1.00	<1.00/<1.00
MTBE	µg/L	<2.5	<0.50	<0.50	<1.0	<1.3	<0.50	NA	<0.50	NA	NA	<1.0	<1.0/<1.0	<0.50	<0.50/<0.50	<0.50	<0.50/<0.50
TBA	µg/L	<50	<20	NA	NA	NA	NA	NA	NA	NA	NA	<20	<20/<20	NA	NA	NA	NA
DIPE	µg/L	<5.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	<2.0	<2.0/<2.0	NA	NA	NA	NA
ETBE	µg/L	<5.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	<2.0	<2.0/<2.0	NA	NA	NA	NA
TAME	µg/L	<5.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	<2.0	<2.0/<2.0	NA	NA	NA	NA
1,3,5-TMB	µg/L	<5.0	<1.0	<1.0	<2.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0/<2.0	<1.0	<1.0/<1.0	<1.0	<1.0/<1.0
1,2,4-TMB	µg/L	<5.0	<1.0	<1.0	<2.0	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0/<2.0	<1.0	<1.0/<1.0	<1.0	<1.0/<1.0
Naphthalene	µg/L	<10	<4.0	<4.0	<4.0	<10	<4.0	<4.0	<4.0	<2.0	<2.0	<8.0	<8.0/<8.0	<10	<10/<10	<4	<4/<4
TOC	mg/L	15	12	17	6	5.8	9.4	NA	NA	NA	NA	32	12.0/12.0	37	25	18	10/9.9
Methane	µg/L	26	8.2	80	150	93	100	NA	NA	NA	NA	900	840/950	<10	<10	520	480/390
Inorganics																	
Nitrate	mg/L	<1.7	1.8	11	<1.7	<2.5	2.5	NA	NA	NA	NA	0.4	<0.25/<0.25	0.28	<0.25	<0.25	<0.25/<0.25
Nitrite	mg/L	<2.3	<2.3	<9.1	<2.3	<2.5	<0.5	NA	NA	NA	NA	<13[g]	<1.0/<1.0	<0.25	<0.25	<0.25	<0.25/<0.25
Sulfate	mg/L	780	740	760	700	670	800	NA	NA	NA	NA	650	570/560	960	1,100	760J	740J/700J
Manganese	mg/L	1.3	1.2	1.4	1	0.76	1	NA	NA	NA	NA	0.79	1.0/0.62	0.14	0.095	0.33	0.42/0.45
Iron	mg/L	6.5	<0.1	0.15	0.51	1	<0.1	NA	NA	NA	NA	<0.050	<0.050/<0.050	<0.050	<0.050	<0.050	0.11/0.073
Lead	mg/L	<0.002	<0.005	<0.02	<0.005	<0.005	<0.005	NA	NA	NA	NA	<0.0050	<0.0050/<0.0050	<0.0050	<0.0050	<0.0050	<0.0050/0.0050
Groundwater Quality Parameters																	
Alkalinity	mg/L as $CaCO_3$	195	170	160	150	160	150	NA	NA	NA	NA	170	190/190	730	640	410	310/310
TDS	mg/L	10,055	9,200	9,400	10,000	8,700	10,000	NA	NA	NA	NA	6,900	7,400/7,000	3,500	3,800	5,100	7,500/7,000
pH	units	6.02	6.05	5.57	5.79	5.89	5.69	5.43	5.5	5.89	5.76	6.02	5.56	6.48	6.59	7.2	5.83
Conductivity	mS/cm	17	17.3	15.9	17.8	17.7	15.4	15.7	14.6	14.5	15	15.2	13	7.97	7.02	9	9.8
DO	mg/L	1.2	1	0.06	0	1.05	0.05	1.27	0.95	0.13	0.46	0	0	0.11	0	0.1	0
Turbidity	NTU	320	120	-6	44	160	0	320	-10	10	-10	0	9	0	0	21	0
Temperature	°C	22.1	21.1	21.8	20.7	21	22.3	21.2	21.8	20.1	24.7	20.6	20.3	20.4	20.4	21	20.4
Salinity	%	0.99	1.02	0.92	1.06	1.06	0.9	0.91	0.83	0.84	0.88	0.89	0.75	0.41	0.38	0.5	0.54
ORP	mV	117	155	203	167	56	189.3	179	221	193.5	144.9	158.6	147	45.9	193.7	73.1	142.6

Table 2. Analytical Results and Water Quality Parameters for Groundwater at Site 1413 (continued)

1413-MW06			
Analyte	**Units**	**10/27/05****	**1/17/06****
Organics			
TPH-JF	mg/L	NA	NA
TPH-D	mg/L	<0.050	<0.050
TPH-MO	mg/L	<0.50	<0.50
Benzene	µg/L	<0.50	<0.50
Toluene	µg/L	<0.50	<0.50
Ethylbenzene	µg/L	<0.50	<0.50
Total Xylenes	µg/L	<1.0	<1.0
MTBE	µg/L	<0.50	<0.50
TBA	µg/L	NA	NA
DIPE	µg/L	NA	NA
ETBE	µg/L	NA	NA
TAME	µg/L	NA	NA
1,3,5-TMB	µg/L	<1.0	<1.0
1,2,4-TMB	µg/L	<1.0	<1.0
Naphthalene	µg/L	<2	<2
TOC	mg/L	9.1	5.7
Methane	µg/L	<10	<10
Inorganics			
Nitrate	mg/L	1.6	1.5J
Nitrite	mg/L	<0.25	<0.25
Sulfate	mg/L	340J	330J
Manganese	mg/L	0.084	0.16
Iron	mg/L	<0.050	<0.050
Lead	mg/L	<0.0050	<0.0050
Groundwater Quality Parameters			
Alkalinity	mg/L as $CaCO_3$	350	400
TDS	mg/L	3,400	3,600
pH	units	7.09	6.46
Conductivity	mS/cm	6.3	6.1
DO	mg/L	1.4	0
Turbidity	NTU	NA	80
Temperature	°C	21	22.3
Salinity	%	0.3	0.32
ORP	mV	186.7	236

1413-MW07			
Analyte	**Units**	**10/27/05****	**1/17/06****
Organics			
TPH-JF	mg/L	NA	NA
TPH-D	mg/L	<0.050	<0.050
TPH-MO	mg/L	<0.50	<0.50
Benzene	µg/L	<0.50	<0.50
Toluene	µg/L	<0.50	<0.50
Ethylbenzene	µg/L	<0.50	<0.50
Total Xylenes	µg/L	<1.0	<1.0
MTBE	µg/L	<0.50	<0.50
TBA	µg/L	NA	NA
DIPE	µg/L	NA	NA
ETBE	µg/L	NA	NA
TAME	µg/L	NA	NA
1,3,5-TMB	µg/L	<1.0	<1.0
1,2,4-TMB	µg/L	<1.0	<1.0
Naphthalene	µg/L	<4	<2
TOC	mg/L	14	12
Methane	µg/L	<10	<10
Inorganics			
Nitrate	mg/L	3.6	4.5J
Nitrite	mg/L	<0.25	<0.25
Sulfate	mg/L	580J	490J
Manganese	mg/L	0.41	0.4
Iron	mg/L	<0.050	0.061
Lead	mg/L	<0.0050	<0.0050
Groundwater Quality Parameters			
Alkalinity	mg/L as $CaCO_3$	340	280
TDS	mg/L	5,400	5,700
pH	units	7	6.09
Conductivity	mS/cm	10	9.39
DO	mg/L	1.1	0.59
Turbidity	NTU	87	2.4
Temperature	°C	23	22.4
Salinity	%	0.5	0.5
ORP	mV	141.8	85

1413-MW08			
Analyte	**Units**	**10/27/05****	**1/17/06****
Organics			
TPH-JF	mg/L	NA	NA
TPH-D	mg/L	0.052	0.081
TPH-MO	mg/L	<0.50	<0.50
Benzene	µg/L	<0.50	<0.50
Toluene	µg/L	<0.50	<0.50
Ethylbenzene	µg/L	<0.50	<0.50
Total Xylenes	µg/L	<1.0	<1.0
MTBE	µg/L	<0.50	<0.50
TBA	µg/L	NA	NA
DIPE	µg/L	NA	NA
ETBE	µg/L	NA	NA
TAME	µg/L	NA	NA
1,3,5-TMB	µg/L	<1.0	<1.0
1,2,4-TMB	µg/L	<1.0	<1.0
Naphthalene	µg/L	<4	<4
TOC	mg/L	13	9.5
Methane	µg/L	<10	<10
Inorganics			
Nitrate	mg/L	1.5	1.5J
Nitrite	mg/L	<0.25	<0.25
Sulfate	mg/L	910J	850J
Manganese	mg/L	0.44	0.42
Iron	mg/L	<0.050	<0.050
Lead	mg/L	<0.0050	<0.0050
Groundwater Quality Parameters			
Alkalinity	mg/L as $CaCO_3$	340	310
TDS	mg/L	8,300	9,600
pH	units	7.1	5.54
Conductivity	mS/cm	15	13.2
DO	mg/L	3.6	2.69
Turbidity	NTU	1	0
Temperature	°C	22	20.6
Salinity	%	0.9	0.76
ORP	mV	124.3	190.6

1413-MW09			
Analyte	**Units**	**10/27/05****	**1/17/06****
Organics			
TPH-JF	mg/L	NA	NA
TPH-D	mg/L	0.43/0.44	0.36
TPH-MO	mg/L	<0.50/<0.50	<0.50
Benzene	µg/L	<1.0/<1.0	<1.0
Toluene	µg/L	<1.0/<1.0	<1.0
Ethylbenzene	µg/L	<1.0/<1.0	<1.0
Total Xylenes	µg/L	<2.0/<2.0	<2.0
MTBE	µg/L	<1.0/<1.0	<1.0
TBA	µg/L	NA	NA
DIPE	µg/L	NA	NA
ETBE	µg/L	NA	NA
TAME	µg/L	NA	NA
1,3,5-TMB	µg/L	<2.0/<2.0	<2.0
1,2,4-TMB	µg/L	2.5/2.5	<2.0
Naphthalene	µg/L	<8/<8	<8
TOC	mg/L	34/25	15
Methane	µg/L	410/420	570
Inorganics			
Nitrate	mg/L	<0.25/<0.25	<0.25
Nitrite	mg/L	<0.25/<0.25	<0.25
Sulfate	mg/L	95/87	100J
Manganese	mg/L	0.55/0.40	0.31
Iron	mg/L	<0.050/<0.050	0.22
Lead	mg/L	<0.0050/<0.0050	<0.0050
Groundwater Quality Parameters			
Alkalinity	mg/L as $CaCO_3$	390/350	280
TDS	mg/L	980/920	740
pH	units	7.1	6.94
Conductivity	mS/cm	2.6	1.84
DO	mg/L	0	0
Turbidity	NTU	2	43.1
Temperature	°C	20	19.4
Salinity	%	0.1	0.1
ORP	mV	-9.7	-38

Notes: Detection limits may be increased on VOC analyses due to sample foaming.
* Reporting Limits were increased due to matrix interference.
**PNAs were less than detection limits. PNAs include: Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene, Benzo(g,h,i)perylene

E = reported concentration includes additional compounds uncharacteristic of common fuels and lubricants
G = compounds outside the range of diesel have varying amounts of recovery.
J = The analyte was positively identified; the associated numerical value is an approximate concentration of the analyte in the sample.

(a) Water samples collected from developed well during site assessment work.
(b) Well purged dry.
(c) Duplicate sample.
(d) Reported diesel concentration may include some undifferentiated lighter-end hydrocarbons.
(e) Reported diesel concentration may include some undifferentiated heavier-end hydrocarbons.
(f) Wells were destroyed in June 2000.
(g) Reporting limits were increased due to high concentrations of non-target analytes.

MCL for benzene = 1 µg/L.
MCL for toluene = 150 µg/L.
MCL for ethylbenzene = 300 µg/L.
MCL for xylenes = 1,750 µg/L
MCL for MTBE = 13 µg/L.
NA = not analyzed.
NS = not sampled.

Table 3. Site 1413 Historic Free Product Removal Results

Date	1413-MW03 (*Recovery Sock*)				
	Depth to Water (ft extension toc)	**Depth to Product (ft extension toc)**	**Product Thickness (ft)**	**Product Removed (gal)**	**Notes**
10/18/2004	16.62	16.3	0.32	NA	Sock Installed
1/1/2005	-	-	-	Sheen*	Sock Replaced
2/4/2005	14.15	NA-sheen only	0	Sheen*	
2/25/2005	11.705	NA-sheen only	0	Sheen*	
3/28/2005	12.725	NA-sheen only	0	Sheen*	
4/21/2005	13.42	NA-sheen only	0	Sheen*	
5/18/2005	12.62	NA-sheen only	0	Sheen*	light sheen recovered; no hydrocarbon odor detected
6/17/2005	14.13	NA-sheen only	0	Sheen*	light sheen recovered; no hydrocarbon odor detected. Sock in moderate condition.
7/8/2005	14.81	NA-sheen only	0	Sheen*	light sheen recovered; no hydrocarbon odor detected. Sock in moderate condition.
8/15/2005	15.22	NA-sheen only	0	Sheen*	light sheen recovered; no hydrocarbon odor detected. Sock in moderate condition.
WELL ABANDONED 9/8/2005					

* "Sheen" noted in the "Product Removed" column indicates that a sheen was the only product observed in the groundwater rung from the product recovery sock

Table 4. Groundwater- and Product-Level Measurements

Well ID	Date Measured	Top of Casing Elevation (ft amsl)	Total Depth (ft btoc)	Water Level (ft btoc)	Water Elevation (ft amsl) [a]	Product Level (ft btoc)	Product Elevation (ft amsl)
1413-MW03	10/31/1998	335.93	25.5	14.39	321.54	-	-
	10/6/1999			16.28	319.65	16.015	319.915
	1/15/2000			16.49	319.44 (319.55)	16.36	319.57
	4/6/2000			16.91	319.02 (319.20)	16.7	319.23
	7/11/2000			16.93	319.00 (319.21)	16.7	319.23
	10/10/2000			16.6	319.33	16.60 (b)	319.33
	1/12/2001			16.76	319.17 (319.17)	16.755	319.175
	4/4/2001			16.32	319.61	16.32 (b)	319.61
	8/10/2001			15.54	320.39 (320.44)	15.48	320.45
	10/31/2001			16.53	319.40 (319.45)	16.47	319.46
	1/8/2002			16.75	319.18 (319.26)	16.66	319.27
	5/10/2002			17.19	318.74 (318.87)	17.04	318.89
	7/22/2002			17.42	318.51 (318.73)	17.16	318.77
	4/14/2004			16.18	319.75 (320.03)	15.85	320.08
	10/18/2004			16.62	319.31 (319.04)	16.3	319.63
	4/21/2005			13.42	322.51 -	13.42 (b)	322.51
	7/8/2005			14.81	321.12 -	14.81 (b)	321.12
Well 1413-MW03 ABANDONED 9/8/2005							
1413-MW04	10/31/1998	334.98	25.5	13.38	321.6	-	-
	10/6/1999			15.14	319.84	-	-
	1/15/2000			15.49	319.49	-	-
	4/6/2000			15.81	319.17	-	-
	7/11/2000			15.83	319.15	-	-
	10/10/2000			15.71	319.27	-	-
	1/12/2001			15.84	319.14	-	-
	4/4/2001			16.36	318.62	-	-

Table 4. Groundwater- and Product-Level Measurements (continued)

Well ID	Date Measured	Top of Casing Elevation (ft amsl)	Total Depth (ft btoc)	Water Level (ft btoc)	Water Elevation (ft amsl) [(a)]	Product Level (ft btoc)	Product Elevation (ft amsl)
1413-MW04 Continued	8/10/2001	334.98	25.5	15.59	319.39	-	-
	10/31/2001			15.6	319.38	-	-
	1/8/2002			15.83	319.15	-	-
	5/10/2002			16.18	318.8	-	-
	7/22/2002			16.34	318.64	-	-
	4/14/2004			15.11	319.87	-	-
	10/18/2004			15.6	319.38	-	-
	4/14/2005			12.1	322.88	-	-
	7/7/2005			13.15	321.83	-	-
	10/27/2005			13.88	321.1	-	-
	1/17/2006			14.48	320.5	-	-
1413-MW05	4/6/2000	334.34	24.64	15.56	318.78	-	-
	7/11/2000			15.41	318.93	-	-
	10/10/2000			15.16	319.18	-	-
	1/12/2001			15.5	318.84	-	-
	4/4/2001			14.78	319.56	-	-
	8/10/2001			15.16	319.18	-	-
	10/31/2001			14.12	320.22	-	-
	1/8/2002			15.45	318.89	-	-
	5/10/2002			15.84	318.5	-	-
	7/22/2002			15.96	318.38	-	-
	4/14/2004			14.74	319.6	-	-
	10/18/2004			15.22	319.12	-	-
	4/14/2005			11.02	323.32	-	-
	7/7/2005			12.75	321.59	-	-
	10/27/2005			13.82	320.52	-	-
	1/17/2006			14.29	320.05	-	-
1413-MW06	10/27/2005	336.09	20	14.18	321.91	-	-
	1/17/2006			14.8	321.29	-	-
1413-MW07	10/27/2005	334.89	20	14.45	320.44	-	-
	1/17/2006			15.18	319.71	-	-
1413-MW08	10/27/2005	333.83	20	16.61	317.22	-	-
	1/17/2006			16.92	316.91	-	-
1413-MW09	10/27/2005	336.4	20	12.06	324.34	-	-
	1/17/2006			12.09	324.31	-	-

(a) Value in parentheses indicates groundwater elevation corrected for the presence of free product using a density factor for diesel fuel of 0.84 g/cm^3 (Dragun, 1998). Corrected values were used to calculate the groundwater flow direction and hydraulic gradient.
(b) A sheen of free product was detected in the monitoring well.

Table 5. Groundwater Sampling Methods, Analytical Methods, and Standard Reporting Limits

Analyte	Volume/Storage Container	Preservation	Sample Holding Time	Analytical Method	Reporting Limit[a]
Organic Analyses					
TPH-D	3x40 mL Glass	4°C	14 d	EPA 8015B	0.05 mg/L
TPH-MO	3x40 mL Glass	4°C	14 d	EPA 8015B	0.50 mg/L
BTEX	3x40 mL Glass	4°C; pH<2	14 d	EPA 624/SW8260B	0.50 µg/L
Naphthalene	3x40 mL Glass	4°C; pH<2	14 d	EPA 624/SW8260B	2.0 µg/L
TMBs	3x40 mL Glass	4°C; pH<2	14 d	EPA 624/SW8260B	1.0 µg/L
MTBE	3x40 mL Glass	4°C; pH<2	14 d	EPA 624/SW8260B	0.50 µg/L
TOC	125 mL Glass	4°C; pH<2	28 d	EPA 415.1/9060/SM-5310C	1.0 mg/L
Methane	3x40 mL Glass	4°C; pH<2	14 d	RSK 175	10 µg/L
PAHs	250 mL Glass	4°C	7 d	EPA 8270	10 µg/L
Inorganic Analyses					
Sulfate	250 mL Glass or Plastic	4°C	28 d	EPA 300.0	1.5 mg/L
Nitrate[b]	250 mL Glass or Plastic	4°C; pH<2	28 d	EPA 300.0	0.3mg/L
Nitrite*	250 mL Glass or Plastic	4°C	48 h	EPA 300.0	0.5 mg/L
Lead	250 mL Glass or Plastic	4°C; pH<2	6 mo	SW6020	0.005 mg/L
Manganese	250 mL Glass or Plastic	4°C; pH<2	6 mo	EPA 200.8	0.01 mg/L
Iron	250 mL Glass or Plastic	4°C; pH<2	6 mo	SM 3500 Fe D	0.1 mg/L
Groundwater Quality Parameters					
Alkalinity	250 mL Glass or Plastic	4°C	14 d	EPA 310.1	0.1 mg/L
TDS	500 mL Glass or Plastic	4°C	7 d	EPA 160.1	7mg/L

(a) The reporting limit may vary depending on concentration in the sample, sample matrix, sample volume, and the amount of TDS. Reporting limit is less than or equal to the recommended detection limit in the County of San Diego DEH *SAM Manual* (DEH, 2005).

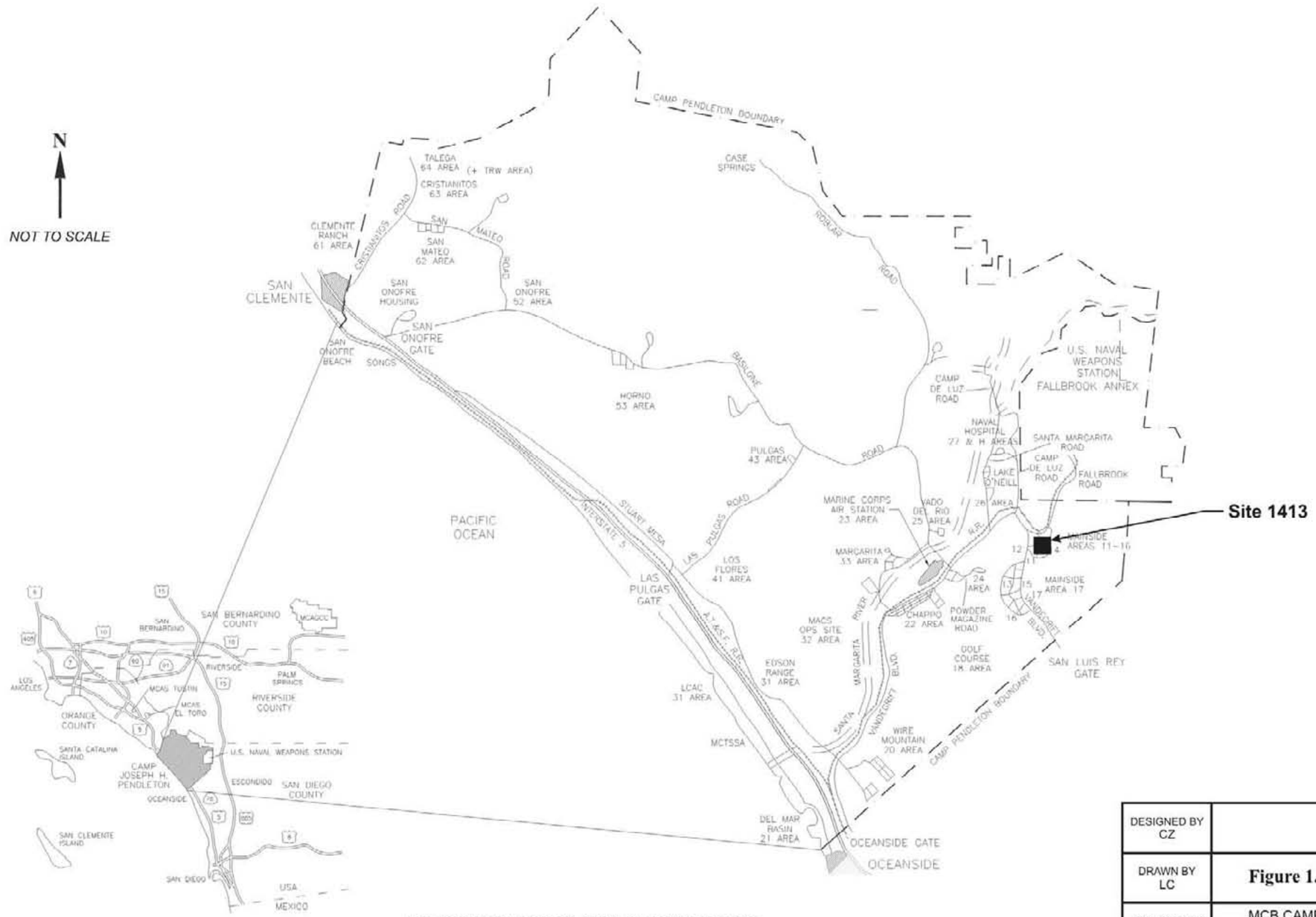
(b) Nitrate reporting limits may vary if the analysis is performed on a preserved sample (preserved samples have a 28-day holding time, whereas unpreserved samples have a 2-day holding time)

.Table 6. QC Analytical Results

Analyte	Units	1413-QCEB 10/27/2005	1413-QCTB 10/27/2005	1413-QCFB 10/27/2005	1413-EB01 1/17/2006	1413-QCTB 1/17/2006	1413-QCFB 1/17/2006
TPH-D	mg/L	<0.050	NA	NA	<0.050	NA	NA
TPH-MO	mg/L	<0.50	NA	NA	<0.50	NA	NA
Benzene	µg/L	<0.50	<0.50	<0.50	NA	<0.50	<0.50
Toluene	µg/L	0.57	<0.50	0.58	NA	<0.50	<0.50
Ethylbenzene	µg/L	<0.50	<0.50	<0.50	NA	<0.50	<0.50
Total Xylenes	µg/L	<1.00	<1.00	<1.00	NA	<1.00	<1.00
MTBE	µg/L	<0.50	<0.50	<0.50	NA	<0.50	<0.50
TBA	µg/L	NA	NA	NA	NA	NA	NA

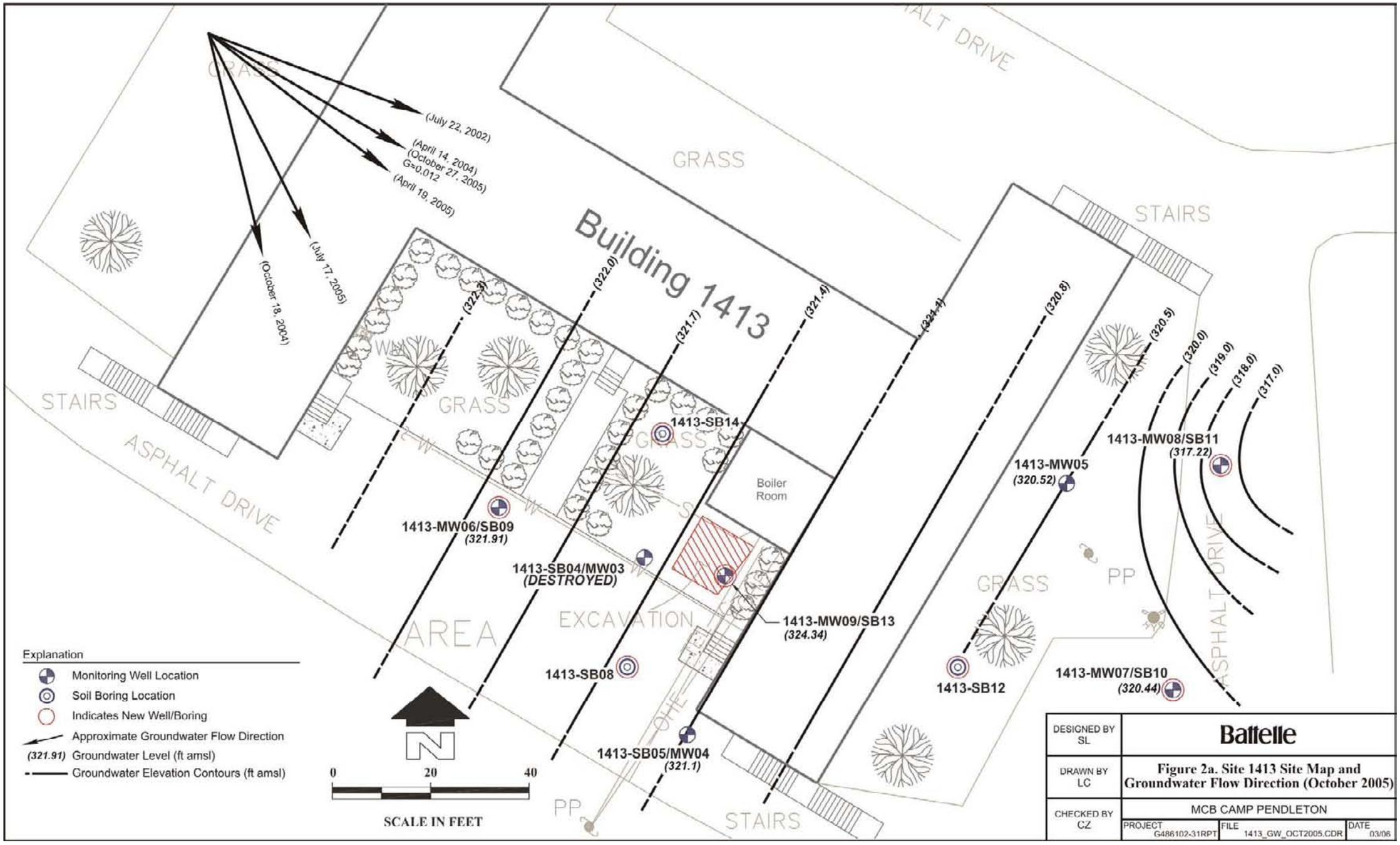
EB = equipment blank.
FB = field blank.
TB = trip blank.
NA = not analyzed

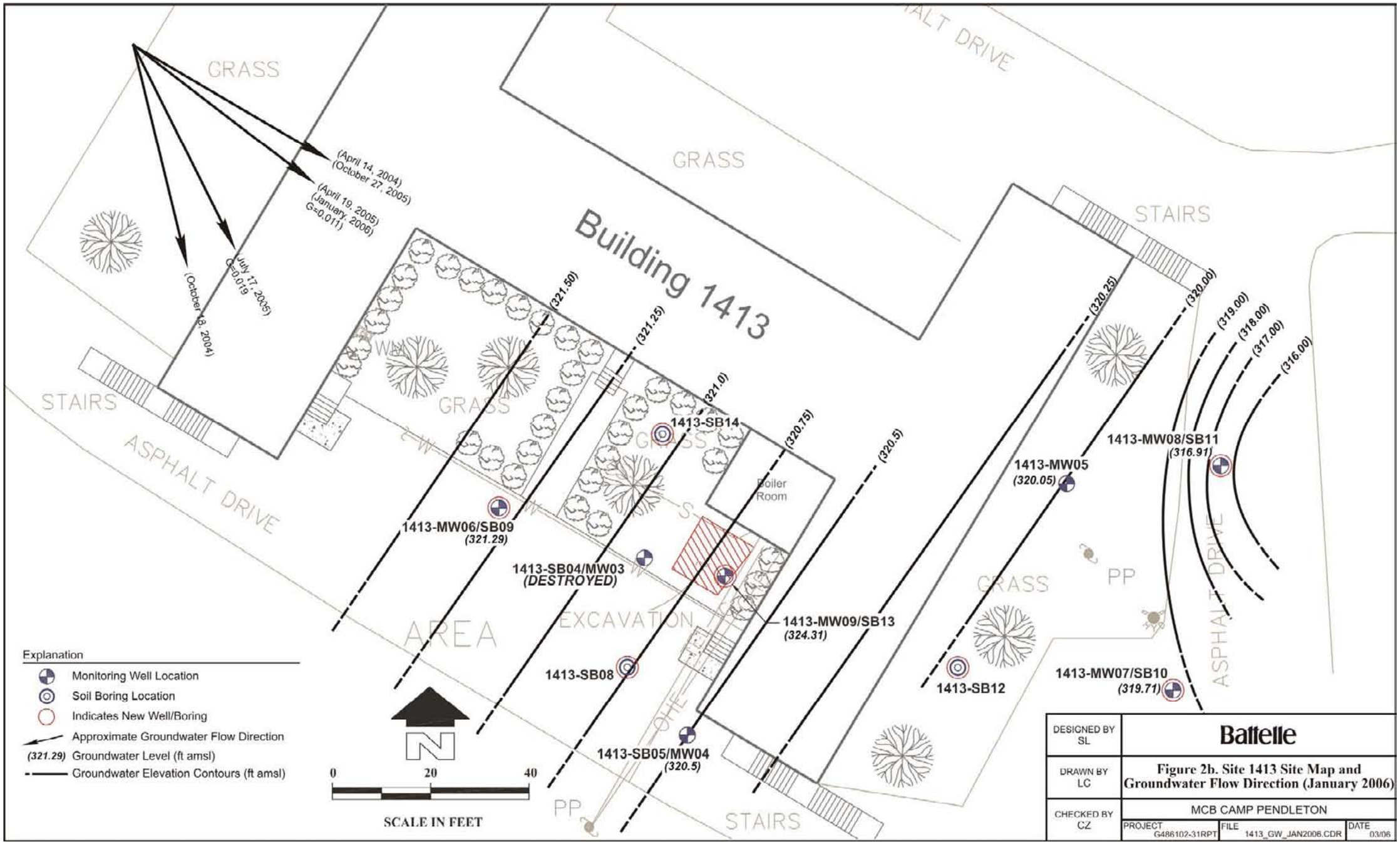
FIGURES

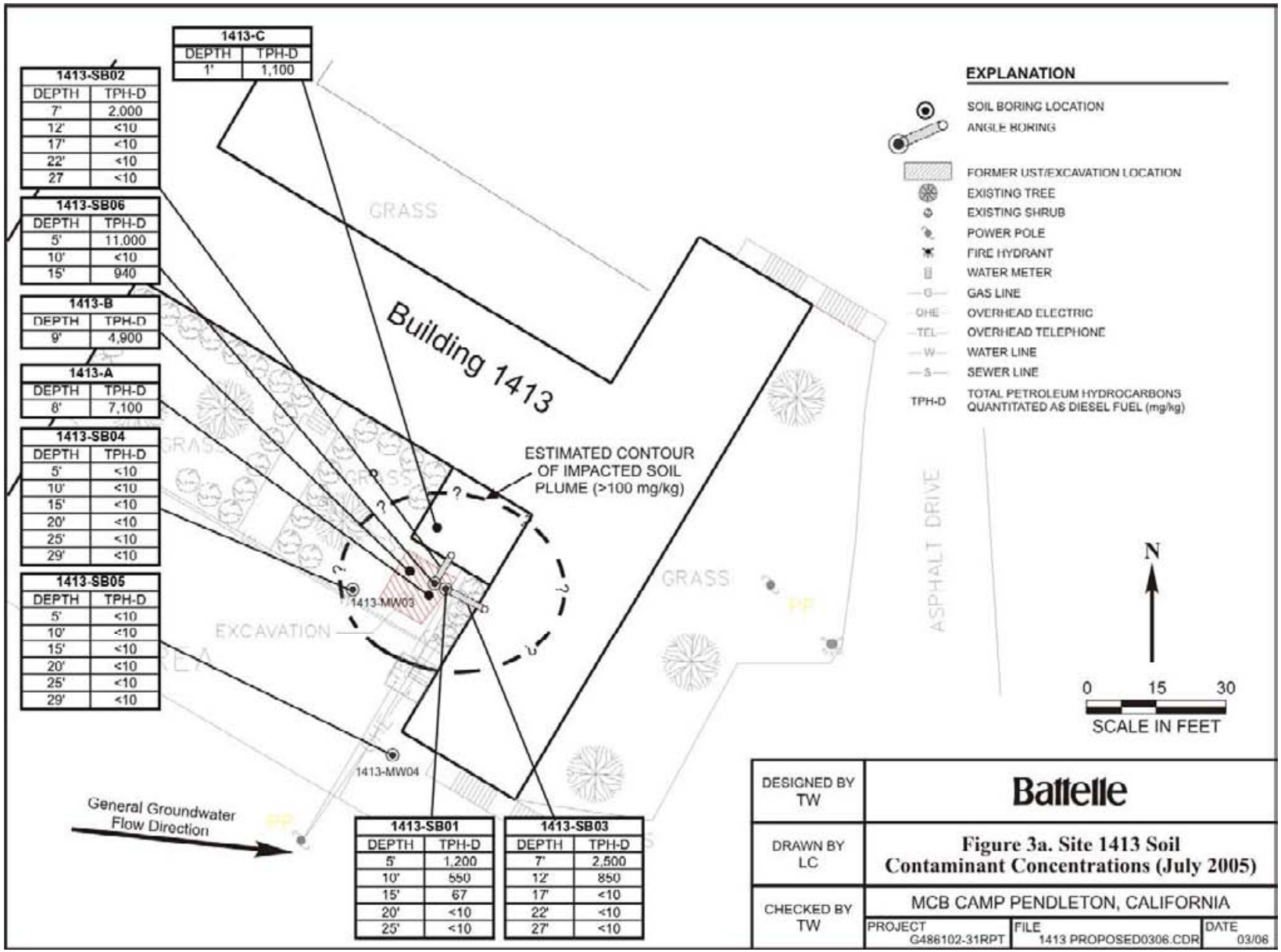


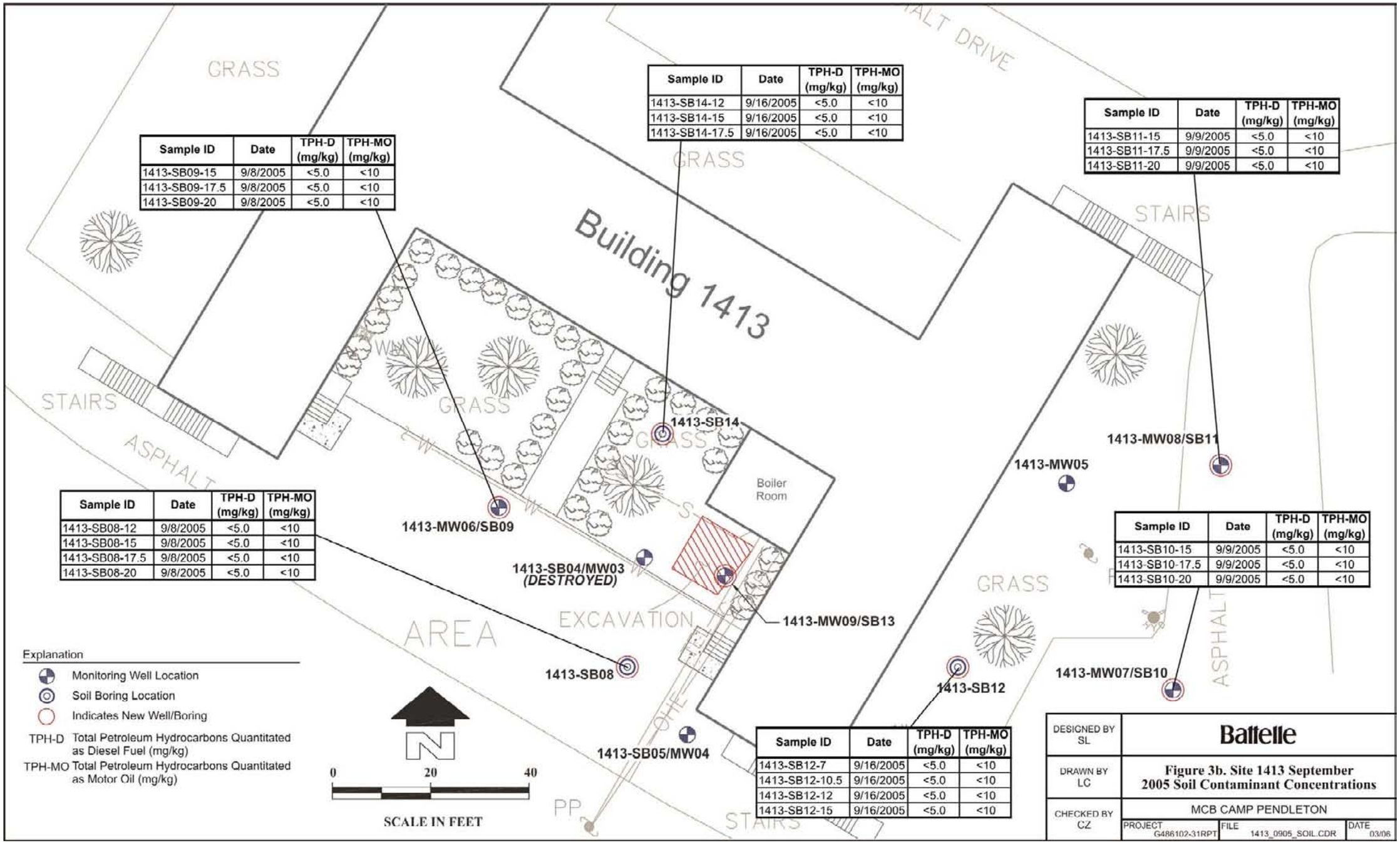
NOTE: MODIFIED FROM KLEINFELDER, REMOVAL OF UNDERGROUND STORAGE TANKS, CAMP JOSEPH H. PENDLETON, CAMP PENDLETON, CALIFORNIA NAVFAC DWG. NO. 8029558 AND 8029563

DESIGNED BY CZ	Battelle		
DRAWN BY LC	Figure 1. Site 1413 Vicinity Map		
CHECKED BY MG	MCB CAMP PENDLETON, CALIFORNIA		
	PROJECT G486102-31RPT	FILE 1413FIGURE1.CDR	DATE 03/06


GRASS
(July 22, 2002)
(April 14, 2004)
(October 27, 2005)
G=0.012
(April 19, 2005)
(July 17, 2005)
(October 18, 2004)
GRASS
Building 1413
STAIRS
(322.0)
(321.7)
(321.4)
(321.1)
(320.8)
(320.5)
(320.0)
(319.0)
(318.0)
(317.0)
STAIRS
GRASS
1413-SB14
GRASS
Boiler Room
ASPHALT DRIVE
1413-MW08/SB11
(317.22)
1413-MW05
(320.52)
1413-MW06/SB09
(321.91)
1413-SB04/MW03
(DESTROYED)
GRASS
PP
ASPHALT DRIVE
AREA
EXCAVATION
1413-MW09/SB13
(324.34)
1413-SB08
1413-SB12
1413-MW07/SB10
(320.44)
OHE
1413-SB05/MW04
(321.1)
PP
STAIRS
Explanation
Monitoring Well Location
Soil Boring Location
Indicates New Well/Boring
Approximate Groundwater Flow Direction
(321.91) Groundwater Level (ft amsl)
Groundwater Elevation Contours (ft amsl)
0
20
40
SCALE IN FEET
DESIGNED BY SL
Battelle
DRAWN BY LC
Figure 2a. Site 1413 Site Map and Groundwater Flow Direction (October 2005)
CHECKED BY CZ
MCB CAMP PENDLETON
PROJECT G486102-31RPT
FILE 1413_GW_OCT2005.CDR
DATE 03/06


GRASS
(April 14, 2004)
(October 27, 2005)
(April 19, 2005)
(January, 2006)
G=0.011)
July 17, 2005)
G=0.019
(October 18, 2004)
GRASS
Building 1413
STAIRS
STAIRS
ASPHALT DRIVE
GRASS
(321.50)
(321.25)
(321.0)
(320.75)
(320.5)
(320.25)
(320.00)
(319.00)
(318.00)
(317.00)
(316.00)
1413-SB14
Boiler Room
1413-MW08/SB11
(316.91)
1413-MW05
(320.05)
1413-MW06/SB09
(321.29)
1413-SB04/MW03
(DESTROYED)
GRASS
PP
ASPHALT DRIVE
1413-MW09/SB13
(324.31)
AREA
EXCAVATION
1413-SB08
1413-SB12
1413-MW07/SB10
(319.71)
OHE
1413-SB05/MW04
(320.5)
PP
STAIRS
Explanation
Monitoring Well Location
Soil Boring Location
Indicates New Well/Boring
Approximate Groundwater Flow Direction
(321.29) Groundwater Level (ft amsl)
Groundwater Elevation Contours (ft amsl)
0
20
40
SCALE IN FEET
DESIGNED BY SL
Battelle
DRAWN BY LC
Figure 2b. Site 1413 Site Map and Groundwater Flow Direction (January 2006)
CHECKED BY CZ
MCB CAMP PENDLETON
PROJECT G486102-31RPT
FILE 1413_GW_JAN2006.CDR
DATE 03/06


1413-C
DEPTH TPH-D
1' 1,100
1413-SB02
DEPTH TPH-D
7' 2,000
12' <10
17' <10
22' <10
27 <10
1413-SB06
DEPTH TPH-D
5' 11,000
10' <10
15' 940
1413-B
DEPTH TPH-D
9' 4,900
1413-A
DEPTH TPH-D
8' 7,100
1413-SB04
DEPTH TPH-D
5' <10
10' <10
15' <10
20' <10
25' <10
29' <10
1413-SB05
DEPTH TPH-D
5' <10
10' <10
15' <10
20' <10
25' <10
29' <10
GRASS
Building 1413
ESTIMATED CONTOUR OF IMPACTED SOIL PLUME (>100 mg/kg)
1413-MW03
EXCAVATION
1413-MW04
General Groundwater Flow Direction
1413-SB01
DEPTH TPH-D
5' 1,200
10' 550
15' 67
20' <10
25' <10
1413-SB03
DEPTH TPH-D
7' 2,500
12' 850
17' <10
22' <10
27' <10
EXPLANATION
SOIL BORING LOCATION
ANGLE BORING
FORMER UST/EXCAVATION LOCATION
EXISTING TREE
EXISTING SHRUB
POWER POLE
FIRE HYDRANT
WATER METER
GAS LINE
OVERHEAD ELECTRIC
OVERHEAD TELEPHONE
WATER LINE
SEWER LINE
TPH-D TOTAL PETROLEUM HYDROCARBONS QUANTITATED AS DIESEL FUEL (mg/kg)
ASPHALT DRIVE
N
0 15 30
SCALE IN FEET
DESIGNED BY TW
DRAWN BY LC
CHECKED BY TW
Battelle
Figure 3a. Site 1413 Soil Contaminant Concentrations (July 2005)
MCB CAMP PENDLETON, CALIFORNIA
PROJECT G486102-31RPT
FILE 1413 PROPOSED0306.CDR
DATE 03/06



Sample ID	Date	TPH-D (mg/kg)	TPH-MO (mg/kg)
1413-SB09-15	9/8/2005	<5.0	<10
1413-SB09-17.5	9/8/2005	<5.0	<10
1413-SB09-20	9/8/2005	<5.0	<10

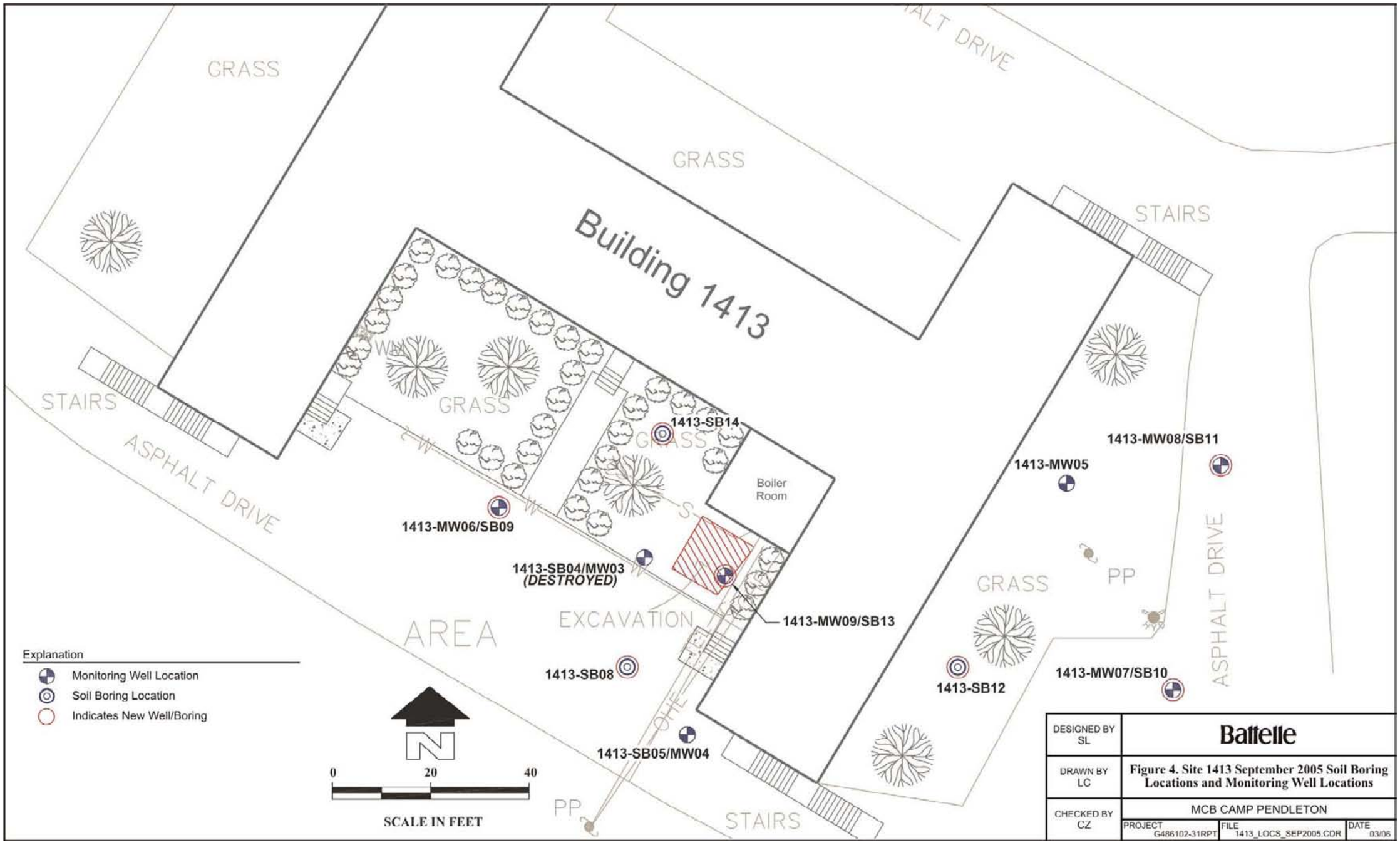
Sample ID	Date	TPH-D (mg/kg)	TPH-MO (mg/kg)
1413-SB14-12	9/16/2005	<5.0	<10
1413-SB14-15	9/16/2005	<5.0	<10
1413-SB14-17.5	9/16/2005	<5.0	<10

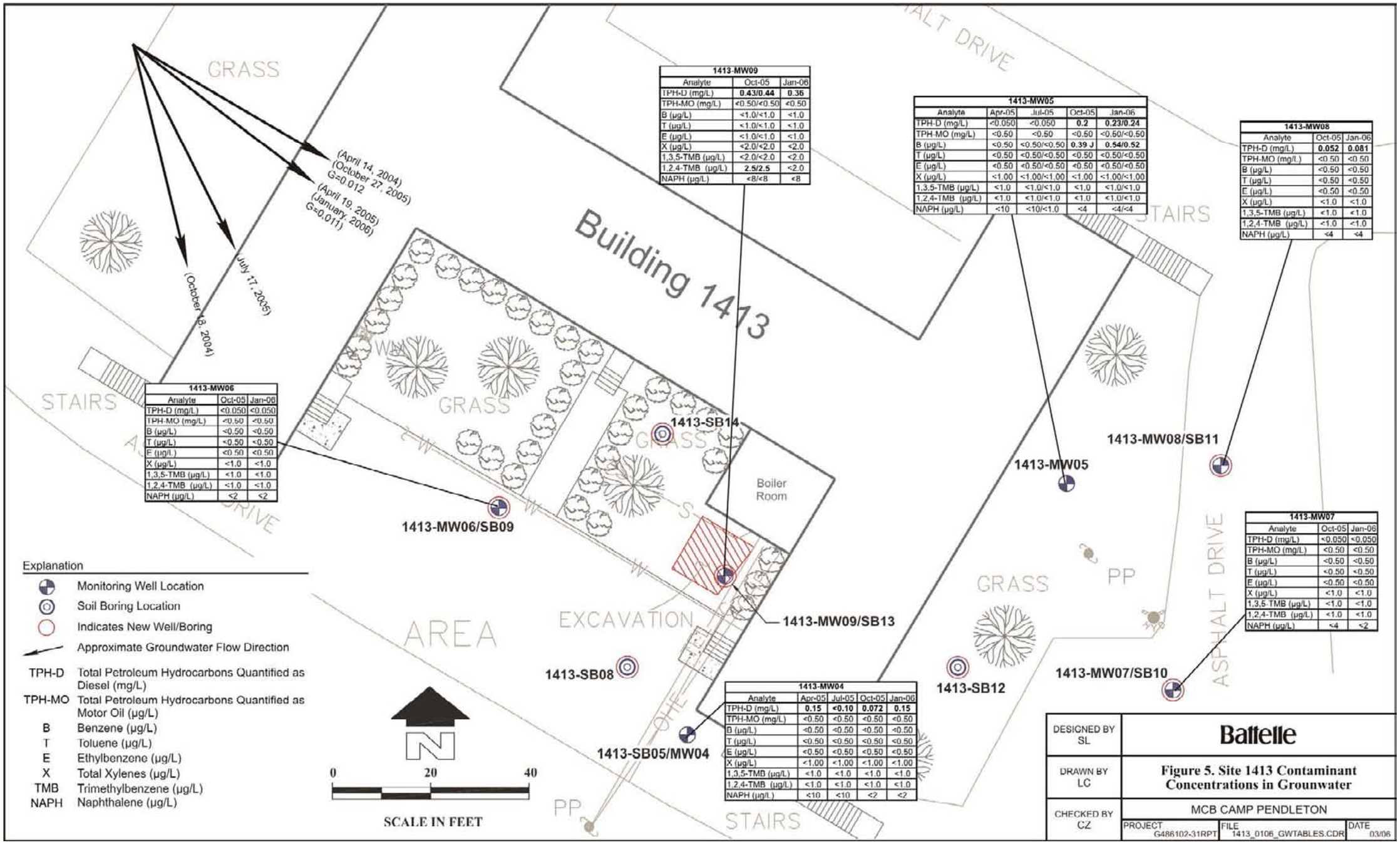
Sample ID	Date	TPH-D (mg/kg)	TPH-MO (mg/kg)
1413-SB11-15	9/9/2005	<5.0	<10
1413-SB11-17.5	9/9/2005	<5.0	<10
1413-SB11-20	9/9/2005	<5.0	<10

Sample ID	Date	TPH-D (mg/kg)	TPH-MO (mg/kg)
1413-SB08-12	9/8/2005	<5.0	<10
1413-SB08-15	9/8/2005	<5.0	<10
1413-SB08-17.5	9/8/2005	<5.0	<10
1413-SB08-20	9/8/2005	<5.0	<10

Sample ID	Date	TPH-D (mg/kg)	TPH-MO (mg/kg)
1413-SB10-15	9/9/2005	<5.0	<10
1413-SB10-17.5	9/9/2005	<5.0	<10
1413-SB10-20	9/9/2005	<5.0	<10

Sample ID	Date	TPH-D (mg/kg)	TPH-MO (mg/kg)
1413-SB12-7	9/16/2005	<5.0	<10
1413-SB12-10.5	9/16/2005	<5.0	<10
1413-SB12-12	9/16/2005	<5.0	<10
1413-SB12-15	9/16/2005	<5.0	<10


GRASS
ALT DRIVE
GRASS
STAIRS
Building 1413
STAIRS
GRASS
1413-SB14
GRASS
1413-MW08/SB11
1413-MW05
Boiler Room
ASPHALT DRIVE
1413-MW06/SB09
1413-SB04/MW03
(DESTROYED)
GRASS
PP
ASPHALT DRIVE
EXCAVATION
1413-MW09/SB13
AREA
1413-SB08
1413-SB12
1413-MW07/SB10
1413-SB05/MW04
PP
STAIRS
Explanation
Monitoring Well Location
Soil Boring Location
Indicates New Well/Boring
0
20
40
SCALE IN FEET
DESIGNED BY SL
Battelle
DRAWN BY LC
Figure 4. Site 1413 September 2005 Soil Boring Locations and Monitoring Well Locations
CHECKED BY CZ
MCB CAMP PENDLETON
PROJECT G486102-31RPT
FILE 1413_LOCS_SEP2005.CDR
DATE 03/06



1413-MW09		
Analyte	Oct-05	Jan-06
TPH-D (mg/L)	**0.43/0.44**	**0.36**
TPH-MO (mg/L)	<0.50/<0.50	<0.50
B (µg/L)	<1.0/<1.0	<1.0
T (µg/L)	<1.0/<1.0	<1.0
E (µg/L)	<1.0/<1.0	<1.0
X (µg/L)	<2.0/<2.0	<2.0
1,3,5-TMB (µg/L)	<2.0/<2.0	<2.0
1,2,4-TMB (µg/L)	**2.5/2.5**	<2.0
NAPH (µg/L)	<8/<8	<8

1413-MW05				
Analyte	Apr-05	Jul-05	Oct-05	Jan-06
TPH-D (mg/L)	<0.050	<0.050	**0.2**	**0.23/0.24**
TPH-MO (mg/L)	<0.50	<0.50	<0.50	<0.50/<0.50
B (µg/L)	<0.50	<0.50/<0.50	**0.39 J**	**0.54/0.52**
T (µg/L)	<0.50	<0.50/<0.50	<0.50	<0.50/<0.50
E (µg/L)	<0.50	<0.50/<0.50	<0.50	<0.50/<0.50
X (µg/L)	<1.00	<1.00/<1.00	<1.00	<1.00/<1.00
1,3,5-TMB (µg/L)	<1.0	<1.0/<1.0	<1.0	<1.0/<1.0
1,2,4-TMB (µg/L)	<1.0	<1.0/<1.0	<1.0	<1.0/<1.0
NAPH (µg/L)	<10	<10/<1.0	<4	<4/<4

1413-MW08		
Analyte	Oct-05	Jan-06
TPH-D (mg/L)	**0.052**	**0.081**
TPH-MO (mg/L)	<0.50	<0.50
B (µg/L)	<0.50	<0.50
T (µg/L)	<0.50	<0.50
E (µg/L)	<0.50	<0.50
X (µg/L)	<1.0	<1.0
1,3,5-TMB (µg/L)	<1.0	<1.0
1,2,4-TMB (µg/L)	<1.0	<1.0
NAPH (µg/L)	<4	<4

1413-MW06		
Analyte	Oct-05	Jan-06
TPH-D (mg/L)	<0.050	<0.050
TPH-MO (mg/L)	<0.50	<0.50
B (µg/L)	<0.50	<0.50
T (µg/L)	<0.50	<0.50
E (µg/L)	<0.50	<0.50
X (µg/L)	<1.0	<1.0
1,3,5-TMB (µg/L)	<1.0	<1.0
1,2,4-TMB (µg/L)	<1.0	<1.0
NAPH (µg/L)	<2	<2

1413-MW07		
Analyte	Oct-05	Jan-06
TPH-D (mg/L)	<0.050	<0.050
TPH-MO (mg/L)	<0.50	<0.50
B (µg/L)	<0.50	<0.50
T (µg/L)	<0.50	<0.50
E (µg/L)	<0.50	<0.50
X (µg/L)	<1.0	<1.0
1,3,5-TMB (µg/L)	<1.0	<1.0
1,2,4-TMB (µg/L)	<1.0	<1.0
NAPH (µg/L)	<4	<2

1413-MW04				
Analyte	Apr-05	Jul-05	Oct-05	Jan-06
TPH-D (mg/L)	**0.15**	**<0.10**	**0.072**	**0.15**
TPH-MO (mg/L)	<0.50	<0.50	<0.50	<0.50
B (µg/L)	<0.50	<0.50	<0.50	<0.50
T (µg/L)	<0.50	<0.50	<0.50	<0.50
E (µg/L)	<0.50	<0.50	<0.50	<0.50
X (µg/L)	<1.00	<1.00	<1.00	<1.00
1,3,5-TMB (µg/L)	<1.0	<1.0	<1.0	<1.0
1,2,4-TMB (µg/L)	<1.0	<1.0	<1.0	<1.0
NAPH (µg/L)	<10	<10	<2	<2

Figure 6. Historical Trends of Contaminant Concentrations at Site 1413

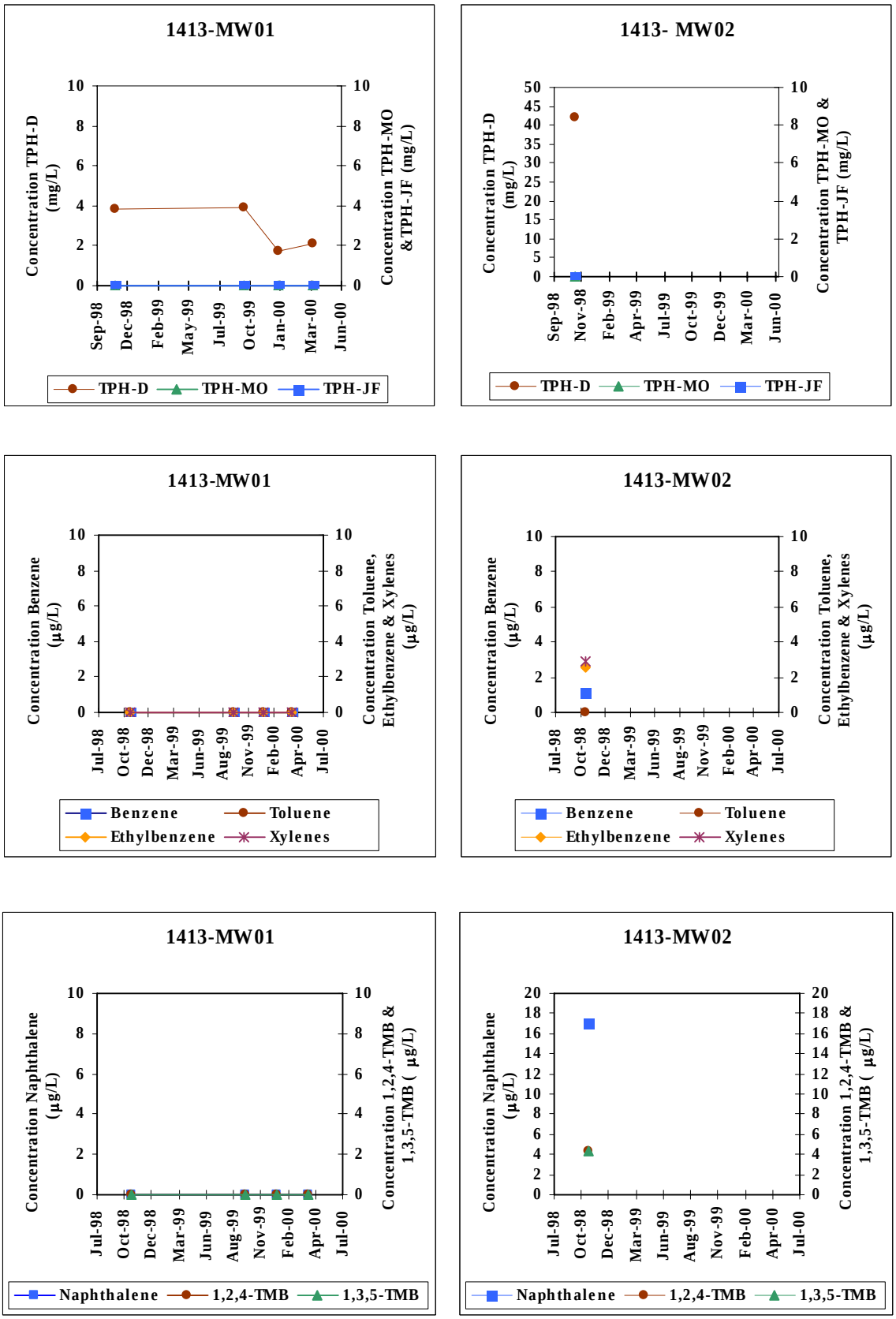
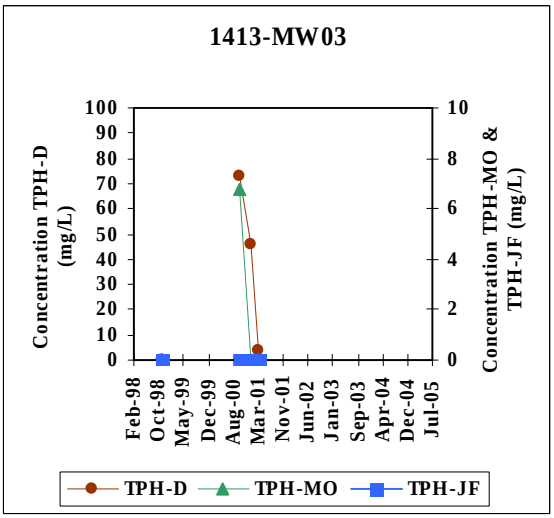
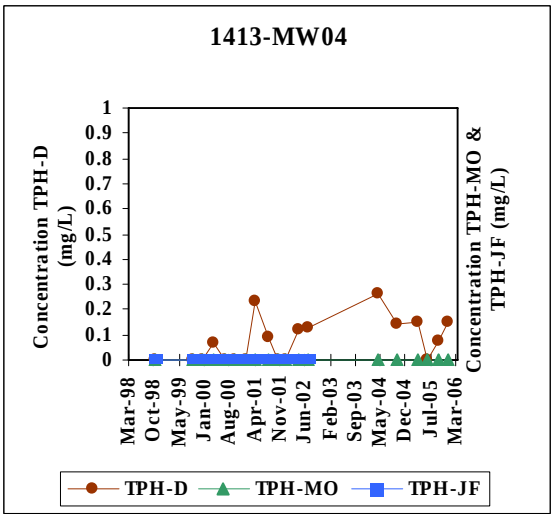
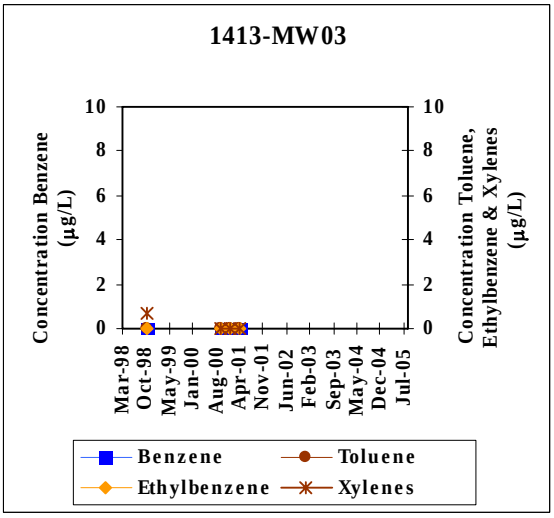
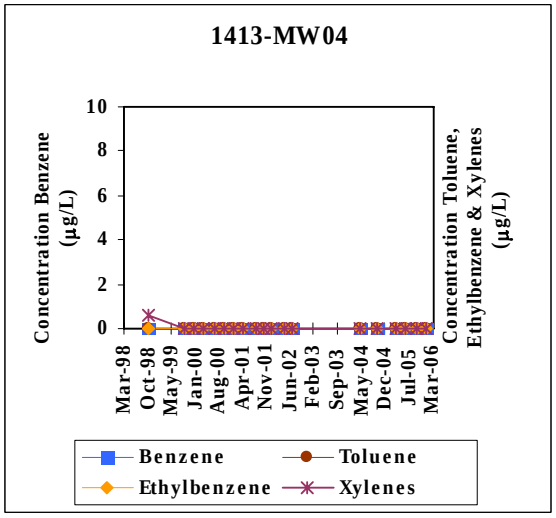


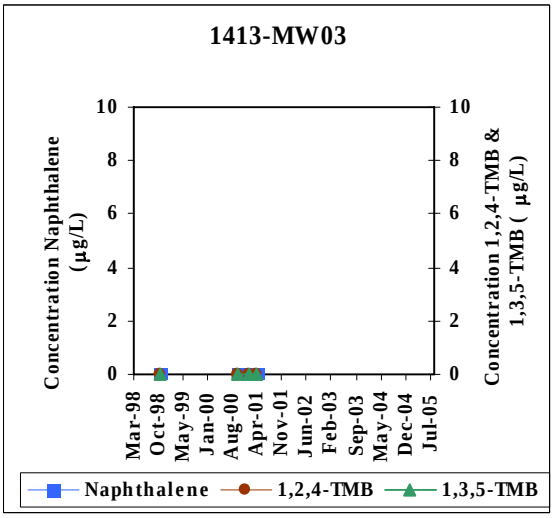
Figure 6. Historical Trends of Contaminant Concentrations at Site 1413 (Continued)











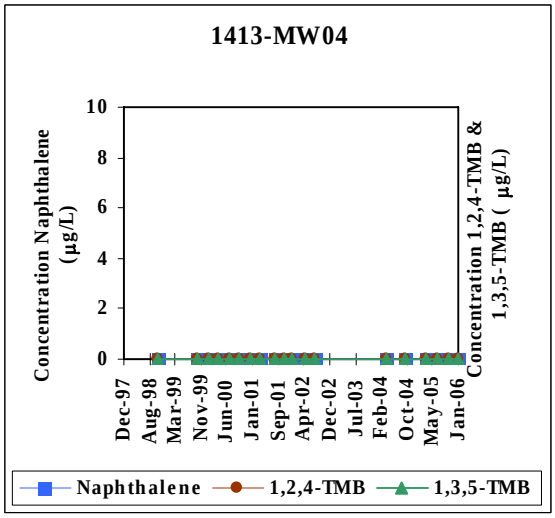
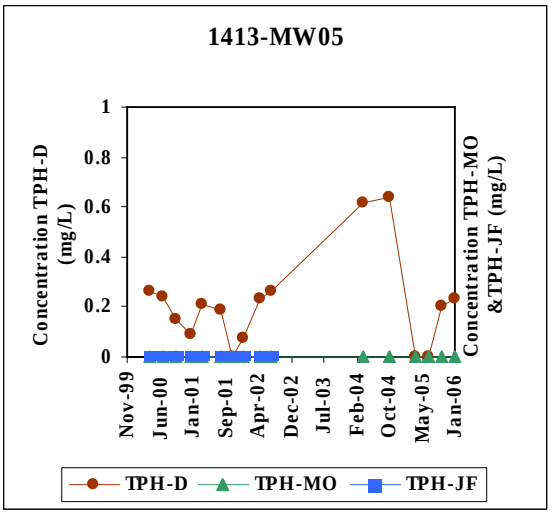
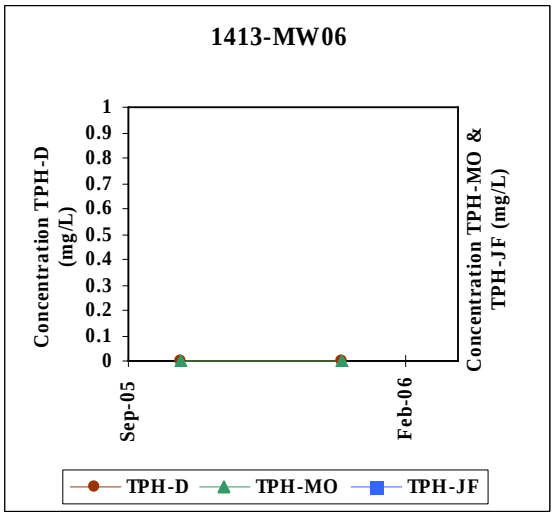
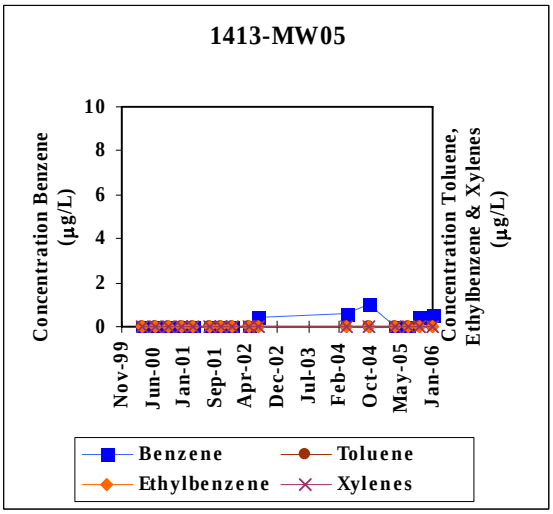
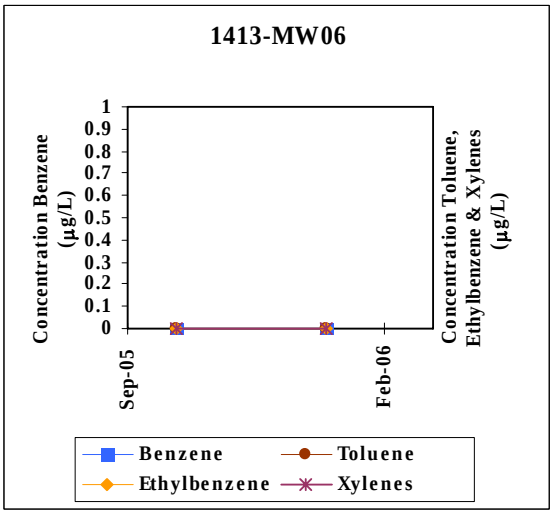


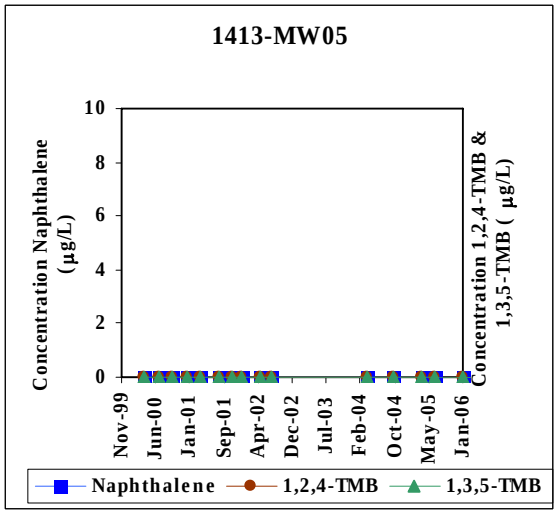
Figure 6. Historical Trends of Contaminant Concentrations at Site 1413 (Continued)











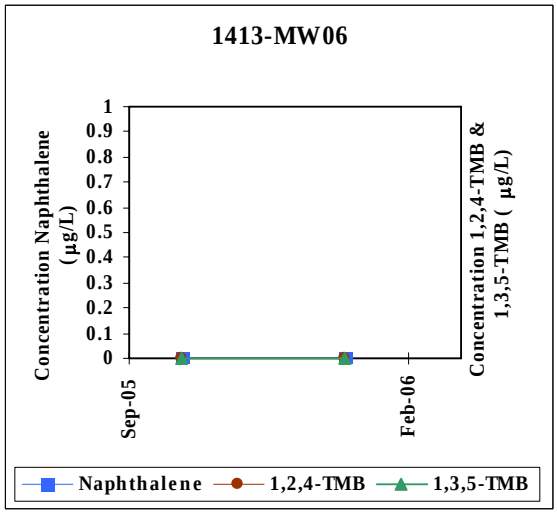
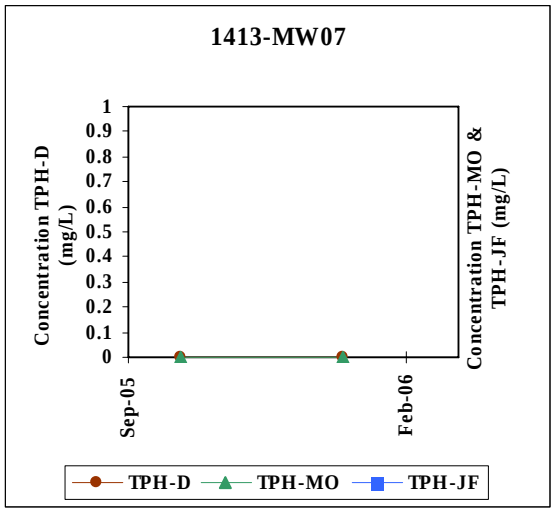
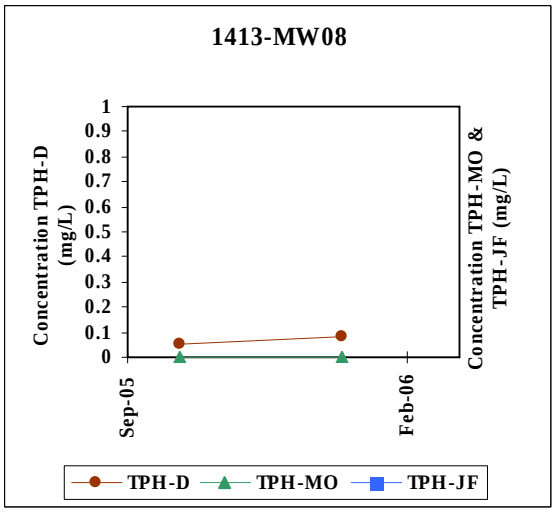
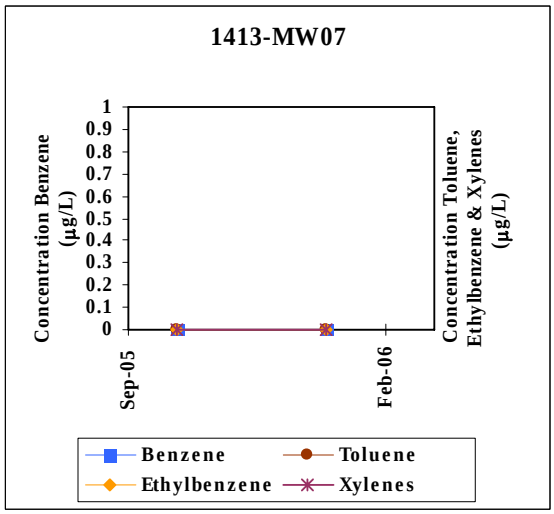
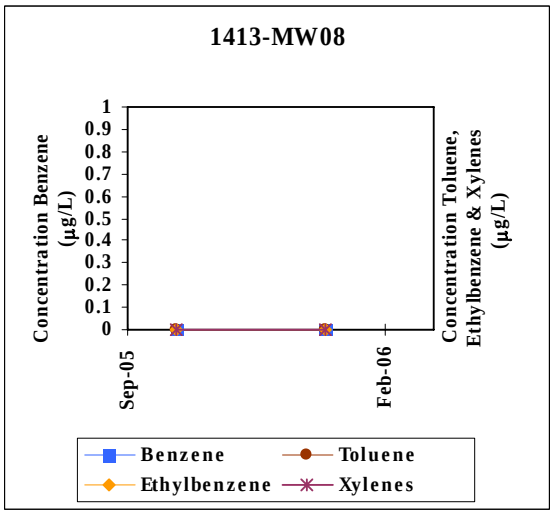


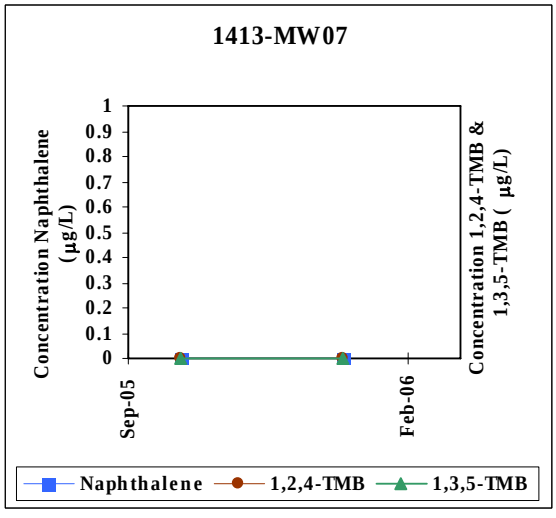
Figure 6. Historical Trends of Contaminant Concentrations at Site 1413 (Continued)











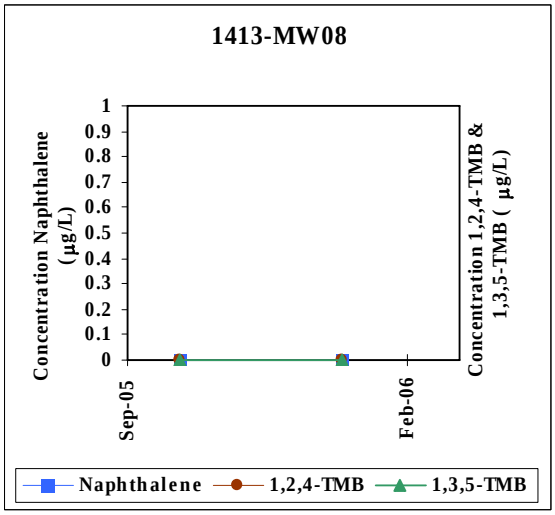
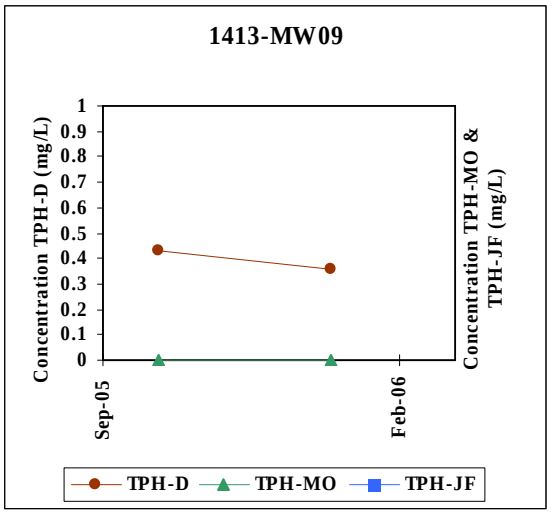
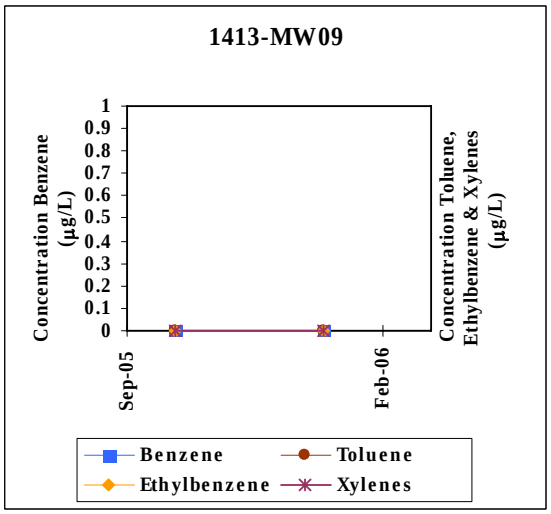
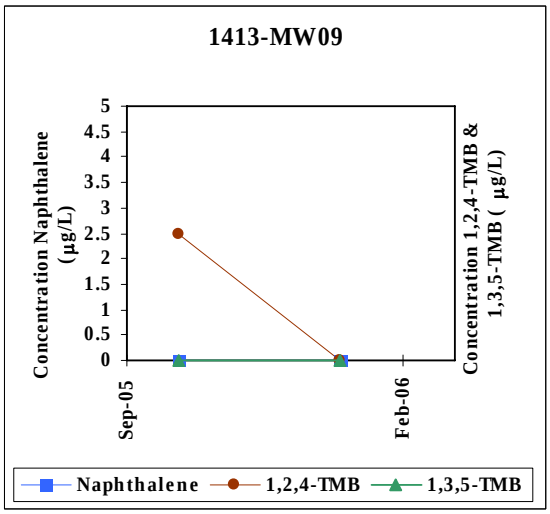


Figure 6. Historical Trends of Contaminant Concentrations at Site 1413 (Continued)







APPENDIX A

SEPTEMBER 2005 ADDITIONAL SITE ASSESSMENT DOCUMENTATION

(INCLUDES: SURVEY DATA, SOIL BORING LOGS, WELL COMPLETION DIAGRAMS, WELL DESTRUCTION DOCUMENTATION, SOIL ANALYTICAL DATA, DATA VALIDATION RESULTS, AND GROUNDWATER WELL DEVELOPMENT LOGS)

SOIL BORING, GROUNDWATER MONITORING WELL INSTALLATION, AND GROUNDWATER MONITORING WELL DESTRUCTION LOGS

Battelle
The Business of Innovation

3990 Old Town Ave., Suite C-205
San Diego, CA 92110

October 28, 2005

County of San Diego
Department of Environmental Health
Site Assessment and Mitigation Division
1255 Imperial Avenue
San Diego, CA 92101

Attn: Ms. Marisue Crystal

Groundwater Monitoring Well and Exploratory Test Boring Construction Report for UST Site 1413 located at Camp Pendleton, California. Permit No. LMON102882, Assessor's Parcel No. 101-000-00, Establishment No. H05939-273.

Dear Marisue:

Enclosed please find three copies of a groundwater monitoring well construction report for Monitoring Well and Boring Construction Permit LMON102882. Three soil borings and 4 wells were completed and one well was destroyed under this permit for the purpose of delineating soil and groundwater contamination at Site1413, Marine Corps Base, Camp Pendleton, California.

Included in this report are copies of the permit cover page, site maps, soil boring logs, well completion diagrams, well destruction diagrams, and laboratory analytical reports summarizing all soil sample analytical results for samples collected at the site.

If you have any questions or comments, please contact me at (619) 726-0821.

Sincerely,

David Clexton, for

Thomas R. Worthington
Research Scientist
Environmental Restoration Department

Enc.

PROFESSIONAL GEOLOGIST
DAVID W. CLEXTON
No. 7350
Expires 10/06
STATE OF CALIFORNIA

MODIFICATION
PERMIT #LMON102882
A.P.N. #101-520-15
EST #h05939-273

COUNTY OF SAN DIEGO
DEPARTMENT OF ENVIRONMENTAL HEALTH
LAND AND WATER QUALITY DIVISION
MONITORING WELL PROGRAM

MONITORING WELL PERMIT EXTENSION

SITE NAME: SITE 1413

SITE ADDRESS: 16TH ST. NEAR VANDERGRIFT, MCB CAMP PENDLETON CA 92055

PERMIT FOR: **4 GROUNDWATER MONITORING WELLS, 4 SOIL BORINGS, & 1 DESTROY 1 GROUNDWATER MONITORING WELL (MW-3)**

ORIGINAL EXPIRATION DATE: JUNE 10, 2005

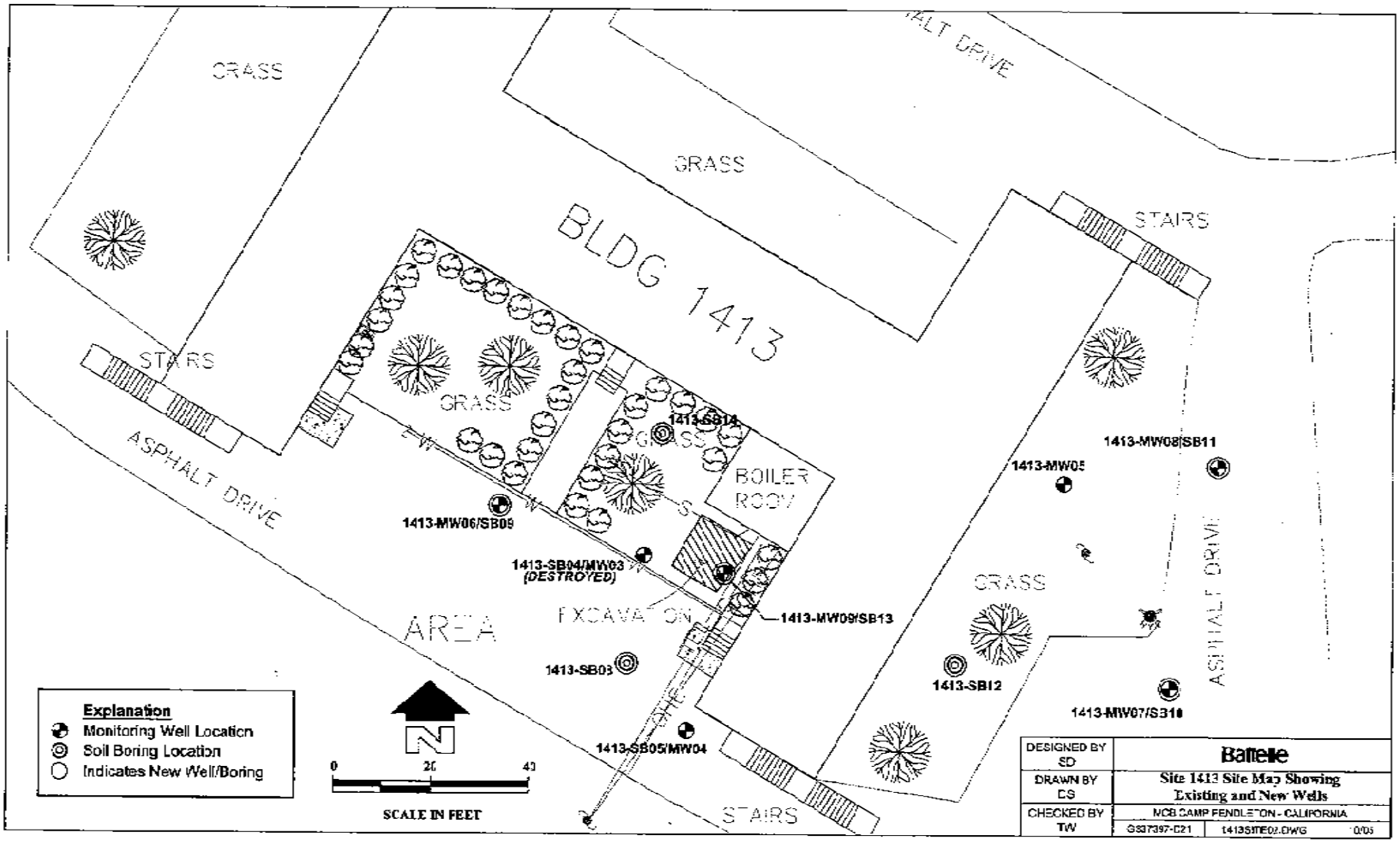
THIS WELL PERMIT HAS BEEN EXTENDED AT THE REQUEST OF THE PERMITEE. ALL CONDITIONS ON THE ORIGINAL OR MODIFIED PERMIT ARE STILL IN EFFECT.

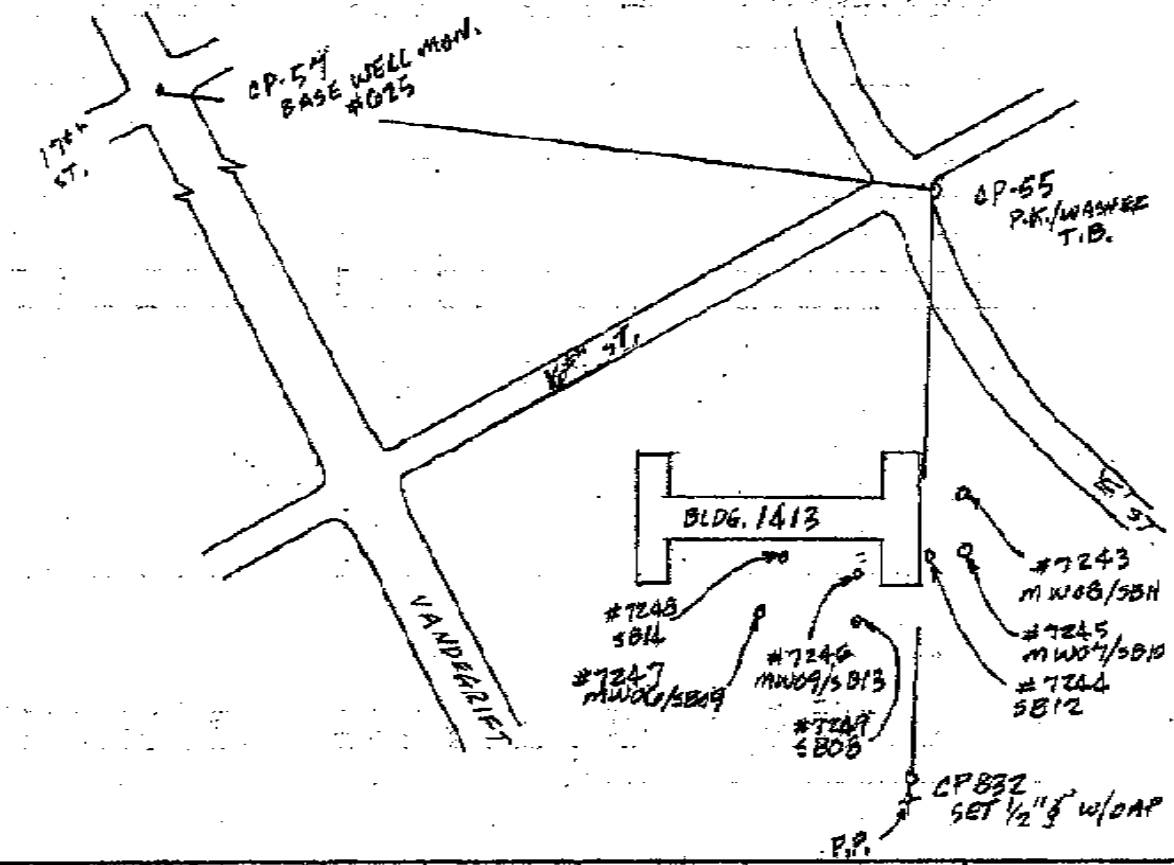
REQUEST RECEIVED: JUNE 9, 2005

NEW EXPIRATION DATE: OCTOBER 8, 2005

APPROVED BY: Amelia C. AMELIA CESENA DATE: 10/05/05

NOTIFIED: Mailed 10/05/05


GRASS
GRASS
BLDG 1413
STAIRS
STAIRS
GRASS
GRASS
BOILER ROOM
ASPHALT DRIVE
1413-SB14
1413-MW06/SB09
1413-SB04/MW03
(DESTROYED)
1413-MW09/SB13
EXCAVATION
AREA
1413-SB03
1413-SB05/MW04
STAIRS
1413-MW08/SB11
1413-MW05
GRASS
ASPHALT DRIVE
1413-SB12
1413-MW07/SB10
Explanation
Monitoring Well Location
Soil Boring Location
Indicates New Well/Boring
N
0
20
40
SCALE IN FEET
DESIGNED BY SD
DRAWN BY CS
CHECKED BY TW
Battelle
Site 1413 Site Map Showing Existing and New Wells
MCB CAMP PENDLETON - CALIFORNIA
G337397-C21
1413SITE01.DWG



SITE 1413
CAMP PENDLETON
BATTELLE
10-17-05
PS/PO

PT No.	Designation	Lid Elev.	Minus	Casing Elev.	Description	Northing	Easting	Latitude (Dec. Deg.)	Longitude (Dec. Deg.)
7243	1413 MW08/SB11	333.83	-0.43	333.40	2" PVC	2058754.53	6238223.03	33.3118986	-117.3087289
7244	1413 SB12	335.36	-	335.36	GROUND	2058713.52	6238169.55	33.3117844	-117.3089025
7245	1413 MW07/SB10	334.89	-0.37	334.52	2" PVC	2058708.92	6238213.30	33.3117730	-117.3087592
7246	1413 MW09/SB13	336.40	-0.42	335.98	2" PVC	2058732.09	6238122.20	33.3118342	-117.3090582
7247	1413 MW06/SB09	336.09	-0.40	335.69	2" PVC	2058745.96	6238076.19	33.3118710	-117.3092092
7248	1413 SB14	336.44	-	336.44	GROUND	2058760.93	6238109.47	33.3119130	-117.3091008
7249	1413 SB08	335.73	-	335.73	CONC.	2058713.58	6238102.31	33.3117827	-117.3091226

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SITE 1413, MCB Camp Pendleton
BORING LOG - 1413-SB08

Borehole Location: Building 1413 Project Location: MCB Camp Pendleton Project #: G486102 Geologist: Tom Worthington Drilling Contractor: WDC Driller: Ted Nichols Reviewed by: David Clexton #7350	Sampler Type: 5' Barrel Core Boring Diameter: 8" Drilling Method" HSA Drill Rig: CME 85 Hammer Type: NA Date: 09/08/2005 Total Depth: 20' bgs	Northing (NAD 83): 2058713.58 Easting (NAD 83): 6238102.31 Surface Elevation (NAVD 88): 335.73 Borehole Abandoned: X Yes __ No Backfill Method: Bentonite Grout Monitoring Device Installed: __Yes X No Type: NA

Depth (feet bgs)	Lithology	USCS Symbol	Sample Description	FID (ppm)	Boring Completion	Comments
0			Asphalt surface			Hand augered to 5' bgs
			Silty SAND; white to pale yellow, dry, dense, fine grain.			0'-1.5' Backfill: Concrete (0.53 ft³)
5		SM	Silty SAND; light gray, dry, dense, fine to medium grain, some iron staining. Damp with heavy iron oxide staining in the 6'-7' interval.	0		1.5'-20' Backfill: Bentonite Grout (6.5 ft³)
10			Silty SAND; light gray, dry, dense, fine to medium grain, some iron staining. Moist and heavy iron oxide staining in the 12'-13' interval. Reddish brown, dry, silty lamina present at 11' and 13'.	0		Core Intervals: 5'-10' 10'-15' 15'-20'
15				0		
		ML	Clayey SILT; brown to dark greenish gray (laminated), dry, well compacted.			Samples collected: 12', 15', 17.5', 20'
▽		SM	Silty SAND; light gray, moist, medium grain.			
20		ML	Clayey SILT; dark greenish gray, dry, well compacted.	0		
			TOTAL DEPTH = 20'			
25						
30						
35						
40						
45						
50						
55						
60						

1413-SB08.cdr

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SITE 1413, MCB Camp Pendleton
BORING LOG - 1413-SB09/MW06

Borehole Location: Building 1413 Project Location: MCB Camp Pendleton Project#: G486102 Geologist: Tom Worthington Drilling Contractor: WDC Driller: Ted Nichols Reviewed by: David Clexton #7350	Sampler Type: 5' Barrel Core Boring Diameter: 8" Drilling Method" HSA Drill Rig: CME 85 Hammer Type: NA Date: 09/08/2005 Total Depth: 20' bgs	Northing (NAD 83): 2058745.96 Easting (NAD 83): 6238076.19 Surface Elevation (NAVD 88): 336.09 Borehole Abandoned:__Yes X No Backfill Method: NA Monitoring Device Installed: X Yes__No Type: 2" Schedule 40 PVC

Depth (feet bgs)	Lithology	USCS Symbol	Sample Description	FID (ppm)	Boring Completion	Comments
0			Asphalt surface			Hand Augered to 5'
			Silty SAND; white to pale yellow, dry, fine grain.			0'-3' Surface seal: Concrete (0.99 ft³)
5		SM	Silty SAND; buff, dry, fine to medium grain.	0		0'-10' Casing
						3' - 8.5' Seal: bentonite chips (1.81 ft³)
10			Silty SAND; light gray, dry, fine to medium grain. Damp with heavy iron oxide staining from 12'-13'. Some purple silt banding at 13', 10cm thick.	0		8.5'-20' Filter Pack: #3 Sand (3.79ft³)
15				0		
		ML	Clayey SILT; brown to dark greenish gray (laminated), dry, well compacted.			10'-20' Well Screen: 0.020-inch slot
		SM	Silty SAND; light gray, wet, medium grain.			
20		ML	Clayey SILT; purple, dry, well compacted.	0		Core Intervals: 10'-15' 15'-20'
			TOTAL DEPTH = 20'			Samples collected: 15', 17.5', 20'
25						
30						No soil samples taken from 0' - 10'. Boring logged from soil cuttings.
35						No water encountered in the borehole during drilling.
40						Water Level Data: 9/23/05 13.91' btoc (pre-development)
45						10/27/05 14.18' btoc (post-development)
50						
55						
60						

1413-SB09MW06.xls

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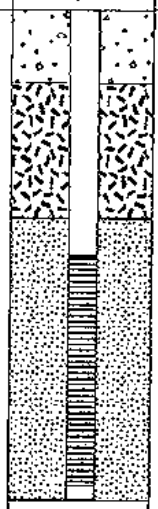
SITE 1413, MCB Camp Pendleton
BORING LOG - 1413-SB10/MW07

Borehole Location: Building 1413 Project Location: MCB Camp Pendleton Project #: G486102 Geologist: Tom Worthington Drilling Contractor: WDC Driller: Ted Nichols Reviewed by: David Clexton #7350	Sampler Type: 5' Barrel Core Boring Diameter: 8" Drilling Method" HSA Drill Rig: CME 85 Hammer Type: NA Date: 09/09/2005 Total Depth: 20' bgs	Northing (NAD 83): 2058708.92 Easting (NAD 83): 6238213.30 Surface Elevation (NAVD 88): 334.89 Borehole Abandoned:___Yes X No Backfill Method: NA Monitoring Device Installed: X Yes__No Type: 2" Schedule 40 PVC

Depth (feet bgs)	Lithology	USCS Symbol	Sample Description	FID (ppm)
0			Asphalt surface	
			Silty SAND; white to pale yellow, dry, fine grain.	
5		SM	Silty SAND; buff, dry, fine to medium grain.	0
10			Silty SAND; light gray, dry, fine to medium grain.	0
			Clayey SILT; dark greenish gray, dry, well compacted, some lamina. Some purple silty banding at 14'.	
15		ML	Sandy SILT; light gray, dry to damp, well compacted, heavy iron oxide staining, some lamina.	0
		SM	Silty SAND; light gray, moist, medium grain, iron oxide staining.	
20			TOTAL DEPTH = 20'	0
25				
30				
35				
40				
45				
50				
55				
60				

Boring Completion



Comments

Hand Augered to 5'

0'-3' Surface seal: Concrete (0.99 ft^3)

0'-10' Casing

3' - 8.5' Seal: bentonite chips (1.81 ft^3)

8.5'-20' Filter Pack: #3 Sand (3.79ft^3)

10'-20' Well Screen: 0.020-inch slot

Core Intervals:
10'-15'
15'-20'

Samples collected: 15', 17.5', 20'

No soil samples taken from 0' - 10'. Boring logged from soil cuttings.

No water encountered in the borehole during drilling.

Water Level Data:

9/23/05 14.84' btoc (pre-development)

10/27/05 14.45' btoc (post-development)

1413-SB10MW07.cdr

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SITE 1413, MCB Camp Pendleton
BORING LOG - 1413-SB11/MW08

Borehole Location: Building 1413 Project Location: MCB Camp Pendleton Project #: G486102 Geologist: Tom Worthington Drilling Contractor: WDC Driller: Ted Nichols Reviewed by: David Clexton #7350	Sampler Type: 5' Barrel Core Boring Diameter: 8" Drilling Method" HSA Drill Rig: CME 85 Hammer Type: NA Date: 09/09/2005 Total Depth: 20' bgs	Northing (NAD 83): 2058754.53 Easting (NAD 83): 6238223.03 Surface Elevation (NAVD 88): 333.83 Borehole Abandoned: __Yes X No Backfill Method: NA Monitoring Device Installed: X Yes __No Type: 2" Schedule 40 PVC

Depth (feet bgs)	Lithology	USCS Symbol	Sample Description	FID (ppm)	Boring Completion	Comments
0			Asphalt surface			Hand Augered to 5'
			Silty SAND; white to pale yellow, dry, fine grain.			0'-3' Surface seal: Concrete (0.99 ft³)
5		SM	Silty SAND; buff, dry, fine to medium grain.	0		0'-10' Casing
						3' - 8.5' Seal: bentonite chips (1.81 ft³)
10			Silty SAND; light gray, dry, fine to medium grain.	0		
		ML	Clayey SILT; dark greenish gray, dry, well compacted, some lamina. Some purple silty banding at 13'.			8.5'-20' Filter Pack: #3 Sand (3.79ft³)
15 ▼			Sandy SILT; light gray, dry to damp, well compacted, heavy iron oxide staining, some lamina.	0		10'-20' Well Screen: 0.020-inch slot
		SM	Silty SAND; light gray, moist, medium grain, iron oxide staining.			Core Intervals: 10'-15' 15'-20'
20			TOTAL DEPTH = 20'	0		
25						Samples collected: 15', 17.5', 20'
30						No soil samples taken from 0' - 10'. Boring logged from soil cuttings.
35						
40						No water encountered in the borehole during drilling.
45						Water Level Data: 9/23/05 17.40' btoc (pre-development) 10/27/05 16.51' btoc (post-development)
50						
55						
60						

1413-SB11/MW08.cdr

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SITE 1413, MCB Camp Pendleton
BORING LOG - 1413-SB12

Borehole Location: Building 1413 Project Location: MCB Camp Pendleton Project #: G486102 Geologist: Tom Worthington Drilling Contractor: WDC Driller: Jim Duke Reviewed by: David Clexton #7350	Sampler Type: 18" SS 2.0" I.D Boring Diameter: 8" Drilling Method" HSA Drill Rig: CME 75 Limited Access Hammer Type: 140 lb Date: 09/16/2005 Total Depth: 20' bgs	Northing (NAD 83): 2058713.52 Easting (NAD 83): 6238169.55 Surface Elevation (NAVD 88): 335.36 Borehole Abandoned: X Yes __No Backfill Method: Bentonite Grout Monitoring Device Installed: __Yes X No Type: NA

Depth (feet bgs)	Lithology	USCS Symbol	Sample Description	FID (ppm)	Blow Counts	Boring Completion	Comments
0							Hand Augered to 5'
			Silty SAND; light gray to pale yellow, dry, fine grain.				0'-20' Backfill: Bentonite Grout (7.02 ft³)
5		SM	Silty SAND; light gray, dry, fine to medium grain, iron oxide staining.	0	14,50/ 3"		
			As above	0	23, 50/5"		
			As above	168	23, 50/5"		
10			Silty SAND; light gray, dry, fine to medium grain, iron oxide staining. Damp lense at 10.5'	88	40, 50/4"		
			Clayey SILT; buff to orange, dry, well compacted, some lamina.	0	16,44 50/ 4"		
			As above; purple	0	28,38 42		
15		ML	Clayey SILT; light gray to greenish gray, dry to damp, well compacted, some lamina, iron oxide staining.	0	16,44 50		
			Clayey SILT; purple, dry, well compacted, some lamina.	0	32, 50/ 5"		
			Clayey SILT; light gray to greenish gray, dry, well compacted, some lamina, iron oxide staining.	0	18, 50/ 5"		
20				0	17, 50/ 5"		
			TOTAL DEPTH = 20'	0			
25							Continuous sampling between 5' and 20' bgs
							Samples collected: 7', 10.5', 12', 15'
30							No water encountered in the borehole during drilling.
35							
40							
45							
50							
55							
60							

1413-SB12.cdr

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SITE 1413, MCB Camp Pendleton
BORING LOG - 1413-SB13/MW09

Borehole Location: Building 1413 Project Location: MCB Camp Pendleton Project #: G486102 Geologist: Tom Worthington Drilling Contractor: WDC Driller: Jim Duke Reviewed by: David Clexton #7350	Sampler Type: 18" SS 2.0" I.D Boring Diameter: 8" Drilling Method" HSA Drill Rig: CME 75 Limited Access Hammer Type: 140 lb Date: 09/16/2005 Total Depth: 20' bgs	Northing (NAD 83): 2058732.09 Easting (NAD 83): 6238122.20 Surface Elevation (NAVD 88): 336.40 Borehole Abandoned: __Yes _X_ No Backfill Method: NA Monitoring Device Installed: _X_Yes__No Type: 2" Schedule 40 PVC

Depth (feet bgs)	Lithology	USCS Symbol	Sample Description	Boring Completion	Comments
0			GRAVEL: 3/4" gravel backfill from former UST excavation.		Hand Augered to 3' 0'-3' Surface seal: Concrete (0.99 ft³) 0'-10' Casing
5					
10			As above; wet, strong hydrocarbon odor.		3' - 8.5' Seal: bentonite chips (1.81 ft³) 8.5'-20' Filter Pack: #3 Sand (3.79 ft³)
15		ML	SILT: gray, wet, strong hydrocarbon odor.		10'-20' Well Screen: 0.020-inch slot
20			TOTAL DEPTH = 20'		
25					No soil samples collected, boring logged from drill cuttings.
30					
35					No water encountered in the borehole during drilling.
40					Water Level Data: 9/23/05 13.67' btoc (pre-development) 10/27/05 12.06' btoc (post-development)
45					
50					No FID readings collected. This boring was advanced within the known soil plume specifically for the purpose of well installation.
55					
60					

1413-SB13MW09.cdr

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SITE 1413, MCB Camp Pendleton
BORING LOG - 1413-SB14

Borehole Location: Building 1413 Project Location: MCB Camp Pendleton Project #: G486102 Geologist: Tom Worthington Drilling Contractor: WDC Driller: Jim Duke Reviewed by: David Clexton #7350	Sampler Type: 18" SS 2.0" I.D Boring Diameter: 8" Drilling Method" HSA Drill Rig: CME 75 Limited Access Hammer Type: 140 lb Date: 09/16/2005 Total Depth: 20' bgs	Northing (NAD 83): 2058760.93 Easting (NAD 83): 6238109.47 Surface Elevation (NAVD 88): 336.44 Borehole Abandoned: X Yes __No Backfill Method: Bentonite Grout Monitoring Device Installed: __Yes X No Type: NA

Depth (feet bgs)	Lithology	USCS Symbol	Sample Description	FID (ppm)	Blow Counts	Boring Completion	Comments
0			Silty SAND; light gray to pale yellow, dry, fine grain.				Hand Augered to 5'
5		SM	Silty SAND; light gray, dry, fine to medium grain, iron oxide staining.	0	5,14, 50/ 4"		0'-20' Backfill: Bentonite Grout (7.02 ft³)
			As above	0	18,26, 50/4"		
			As above	0	17,50, 50/4"		
10			Purple silty banding from 9'-9.5'.	0	17,50, 50/3"		
			Clayey SILT; light gray, dry, well compacted, some iron oxide staining.	0	20,44, 50/ 5"		
		ML	Clayey SILT; buff, dry , well compacted, some lamina, iron oxide staining.	0	16,50, 50/3"		
15			Clayey SILT; purple, dry, well compacted, some lamina.	0	50, 50/5"		
			Clayey SILT; light gray to greenish gray, dry, well compacted, some lamina, iron oxide staining.	0	17,44, 50/ 3"		
		SP	SAND; light gray, wet, medium grain, trace fine grain.	0	18,20, 50/ 5"		
20			TOTAL DEPTH = 20'	0	17,32, 50/ 5"		No water encountered in the borehole.
							Continuous sampling between 5' and 20' bgs
25							Samples collected: 12', 15', 17.5'
30							
35							
40							
45							
50							
55							
60							

1413-SB14.cdr

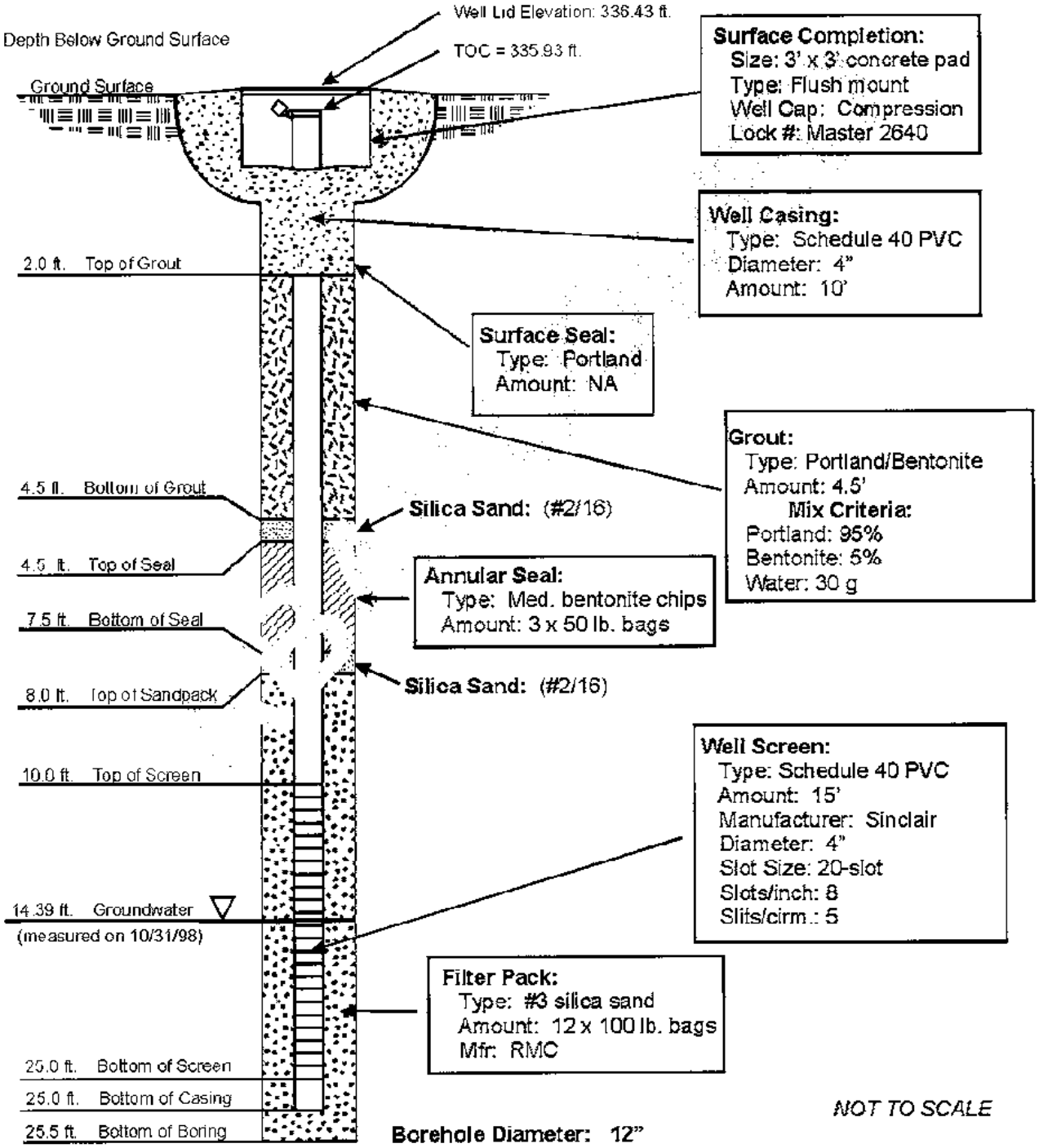
Well Abondonment Record
Site 1413, Marine Corps Base Camp Pendleton, CA

Well ID	County of San Diego DEH Permit #	Date Abandoned	Original Boring Diameter (in)	Auger Size used in Abandonment (in)	Backfill Material	Comments
1413-MW03	LMON102882	09/08/2005	8	8	Bentonite Grout (8.78 ft^3)	Concrete Pad removed, PVC casing and Screen extracted in entirety. Seal and filter back removed with clean augers, backfilled with bentonite grout.

Battelle
... Putting Technology To Work

MCB CAMP PENDLETON - D.O. 42
WELL COMPLETION DIAGRAM
1413-MW03 (1413-SB04)

Project #: G337342-C11	Site: MCB Camp Pendleton	Well #: 1413-MW03	Northing: 2058735.660
Drilling Contractor: Water Development	Rig Type and Drilling Method: CME 1050 HSA	Date: 8/8/98	Easting: 6238105.689
Reviewed by:	Driller: Jason Pottroff	Hydrologist: Matthew Place	Surface Elevation: 336.43



LABORATORY ANALYTICAL DATA FOR SOIL

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *04-Oct-05*

Tom Worthington
Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
(619) 574-4826

CASE NARRATIVE

Project:

Work Order: BMI05091902 **Cooler Temp:** 4°C

Alpha's Sample ID	Client's Sample ID	Matrix
05091902-01A	1413-SB08-12	Soil
05091902-02A	1413-SB08-15	Soil
05091902-03A	1413-SB08-17.5	Soil
05091902-04A	1413-SB08-20	Soil
05091902-05A	1413-SB09-15	Soil
05091902-06A	1413-SB09-17.5	Soil
05091902-07A	1413-SB09-20	Soil
05091902-08A	1413-SB10-15	Soil
05091902-09A	1413-SB10-17.5	Soil
05091902-10A	1413-SB10-20	Soil
05091902-11A	1413-SB11-15	Soil
05091902-12A	1413-SB11-17.5	Soil
05091902-13A	1413-SB11-20	Soil
05091902-14A	1413-SB12-7	Soil
05091902-15A	1413-SB12-10.5	Soil
05091902-16A	1413-SB12-12	Soil
05091902-17A	1413-SB12-15	Soil
05091902-18A	1413-SB14-12	Soil
05091902-19A	1413-SB14-15	Soil
05091902-20A	1413-SB14-17.5	Soil

Enclosed please find the analytical results of the samples received by Alpha Analytical, Inc. under the above mentioned Work Order/Chain-of-Custody.

Alpha Analytical, Inc. has a formal Quality Assurance/Quality Control program, which is designed to meet or exceed the EPA requirements. All relevant QC met quality assurance objectives for this project unless otherwise stated in the footnotes.

If you have any questions with regards to this report, please contact Randy Gardner, Project Manager, at (800) 283-1183.

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201

Attn: Tom Worthington
Phone: (619) 574-4826
Fax: (619) 260-0882
Date Received : 09/17/05

Job#:

Total Petroleum Hydrocarbons - Extractable (TPH-E) EPA Method SW8015B/DHS LUFT Manual

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1413-SB08-12	TPH-E (Diesel)	ND	5.0 mg/Kg	09/08/05	09/21/05
Lab ID :	BMI05091902-01A	TPH-E (Oil)	ND	10 mg/Kg	09/08/05	09/21/05
		Surr: Nonane	112	%REC	09/08/05	09/21/05
Client ID :	1413-SB08-15	TPH-E (Diesel)	ND	5.0 mg/Kg	09/08/05	09/21/05
Lab ID :	BMI05091902-02A	TPH-E (Oil)	ND	10 mg/Kg	09/08/05	09/21/05
		Surr: Nonane	118	%REC	09/08/05	09/21/05
Client ID :	1413-SB08-17.5	TPH-E (Diesel)	ND	5.0 mg/Kg	09/08/05	09/21/05
Lab ID :	BMI05091902-03A	TPH-E (Oil)	ND	10 mg/Kg	09/08/05	09/21/05
		Surr: Nonane	109	%REC	09/08/05	09/21/05
Client ID :	1413-SB08-20	TPH-E (Diesel)	ND	5.0 mg/Kg	09/08/05	09/21/05
Lab ID :	BMI05091902-04A	TPH-E (Oil)	ND	10 mg/Kg	09/08/05	09/21/05
		Surr: Nonane	117	%REC	09/08/05	09/21/05
Client ID :	1413-SB09-15	TPH-E (Diesel)	ND	5.0 mg/Kg	09/08/05	09/21/05
Lab ID :	BMI05091902-05A	TPH-E (Oil)	ND	10 mg/Kg	09/08/05	09/21/05
		Surr: Nonane	113	%REC	09/08/05	09/21/05
Client ID :	1413-SB09-17.5	TPH-E (Diesel)	ND	5.0 mg/Kg	09/08/05	09/21/05
Lab ID :	BMI05091902-06A	TPH-E (Oil)	ND	10 mg/Kg	09/08/05	09/21/05
		Surr: Nonane	122	%REC	09/08/05	09/21/05
Client ID :	1413-SB09-20	TPH-E (Diesel)	ND	5.0 mg/Kg	09/08/05	09/21/05
Lab ID :	BMI05091902-07A	TPH-E (Oil)	ND	10 mg/Kg	09/08/05	09/21/05
		Surr: Nonane	128	%REC	09/08/05	09/21/05
Client ID :	1413-SB10-15	TPH-E (Diesel)	ND	5.0 mg/Kg	09/09/05	09/22/05
Lab ID :	BMI05091902-08A	TPH-E (Oil)	ND	10 mg/Kg	09/09/05	09/22/05
		Surr: Nonane	118	%REC	09/09/05	09/22/05
Client ID :	1413-SB10-17.5	TPH-E (Diesel)	ND	5.0 mg/Kg	09/09/05	09/22/05
Lab ID :	BMI05091902-09A	TPH-E (Oil)	ND	10 mg/Kg	09/09/05	09/22/05
		Surr: Nonane	120	%REC	09/09/05	09/22/05
Client ID :	1413-SB10-20	TPH-E (Diesel)	ND	5.0 mg/Kg	09/09/05	09/22/05
Lab ID :	BMI05091902-10A	TPH-E (Oil)	ND	10 mg/Kg	09/09/05	09/22/05
		Surr: Nonane	117	%REC	09/09/05	09/22/05

Alpha Analytical, Inc.

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Client ID :	1413-SB11-15	TPH-E (Diesel)	ND	5.0 mg/Kg	09/09/05	09/22/05
Lab ID :	BMI05091902-11A	TPH-E (Oil)	ND	10 mg/Kg	09/09/05	09/22/05
		Surr: Nonane	108	%REC	09/09/05	09/22/05
Client ID :	1413-SB11-17.5	TPH-E (Diesel)	ND	5.0 mg/Kg	09/09/05	09/22/05
Lab ID :	BMI05091902-12A	TPH-E (Oil)	ND	10 mg/Kg	09/09/05	09/22/05
		Surr: Nonane	86	%REC	09/09/05	09/22/05
Client ID :	1413-SB11-20	TPH-E (Diesel)	ND	5.0 mg/Kg	09/09/05	09/22/05
Lab ID :	BMI05091902-13A	TPH-E (Oil)	ND	10 mg/Kg	09/09/05	09/22/05
		Surr: Nonane	111	%REC	09/09/05	09/22/05
Client ID :	1413-SB12-7	TPH-E (Diesel)	ND	5.0 mg/Kg	09/16/05	09/22/05
Lab ID :	BMI05091902-14A	TPH-E (Oil)	ND	10 mg/Kg	09/16/05	09/22/05
		Surr: Nonane	120	%REC	09/16/05	09/22/05
Client ID :	1413-SB12-10.5	TPH-E (Diesel)	ND	5.0 mg/Kg	09/16/05	09/22/05
Lab ID :	BMI05091902-15A	TPH-E (Oil)	ND	10 mg/Kg	09/16/05	09/22/05
		Surr: Nonane	115	%REC	09/16/05	09/22/05
Client ID :	1413-SB12-12	TPH-E (Diesel)	ND	5.0 mg/Kg	09/16/05	09/22/05
Lab ID :	BMI05091902-16A	TPH-E (Oil)	ND	10 mg/Kg	09/16/05	09/22/05
		Surr: Nonane	113	%REC	09/16/05	09/22/05
Client ID :	1413-SB12-15	TPH-E (Diesel)	ND	5.0 mg/Kg	09/16/05	09/22/05
Lab ID :	BMI05091902-17A	TPH-E (Oil)	ND	10 mg/Kg	09/16/05	09/22/05
		Surr: Nonane	127	%REC	09/16/05	09/22/05
Client ID :	1413-SB14-12	TPH-E (Diesel)	ND	5.0 mg/Kg	09/16/05	09/22/05
Lab ID :	BMI05091902-18A	TPH-E (Oil)	ND	10 mg/Kg	09/16/05	09/22/05
		Surr: Nonane	124	%REC	09/16/05	09/22/05
Client ID :	1413-SB14-15	TPH-E (Diesel)	ND	5.0 mg/Kg	09/16/05	09/22/05
Lab ID :	BMI05091902-19A	TPH-E (Oil)	ND	10 mg/Kg	09/16/05	09/22/05
		Surr: Nonane	128	%REC	09/16/05	09/22/05
Client ID :	1413-SB14-17.5	TPH-E (Diesel)	ND	5.0 mg/Kg	09/16/05	09/22/05
Lab ID :	BMI05091902-20A	TPH-E (Oil)	ND	10 mg/Kg	09/16/05	09/22/05
		Surr: Nonane	115	%REC	09/16/05	09/22/05

ND = Not Detected

Roger Scholl Randy Gardner Walter Hirschman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hirschman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

9/30/05
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: 04-Oct-05

QC Summary Report

Work Order: 05091902

Method Blank

Type: MBLK Test Code: EPA Method SW8015

File ID: Batch ID: 13153 Analysis Date: 09/21/2005 16:56

Sample ID: MBLK-13153 Units : mg/Kg Run ID: FID_4_050921A Prep Date: 09/21/2005

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH-E (Diesel)	ND	5								
TPH-E (Oil)	ND	10								
Surr: Nonane	108		100		108	48	142			

Laboratory Control Spike

Type: LCS Test Code: EPA Method SW8015

File ID: Batch ID: 13153 Analysis Date: 09/22/2005 11:04

Sample ID: LCS-13153 Units : mg/Kg Run ID: FID_4_050921A Prep Date: 09/21/2005

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH-E (Diesel)	110	10	100		110	68	128			
Surr: Nonane	97		100		97	48	142			

Sample Matrix Spike

Type: MS Test Code: EPA Method SW8015

File ID: Batch ID: 13153 Analysis Date: 09/21/2005 18:06

Sample ID: 05091902-01AMS Units : mg/Kg Run ID: FID_4_050921A Prep Date: 09/21/2005

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH-E (Diesel)	98	10	100	0	98	53	153			
Surr: Nonane	104		100		104	48	142			

Sample Matrix Spike Duplicate

Type: MSD Test Code: EPA Method SW8015

File ID: Batch ID: 13153 Analysis Date: 09/21/2005 18:41

Sample ID: 05091902-01AMSD Units : mg/Kg Run ID: FID_4_050921A Prep Date: 09/21/2005

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH-E (Diesel)	107	10	100	0	107	53	153	97.96	8.6(22)	
Surr: Nonane	117		100		117	48	142			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Billing Information:

Name Jerry Tompkins
Address 505 King Ave
City, State, Zip Columbus, OH 43201
Phone Number 614-424-4849 Fax 614-458-4849

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21
Sparks, Nevada 89431-5778
Phone (775) 355-1044
Fax (775) 355-0406

Samples Collected From Which State?
AZ ___ CA X NV ___ WA ___
ID ___ OR ___ OTHER ___

6908

Client Name Battelle
Address 505 King Ave
City, State Zip Columbus, OH 43201
P.O. # 190907
Job #
EMail Address worthington@battelle.org
Phone # 619-726-0821
Fax # 614-458-6624
Sampled by T. Worthington
Report Attention T. Worthington

Analyses Required: TPH-D (8015)

Required QC Level? I II III IV
EDD / EDF? YES ___ NO ___
Global ID # ___

Time Sampled	Date Sampled	Matrix* See Key Below	Office Use Only / Lab ID Number	Sample Description	TAT	Field Filtered	Total and type of containers ** See below	TPH-D (8015)							REMARKS
1113	09-08-05	SO		1413-SB08-12			1x SS	X							
1111	09-08-05	SO		1413-SB08-15			1x SS	X							
1112	09-08-05	SO		1413-SB08-17.5			1x SS	X							
1110	09-08-05	SO		1413-SB08-20			1x SS	X							
1310	09-08-05	SO		1413-SB09-15			1x SS	X							Label Id differs from Sleeve ID, Logged in per chai
1311	09-08-05	SO		1413-SB09-17.5			1x SS	X							"
1312	09-08-05	SO		1413-SB09-20			1x SS	X							"
0830	09-09-05	SO		1413-SB10-15			~~X~~ 1x SS	X							
0831	09-09-05	SO		1413-SB10-17.5			1x SS	X							
0832	09-09-05	SO		1413-SB10-20			1x SS	X							
1000	09-09-05	SO		1413-SB11-15			1x SS	X							
1001	09-09-05	SO		1413-SB11-17.5			1x SS	X							
1002	09-09-05	SO		1413-SB11-20			1x SS	X							

ADDITIONAL INSTRUCTIONS:

SS - Stainless Sleeve

	Signature	Print Name	Company	Date	Time
Relinquished by	[signature]	Tom Worthington	Battelle	09-16-05	1600
Received by					
Relinquished by					
Received by					
Relinquished by					
Received by					

*Key: AQ - Aqueous SO - Soil WA - Waste OT - Other **: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this coc. The liability of the laboratory is limited to the amount paid for the report.

Billing Information:
Name Jerry Tompkins
Address 505 King Ave
City, State, Zip Columbus, OH 43201
Phone Number ~~614-424-4949~~ Fax 614-458-4849

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21
Sparks, Nevada 89431-5778
Phone (775) 355-1044
Fax (775) 355-0406

Samples Collected From Which State?
AZ ___ CA X NV ___ WA ___
ID ___ OR ___ OTHER ___

Page # 2 of 2

Analyses Required

6906

Client Name Battelle
Address 505 King Ave
City, State, Zip Columbus, OH 43201
P.O. # 190907
Job #
EMail Address wworthington@battelle.org
Phone # 614-726-0821
Fax # 614-458-6624

Required QC Level? I II III IV

EDD / EDF? YES ___ NO ___
Global ID # ___

Sampled by T. Worthington
Report Attention T. Worthington

Time Sampled	Date Sampled	Matrix* See Key Below	Office Use Only Lab ID Number	Sample Description	TAT	Field Filtered	Total and type of containers ** See below	TPH-D (8015)								REMARKS
0890	09/06/05	SO		1413-SB12-7			1x55	X								
0900	09/06/05	SO		1413-SB12-10.5			1x55	X								
0910	09/06/05	SO		1413-SB12-12			1x55	X								
0930	09/06/05	SO		1413-SB12-15			1x55	X								
1400	09/06/05	SO		1413-SB14-12			1x55	X								
1409	09/06/05	SO		1413-SB14-15			1x55	X								
1420	09/06/05	SO		1413-SB14-17.5			1x55	X								

ADDITIONAL INSTRUCTIONS:
55 stainless sleeve

	Signature	Print Name	Company	Date	Time
Relinquished by	[signature]	Tom Worthington	Battelle	09/06/05	1600
Received by					
Relinquished by					
Received by					
Relinquished by					
Received by					

*Key: AQ - Aqueous SO - Soil WA - Waste OT - Other **: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this coc. The liability of the laboratory is limited to the amount paid for the report.

CHAIN-OF-CUSTODY RECORD

CA

Billing Information :
Battelle
505 King Avenue

Columbus, OH 43201

Client:
Battelle Memorial Institute
505 King Avenue

Columbus, OH 43201

Report Attention : Tom Worthington
CC Report :

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL. (775) 355-1044 FAX: (775) 355-0406

Tom Worthington
TEL : (619) 574-4826
FAX : (619) 260-0882
EMail worthingtont@battelle.org

Job :
PO : 190907
Client's COC # : 6906/6908

WorkOrder : BMI05091902

Report Due By : 5:00 PM On : 03-Oct-05

EDD Required : **Yes**

Sampled by : T. Worthington

Cooler Temp : 4 °C

Date Printed: **19-Sep-05**

QC Level : DS3 = DOD QC Required : Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles ORG	SUB	TAT	PWS #	Requested Tests TPH/E_S								Sample Remarks
BMI05091902-01A	1413-SB08-12	SO	09/08/05 11:13	1	0	10		TPH/E_C								
BMI05091902-02A	1413-SB08-15	SO	09/08/05 11:11	1	0	10		TPH/E_C								
BMI05091902-03A	1413-SB08-17.5	SO	09/08/05 11:12	1	0	10		TPH/E_C								
BMI05091902-04A	1413-SB08-20	SO	09/08/05 11:10	1	0	10		TPH/E_C								
BMI05091902-05A	1413-SB09-15	SO	09/08/05 13:10	1	0	10		TPH/E_C								Label ID differs from sleeve ID logged in per chain
BMI05091902-06A	1413-SB09-17.5	SO	09/08/05 13:11	1	0	10		TPH/E_C								Label ID differs from sleeve ID logged in per chain
BMI05091902-07A	1413-SB09-20	SO	09/08/05 13:12	1	0	10		TPH/E_C								Label ID differs from sleeve ID logged in per chain
BMI05091902-08A	1413-SB10-15	SO	09/09/05 08:30	1	0	10		TPH/E_C								
BMI05091902-09A	1413-SB10-17.5	SO	09/09/05 08:31	1	0	10		TPH/E_C								
BMI05091902-10A	1413-SB10-20	SO	09/09/05 08:32	1	0	10		TPH/E_C								

Comments: Saturday delivery, samples kept in secured area @ 4'c until log in 9-19-05. No security seals, frozen ice. Level IV QC required. Samples should be used as the control spike sample if possible. No Temp Blank rec'd. : For TPHE--report Diesel and Oil ONLY. Make a comment on COC "If Jet Fuel is seen, report as Diesel and Footnote report. Client COC had no job# noted, logged in as level IV QC, followed procedure.

	Signature	Print Name	Company	Date/Time
Received by:	[illegible]	[illegible]	Alpha Analytical, Inc.	[illegible]

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

CHAIN-OF-CUSTODY RECORD

CA

Billing Information :
Battelle
505 King Avenue

Columbus, OH 43201

Client:
Battelle Memorial Institute
505 King Avenue

Columbus, OH 43201

Report Attention : Tom Worthington
CC Report :

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

Tom Worthington
TEL : (619) 574-4826
FAX : (619) 260-0882
EMail worthingtont@battelle.org

Job :
PO : 190907

Client's COC # : 6906/6908

WorkOrder : BMI05091902

Report Due By : 5:00 PM On : 03-Oct-05

EDD Required : **Yes**

Sampled by : T. Worthington

Cooler Temp : 4 °C

Date Printed: **19-Sep-05**

QC Level : DS3 = DOD QC Required : Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles ORG	SUB	TAT	PWS #	Requested Tests TPH/E_S								Sample Remarks
BMI05091902-11A	1413-SB11-15	SO	09/09/05 10:00	1	0	10		TPH/E_C								
BMI05091902-12A	1413-SB11-17.5	SO	09/09/05 10:01	1	0	10		TPH/E_C								
BMI05091902-13A	1413-SB11-20	SO	09/09/05 10:02	1	0	10		TPH/E_C								
BMI05091902-14A	1413-SB12-7	SO	09/16/05 08:40	1	0	10		TPH/E_C								
BMI05091902-15A	1413-SB12-10.5	SO	09/16/05 09:00	1	0	10		TPH/E_C								
BMI05091902-16A	1413-SB12-12	SO	09/16/05 09:10	1	0	10		TPH/E_C								
BMI05091902-17A	1413-SB12-15	SO	09/16/05 09:30	1	0	10		TPH/E_C								
BMI05091902-18A	1413-SB14-12	SO	09/16/05 14:00	1	0	10		TPH/E_C								
BMI05091902-19A	1413-SB14-15	SO	09/16/05 14:09	1	0	10		TPH/E_C								
BMI05091902-20A	1413-SB14-17.5	SO	09/16/05 14:20	1	0	10		TPH/E_C								

Comments: Saturday delivery, samples kept in secured area @ 4'c until log in 9-19-05. No security seals, frozen ice. Level IV QC required. Samples should be used as the control spike sample if possible. No Temp Blank rec'd. : For TPHE--report Diesel and Oil ONLY. Make a comment on COC "If Jet Fuel is seen, report as Diesel and Footnote report. Client COC had no job# noted, logged in as level IV QC, followed procedure.

	Signature	Print Name	Company	Date/Time
Received by:			Alpha Analytical, Inc.	

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.

Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

LABORATORY DATA VALIDATION REPORTS

LABORATORY DATA CONSULTANTS, INC.
7750 El Camino Real, Suite 2L Carlsbad, CA 92009 Phone: 760/634-0437 Fax: 760/634-0439

Battelle
505 King Ave
Columbus, OH 43201-2693
ATTN: Mr. Robert Janosy

October 25, 2005

SUBJECT: MCB Camp Pendleton, CTO 102, Data Validation

Dear Mr. Janosy,

Enclosed is the final validation report for the fraction listed below. This SDG was received on October 13, 2005. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 14138:

SDG #	**Fraction**
BMI05091902	TPH as Extractables

The data validation was performed under EPA Level III and IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA, Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998

Please feel free to contact us if you have any questions.

Sincerely,

Erlinda T. Rauto
Operations Manager/Senior Chemist

Attachment 1

LDC #14138 (Battelle-Columbus OH / MCB Camp Pendleton, CTO 102)

LDC	SDG#	DATE REC'D	(3) DATE DUE	TPH-E (8015)																																	
Matrix	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	BMI05091902	10/13/05	11/03/05	0	20																																
A	BMI05091902	10/13/05	11/03/05	0	2																																
Total	B/LR			0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22

Shaded cells indicate Level IV validation (all other cells are Level III validation).

14138ST.wpd

MCB Camp Pendleton, CTO 102
Data Validation Reports
LDC# 14138

TPH as Extractables

LDC

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Camp Pendleton, CTO 102

Collection Date: September 8 through September 16, 2005

LDC Report Date: October 24, 2005

Matrix: Soil

Parameters: Total Petroleum Hydrocarbons as Extractables

Validation Level: EPA Level III & IV

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): BMI05091902

Sample Identification

1413-SB08-12	1413-SB08-12MS
1413-SB08-15	1413-SB08-12MSD
1413-SB08-17.5	
1413-SB08-20	
1413-SB09-15	
1413-SB09-17.5	
1413-SB09-20**	
1413-SB10-15	
1413-SB10-17.5	
1413-SB10-20	
1413-SB11-15	
1413-SB11-17.5	
1413-SB11-20	
1413-SB12-7	
1413-SB12-10.5	
1413-SB12-12**	
1413-SB12-15	
1413-SB14-12	
1413-SB14-15	
1413-SB14-17.5	

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 22 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Petroleum Hydrocarbons (TPH) as Extractables.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified a P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent a EPA Level IV review. A EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for all compounds were less than or equal to 20.0% .

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent recoveries (%R) of amounts in continuing standard mixtures were within the 85-115% QC limits.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as extractable contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

All target compound identifications were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VI. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VII. System Performance

The system performance was acceptable for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

Camp Pendleton, CTO 102
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG BMI05091902

No Sample Data Qualified in this SDG

Camp Pendleton, CTO 102
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG BMI05091902

No Sample Data Qualified in this SDG

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201

Attn: Tom Worthington
Phone: (619) 574-4826
Fax: (619) 260-0882
Date Received : 09/17/05

Job#:

Total Petroleum Hydrocarbons - Extractable (TPH-E) EPA Method SW8015B/DHS LUFT Manual

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1413-SB08-12	TPH-E (Diesel)	ND	5.0 mg/Kg	09/08/05	09/21/05
Lab ID :	BMI05091902-01A	TPH-E (Oil)	ND	10 mg/Kg	09/08/05	09/21/05
		Surr: Nonane	112	%REC	09/08/05	09/21/05
Client ID :	1413-SB08-15	TPH-E (Diesel)	ND	5.0 mg/Kg	09/08/05	09/21/05
Lab ID :	BMI05091902-02A	TPH-E (Oil)	ND	10 mg/Kg	09/08/05	09/21/05
		Surr: Nonane	118	%REC	09/08/05	09/21/05
Client ID :	1413-SB08-17.5	TPH-E (Diesel)	ND	5.0 mg/Kg	09/08/05	09/21/05
Lab ID :	BMI05091902-03A	TPH-E (Oil)	ND	10 mg/Kg	09/08/05	09/21/05
		Surr: Nonane	109	%REC	09/08/05	09/21/05
Client ID :	1413-SB08-20	TPH-E (Diesel)	ND	5.0 mg/Kg	09/08/05	09/21/05
Lab ID :	BMI05091902-04A	TPH-E (Oil)	ND	10 mg/Kg	09/08/05	09/21/05
		Surr: Nonane	117	%REC	09/08/05	09/21/05
Client ID :	1413-SB09-15	TPH-E (Diesel)	ND	5.0 mg/Kg	09/08/05	09/21/05
Lab ID :	BMI05091902-05A	TPH-E (Oil)	ND	10 mg/Kg	09/08/05	09/21/05
		Surr: Nonane	113	%REC	09/08/05	09/21/05
Client ID :	1413-SB09-17.5	TPH-E (Diesel)	ND	5.0 mg/Kg	09/08/05	09/21/05
Lab ID :	BMI05091902-06A	TPH-E (Oil)	ND	10 mg/Kg	09/08/05	09/21/05
		Surr: Nonane	122	%REC	09/08/05	09/21/05
Client ID :	1413-SB09-20	TPH-E (Diesel)	ND	5.0 mg/Kg	09/08/05	09/21/05
Lab ID :	BMI05091902-07A	TPH-E (Oil)	ND	10 mg/Kg	09/08/05	09/21/05
		Surr: Nonane	128	%REC	09/08/05	09/21/05
Client ID :	1413-SB10-15	TPH-E (Diesel)	ND	5.0 mg/Kg	09/09/05	09/22/05
Lab ID :	BMI05091902-08A	TPH-E (Oil)	ND	10 mg/Kg	09/09/05	09/22/05
		Surr: Nonane	118	%REC	09/09/05	09/22/05
Client ID :	1413-SB10-17.5	TPH-E (Diesel)	ND	5.0 mg/Kg	09/09/05	09/22/05
Lab ID :	BMI05091902-09A	TPH-E (Oil)	ND	10 mg/Kg	09/09/05	09/22/05
		Surr: Nonane	120	%REC	09/09/05	09/22/05
Client ID :	1413-SB10-20	TPH-E (Diesel)	ND	5.0 mg/Kg	09/09/05	09/22/05
Lab ID :	BMI05091902-10A	TPH-E (Oil)	ND	10 mg/Kg	09/09/05	09/22/05
		Surr: Nonane	117	%REC	09/09/05	09/22/05

10/20/05

9

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Client ID :	1413-SB11-15	TPH-E (Diesel)	ND	5.0 mg/Kg	09/09/05	09/22/05
Lab ID :	BMI05091902-11A	TPH-E (Oil)	ND	10 mg/Kg	09/09/05	09/22/05
		Surr: Nonane	108	%REC	09/09/05	09/22/05
Client ID :	1413-SB11-17.5	TPH-E (Diesel)	ND	5.0 mg/Kg	09/09/05	09/22/05
Lab ID :	BMI05091902-12A	TPH-E (Oil)	ND	10 mg/Kg	09/09/05	09/22/05
		Surr: Nonane	86	%REC	09/09/05	09/22/05
Client ID :	1413-SB11-20	TPH-E (Diesel)	ND	5.0 mg/Kg	09/09/05	09/22/05
Lab ID :	BMI05091902-13A	TPH-E (Oil)	ND	10 mg/Kg	09/09/05	09/22/05
		Surr: Nonane	111	%REC	09/09/05	09/22/05
Client ID :	1413-SB12-7	TPH-E (Diesel)	ND	5.0 mg/Kg	09/16/05	09/22/05
Lab ID :	BMI05091902-14A	TPH-E (Oil)	ND	10 mg/Kg	09/16/05	09/22/05
		Surr: Nonane	120	%REC	09/16/05	09/22/05
Client ID :	1413-SB12-10.5	TPH-E (Diesel)	ND	5.0 mg/Kg	09/16/05	09/22/05
Lab ID :	BMI05091902-15A	TPH-E (Oil)	ND	10 mg/Kg	09/16/05	09/22/05
		Surr: Nonane	115	%REC	09/16/05	09/22/05
Client ID :	1413-SB12-12	TPH-E (Diesel)	ND	5.0 mg/Kg	09/16/05	09/22/05
Lab ID :	BMI05091902-16A	TPH-E (Oil)	ND	10 mg/Kg	09/16/05	09/22/05
		Surr: Nonane	113	%REC	09/16/05	09/22/05
Client ID :	1413-SB12-15	TPH-E (Diesel)	ND	5.0 mg/Kg	09/16/05	09/22/05
Lab ID :	BMI05091902-17A	TPH-E (Oil)	ND	10 mg/Kg	09/16/05	09/22/05
		Surr: Nonane	127	%REC	09/16/05	09/22/05
Client ID :	1413-SB14-12	TPH-E (Diesel)	ND	5.0 mg/Kg	09/16/05	09/22/05
Lab ID :	BMI05091902-18A	TPH-E (Oil)	ND	10 mg/Kg	09/16/05	09/22/05
		Surr: Nonane	124	%REC	09/16/05	09/22/05
Client ID :	1413-SB14-15	TPH-E (Diesel)	ND	5.0 mg/Kg	09/16/05	09/22/05
Lab ID :	BMI05091902-19A	TPH-E (Oil)	ND	10 mg/Kg	09/16/05	09/22/05
		Surr: Nonane	128	%REC	09/16/05	09/22/05
Client ID :	1413-SB14-17.5	TPH-E (Diesel)	ND	5.0 mg/Kg	09/16/05	09/22/05
Lab ID :	BMI05091902-20A	TPH-E (Oil)	ND	10 mg/Kg	09/16/05	09/22/05
		Surr: Nonane	115	%REC	09/16/05	09/22/05

ND = Not Detected

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hindman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-1848 / info@alpha-analytical.com

9/30/05
Report Date

10/25/05

LDC #: 14138A8

SDG #: BMI05091902

Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 10/20/05

Page: 1 of 1

Reviewer: JTC

2nd Reviewer: [illegible]

METHOD: GC TPH as Extractables (EPA SW 846 Method 8015)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/08 - 10/05
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	%R = 85-115 %
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	A	
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	A	Not reviewed for Level III validation.
VI.	Compound Quantitation and CRQLs	A	Not reviewed for Level III validation.
VII.	System Performance	A	Not reviewed for Level III validation.
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

Note: A = Acceptable; ND = No compounds detected; D = Duplicate; N = Not provided/applicable; R = Rinsate; TB = Trip blank; SW = See worksheet; FB = Field blank; EB = Equipment blank

Validated Samples: Soil ** Indicates sample underwent Level IV validation

1	1413-SB08-12	11	1413-SB11-15	21	1413-SB08-12MS	31	
2	1413-SB08-15	12	1413-SB11-17.5	22	1413-SB08-12MSD	32	
3	1413-SB08-17.5	13	1413-SB11-20	23	MB LK-13153	33	
4	1413-SB08-20	14	1413-SB12-7	24		34	
5	1413-SB09-15	15	1413-SB12-10.5	25		35	
6	1413-SB09-17.5	16	1413-SB12-12**	26		36	
7	1413-SB09-20**	17	1413-SB12-15	27		37	
8	1413-SB10-15	18	1413-SB14-12	28		38	
9	1413-SB10-17.5	19	1413-SB14-15	29		39	
10	1413-SB10-20	20	1413-SB14-17.5	30		40	

Notes:

LDC #: 14138A8
SDG #: BMT 0509191 2

VALIDATION FINDINGS CHECKLIST

Reviewer: JR
2nd Reviewer: g

Method: ✓ GC | HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Was a linear fit used for evaluation? If yes, were all percent relative standard deviations (%RSD) < 20%?	✓			
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?		✓		
Did the initial calibration meet the curve fit acceptance criteria?			✓	
Were the RT windows properly established?	✓			
IV. Continuing calibration				
What type of continuing calibration calculation was performed? ✓ %D or %R	✓			
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) < 15%.0 or percent recoveries 85-115%?	✓			
Were all the retention times within the acceptance windows?	✓			
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %R within the QC limits?	✓			
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			

LDC #: 14138 A8
SDG #: BMI 0509 1962

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: JG
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XI. Compound quantitation/CRQLs				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XII. System performance				
System performance was found to be acceptable.	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XIV. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
XV. Field blanks				
Were field blanks identified in this SDG?		✓		
Were target compounds detected in the field blanks?			✓	

LDC #: 14138A3
SDG #: BMT 0509190V

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: [illegible]

METHOD: GC / HPLC

The calibration Factor (CF), average CF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

A = Area of compound,
C = Concentration of compound,
S = Standard deviation of the CF
X = Mean of the CFs

#	Standard ID	Calibration Date	Compound	Reported CF (10 std)	Recalculated CF (10 std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	7/13/05	Diesel	1.3759e-4	1.3759e-4	1.21239e-4	1.21235e-4	9.47	9.47
2									
3									
4									

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14138A8
SDG #: BMF0509190

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: JVL
2nd Reviewer: [illegible]

METHOD: GC ✓ HPLC ____

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF - CF)/ave. CF
CF = A/C

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(Ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %R	Recalculated %R
1	4A092001	7/	Diesel	250	252.45	250.63	100.98	101.05
2								
3								
4								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14138 A8
SDG #: BMI 0509 1907

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: JVB
2nd reviewer: 9

METHOD: ✓ GC __ HPLC

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #7

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Nonane	DB-1	100	128	128	0	0

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

LDC #: 14178 A8
SDG #: BM1 0509/907

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: DC
2nd Reviewer: G

METHOD: /GC __HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA

RPD =((|SSCMS - SSCMSD| * 2) / (SSCMS + SSCMSD))*100

Where SSC = Spiked sample concentration; SA = Spike added; MS = Matrix spike; SC = Sample concentration; MSD = Matrix spike duplicate

MS/MSD samples 21/22

Compound	Spike Added (mg/kg)		Sample Conc. (mg/kg)	Spike Sample Concentration (mg/kg)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	—	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)	100	100	0	98	107	~~107~~ 98	98	107	107	8.6	8.8
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14178A8

SDG #: BMI0509190

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Page: 1 of 1

Reviewer: JVC

2nd Reviewer: [illegible]

____METHOD: ✓ GC ___HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA

RPD =(((SSCLCS - SSCLCSD) * 2) / (SSCLCS + SSCLCSD))*100

Where SSC = Spiked sample concentration; SA = Spike added; LCS = Laboratory Control Sample; SC = Sample concentration; LCSD = Laboratory Control Sample duplicate

LCS/LCSD samples: LCS-13153

Compound	Spike Added (mg/kg)		Sample Conc. (mg/kg)	Spike Sample Concentration (mg/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	—	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)	100	NA	0	110	NA	110	110	—	—	—	—
Benzene (8021B)											
Methane (RSK-175)	—										
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14138A8
SDG #: BMI05091902

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: JR
2nd Reviewer: [illegible]

METHOD: ✓ GC ___ HPLC

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10% of the reported results?

Concentration= $\frac{(A)(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound in the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID._____ Compound Name ND

Concentration = _____

#	Sample ID	Compound	Reported Concentrations ( )	Recalculated Results Concentrations ( )	Qualifications

Comments: _____

SAMPOA Approved

SEPTEMBER 2005 GROUNDWATER WELL DEVELOPMENT LOGS

Battelle
The Business of Innovation

Marine Corps Base Camp Pendleton Site 1413

Well Development / Purge Log

Location: 1413	Well No.: MW-6	Date: 9-23-2005	Project No.: G486102-11FN	Page 1 of 1

Equipment:

HORIBA U 10	☐	HORIBA U22	☐
S/N:		S/N:	
FID/PHOTO VAC	☐	ORION 290A	☐
INTERFACE PROBE	☐	OVA 128	☐
HORIBA ORP	☐	WATER LEVEL	☐

Personnel: D. Conner + D. Emerson

EXPOSURE MONITORING
Background: _____ PPM
Reading: _____ PPM

WELL CONDITION
Good ☒ New
Fair ☐
Poor ☐

Total Well Depth: 19.82
Static Water Level: 13.91 Depth to Product: Ø
Water Column: 5.91 Product Layer: Ø
Well Casing Diameter: 2" = 0.167'
Borehole Diameter: 8" = 0.667 Multiplier: 0.776 1BV = 4.6 gals
Low Flow Method ☐
Minimal Purge Sampling ☐
Criteria used to stop purging / development: Dry Well ☒

Pump Type: Peristaltic ☐ Submersible ☐
Liquid Ring ☐ Bladder Pump ☐
Pump Rate:
Purge Start Time: HRS
Purge Stop Time: HRS
Total volume Purged: 45 Gal.
Parameter Stabilization ☐

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units) +/- 0.2	Conductivity (mS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
1315										Surge well 15 mins
1330										Begin bailing
1335		1.0	7.52	3999			24.2			
1338		3.0	7.72	3999			23.8			
1340		4.0	7.33	3999			22.7			End bailing well
1342	19.1	DRY (4.5)								
										80% Recharge Level:
										Sample Collected: HRS

Field Team Leader Signature: [signature]

Battelle
The Business of Innovation

Marine Corps Base Camp Pendleton Site 1413

Well Development / Purge Log

Location: 1413	Well No.: MW-6	Date: 9-23-2005	Project No.: G486102-11FN		Page 1 of 1

Equipment:		Personnel:	
HORIBA U 10 ☐	HORIBA U22 ☐	David Conner (Battelle) and	
S/N:	S/N:	Dale Emerson (WDC)	
FID/PHOTO VAC ■	ORION 290A ☐	EXPOSURE MONITORING	WELL CONDITION
INTERFACE PROBE ☐	HANNA 99100 ■	Background: 0.0 PPM	Good ■
HORIBA ORP ☐	WATER LEVEL ■	Reacing: 0.0 PPM	Fair ☐
			Poor ☐
Total Well Depth: 19.82			
Static Water Level: 13.91	Depth to Product	Pump Type: Peristaltic ☐	Submersible ☐
Water Column: 5.91	Product Layer:	Liquid Ring ☐	Bladder Pump ☐
Well Casing Diameter: 2"	0.167'	Pump Rate:	
Borehole Diameter: 8.25"	Multiplier:	Purge Start Time: 13:30 HRS	
Low Flow Method ☐		Purge Stop Time: 13:40 HRS	
Minimal Purge Sampling ☐		Total volume Purged: 4.5 Gal.	
Criteria used to stop purging / development: Dry Well ■		Parameter Stabilization ☐	

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units) +/- 0.2	Conductivity (µS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
13:15										Surge well (15 minutes).
13:30										Begin bailing well.
13:35		1.0	7.52	3999			24.2			
13:38		3.0	7.72	3999			23.8			
13:40		4.0	7.33	3999			22.7			End bailing well.
13:42	19.1	DRY								
										80% Recharge Level:
										Sample Collected: HRS

Field Team Leader Signature _____

Battelle
The Business of Innovation

Marine Corps Base Camp Pendleton Site 1413

Well Development / Purge Log

Location: 1413	Well No.: MW-7	Date: 9-23-2005 Project No.: G486102-11FN	Page 1 of 1

Equipment:

HORIBA U 10	☐	HORIBA U22	☐
S/N:		S/N:	
FID/PHOTO VAC	☐	ORION 290A	☐
INTERFACE PROBE	☐	OVA 128	☐
HORIBA ORP	☐	WATER LEVEL	☐

Personnel: D. Conner + D. Emerson

EXPOSURE MONITORING
Background: _____ PPM
Reading: _____ PPM

WELL CONDITION
Good ☒ New
Fair ☐
Poor ☐

Total Well Depth: 19.92
Static Water Level: 14.84 Depth to Product:
Water Column: 5.08 Product Layer:
Well Casing Diameter:
Borehole Diameter: Multiplier: 1BV = 3.94 gals
Low Flow Method ☐
Minimal Purge Sampling ☐
Criteria used to stop purging / development: Dry Well ☒

Pump Type: Peristaltic ☐ Submersible ☐ Liquid Ring ☐ Bladder Pump ☐
Pump Rate:
Purge Start Time: HRS
Purge Stop Time: HRS
Total volume Purged: Gal.
Parameter Stabilization ☐

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units) +/- 0.2	Conductivity ~~(mS/cm)~~ +/- 5% mS	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
14:35										Surge well 15 mins
14:50										Bail well
14:52		0.5	6.96	3999			24.5			
14:54		2.0	6.94	3999			23.4			
14:57	DRY	3.5	6.76	3999			22.9			
14:58	19.20									
										80% Recharge Level:
										Sample Collected: HRS

Field Team Leader Signature _____

Battelle
The Business of Innovation

Marine Corps Base Camp Pendleton Site 1413
Well Development / Purge Log

Location: 1413	Well No.: MW-7	Date: 9-23-2005	Project No.: G486102-11FN	Page 1 of 1

Equipment:

HORIBA U 10	☐	HORIBA U22	☐
S/N:		S/N:	
FID/PHOTO VAC	■	ORION 290A	☐
INTERFACE PROBE	☐	HANNA 991001	■
HORIBA ORP	☐	WATER LEVEL	■

Personnel:
David Conner (Battelle) and
Dale Emerson (WDC)

EXPOSURE MONITORING
Background: 0.0 PPM
Reading: 0.0 PPM

WELL CONDITION
Good ■
Fair ☐
Poor ☐

Total Well Depth:	19.92		
Static Water Level:	14.84	Depth to Product:	
Water Column:	5.08	Product Layer:	
Well Casing Diameter:	2"	0.167'	
Borehole Diameter:		Multiplier:	
Low Flow Method	☐		
Minimal Purge Sampling	☐		
Criteria used to stop purging / development:	Dry Well	■	

Pump Type: Peristaltic ☐ Submersible ☐ Liquid Ring ☐ Bladder Pump ☐

Pump Rate:

Purge Start Time: 14:50 HRS

Purge Stop Time: 14:57 HRS

Total volume Purged 3.5 Gal.

Parameter Stabilization ☐

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units) -/- 0.2	Conductivity (µS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
14:35										Surge well (15 minutes).
14:50										Begin bailing well.
14:52		0.5	6.96	3999			24.5			
14:54		2.0	6.94	3999			23.4			
14:57	DRY	3.5	6.76	3999			22.9			Stop bailing well.
14:58	19.20									
										80% Recharge Level:
										Sample Collected: HRS

Field Team Leader Signature _____

Battelle
The Business of Innovation

Marine Corps Base Camp Pendleton Site 1413

Well Development / Purge Log

Location: 1413	Well No.: MW-8	Date: 9-23-2005	Project No.: G486102-11FN	Page 1 of 1

Equipment:

HORIBA U 10	☐	HORIBA U22	☐
S/N:		S/N:	
FID/PHOTO VAC	☐	ORION 290A	☐
INTERFACE PROBE	☐	OVA 128	☐
HORIBA ORP	☐	WATER LEVEL	☐

Personnel: D. Gover + D. Emerson

EXPOSURE MONITORING
Background:_____PPM
Reading:_____PPM

WELL CONDITION
Good ☒ New
Fair ☐
Poor ☐

Total Well Depth: 20.00

Static Water Level: 17.40 Depth to Product:

Water Column: 2.60 Product Layer:

Well Casing Diameter: 2"

Borehole Diameter: 8" Multiplier: 0.376 1 BV = 2.02 gals

Low Flow Method ☐

Minimal Purge Sampling ☐

Criteria used to stop purging / development: Dry Well ☒

Pump Type: Peristaltic ☐ Submersible ☐
Liquid Ring ☐ Bladder Pump ☐

Pump Rate:

Purge Start Time: HRS

Purge Stop Time: HRS

Total volume Purged: Gal.

Parameter Stabilization ☐

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units) +/- 0.2	Conductivity (mS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
14:00										Surge well
14:15		0.75	6.87	3999			23.8			Bail well
14:16		1.0	6.87	3999			23.0			
14:19	DRY	2.5	6.88	3999			22.2			
14:20	19.25									
										80% Recharge Level:
										Sample Collected: HRS

Field Team Leader Signature _____

Battelle
The Business of Innovation

Marine Corps Base Camp Pendleton Site 1413

Well Development / Purge Log

Location: 1413	Well No.: MW-8	Date: 9-23-2005	Project No.: G486102-11FN	Page 1 of 1

Equipment:

HORIBA U 10	☐	HORIBA U22	☐
S/N:		S/N:	
FID/PHOTO VAC	■	ORION 290A	☐
INTERFACE PROBE	☐	HANNA 991001	■
HORIBA ORP	☐	WATER LEVEL	■

Personnel:
Davic Conner (Battelle) and
Dale Emerson (WDC)

EXPOSURE MONITORING
Background: 0.0 PPM
Reading: 0.0 PPM

WELL CONDITION
Good ■
Fair ☐
Poor ☐

Total Well Depth:	20.00		
Static Water Level:	17.40	Depth to Product:	
Water Column:	2.60	Product Layer:	
Well Casing Diameter:	2"	0.167'	
Borehole Diameter:		Multiplier:	
Low Flow Method	☐		
Minimal Purge Sampling	☐		

Pump Type: Peristaltic ☐ Submersible ☐
Liquid Ring ☐ Bladder Pump ☐

Pump Rate:
Purge Start Time: 14:15 HRS
Purge Stop Time: 14:19 HRS
Total volume Purged: 2.5 Gal.

Criteria used to stop purging / development: Dry Well ■ Parameter Stabilization ☐

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units) +/- 0.2	Conductivity (µS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
14:00										Surge well (15 minutes).
14:15		0.75	6.87	3999			23.8			Begin bailing well.
14:16		1.0	6.87	3999			23.0			
14:19	DRY	2.5	6.88	3999			22.2			Stop bailing well.
14:20	19.25									
										80% Recharge Level:
										Sample Collected: HRS

Field Team Leader Signature _____

Battelle
The Business of Innovation

Marine Corps Base Camp Pendleton Site 1413

Well Development / Purge Log

Location: 1413	Well No.: MW-9	Date: 9-23-2005	Project No.: G486102-11FN	Page 1 of 1

Equipment:

HORIBA U 10	☐	HORIBA J22	☐
S/N:		S/N:	
FID/PHOTO VAC	☐	ORION 290A	☐
INTERFACE PROBE	☐	OVA 128	☐
HORIBA ORP	☐	WATER LEVEL	☐

Personne: D. Conner + D. Emerson

EXPOSURE MONITORING
Background: _____ PPM
Reading: _____ PPM

WELL CONDITION
Good ☒ New
Fair ☐
Poor ☐

Total Well Depth: 19.66
Static Water Level: 13.65 Depth to Product:
Water Column: 6.01 Product Layer:
Well Casing Diameter:
Borehole Diameter: 8" = 0.667 Multiplier: 1BV = 4.6617 gals
Low Flow Method ☐
Minimal Purge Sampling ☐

Pump Type: Peristaltic ☐ Submersible ☐
Liquid Ring ☐ Bladder Pump ☐
Pump Rate:
Purge Start Time: HRS
Purge Stop Time: HRS
Total volume Purged: Gal.

Criteria used to stop purging / development: Dry Well ☐ Parameter Stabilization ☒ + 10 well volumes purged = 46 gals

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units) +/- 0.2	Conductivity (mS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
1115										Begin Surging
1130			7.47	2614			22.1			Begin bailing
1131			7.49	2191			21.3			Fuel odor, light sheen on water
1141		~10.0	7.33	1971			21.0			Strong odor
1144	14.70	12.0	7.16	2035			20.9			Strong odor
1212	13.72	30.0	7.06	2039	D.O. Inaccurate reading		20.9			Strong odor
1220		35.0	7.28	2022			20.9			80% Recharge Level:
1225	13.73	40.0	7.26	2022			20.9			Sample Collected: HRS
1235	13.76	46.0	7.29	1951			20.9			

Field Team Leader Signature _____

Battelle
The Business of Innovation

Marine Corps Base Camp Pendleton Site 1413
Well Development / Purge Log

Location: 1413	Well No.: MW-9	Date: 9-23-2005	Project No.: G486102-11FN	Page 1 of 1

Equipment:

HORIBA U 10	☐	HORIBA U22	☐
S/N:		S/N:	
FID/PHOTO VAC	■	ORION 290A	☐
INTERFACE PROBE	☐	HANNA 991001	■
HORIBA ORP	☐	WATER LEVEL	■

Personnel:
David Corner (Battelle) and
Dale Emerson (WDC)

EXPOSURE MONITORING
Background: 0.0 PPM
Reading: 0.0 PPM

WELL CONDITION
Good ■
Fair ☐
Poor ☐

Total Well Depth:	19.66		
Static Water Level:	13.65	Depth to Product:	
Water Column:	6.01	Product Layer:	
Well Casing Diameter:	2"	0.167'	
Borehole Diameter:	8.25"	Multiplier:	
Low Flow Method	☐		
Minimal Purge Sampling	☐		

Pump Type: Peristaltic ☐ Submersible ☐ Liquid Ring ☐ Bladder Pump ☐

Pump Rate:

Purge Start Time: 11:30 HRS

Purge Stop Time: 12:35 HRS

Total volume Purged: 47.0 Gal.

Criteria used to stop purging / development Dry Well ☐ Parameter Stabilization ■ 10 well volumes purged.

Time	Water Depth (bloc)	Volume Recovered (gal)	PH (units) +/- 0.2	Conductivity (µS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
11:15										Surge well (15 minutes).
11:30			7.47	2614			22.1			Begin bailing well.
11:31			7.49	2191			21.3			Hydrocarbon odor; light sheen on water.
11:41		10.0	7.33	1971			21.0			Strong hydrocarbon odor.
11:44	14.70	12.0	7.16	2035			20.9			Strong hydrocarbon odor.
12:12	13.72	30.0	7.06	2039			20.9			Strong hydrocarbon odor.
12:20		35.0	7.28	2022			20.9			Strong hydrocarbon odor.
12:25	13.73	40.0	7.26	2022			20.9			Strong hydrocarbon odor.
12:35	13.76	47.0	7.29	1951			20.9			Stop bailing.

Field Team Leader Signature _____

APPENDIX B

FIELD DATA COLLECTION LOG SHEETS

OCTOBER 2005

Battelle
. . . Putting Technology To Work

Well Development / Purge Log

Location: SITE 1413 | Well No.: MW-04 | Date: 10-27-05 | Project No.: 64866102 | Page 1 of 1

Personnel: SCOTT LOWE

Equipment:

HORIBA U 10	☒	HORIBA U22	☐ OAKTON ORP X
S/N:		S/N:	
FID/PHOTO VAC	☐	ORION 290A	☐
INTERFACE PROBE	☒	OVA 128	☐
HORIBA ORP	☐	WATER LEVEL	☐

EXPOSURE MONITORING
Background: _____ PPM
Reading: _____ PPM

WELL CONDITION
Good ☒
Fair ☐
Poor ☐

Total Well Depth (ft bgs): 25.5 | Screened Interval (ft bgs):
Static Water Level: 13.88' | Depth to Product: —
Water Column: | Product Layer: —
Well Casing Diameter:
Borehole Diameter: | Multiplier:
Low Flow Method ☒
Minimal Purge Sampling ☐

Pump Type: Peristaltic ☐ Submersible ☐ Liquid Ring ☐ Bladder Pump ☒
Pump Rate:
Purge Start Time: 1015 HRS
Purge Stop Time: 1035 HRS
Total volume Purged: 1.20 Gal.
Parameter Stabilization ☒

Criteria used to stop purging / development: Dry Well ☐

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units) +/- 0.2	Conductivity (mS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
1020	13.93	0.30	7.4	4.7	99	1.5	22	0.2	88.6	PUMP SET @ 0615, 10/27
1025	14.41	0.60	7.2	4.8	67	1.0	23	0.3	90.1	
1030	14.61	0.90	7.2	4.8	60	0.9	22	0.3	91.9	
1033	14.76	1.10	7.2	4.8	58	0.7	21	0.3	93.8	
1035	14.83	1.20	7.2	4.9	54	0.8	21	0.3	94.8	

Sample Collected: 1040 HRS

Field Team Leader Signature: [signature]

Battelle
. . . Putting Technology To Work

Well Development / Purge Log

Location: SITE 143 | Well No.: MW05 | Date: 10-27-05 | Project No.: G486102 | Page 1 of 1

Personnel: SCOTT LOWE

Equipment:

HORIBA U 10	☒	HORIBA U22	☐ OAKTON ORP ☒
S/N:		S/N:	
FID/PHOTO VAC	☐	CRION 290A	☐
INTERFACE PROBE	☒	OVA 128	☐
HORIBA ORP	☐	WATER LEVEL	☐

EXPOSURE MONITORING
Background: _____ PPM
Reading: _____ PPM

WELL CONDITION
Good ☒
Fair ☐
Poor ☐

Total Well Depth (ft bgs): 24.60 | Screened Interval (ft bgs):
Static Water Level: 13.82 | Depth to Product: —
Water Column: | Product Layer: —
Well Casing Diameter:
Borehole Diameter: | Multiplier:
Low Flow Method ☒
Minimal Purge Sampling ☐

Pump Type: Peristaltic ☐ Submersible ☐ Liquid Ring ☐ Bladder Pump ☒
Pump Rate:
Purge Start Time: 1115 HRS
Purge Stop Time: 1135 HRS
Total volume Purged: 1.20 Gal.
Parameter Stabilization ☒

Criteria used to stop purging / development: Dry Well ☐

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units) +/- 0.2	Conductivity (mS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
1120	13.90	0.30	7.4	14	83	0.1	22	0.6	101.7	-PUMP SET @ 0625, 10/27
1125	14.04	0.60	7.2	12	66	0.1	21	0.5	96.3	
1130	14.16	0.90	7.2	10	26	0.1	21	0.5	81.9	-MS/MSD COLLECTED FOR PNAs
1133	14.27	1.10	7.2	10	24	0.1	21	0.5	75.5	ONLY
1135	14.33	1.20	7.2	9	21	0.1	21	0.5	73.1	

Sample Collected: 1140 HRS

Field Team Leader Signature: [signature]

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Well Development / Purge Log

Location: SITE 1413	Well No.: MW06	Date: 10-27-05	Project No.: G4866102
			Page 1 of 1

Equipment:

HORIBA U 10	☒	HORIBA U22	☐ OAKTON ORP ☒
S/N:		S/N:	
FID/PHOTO VAC	☐	ORION 290A	☐
INTERFACE PROBE	☒	OVA 128	☐
HORIBA ORP	☐	WATER LEVEL	☐

Personnel: SCOTT LOWE

EXPOSURE MONITORING
Background: _____ PPM
Reading: _____ PPM

WELL CONDITION
Good ☒
Fair ☐
Poor ☐

Total Well Depth (ft bgs): 20'
Screened Interval (ft bgs): 10'-20'
Static Water Level: 14.18'
Depth to Product: —
Water Column:
Product Layer: —
Well Casing Diameter: 2"
Borehole Diameter:
Multiplier:
Low Flow Method ☒
Minimal Purge Sampling ☐

Pump Type: Peristaltic ☐ Submersible ☐
Liquid Ring ☐ Bladder Pump ☒
Pump Rate:
Purge Start Time: 0845 HRS
Purge Stop Time: 0905 HRS
Total volume Purged: Gal.
Parameter Stabilization ☒

Criteria used to stop purging / development: Dry Well ☐

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units) +/- 0.2	Concuctivity (mS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
0850	14.22	0.25	7.20	6.50	—	1.99	21.1	0.33	186.2	- PUMP SET @ 0835, 10/27
0855	14.40	0.50	7.12	6.42	—	1.71	21.1	0.31	~~186~~ 186.1	- ABUNDANT SILT IN PURGED
0900	14.61	0.75	7.10	6.33	—	1.55	21.0	0.33	186.7	GROUNDWATER + NEW WELL
0903	14.72	0.90	7.10	6.31	—	1.46	21.0	0.32	187.2	- H-LOCK WELL CAP INSTALLED
0905	14.83	1.0	7.09	6.30	—	1.40	21.0	0.30	186.7	
										Sample Collected: 0910 HRS

Field Team Leader Signature: [signature]

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Well Development / Purge Log

Location: SITE 1413 | Well No. MW07 | Date: 10-27-05 | Project No.: G4860102 | Page 1 of 1

Personnel: SCOTT LOWE

Equipment:

HORIBA U 10	☒	HORIBA U22	☐ OAKTON ORP X
S/N:		S/N:	
FID/PHOTO VAC	☐	ORION 290A	☐
INTERFACE PROBE	☒	OVA 128	☐
HORIBA ORP	☐	WATER LEVEL	☐

EXPOSURE MONITORING
Background: _____ PPM
Reading: _____ PPM

WELL CONDITION
Good ☒
Fair ☐
Poor ☐

Total Well Depth (ft bgs): 20' | Screened Interval (ft bgs): 10'-20'
Static Water Level: 14.45' | Depth to Product: —
Water Column: | Product Layer: —
Well Casing Diameter: 2"
Borehole Diameter: | Multiplier:
Low Flow Method ☒
Minimal Purge Sampling ☐
Criteria used to stop purging / development: Dry Well ☐

Pump Type: Peristaltic ☐ Liquid Ring ☐ Submersible ☐ Bladder Pump ☒
Pump Rate:
Purge Start Time: 1250 HRS
Purge Stop Time: 1310 HRS
Total volume Purged: 1.20 Gal.
Parameter Stabilization ☒

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units) +/- 0.2	Conductivity (mS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
1255	14.60	0.30	6.9	10	99	1.0	23	0.6	134.2	-PUMP SET @ 0640, 10/27
1300	14.72	0.60	7.0	10	93	1.1	23	0.6	137.4	
1305	14.96	0.90	7.0	10	89	1.2	23	0.5	143.9	-NEW WELL, ABUNDANT SILT
1307	15.14	1.10	7.0	10	88	1.1	23	0.5	142.2	IN PURGED GROUNDWATER
1310	15.22	1.20	7.0	10	87	1.1	23	0.5	141.8	
										Sample Collected: 1315 HRS

Field Team Leader Signature: [signature]

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Well Development / Purge Log

Location: SITE 1413 | Well No.: MW-08 | Date: 10-27-05 | Project No.: 64866102 | Page 1 of 1

Personnel: SCOTT LOWE

Equipment:

HORIBA U 10	☒	HORIBA U22	☐ OAKTON ORP ☒
S/N:		S/N:	
FID/PHOTO VAC	☐	ORION 290A	☐
INTERFACE PROBE	☒	OVA 128	☐
HORIBA ORP	☐	WATER LEVEL	☐

EXPOSURE MONITORING
Background: _____ PPM
Reading: _____ PPM

WELL CONDITION
Good ☒
Fair ☐
Poor ☐

Total Well Depth (ft bgs): 20 | Screened Interval (ft bgs): 10'-20'
Static Water Level: 16.61 | Depth to Product: —
Water Column: | Product Layer: —
Well Casing Diameter: 2"
Borehole Diameter: | Multiplier:
Low Flow Method ☒
Minimal Purge Sampling ☐
Criteria used to stop purging / development: Dry Well ☐

Pump Type: Peristaltic ☐ Submersible ☐ Liquid Ring ☐ Bladder Pump ☒
Pump Rate:
Purge Start Time: 1200 HRS
Purge Stop Time: 1220 HRS
Total volume Purged: 1.20 Gal.
Parameter Stabilization ☒

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units) +/- 0.2	Conductivity (mS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
1205	16.76	0.30	7.3	14	1	3.3	22	0.8	114.3	-PUMP SET @ 0645, 10/27
1210	16.91	0.60								
1215	17.31	0.90								-NEW WELL, ABUNDANT
1217	17.49	1.10								SILT IN PURGED
1220	17.55	1.20	7.1	15	1	3.6	22	0.9	124.3	GROUNDWATER
										Sample Collected: 1225 HRS

Field Team Leader Signature: [signature]

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Well Development / Purge Log

Location: SITE 1413 | Well No.: MW-09 | Date: 10-27-05 | Project No.: G4860102 | Page 1 of 1

Equipment:

HORIBA U 10	☒	HORIBA U22	☐ OAKTON ORP X
S/N:		S/N:	
FID/PHOTO VAC	☐	ORION 290A	☐
INTERFACE PROBE	☒	OVA 128	☐
HORIBA ORP	☐	WATER LEVEL	☐

Personnel: SCOTT LOWE

EXPOSURE MONITORING
Background: _____ PPM
Reading: _____ PPM

WELL CONDITION
Good ☒
Fair ☐
Poor ☐

Total Well Depth (ft bgs): 20' | Screened Interval (ft bgs): 10'-20'
Static Water Level: 12.06' | Depth to Product: —
Water Column: | Product Layer: —
Well Casing Diameter: 2"
Borehole Diameter: | Multiplier:
Low Flow Method ☒
Minimal Purge Sampling ☐
Criteria used to stop purging / development: Dry Well ☐

Pump Type: Peristaltic ☐ Submersible ☐ Liquid Ring ☐ Bladder Pump ☒
Pump Rate:
Purge Start Time: 0920 HRS
Purge Stop Time: 0940 HRS
Total volume Purged: 1.20 Gal.
Parameter Stabilization ☒

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units) +/- 0.2	Conductivity (mS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
0925	12.19	0.30	6.9	3.2	2.0	0.4	20	0.1	26.6	-PUMP SET @ 0650, 10/27
0930	12.40	0.60	7.0	3.0	2.0	0.1	20	0.1	7.9	-NEW WELL, ABUNDANT SILT
0935	12.76	0.90	7.0	2.8	2.0	0.1	20	0.1	0.3	IN PURGED GROUNDWATER
0937	12.99	1.10	7.1	2.6	2.0	0	20	0.1	-8.2	-H-LOCK WELL CAP INSTALLED
0940	13.12	1.20	7.1	2.6	2.0	0	20	0.1	-9.7	-DUP COLLECTED
										-HYDROCARBON ODOR IN
										PURGED GROUNDWATER
										Sample Collected: 0945 HRS

Field Team Leader Signature: [signature]

JANUARY 2006

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MCB Camp Pendleton

Well Development / Purge Log

Location: 1413	Well No.: MW-04	Date: 1-17-06	Project No.: ~~[illegible]~~ AH 10102	Page 1 of 1

Equipment:

- HORIBA U 10 ☐
- HORIBA U22 ☒
- S/N:
- S/N:
- FID/PHOTO VAC ☐
- ORION 290A ☐
- INTERFACE PROBE ☒
- OVA 128 ☐
- HORIBA ORP ☐
- WATER LEVEL ☐

Personnel: SL, GH

EXPOSURE MONITORING
Background: _____ PPM
Reading: _____ PPM

WELL CONDITION
Good ☒
Fair ☐
Poor ☐

Total Well Depth:

Static Water Level: 14.48' Depth to Product: —

Water Column: Product Layer: —

WELL CASING DIAMETER: 4"

Borehole Diameter: Multiplier:

Low Flow Method ☒

Minimal Purge Sampling ☐

Criteria used to stop purging / development: Dry Well ☐

Pump Type: Peristaltic ☐ Submersible ☐ Liquid Ring ☐ Bladder Pump ☒

Pump Rate:

Purge Start Time: 1245 HRS

Purge Stop Time: 1300 HRS

Total volume Purged: 2.50L ~~Gal~~ + SAMPLE VOLUME

Parameter Stabilization ☒

Time	Water Depth (btoc)	Volume Recovered ~~(gal)~~ L	PH (units) +/- 0.2	Conductivity (mS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
1248	14.60	0.50	6.45	5.02	0.6	4.22	22.6	0.3	104	PUMP SET @ 0845,
1251	14.61	1.0	6.38	5.10	-0.1	0.76	22.6	0.3	107	1-17-06
1254	14.61	1.50	6.37	5.11	-0.2	0.15	22.6	0.3	108	
1257	14.62	2.0	6.37	5.12	-0.2	0.02	22.6	0.3	108	
1300	14.62	2.50	6.36	5.13	-0.2	0.0	22.5	0.3	109	
										80% Recharge Level:
										Sample Collected: 1310 HRS

Field Team Leader Signature [signature]

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MCB Camp Pendleton
Well Development / Purge Log

Location: 1413	Well No.: MW-05	Date: 17JAN06	Project No. ~~CG337397~~ CH TO 102	Page 1 of 1

Equipment:
- HORIBA U 10 ☒ S/N: 101028
- HORIBA U22 ☐ S/N:
- Oakton ORP ☒
- FID/PHOTO VAC ☐
- ORION 290A ☐
- INTERFACE PROBE ☒
- OVA 128 ☐
- HORIBA ORP ☐
- WATER LEVEL ☐

Personnel: Scott Lowe, Greg Headington

EXPOSURE MONITORING
Background: _____ PPM
Reading: _____ PPM

WELL CONDITION
Good ☒
Fair ☐
Poor ☐

Total Well Depth: 24.64'

Static Water Level: 14.29'

Depth to Product:

Water Column:

Product Layer:

Pump Type: Peristaltic ☐ Liquid Ring ☐ Submersible ☐ Bladder Pump ☒

Well Casing Diameter: 0.33'

Pump Rate:

Borehole Diameter:

Multiplier:

Purge Start Time: 1318 HRS

Low Flow Method ☒

Purge Stop Time: 1443 HRS

Minimal Purge Sampling ☐

Total volume Purged: 3.8 Liter Gal. plus volume collected

Criteria used to stop purging / development: Dry Well ☐ Parameter Stabilization ☒

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units) +/- 0.2	Conductivity (mS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
										Collected 1413-MW05 Dup; pump set @ 0830 HRS
1325	14.45'		5.84	9.70	0.0	0.07	20.5	0.54	196.8	120 cc/min
1329	14.48'		5.84	9.80	0.0	0.00	20.5	0.54	178.0	reduce flow slightly
1333	14.52'		5.84	9.8	0.0	0.00	20.4	0.54	160.0	
1338	14.55'		5.83	9.8	0.0	0.00	20.4	0.54	145.0	
1341	14.55'		5.83	9.8	0.0	0.00	20.4	0.54	142.6	
										80% Recharge Level:
										Sample Collected: 1344 HRS

Field Team Leader Signature: [signature]

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MCB Camp Pendleton

Well Development / Purge Log

Location: 1413	Well No.:MW-06	Date: 17 JAN 06	Project No.: 6486102	Page 1 of 1

Equipment:

- HORIBA U 10 ☐ S/N: 101028
- HORIBA U22 ☐ S/N:
- CAK tow ☒ #96588
- FID/PHOTO VAC ☐
- ORION 290A ☐
- INTERFACE PROBE ☒ 1
- OVA 128 ☐
- HORIBA ORP ☐
- WATER LEVEL ☐

Personnel: Scott Lowe, G. Headington

EXPOSURE MONITORING
Background:_____PPM
Reading:_____PPM

WELL CONDITION
Good ☒
Fair ☐
Poor ☐

Total Well Depth:

Static Water Level: 14.80' Depth to Product:

Water Column: Product Layer:

Well Casing Diameter:

Borehole Diameter: Multiplier:

Low Flow Method ☒

Minimal Purge Sampling ☐

Criteria used to stop purging / development: Dry Well ☐

Pump Type: Peristaltic ☐ Submersible ☐ Liquid Ring ☐ Bladder Pump ☒

Pump Rate:

Purge Start Time: ~~1050~~ HRS 1152 HRS

Purge Stop Time: 1300 HRS

Total volume Purged: 4 L-u Gal. plus volume collected

Parameter Stabilization ☒

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units) +/- 0.2	Conductivity (mS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
										Pump set @ 0840 HRS
1205	15.01'		6.41	6.13	30	0.17	22.3	0.32	237	~70cc/min / turbidity, sample acc
1209	15.03'		6.44	6.10	62	0.07	22.3	0.32	237	
1212	15.02'		6.45	6.10	129	0.06	22.3	0.32	237	Alot of fines (new well)
1215	15.02'		6.46	6.10	127	0.00	22.3	0.32	236	
1216	15.02'				80					
										80% Recharge Level:
										Sample Collected: 1218 HRS

Field Team Leader Signature [signature]

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MCB Camp Pendleton
Well Development / Purge Log

Location: 1413	Well No.: MW-07	Date: 1-17-06	Project No.: G486044 TO 102
Page 1 of 1			

Equipment:

HORIBA U 10	☐	HORIBA U22	☒
S/N:		S/N:	
FID/PHOTO VAC	☐	ORION 290A	☐
INTERFACE PROBE	☒	OVA 128	☐
HORIBA ORP	☐	WATER LEVEL	☐

Personnel: SL, GM

EXPOSURE MONITORING
Background: _____ PPM
Reading: _____ PPM

WELL CONDITION
Good ☒
Fair ☐
Poor ☐

Total Well Depth:

Static Water Level: 15.18 Depth to Product: —

Water Column: Product Layer: —

Pump Type: Peristaltic ☐ Submersible ☐
Liquid Ring ☐ Bladder Pump ☒

WELL CASING DIAMETER: 2"

Borehole Diameter: Multiplier:

Pump Rate:

Purge Start Time: 1400 HRS

Low Flow Method ☒

Purge Stop Time: 1415 HRS

Minimal Purge Sampling ☐

Total volume Purged: 3.0L ~~Gal.~~ + SAMPLE VOLUME

Criteria used to stop purging / development: Dry Well ☐ Parameter Stabilization ☒

Time	Water Depth (btoc)	Volume Recovered ~~(gal)~~ L	PH (units) +/- 0.2	Conductivity (mS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
1403	15.24	1.0	6.13	9.45	2.6	1.70	23.1	0.5	78	Pump SET @ 0830,
1406	15.27	1.5	6.11	9.43	2.4	1.03	23.0	0.5	79	1-17-06
1409	15.32	2.0	6.10	9.38	2.5	0.77	22.7	0.5	80	
1412	15.36	2.5	6.10	9.36	3.0	0.68	22.5	0.5	83	
1415	15.41	3.0	6.09	9.39	2.4	0.59	22.4	0.5	85	
										80% Recharge Level:
										Sample Collected: 1425 HRS

Field Team Leader Signature Greg Healy

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MCB Camp Pendleton

Well Development / Purge Log

Location: 1413	Well No.: MW-08	Date: 17JAN06	Project No.: T0102	Page 1 of 1

Equipment:
- HORIBA U 10 ☒ — HORIBA U22 ☐ — OAKton ORP ☒
- S/N: — S/N:
- FID/PHOTO VAC ☐ — ORION 290A ☐
- INTERFACE PROBE ☒ 5 — OVA 128 ☐
- HORIBA ORP ☐ — WATER LEVEL ☐

Personnel: S. LOWE, G. HEADINGTON

EXPOSURE MONITORING
Background: _____ PPM
Reading: _____ PPM

WELL CONDITION
Good ☒
Fair ☐
Poor ☐

Total Well Depth: 20.2'

Static Water Level: 16.92' — Depth to Product:

Water Column: — Product Layer:

Pump Type: Peristaltic ☒ — Submersible ☐ — Liquid Ring ☐ — Bladder Pump ☐

Well Casing Diameter: — Pump Rate:

Borehole Diameter: — Multiplier: — Purge Start Time: 1452 HRS

Low Flow Method ☒ — Purge Stop Time: 1607 HRS

Minimal Purge Sampling ☐ — Total volume Purged: 2 liters Gal. plus volume collected

Criteria used to stop purging / development: Dry Well ☐ — Parameter Stabilization ☒

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units) +/- 0.2	Conductivity (mS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
1503	17.20'		5.64	13.3	0.0	3.20	20.8	0.76	182.3	500cc/min
1507	17.20'		5.44	13.3	0.0	2.89	20.8	0.76	183.4	
1518	17.15'		5.51	13.2	0.0	2.66	20.6	0.76	181.2	
1521	17.15'		5.54	13.2	0.0	2.69	20.6	0.76	190.6	
										80% Recharge Level:
										Sample Collected: 1522 HRS

Field Team Leader Signature: [signature]

1413 - QCEB - 1525 HRS
1413 - QCFB - 1110 HRS

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Well Development / Purge Log

Location: 1413	Well No.: MW-09	Date: 1-17-06	Project No.: TO 611 102	Page 1 of 1

Equipment:

HORIBA U 10	☐	HORIBA U22	☒
S/N:		S/N:	
FID/PHOTO VAC	☐	ORION 290A	☐
INTERFACE PROBE	☒	OVA 128	☐
HORIBA ORP	☐	WATER LEVEL	☐

Personnel: SL, GH

EXPOSURE MONITORING
Background: _____ PPM
Reading: _____ PPM

WELL CONDITION
Good ☒
Fair ☐
Poor ☐

Total Well Depth:

Static Water Level: 12.09 Depth to Product: ___

Water Column: Product Layer: ___

Pump Type: Peristaltic ☐ Submersible ☐ Liquid Ring ☐ Bladder Pump ☒

Well Casing Diameter: 2 in

Pump Rate:

Borehole Diameter: Multiplier:

Purge Start Time: 1100 HRS

Low Flow Method ☒

Purge Stop Time: 1116 HRS

Minimal Purge Sampling ☐

Total volume Purged: 3.0L Gal. + SAMPLE Volume

Criteria used to stop purging / development: Dry Well ☐ Parameter Stabilization ☒

Time	Water Depth (btoc)	Volume Recovered ~~(gal)~~ L	PH (units) +/- 0.2	Conductivity (mS/cm) +/- 5%	Turbicity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
1104	12.12	1.0	6.85	2.25	23.0	1.04	19.2	0.1	-49	•Light Product Sheen
1107	12.14	1.5	6.86	2.26	27.1	0.13	19.2	0.1	-57	in well, Slight Hydrocarbon
1110	12.14	2.0	6.88	2.08	41.0	0.0	19.3	0.1	-56	odor in Purge H_2O.
1113	12.14	2.5	6.91	1.90	42.8	0.0	19.4	0.1	-49	•Pump Set @ 0840.
1116	12.14	3.0	6.94	1.84	43.1	0.0	19.4	0.1	-38	1-17-06
										80% Recharge Level:
										Sample Collected: 1135 HRS

Field Team Leader Signature [signature]

APPENDIX C

LABORATORY ANALYTICAL RESULTS

OCTOBER 2005

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *11-Nov-05*

Chris Zimmerman
Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
(614) 424-3779

CASE NARRATIVE

Project: TO102:14133

Work Order: BMI05102803 **Cooler Temp:** 4 °C

Alpha's Sample ID	Client's Sample ID	Matrix
05102803-01A	1413-MW04	Aqueous
05102803-02A	1413-MW05	Aqueous
05102803-03A	1413 MW06	Aqueous
05102803-04A	1413-MW07	Aqueous
05102803-05A	1413-MW08	Aqueous
05102803-06A	1413-MW09	Aqueous
05102803-07A	1413-MW09DUP	Aqueous
05102803-08A	1413-QCFB	Aqueous
05102803-09A	1413-QCEB	Aqueous
05102803-10A	1413-QCTB	Aqueous

Enclosed please find the analytical results of the samples received by Alpha Analytical, Inc. under the above mentioned Work Order/Chain-of-Custody.

Alpha Analytical, Inc. has a formal Quality Assurance/Quality Control program, which is designed to meet or exceed the EPA requirements. All relevant QC met quality assurance objectives for this project unless otherwise stated in the footnotes.

If you have any questions with regards to this report, please contact Randy Gardner, Project Manager, at (800) 283-1183.

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 10/28/05

Job#: TO102:14133

Total Petroleum Hydrocarbons - Extractable (TPH-E) EPA Method SW8015B/DHS LUFT Manual

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1413-MW04	TPH-E (Diesel)	0.072	0.050 mg/L	10/27/05	10/31/05
Lab ID :	BMI05102803-01A	TPH-E (Oil)	ND	0.50 mg/L	10/27/05	10/31/05
		Surr: Nonane	118	%REC	10/27/05	10/31/05
Client ID :	1413-MW05	TPH-E (Diesel)	0.20	0.050 mg/L	10/27/05	10/31/05
Lab ID :	BMI05102803-02A	TPH-E (Oil)	ND	0.50 mg/L	10/27/05	10/31/05
		Surr: Nonane	118	%REC	10/27/05	10/31/05
Client ID :	1413-MW06	TPH-E (Diesel)	ND	0.050 mg/L	10/27/05	11/01/05
Lab ID :	BMI05102803-03A	TPH-E (Oil)	ND	0.50 mg/L	10/27/05	11/01/05
		Surr: Nonane	120	%REC	10/27/05	11/01/05
Client ID :	1413-MW07	TPH-E (Diesel)	ND	0.050 mg/L	10/27/05	11/01/05
Lab ID :	BMI05102803-04A	TPH-E (Oil)	ND	0.50 mg/L	10/27/05	11/01/05
		Surr: Nonane	122	%REC	10/27/05	11/01/05
Client ID :	1413-MW08	TPH-E (Diesel)	0.052	0.050 mg/L	10/27/05	11/01/05
Lab ID :	BMI05102803-05A	TPH-E (Oil)	ND	0.50 mg/L	10/27/05	11/01/05
		Surr: Nonane	121	%REC	10/27/05	11/01/05
Client ID :	1413-MW09	TPH-E (Diesel)	0.43	0.050 mg/L	10/27/05	11/01/05
Lab ID :	BMI05102803-06A	TPH-E (Oil)	ND	0.50 mg/L	10/27/05	11/01/05
		Surr: Nonane	120	%REC	10/27/05	11/01/05
Client ID :	1413-MW09DUP	TPH-E (Diesel)	0.44	0.050 mg/L	10/27/05	11/01/05
Lab ID :	BMI05102803-07A	TPH-E (Oil)	ND	0.50 mg/L	10/27/05	11/01/05
		Surr: Nonane	115	%REC	10/27/05	11/01/05
Client ID :	1413-QCEB	TPH-E (Diesel)	ND	0.050 mg/L	10/27/05	11/01/05
Lab ID :	BMI05102803-09A	TPH-E (Oil)	ND	0.50 mg/L	10/27/05	11/01/05
		Surr: Nonane	127	%REC	10/27/05	11/01/05

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ND - Not Detected

Roger L. Scholl, Ph D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer

Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

11/10/05

Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-01A
Client I.D. Number: 1413-MW04

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/05/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	1.0	µg/L	36	m,p-Xylene	ND	0.50	µg/L
2	Chloromethane	ND	2.0	µg/L	37	Bromoform	ND	1.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L	38	Styrene	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L	39	o-Xylene	ND	0.50	µg/L
5	Bromomethane	ND	2.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L	41	1,2,3-Trichloropropane	ND	2.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L	42	Isopropylbenzene	ND	1.0	µg/L
8	Dichloromethane	ND	2.0	µg/L	43	Bromobenzene	ND	1.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L	44	n-Propylbenzene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L	45	4-Chlorotoluene	ND	1.0	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L	46	2-Chlorotoluene	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L	47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L	48	tert-Butylbenzene	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L	49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
15	2,2-Dichloropropane	ND	1.0	µg/L	50	sec-Butylbenzene	ND	1.0	µg/L
16	1,2-Dichloroethane	ND	1.0	µg/L	51	1,3-Dichlorobenzene	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L	52	1,4-Dichlorobenzene	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L	53	4-Isopropyltoluene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L	54	1,2-Dichlorobenzene	ND	1.0	µg/L
20	Benzene	ND	0.50	µg/L	55	n-Butylbenzene	ND	1.0	µg/L
21	Dibromomethane	ND	1.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L	57	1,2,4-Trichlorobenzene	ND	2.0	µg/L
23	Trichloroethene	ND	1.0	µg/L	58	Naphthalene	ND	2.0	µg/L
24	Bromodichloromethane	ND	1.0	µg/L	59	Hexachlorobutadiene	ND	2.0	µg/L
25	cis-1,3-Dichloropropene	ND	1.0	µg/L	60	1,2,3-Trichlorobenzene	ND	2.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	105		%REC
27	1,1,2-Trichloroethane	ND	1.0	µg/L	62	Surr: Toluene-d8	94		%REC
28	Toluene	ND	0.50	µg/L	63	Surr: 4-Bromofluorobenzene	103		%REC
29	1,3-Dichloropropane	ND	1.0	µg/L					
30	Dibromochloromethane	ND	1.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND	2.0	µg/L					
32	Tetrachloroethene	ND	1.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L					
34	Chlorobenzene	ND	1.0	µg/L					
35	Ethylbenzene	ND	0.50	µg/L					

No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

11/10/05
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-02A
Client I.D. Number: 1413-MW05

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/05/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration		Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND		1.0	µg/L	36	m,p-Xylene	ND	0.50	µg/L
2	Chloromethane	ND		2.0	µg/L	37	Bromoform	ND	1.0	µg/L
3	Vinyl chloride	ND		1.0	µg/L	38	Styrene	ND	1.0	µg/L
4	Chloroethane	ND		1.0	µg/L	39	o-Xylene	ND	0.50	µg/L
5	Bromomethane	ND		4.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
6	Trichlorofluoromethane	ND		1.0	µg/L	41	1,2,3-Trichloropropane	ND	4.0	µg/L
7	1,1-Dichloroethene	ND		1.0	µg/L	42	Isopropylbenzene	ND	1.0	µg/L
8	Dichloromethane	ND		4.0	µg/L	43	Bromobenzene	ND	1.0	µg/L
9	trans-1,2-Dichloroethene	ND		1.0	µg/L	44	n-Propylbenzene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND		0.50	µg/L	45	4-Chlorotoluene	ND	1.0	µg/L
11	1,1-Dichloroethane	ND		1.0	µg/L	46	2-Chlorotoluene	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND		1.0	µg/L	47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
13	Bromochloromethane	ND		1.0	µg/L	48	tert-Butylbenzene	ND	1.0	µg/L
14	Chloroform	ND		1.0	µg/L	49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
15	2,2-Dichloropropane	ND		1.0	µg/L	50	sec-Butylbenzene	ND	1.0	µg/L
16	1,2-Dichloroethane	ND		1.0	µg/L	51	1,3-Dichlorobenzene	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND		1.0	µg/L	52	1,4-Dichlorobenzene	ND	1.0	µg/L
18	1,1-Dichloropropene	ND		1.0	µg/L	53	4-Isopropyltoluene	ND	1.0	µg/L
19	Carbon tetrachloride	ND		1.0	µg/L	54	1,2-Dichlorobenzene	ND	1.0	µg/L
20	Benzene	0.39	J	0.50	µg/L	55	n-Butylbenzene	ND	1.0	µg/L
21	Dibromomethane	ND		1.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	6.0	µg/L
22	1,2-Dichloropropane	ND		1.0	µg/L	57	1,2,4-Trichlorobenzene	ND	4.0	µg/L
23	Trichloroethene	ND		1.0	µg/L	58	Naphthalene	ND	4.0	µg/L
24	Bromodichloromethane	ND		1.0	µg/L	59	Hexachlorobutadiene	ND	4.0	µg/L
25	cis-1,3-Dichloropropene	ND		1.0	µg/L	60	1,2,3-Trichlorobenzene	ND	4.0	µg/L
26	trans-1,3-Dichloropropene	ND		1.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	104		%REC
27	1,1,2-Trichloroethane	ND		1.0	µg/L	62	Surr: Toluene-d8	98		%REC
28	Toluene	ND		0.50	µg/L	63	Surr: 4-Bromofluorobenzene	96		%REC
29	1,3-Dichloropropane	ND		1.0	µg/L					
30	Dibromochloromethane	ND		1.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND		4.0	µg/L					
32	Tetrachloroethene	ND		1.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND		1.0	µg/L					
34	Chlorobenzene	ND		1.0	µg/L					
35	Ethylbenzene	ND		0.50	µg/L					

Some Reporting Limits were increased due to sample foaming.

J- The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

11/10/05
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-03A
Client I.D. Number: 1413-MW06

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/05/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	1.0	µg/L	36	m,p-Xylene	ND	0.50	µg/L
2	Chloromethane	ND	2.0	µg/L	37	Bromoform	ND	1.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L	38	Styrene	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L	39	o-Xylene	ND	0.50	µg/L
5	Bromomethane	ND	2.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/l	41	1,2,3-Trichloropropane	ND	2.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L	42	Isopropylbenzene	ND	1.0	µg/L
8	Dichloromethane	ND	2.0	µg/L	43	Bromobenzene	ND	1.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L	44	n-Propylbenzene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/l	45	4-Chlorotoluene	ND	1.0	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L	46	2 Chlorotoluene	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L	47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L	48	tert-Butylbenzene	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L	49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
15	2,2-Dichloropropane	ND	1.0	µg/L	50	sec-Butylbenzene	ND	1.0	µg/L
16	1,2-Dichloroethane	ND	1.0	µg/L	51	1,3-Dichlorobenzene	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L	52	1,4-Dichlorobenzene	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L	53	4-Isopropyltoluene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L	54	1,2-Dichlorobenzene	ND	1.0	µg/L
20	Benzene	ND	0.50	µg/L	55	n-Butylbenzene	ND	1.0	µg/L
21	Dibromomethane	ND	1.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L	57	1,2,4-Trichlorobenzene	ND	2.0	µg/L
23	Trichloroethene	ND	1.0	µg/L	58	Naphthalene	ND	2.0	µg/L
24	Bromodichloromethane	ND	1.0	µg/L	59	Hexachlorobutadiene	ND	2.0	µg/L
25	cis-1,3-Dichloropropene	ND	1.0	µg/L	60	1,2,3-Trichlorobenzene	ND	2.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	105		%REC
27	1,1,2-Trichloroethane	ND	1.0	µg/L	62	Surr: Toluene-d8	95		%REC
28	Toluene	ND	0.50	µg/L	63	Surr: 4-Bromofluorobenzene	107		%REC
29	1,3-Dichloropropane	ND	1.0	µg/L					
30	Dibromochloromethane	ND	1.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND	2.0	µg/L					
32	Tetrachloroethene	ND	1.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L					
34	Chlorobenzene	ND	1.0	µg/L					
35	Ethylbenzene	ND	0.50	µg/L					

No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer
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11/10/05
Report Date

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-04A
Client I.D. Number: 1413-MW07

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/05/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	1.0	µg/L	36	m,p-Xylene	ND	0.50	µg/L
2	Chloromethane	ND	2.0	µg/L	37	Bromoform	ND	1.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L	38	Styrene	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L	39	o-Xylene	ND	0.50	µg/L
5	Bromomethane	ND	4.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L	41	1,2,3 Trichloropropane	ND	4.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L	42	Isopropylbenzene	ND	1.0	µg/L
8	Dichloromethane	ND	4.0	µg/L	43	Bromobenzene	ND	1.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L	44	n-Propylbenzene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L	45	4-Chlorotoluene	ND	1.0	µg/L
11	1,1 Dichloroethane	ND	1.0	µg/L	46	2-Chlorotoluene	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L	47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/l	48	tert-Butylbenzene	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L	49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
15	2,2 Dichloropropane	ND	1.0	µg/L	50	sec-Butylbenzene	ND	1.0	µg/L
16	1,2-Dichloroethane	ND	1.0	µg/L	51	1,3-Dichlorobenzene	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L	52	1,4-Dichlorobenzene	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L	53	4-Isopropyltoluene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L	54	1,2-Dichlorobenzene	ND	1.0	µg/L
20	Benzene	ND	0.50	µg/L	55	n-Butylbenzene	ND	1.0	µg/L
21	Dibromomethane	ND	1.0	µg/l	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	6.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L	57	1,2,4-Trichlorobenzene	ND	4.0	µg/L
23	Trichloroethene	ND	1.0	µg/L	58	Naphthalene	ND	4.0	µg/L
24	Bromodichloromethane	ND	1.0	µg/L	59	Hexachlorobutadiene	ND	4.0	µg/L
25	cis-1,3-Dichloropropene	ND	1.0	µg/l	60	1,2,3-Trichlorobenzene	ND	4.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	106		%REC
27	1,1,2-Trichloroethane	ND	1.0	µg/L	62	Surr: Toluene-d8	95		%REC
28	Toluene	ND	0.50	µg/L	63	Surr: 4-Bromofluorobenzene	105		%REC
29	1,3-Dichloropropane	ND	1.0	µg/L					
30	Dibromochloromethane	ND	1.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND	4.0	µg/L					
32	Tetrachloroethene	ND	1.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L					
34	Chlorobenzene	ND	1.0	µg/L					
35	Ethylbenzene	ND	0.50	µg/L					

Some Reporting Limits were increased due to sample foaming.

No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND – Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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11/10/05
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-05A
Client I.D. Number: 1413-MW08

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/05/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	1.0	µg/L
2	Chloromethane	ND	2.0	µg/l
3	Vinyl chloride	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L
5	Bromomethane	ND	4.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/l
7	1,1-Dichloroethene	ND	1.0	µg/L
8	Dichloromethane	ND	4.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/l
15	2,2-Dichloropropane	ND	1.0	µg/L
16	1,2-Dichloroethane	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/l
19	Carbon tetrachloride	ND	1.0	µg/L
20	Benzene	ND	0.50	µg/L
21	Dibromomethane	ND	1.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/l
23	Trichloroethene	ND	1.0	µg/L
24	Bromodichloromethane	ND	1.0	µg/L
25	cis-1,3-Dichloropropene	ND	1.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L
27	1,1,2-Trichloroethane	ND	1.0	µg/L
28	Toluene	ND	0.50	µg/L
29	1,3-Dichloropropane	ND	1.0	µg/L
30	Dibromochloromethane	ND	1.0	µg/L
31	1,2-Dibromoethane (EDB)	ND	4.0	µg/L
32	Tetrachloroethene	ND	1.0	µg/L
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L
34	Chlorobenzene	ND	1.0	µg/l
35	Ethylbenzene	ND	0.50	µg/L
36	m,p-Xylene	ND	0.50	µg/L
37	Bromoform	ND	1.0	µg/L
38	Styrene	ND	1.0	µg/L
39	o-Xylene	ND	0.50	µg/L
40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
41	1,2,3-Trichloropropane	ND	4.0	µg/L
42	Isopropylbenzene	ND	1.0	µg/L
43	Bromobenzene	ND	1.0	µg/L
44	n-Propylbenzene	ND	1.0	µg/L
45	4-Chlorotoluene	ND	1.0	µg/L
46	2-Chlorotoluene	ND	1.0	µg/L
47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
48	tert-Butylbenzene	ND	1.0	µg/L
49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
50	sec-Butylbenzene	ND	1.0	µg/L
51	1,3-Dichlorobenzene	ND	1.0	µg/L
52	1,4-Dichlorobenzene	ND	1.0	µg/L
53	4-Isopropyltoluene	ND	1.0	µg/L
54	1,2-Dichlorobenzene	ND	1.0	µg/L
55	n-Butylbenzene	ND	1.0	µg/L
56	1,2-Dibromo-3-chloropropane (DBCP)	ND	6.0	µg/L
57	1,2,4-Trichlorobenzene	ND	4.0	µg/L
58	Naphthalene	ND	4.0	µg/L
59	Hexachlorobutadiene	ND	4.0	µg/L
60	1,2,3-Trichlorobenzene	ND	4.0	µg/L
61	Surr: 1,2-Dichloroethane-d4	108		%REC
62	Surr: Toluene-d8	96		%REC
63	Surr: 4-Bromofluorobenzene	106		%REC

Some Reporting Limits were increased due to sample foaming.

No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

11/10/05
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-06A
Client I.D. Number: 1413-MW09

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/05/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	2.0	µg/L	36	m,p-Xylene	ND	1.0	µg/L
2	Chloromethane	ND	4.0	µg/l	37	Bromoform	ND	2.0	µg/L
3	Vinyl chloride	ND	2.0	µg/L	38	Styrene	ND	2.0	µg/L
4	Chloroethane	ND	2.0	µg/L	39	o-Xylene	ND	1.0	µg/L
5	Bromomethane	ND	8.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	2.0	µg/L
6	Trichlorofluoromethane	ND	2.0	µg/l	41	1,2,3-Trichloropropane	ND	8.0	µg/L
7	1,1-Dichloroethene	ND	2.0	µg/L	42	Isopropylbenzene	ND	2.0	µg/L
8	Dichloromethane	ND	8.0	µg/L	43	Bromobenzene	ND	2.0	µg/L
9	trans-1,2-Dichloroethene	ND	2.0	µg/L	44	n-Propylbenzene	ND	2.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	1.0	µg/L	45	4-Chlorotoluene	ND	2.0	µg/L
11	1,1-Dichloroethane	ND	2.0	µg/L	46	2-Chlorotoluene	ND	2.0	µg/L
12	cis-1,2-Dichloroethene	ND	2.0	µg/L	47	1,3,5-Trimethylbenzene	ND	2.0	µg/L
13	Bromochloromethane	ND	2.0	µg/L	48	tert-Butylbenzene	ND	2.0	µg/L
14	Chloroform	ND	2.0	µg/L	49	1,2,4-Trimethylbenzene	2.5	2.0	µg/L
15	2,2-Dichloropropane	ND	2.0	µg/L	50	sec-Butylbenzene	ND	2.0	µg/L
16	1,2-Dichloroethane	ND	2.0	µg/L	51	1,3-Dichlorobenzene	ND	2.0	µg/L
17	1,1,1-Trichloroethane	ND	2.0	µg/L	52	1,4-Dichlorobenzene	ND	2.0	µg/L
18	1,1-Dichloropropene	ND	2.0	µg/l.	53	4-Isopropyltoluene	ND	2.0	µg/L
19	Carbon tetrachloride	ND	2.0	µg/L	54	1,2-Dichlorobenzene	ND	2.0	µg/L
20	Benzene	ND	1.0	µg/L	55	n-Butylbenzene	ND	2.0	µg/L
21	Dibromomethane	ND	2.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	12	µg/L
22	1,2-Dichloropropane	ND	2.0	µg/l	57	1,2,4-Trichlorobenzene	ND	8.0	µg/L
23	Trichloroethene	ND	2.0	µg/L	58	Naphthalene	ND	8.0	µg/L
24	Bromodichloromethane	ND	2.0	µg/L	59	Hexachlorobutadiene	ND	8.0	µg/L
25	cis-1,3-Dichloropropene	ND	2.0	µg/L	60	1,2,3-Trichlorobenzene	ND	8.0	µg/L
26	trans-1,3-Dichloropropene	ND	2.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	108		%REC
27	1,1,2-Trichloroethane	ND	2.0	µg/L	62	Surr: Toluene-d8	95		%REC
28	Toluene	ND	1.0	µg/L	63	Surr: 4-Bromofluorobenzene	96		%REC
29	1,3-Dichloropropane	ND	2.0	µg/L					
30	Dibromochloromethane	ND	2.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND	8.0	µg/L					
32	Tetrachloroethene	ND	2.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND	2.0	µg/L					
34	Chlorobenzene	ND	2.0	µg/L					
35	Ethylbenzene	ND	1.0	µg/L					

Reporting Limits were increased due to sample foaming.

No Benzene was observed above an estimated reporting limit of 0.50 µg/L.

ND – Not Detected

Roger Schell Randy Gardner Walter Hinchman

Roger L. Schell, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

11/10/05
Report Date

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-07A
Client I.D. Number: 1413-MW09DUP

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/05/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	2.0	µg/L
2	Chloromethane	ND	4.0	µg/L
3	Vinyl chloride	ND	2.0	µg/L
4	Chloroethane	ND	2.0	µg/L
5	Bromomethane	ND	8.0	µg/L
6	Trichlorofluoromethane	ND	2.0	µg/L
7	1,1-Dichloroethene	ND	2.0	µg/L
8	Dichloromethane	ND	8.0	µg/L
9	trans-1,2-Dichloroethene	ND	2.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	1.0	µg/L
11	1,1-Dichloroethane	ND	2.0	µg/L
12	cis-1,2-Dichloroethene	ND	2.0	µg/L
13	Bromochloromethane	ND	2.0	µg/L
14	Chloroform	ND	2.0	µg/L
15	2,2-Dichloropropane	ND	2.0	µg/L
16	1,2-Dichloroethane	ND	2.0	µg/L
17	1,1,1-Trichloroethane	ND	2.0	µg/L
18	1,1-Dichloropropene	ND	2.0	µg/L
19	Carbon tetrachloride	ND	2.0	µg/L
20	Benzene	ND	1.0	µg/L
21	Dibromomethane	ND	2.0	µg/L
22	1,2-Dichloropropane	ND	2.0	µg/L
23	Trichloroethene	ND	2.0	µg/L
24	Bromodichloromethane	ND	2.0	µg/L
25	cis-1,3-Dichloropropene	ND	2.0	µg/L
26	trans-1,3-Dichloropropene	ND	2.0	µg/L
27	1,1,2-Trichloroethane	ND	2.0	µg/L
28	Toluene	ND	1.0	µg/L
29	1,3-Dichloropropane	ND	2.0	µg/L
30	Dibromochloromethane	ND	2.0	µg/L
31	1,2-Dibromoethane (EDB)	ND	8.0	µg/L
32	Tetrachloroethene	ND	2.0	µg/L
33	1,1,1,2-Tetrachloroethane	ND	2.0	µg/L
34	Chlorobenzene	ND	2.0	µg/L
35	Ethylbenzene	ND	1.0	µg/L
36	m,p-Xylene	ND	1.0	µg/L
37	Bromoform	ND	2.0	µg/L
38	Styrene	ND	2.0	µg/L
39	o-Xylene	ND	1.0	µg/L
40	1,1,2,2-Tetrachloroethane	ND	2.0	µg/L
41	1,2,3-Trichloropropane	ND	8.0	µg/L
42	Isopropylbenzene	ND	2.0	µg/L
43	Bromobenzene	ND	2.0	µg/L
44	n-Propylbenzene	ND	2.0	µg/L
45	4-Chlorotoluene	ND	2.0	µg/L
46	2-Chlorotoluene	ND	2.0	µg/L
47	1,3,5-Trimethylbenzene	ND	2.0	µg/L
48	tert-Butylbenzene	ND	2.0	µg/L
49	1,2,4-Trimethylbenzene	2.5	2.0	µg/L
50	sec-Butylbenzene	ND	2.0	µg/L
51	1,3-Dichlorobenzene	ND	2.0	µg/L
52	1,4-Dichlorobenzene	ND	2.0	µg/L
53	4-Isopropyltoluene	ND	2.0	µg/L
54	1,2-Dichlorobenzene	ND	2.0	µg/L
55	n-Butylbenzene	ND	2.0	µg/L
56	1,2-Dibromo-3-chloropropane (DBCP)	ND	12	µg/L
57	1,2,4-Trichlorobenzene	ND	8.0	µg/L
58	Naphthalene	ND	8.0	µg/L
59	Hexachlorobutadiene	ND	8.0	µg/L
60	1,2,3-Trichlorobenzene	ND	8.0	µg/L
61	Surr: 1,2-Dichloroethane-d4	108		%REC
62	Surr: Toluene-d8	95		%REC
63	Surr: 4-Bromofluorobenzene	97		%REC

Reporting Limits were increased due to sample foaming.

No Benzene was observed above an estimated reporting limit of 0.50 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

11/10/05
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-09A
Client I.D. Number: 1413-QCEB

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/05/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	1.0	µg/L
2	Chloromethane	ND	2.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L
5	Bromomethane	ND	2.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L
8	Dichloromethane	ND	2.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/l
11	1,1-Dichloroethane	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/l
15	2,2-Dichloropropane	ND	1.0	µg/L
16	1,2-Dichloroethane	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L
20	Benzene	ND	0.50	µg/L
21	Dibromomethane	ND	1.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L
23	Trichloroethene	ND	1.0	µg/L
24	Bromodichloromethane	ND	1.0	µg/L
25	cis-1,3-Dichloropropene	ND	1.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/l
27	1,1,2-Trichloroethane	ND	1.0	µg/L
28	Toluene	0.57	0.50	µg/L
29	1,3-Dichloropropane	ND	1.0	µg/L
30	Dibromochloromethane	ND	1.0	µg/L
31	1,2-Dibromoethane (EDB)	ND	2.0	µg/L
32	Tetrachloroethene	ND	1.0	µg/L
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L
34	Chlorobenzene	ND	1.0	µg/L
35	Ethylbenzene	ND	0.50	µg/L
36	m,p-Xylene	ND	0.50	µg/L
37	Bromoform	ND	1.0	µg/L
38	Styrene	ND	1.0	µg/L
39	o-Xylene	ND	0.50	µg/L
40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
41	1,2,3-Trichloropropane	ND	2.0	µg/L
42	Isopropylbenzene	ND	1.0	µg/L
43	Bromobenzene	ND	1.0	µg/L
44	n-Propylbenzene	ND	1.0	µg/L
45	4-Chlorotoluene	ND	1.0	µg/L
46	2-Chlorotoluene	ND	1.0	µg/L
47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
48	tert-Butylbenzene	ND	1.0	µg/L
49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
50	sec-Butylbenzene	ND	1.0	µg/L
51	1,3-Dichlorobenzene	ND	1.0	µg/L
52	1,4-Dichlorobenzene	ND	1.0	µg/L
53	4-Isopropyltoluene	ND	1.0	µg/L
54	1,2 Dichlorobenzene	ND	1.0	µg/L
55	n-Butylbenzene	ND	1.0	µg/L
56	1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L
57	1,2,4-Trichlorobenzene	ND	2.0	µg/L
58	Naphthalene	ND	2.0	µg/L
59	Hexachlorobutadiene	ND	2.0	µg/L
60	1,2,3-Trichlorobenzene	ND	2.0	µg/L
61	Surr: 1,2-Dichloroethane-d4	105		%REC
62	Surr: Toluene-d8	92		%REC
63	Surr: 4-Bromofluorobenzene	104		%REC

No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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Report Date

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-08A
Client I.D. Number: 1413-QCFB

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/05/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	1.0	µg/L
2	Chloromethane	ND	2.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L
5	Bromomethane	ND	2.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L
8	Dichloromethane	ND	2.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L
15	2,2-Dichloropropane	ND	1.0	µg/L
16	1,2-Dichloroethane	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L
20	Benzene	ND	0.50	µg/L
21	Dibromomethane	ND	1.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L
23	Trichloroethene	ND	1.0	µg/L
24	Bromodichloromethane	ND	1.0	µg/L
25	cis-1,3-Dichloropropene	ND	1.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L
27	1,1,2-Trichloroethane	ND	1.0	µg/L
28	Toluene	0.58	0.50	µg/L
29	1,3-Dichloropropane	ND	1.0	µg/L
30	Dibromochloromethane	ND	1.0	µg/L
31	1,2-Dibromoethane (EDB)	ND	2.0	µg/L
32	Tetrachloroethene	ND	1.0	µg/L
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L
34	Chlorobenzene	ND	1.0	µg/L
35	Ethylbenzene	ND	0.50	µg/L
36	m,p-Xylene	ND	0.50	µg/L
37	Bromoform	ND	1.0	µg/L
38	Styrene	ND	1.0	µg/L
39	o-Xylene	ND	0.50	µg/L
40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
41	1,2,3-Trichloropropane	ND	2.0	µg/L
42	Isopropylbenzene	ND	1.0	µg/L
43	Bromobenzene	ND	1.0	µg/L
44	n-Propylbenzene	ND	1.0	µg/L
45	4-Chlorotoluene	ND	1.0	µg/L
46	2-Chlorotoluene	ND	1.0	µg/L
47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
48	tert-Butylbenzene	ND	1.0	µg/L
49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
50	sec-Butylbenzene	ND	1.0	µg/L
51	1,3-Dichlorobenzene	ND	1.0	µg/L
52	1,4-Dichlorobenzene	ND	1.0	µg/L
53	4-Isopropyltoluene	ND	1.0	µg/L
54	1,2-Dichlorobenzene	ND	1.0	µg/L
55	n-Butylbenzene	ND	1.0	µg/L
56	1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L
57	1,2,4-Trichlorobenzene	ND	2.0	µg/L
58	Naphthalene	ND	2.0	µg/L
59	Hexachlorobutadiene	ND	2.0	µg/L
60	1,2,3-Trichlorobenzene	ND	2.0	µg/L
61	Surr: 1,2-Dichloroethane-d4	107		%REC
62	Surr: Toluene-d8	95		%REC
63	Surr: 4-Bromofluorobenzene	105		%REC

No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

11/10/05
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-10A
Client I.D. Number: 1413-QCTB

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/05/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	1.0	µg/L
2	Chloromethane	ND	2.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L
5	Bromomethane	ND	2.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L
8	Dichloromethane	ND	2.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L
15	2,2-Dichloropropane	ND	1.0	µg/L
16	1,2-Dichloroethane	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L
20	Benzene	ND	0.50	µg/L
21	Dibromomethane	ND	1.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L
23	Trichloroethene	ND	1.0	µg/L
24	Bromodichloromethane	ND	1.0	µg/L
25	cis-1,3-Dichloropropene	ND	1.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L
27	1,1,2-Trichloroethane	ND	1.0	µg/L
28	Toluene	ND	0.50	µg/L
29	1,3-Dichloropropane	ND	1.0	µg/L
30	Dibromochloromethane	ND	1.0	µg/L
31	1,2-Dibromoethane (EDB)	ND	2.0	µg/L
32	Tetrachloroethene	ND	1.0	µg/L
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L
34	Chlorobenzene	ND	1.0	µg/L
35	Ethylbenzene	ND	0.50	µg/L
36	m,p-Xylene	ND	0.50	µg/L
37	Bromoform	ND	1.0	µg/L
38	Styrene	ND	1.0	µg/L
39	o-Xylene	ND	0.50	µg/L
40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
41	1,2,3-Trichloropropane	ND	2.0	µg/L
42	Isopropylbenzene	ND	1.0	µg/L
43	Bromobenzene	ND	1.0	µg/L
44	n-Propylbenzene	ND	1.0	µg/L
45	4-Chlorotoluene	ND	1.0	µg/L
46	2-Chlorotoluene	ND	1.0	µg/L
47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
48	tert-Butylbenzene	ND	1.0	µg/L
49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
50	sec-Butylbenzene	ND	1.0	µg/L
51	1,3-Dichlorobenzene	ND	1.0	µg/L
52	1,4-Dichlorobenzene	ND	1.0	µg/L
53	4-Isopropyltoluene	ND	1.0	µg/L
54	1,2-Dichlorobenzene	ND	1.0	µg/L
55	n-Butylbenzene	ND	1.0	µg/L
56	1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L
57	1,2,4-Trichlorobenzene	ND	2.0	µg/L
58	Naphthalene	ND	2.0	µg/L
59	Hexachlorobutadiene	ND	2.0	µg/L
60	1,2,3-Trichlorobenzene	ND	2.0	µg/L
61	Surr: 1,2-Dichloroethane-d4	104		%REC
62	Surr: Toluene-d8	96		%REC
63	Surr: 4-Bromofluorobenzene	107		%REC

No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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11/10/05
Report Date

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

VOC Sample Preservation Report

Work Order: BMI05102803 **Project:** TO102:14133

Alpha's Sample ID	Client's Sample ID	Matrix	pH
05102803-01A	1413-MW04	Aqueous	2
05102803-02A	1413-MW05	Aqueous	2
05102803-03A	1413-MW06	Aqueous	2
05102803-04A	1413-MW07	Aqueous	2
05102803-05A	1413-MW08	Aqueous	2
05102803-06A	1413-MW09	Aqueous	2
05102803-07A	1413-MW09DUP	Aqueous	2
05102803-08A	1413-QCFB	Aqueous	2
05102803-09A	1413-QCEB	Aqueous	2
05102803-10A	1413-QCTB	Aqueous	

11/10/05

Report Date

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-01A
Client I.D. Number: 1413-MW04

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/08/05

Semivolatile Organics by GC/MS
EPA Method SW8270C

	Compound	Concentration	Reporting Limit
1	Naphthalene	ND	10 µg/L
2	Acenaphthylene	ND	10 µg/L
3	Acenaphthene	ND	10 µg/L
4	Fluorene	ND	10 µg/L
5	Phenanthrene	ND	10 µg/L
6	Anthracene	ND	10 µg/L
7	Fluoranthene	ND	10 µg/L
8	Pyrene	ND	10 µg/L
9	Benzo(a)anthracene	ND	10 µg/L
10	Chrysene	ND	10 µg/L
11	Benzo(b)fluoranthene	ND	10 µg/L
12	Benzo(k)fluoranthene	ND	10 µg/L
13	Benzo(a)pyrene	ND	10 µg/L
14	Indeno(1,2,3-cd)pyrene	ND	10 µg/L
15	Dibenz(a,h)anthracene	ND	10 µg/L
16	Benzo(g,h,i)perylene	ND	10 µg/L
17	Surr: Nitrobenzene-d5	94	%REC
18	Surr: 2-Fluorobiphenyl	71	%REC
19	Surr: 4-Terphenyl-d14	89	%REC

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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11/10/05
Report Date

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-02A
Client I.D. Number: 1413-MW05

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/08/05

Semivolatile Organics by GC/MS
EPA Method SW8270C

	Compound	Concentration	Reporting Limit
1	Naphthalene	ND	10 µg/L
2	Acenaphthylene	ND	10 µg/L
3	Acenaphthene	ND	10 µg/L
4	Fluorene	ND	10 µg/L
5	Phenanthrene	ND	10 µg/L
6	Anthracene	ND	10 µg/L
7	Fluoranthene	ND	10 µg/L
8	Pyrene	ND	10 µg/L
9	Benzo(a)anthracene	ND	10 µg/L
10	Chrysene	ND	10 µg/L
11	Benzo(b)fluoranthene	ND	10 µg/L
12	Benzo(k)fluoranthene	ND	10 µg/L
13	Benzo(a)pyrene	ND	10 µg/L
14	Indeno(1,2,3-cd)pyrene	ND	10 µg/L
15	Dibenz(a,h)anthracene	ND	10 µg/L
16	Benzo(g,h,i)perylene	ND	10 µg/L
17	Surr: Nitrobenzene-d5	96	%REC
18	Surr: 2-Fluorobiphenyl	67	%REC
19	Surr: 4-Terphenyl-d14	94	%REC

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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11/10/05
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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-03A
Client I.D. Number: 1413-MW06

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/08/05

Semivolatile Organics by GC/MS
EPA Method SW8270C

	Compound	Concentration	Reporting Limit
1	Naphthalene	ND	10 µg/L
2	Acenaphthylene	ND	10 µg/L
3	Acenaphthene	ND	10 µg/L
4	Fluorene	ND	10 µg/L
5	Phenanthrene	ND	10 µg/L
6	Anthracene	ND	10 µg/L
7	Fluoranthene	ND	10 µg/L
8	Pyrene	ND	10 µg/L
9	Benzo(a)anthracene	ND	10 µg/L
10	Chrysene	ND	10 µg/L
11	Benzo(b)fluoranthene	ND	10 µg/L
12	Benzo(k)fluoranthene	ND	10 µg/L
13	Benzo(a)pyrene	ND	10 µg/L
14	Indeno(1,2,3-cd)pyrene	ND	10 µg/L
15	Dibenz(a,h)anthracene	ND	10 µg/L
16	Benzo(g,h,i)perylene	ND	10 µg/L
17	Surr: Nitrobenzene-d5	84	%REC
18	Surr: 2-Fluorobiphenyl	60	%REC
19	Surr: 4-Terphenyl-d14	81	%REC

ND Not Detected

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer
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11/10/05
Report Date

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-04A
Client I.D. Number: 1413-MW07

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/08/05

Semivolatile Organics by GC/MS
EPA Method SW8270C

	Compound	Concentration	Reporting Limit
1	Naphthalene	ND	10 µg/L
2	Acenaphthylene	ND	10 µg/L
3	Acenaphthene	ND	10 µg/L
4	Fluorene	ND	10 µg/L
5	Phenanthrene	ND	10 µg/L
6	Anthracene	ND	10 µg/L
7	Fluoranthene	ND	10 µg/L
8	Pyrene	ND	10 µg/L
9	Benzo(a)anthracene	ND	10 µg/L
10	Chrysene	ND	10 µg/L
11	Benzo(b)fluoranthene	ND	10 µg/L
12	Benzo(k)fluoranthene	ND	10 µg/L
13	Benzo(a)pyrene	ND	10 µg/L
14	Indeno(1,2,3-cd)pyrene	ND	10 µg/L
15	Dibenz(a,h)anthracene	ND	10 µg/L
16	Benzo(g,h,i)perylene	ND	10 µg/L
17	Surr: Nitrobenzene-d5	93	%REC
18	Surr: 2-Fluorobiphenyl	73	%REC
19	Surr: 4-Terphenyl-d14	93	%REC

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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11/10/05
Report Date

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-05A
Client I.D. Number: 1413-MW08

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/08/05

Semivolatile Organics by GC/MS
EPA Method SW8270C

	Compound	Concentration	Reporting Limit
1	Naphthalene	ND	10 µg/L
2	Acenaphthylene	ND	10 µg/L
3	Acenaphthene	ND	10 µg/L
4	Fluorene	ND	10 µg/L
5	Phenanthrene	ND	10 µg/L
6	Anthracene	ND	10 µg/L
7	Fluoranthene	ND	10 µg/L
8	Pyrene	ND	10 µg/L
9	Benzo(a)anthracene	ND	10 µg/L
10	Chrysene	ND	10 µg/L
11	Benzo(b)fluoranthene	ND	10 µg/L
12	Benzo(k)fluoranthene	ND	10 µg/L
13	Benzo(a)pyrene	ND	10 µg/L
14	Indeno(1,2,3-cd)pyrene	ND	10 µg/L
15	Dibenz(a,h)anthracene	ND	10 µg/L
16	Benzo(g,h,i)perylene	ND	10 µg/L
17	Surr: Nitrobenzene-d5	90	%REC
18	Surr: 2-Fluorobiphenyl	68	%REC
19	Surr: 4-Terphenyl-d14	88	%REC

ND: Not Detected

Roger Scholl Randy Gardner Walter Hirschman

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11/10/05
Report Date

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-06A
Client I.D. Number: 1413-MW09

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/08/05

Semivolatile Organics by GC/MS
EPA Method SW8270C

	Compound	Concentration	Reporting Limit
1	Naphthalene	ND	20 µg/L
2	Acenaphthylene	ND	20 µg/L
3	Acenaphthene	ND	20 µg/L
4	Fluorene	ND	20 µg/L
5	Phenanthrene	ND	20 µg/L
6	Anthracene	ND	20 µg/L
7	Fluoranthene	ND	20 µg/L
8	Pyrene	ND	20 µg/L
9	Benzo(a)anthracene	ND	20 µg/L
10	Chrysene	ND	20 µg/L
11	Benzo(b)fluoranthene	ND	20 µg/L
12	Benzo(k)fluoranthene	ND	20 µg/L
13	Benzo(a)pyrene	ND	20 µg/L
14	Indeno(1,2,3-cd)pyrene	ND	20 µg/L
15	Dibenz(a,h)anthracene	ND	20 µg/L
16	Benzo(g,h,i)perylene	ND	20 µg/L
17	Surr: Nitrobenzene-d5	84	%REC
18	Surr: 2-Fluorobiphenyl	70	%REC
19	Surr: 4-Terphenyl-d14	88	%REC

Reporting Limits were increased due to the hydrocarbons present in the sample.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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11/10/05
Report Date

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-07A
Client I.D. Number: 1413 MW09DUP

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/08/05

Semivolatile Organics by GC/MS
EPA Method SW8270C

	Compound	Concentration	Reporting Limit
1	Naphthalene	ND	20 µg/L
2	Acenaphthylene	ND	20 µg/L
3	Acenaphthene	ND	20 µg/L
4	Fluorene	ND	20 µg/L
5	Phenanthrene	ND	20 µg/L
6	Anthracene	ND	20 µg/L
7	Fluoranthene	ND	20 µg/L
8	Pyrene	ND	20 µg/L
9	Benzo(a)anthracene	ND	20 µg/L
10	Chrysene	ND	20 µg/L
11	Benzo(b)fluoranthene	ND	20 µg/L
12	Benzo(k)fluoranthene	ND	20 µg/L
13	Benzo(a)pyrene	ND	20 µg/L
14	Indeno(1,2,3-cd)pyrene	ND	20 µg/L
15	Dibenz(a,h)anthracene	ND	20 µg/L
16	Benzo(g,h,i)perylene	ND	20 µg/L
17	Surr: Nitrobenzene-d5	85	%REC
18	Surr: 2-Fluorobiphenyl	68	%REC
19	Surr: 4-Terphenyl-d14	88	%REC

Reporting Limits were increased due to the hydrocarbons present in the sample.

ND = Not Detected

Roger Schell Randy Gardner Walter Hinchman

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Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

11/10/05
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 10/28/05

Job#: TO102:14133

Alkalinity
EPA Method 310.1

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1413-MW04					
Lab ID :	BMI05102803-01A	Alkalinity, Total (As CaCO3 at pH 4.5)	290	1.0 mg/L	10/27/05	11/09/05
Client ID :	1413-MW05					
Lab ID :	BMI05102803-02A	Alkalinity, Total (As CaCO3 at pH 4.5)	410	1.0 mg/L	10/27/05	11/09/05
Client ID :	1413-MW06					
Lab ID :	BMI05102803-03A	Alkalinity, Total (As CaCO3 at pH 4.5)	350	1.0 mg/L	10/27/05	11/09/05
Client ID :	1413-MW07					
Lab ID :	BMI05102803-04A	Alkalinity, Total (As CaCO3 at pH 4.5)	340	1.0 mg/L	10/27/05	11/09/05
Client ID :	1413-MW08					
Lab ID :	BMI05102803-05A	Alkalinity, Total (As CaCO3 at pH 4.5)	340	1.0 mg/L	10/27/05	11/09/05
Client ID :	1413-MW09					
Lab ID :	BMI05102803-06A	Alkalinity, Total (As CaCO3 at pH 4.5)	390	1.0 mg/L	10/27/05	11/09/05
Client ID :	1413-MW09DUP					
Lab ID :	BMI05102803-07A	Alkalinity, Total (As CaCO3 at pH 4.5)	350	1.0 mg/L	10/27/05	11/09/05

Roger Scholl Randy Gardner Walter Hinchman

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11/10/05
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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 10/28/05

Job#: TO102:14133

Iron by Spectrophotometer
SM3500-Fe D

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1413-MW04**					
Lab ID :	BMI05102803-01A	Iron, Ferrous (+2)	0.059	0.050 mg/L	10/27/05	10/28/05
Client ID :	**1413-MW05**					
Lab ID :	BMI05102803-02A	Iron, Ferrous (+2)	ND	0.050 mg/L	10/27/05	10/28/05
Client ID :	**1413-MW06**					
Lab ID :	BMI05102803-03A	Iron, Ferrous (+2)	ND	0.050 mg/L	10/27/05	10/28/05
Client ID :	**1413-MW07**					
Lab ID :	BMI05102803-04A	Iron, Ferrous (+2)	ND	0.050 mg/L	10/27/05	10/28/05
Client ID :	**1413-MW08**					
Lab ID :	BMI05102803-05A	Iron, Ferrous (+2)	ND	0.050 mg/L	10/27/05	10/28/05
Client ID :	**1413-MW09**					
Lab ID :	BMI05102803-06A	Iron, Ferrous (+2)	ND	0.050 mg/L	10/27/05	10/28/05
Client ID :	**1413-MW09DUP**					
Lab ID :	BMI05102803-07A	Iron, Ferrous (+2)	ND	0.050 mg/L	10/27/05	10/28/05

ND – Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

11/10/05
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 10/28/05

Job#: TO102:14133

Total Dissolved Solids (TDS)
EPA Method 160.1 / SM 2540 C

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1413-MW04**					
Lab ID :	BMI05102803-01A	Solids, Total Dissolved (TDS)	2,500	25 mg/L	10/27/05	11/07/05
Client ID :	**1413-MW05**					
Lab ID :	BMI05102803-02A	Solids, Total Dissolved (TDS)	5,100	25 mg/L	10/27/05	11/07/05
Client ID :	**1413-MW06**					
Lab ID :	BMI05102803-03A	Solids, Total Dissolved (TDS)	3,400	25 mg/L	10/27/05	11/04/05
Client ID :	**1413-MW07**					
Lab ID :	BMI05102803-04A	Solids, Total Dissolved (TDS)	5,400	25 mg/L	10/27/05	11/07/05
Client ID :	**1413-MW08**					
Lab ID :	BMI05102803-05A	Solids, Total Dissolved (TDS)	8,300	50 mg/L	10/27/05	11/07/05
Client ID :	**1413-MW09**					
Lab ID :	BMI05102803-06A	Solids, Total Dissolved (TDS)	980	10 mg/L	10/27/05	11/04/05
Client ID :	**1413-MW09DUP**					
Lab ID :	BMI05102803-07A	Solids, Total Dissolved (TDS)	920	10 mg/L	10/27/05	11/04/05

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11/10/05
Report Date

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Anions by Ion Chromatography (IC) EPA Method 300.0 / SW9056

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1413-MW04					
Lab ID :	BMI05102803-01A	Nitrite (NO2) - N	ND	0.25 mg/L	10/27/05	10/28/05
		Nitrate (NO3) - N	1.3	0.25 mg/L	10/27/05	10/28/05
		Sulfate (SO4)	270	5.0 mg/L	10/27/05	11/10/05
Client ID :	1413-MW05					
Lab ID :	BMI05102803-02A	Nitrite (NO2) - N	ND	0.25 mg/L	10/27/05	10/28/05
		Nitrate (NO3) - N	ND	0.25 mg/L	10/27/05	10/28/05
		Sulfate (SO4)	760	10 mg/L	10/27/05	11/10/05
Client ID :	1413-MW06					
Lab ID :	BMI05102803-03A	Nitrite (NO2) - N	ND	0.25 mg/L	10/27/05	10/28/05
		Nitrate (NO3) - N	1.6	0.25 mg/L	10/27/05	10/28/05
		Sulfate (SO4)	340	5.0 mg/L	10/27/05	11/10/05
Client ID :	1413-MW07					
Lab ID :	BMI05102803-04A	Nitrite (NO2) - N	ND	0.25 mg/L	10/27/05	10/28/05
		Nitrate (NO3) - N	3.6	0.25 mg/L	10/27/05	10/28/05
		Sulfate (SO4)	580	10 mg/L	10/27/05	11/10/05
Client ID :	1413-MW08					
Lab ID :	BMI05102803-05A	Nitrite (NO2) - N	ND	0.25 mg/L	10/27/05	10/28/05
		Nitrate (NO3) - N	1.5	0.25 mg/L	10/27/05	10/28/05
		Sulfate (SO4)	910	10 mg/L	10/27/05	11/10/05
Client ID :	1413-MW09					
Lab ID :	BMI05102803-06A	Nitrite (NO2) - N	ND	0.25 mg/L	10/27/05	10/28/05
		Nitrate (NO3) N	ND	0.25 mg/L	10/27/05	10/28/05
		Sulfate (SO4)	95	1.0 mg/L	10/27/05	10/28/05
Client ID :	1413-MW09DUP					
Lab ID :	BMI05102803-07A	Nitrite (NO2) - N	ND	0.25 mg/L	10/27/05	10/28/05
		Nitrate (NO3) - N	ND	0.25 mg/L	10/27/05	10/28/05
		Sulfate (SO4)	87	1.0 mg/L	10/27/05	10/28/05

ND -- Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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Report Date

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ANALYTICAL REPORT

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Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 10/28/05

Job#: TO102:14133

Dissolved Metals by ICPMS
EPA Method SW6020

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1413-MW04**					
Lab ID :	BMI05102803-01A	Manganese (Mn), Dissolved	0.13	0.0050 mg/L	10/27/05	11/04/05
Client ID :	**1413-MW05**					
Lab ID :	BMI05102803-02A	Manganese (Mn), Dissolved	0.33	0.0050 mg/L	10/27/05	11/04/05
Client ID :	**1413-MW06**					
Lab ID :	BMI05102803-03A	Manganese (Mn), Dissolved	0.084	0.0050 mg/L	10/27/05	11/04/05
Client ID :	**1413-MW07**					
Lab ID :	BMI05102803-04A	Manganese (Mn), Dissolved	0.41	0.0050 mg/L	10/27/05	11/04/05
Client ID :	**1413-MW08**					
Lab ID :	BMI05102803-05A	Manganese (Mn), Dissolved	0.44	0.0050 mg/L	10/27/05	11/08/05
Client ID :	**1413-MW09**					
Lab ID :	BMI05102803-06A	Manganese (Mn), Dissolved	0.55	0.0050 mg/L	10/27/05	11/04/05
Client ID :	**1413-MW09DUP**					
Lab ID :	BMI05102803-07A	Manganese (Mn), Dissolved	0.40	0.0050 mg/L	10/27/05	11/04/05

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ANALYTICAL REPORT

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Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 10/28/05

Job#: TO102:14133

Metals by ICPMS
EPA Method SW6020

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1413-MW04**					
Lab ID :	BMI05102803 01A	Lead (Pb)	ND	0.0050 mg/L	10/27/05	11/04/05
Client ID :	**1413-MW05**					
Lab ID :	BMI05102803-02A	Lead (Pb)	ND	0.0050 mg/L	10/27/05	11/04/05
Client ID :	**1413-MW06**					
Lab ID :	BMI05102803-03A	Lead (Pb)	ND	0.0050 mg/L	10/27/05	11/04/05
Client ID :	**1413-MW07**					
Lab ID :	BMI05102803-04A	Lead (Pb)	ND	0.0050 mg/L	10/27/05	11/04/05
Client ID :	**1413-MW08**					
Lab ID :	BMI05102803-05A	Lead (Pb)	ND	0.0050 mg/L	10/27/05	11/04/05
Client ID :	**1413-MW09**					
Lab ID :	BMI05102803-06A	Lead (Pb)	ND	0.0050 mg/L	10/27/05	11/04/05
Client ID :	**1413-MW09DUP**					
Lab ID :	BMI05102803-07A	Lead (Pb)	ND	0.0050 mg/L	10/27/05	11/04/05

ND – Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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ANALYTICAL REPORT

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Columbus, OH 43201

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 10/28/05

Job#: TO102:14133

Dissolved Gases
Modified Method RSK-175 GC/FID

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1413-MW04**					
Lab ID :	BMI05102803-01A	Methane	0.037	0.010 mg/L	10/27/05	10/31/05
Client ID :	**1413-MW05**					
Lab ID :	BMI05102803-02A	Methane	0.52	0.010 mg/L	10/27/05	10/31/05
Client ID :	**1413-MW06**					
Lab ID :	BMI05102803-03A	Methane	ND	0.010 mg/L	10/27/05	10/31/05
Client ID :	**1413-MW07**					
Lab ID :	BMI05102803-04A	Methane	ND	0.010 mg/L	10/27/05	10/31/05
Client ID :	**1413-MW08**					
Lab ID :	BMI05102803-05A	Methane	ND	0.010 mg/L	10/27/05	10/31/05
Client ID :	**1413-MW09**					
Lab ID :	BMI05102803-06A	Methane	0.41	0.010 mg/L	10/27/05	10/31/05
Client ID :	**1413-MW09DUP**					
Lab ID :	BMI05102803-07A	Methane	0.42	0.010 mg/L	10/27/05	10/31/05

ND = Not Detected

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ANALYTICAL REPORT

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Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 10/28/05

Job#: TO102:14133

Total Organic Carbon as NonPurgeable Organic Carbon
EPA Method SW9060/415.1/SM-5310C

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1413-MW04**					
Lab ID :	BMI05102803-01A	Total Organic Carbon	11	1.0 mg/L	10/27/05	11/04/05
Client ID :	**1413-MW05**					
Lab ID :	BMI05102803-02A	Total Organic Carbon	18	1.0 mg/L	10/27/05	11/04/05
Client ID :	**1413-MW06**					
Lab ID :	BMI05102803-03A	Total Organic Carbon	9.1	1.0 mg/L	10/27/05	11/04/05
Client ID :	**1413-MW07**					
Lab ID :	BMI05102803-04A	Total Organic Carbon	14	1.0 mg/L	10/27/05	11/04/05
Client ID :	**1413-MW08**					
Lab ID :	BMI05102803-05A	Total Organic Carbon	13	1.0 mg/L	10/27/05	11/04/05
Client ID :	**1413-MW09**					
Lab ID :	BMI05102803-06A	Total Organic Carbon	34	4.0 mg/L	10/27/05	11/05/05
Client ID :	**1413-MW09DUP**					
Lab ID :	BMI05102803-07A	Total Organic Carbon	25	4.0 mg/L	10/27/05	11/10/05

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11/10/05
Report Date

JANUARY 2006

Alpha Analytical, Inc.

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Date: *01-Feb-06*

Chris Zimmerman
Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
(614) 424-3779

CASE NARRATIVE

Project: TO102-1413

Work Order: BMI06011905 **Cooler Temp:** 4 °C

Alpha's Sample ID	Client's Sample ID	Matrix
06011905-01A	1413-QCTB	Aqueous
06011905-02A	1413-QCFB	Aqueous
06011905-03A	1413-QCEB	Aqueous
06011905-04A	1413-MW04	Aqueous
06011905-05A	1413-MW05	Aqueous
06011905-06A	1413-MW05DUP	Aqueous
06011905-07A	1413-MW06	Aqueous
06011905-08A	1413-MW07	Aqueous
06011905-09A	1413-MW08	Aqueous
06011905-10A	1413-MW09	Aqueous

Enclosed please find the analytical results of the samples received by Alpha Analytical, Inc. under the above mentioned Work Order/Chain-of-Custody.

Alpha Analytical, Inc. has a formal Quality Assurance/Quality Control program, which is designed to meet or exceed the EPA requirements. All relevant QC met quality assurance objectives for this project unless otherwise stated in the footnotes.

If you have any questions with regards to this report, please contact Randy Gardner, Project Manager, at (800) 283-1183.

Alpha Analytical, Inc.

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Date: *18-Feb-06*

Chris Zimmerman
Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
(614) 424-3779

CASE NARRATIVE

Project: TO102-1413

Work Order: BMI06011852 **Cooler Temp:** 4 °C

Alpha's Sample ID	Client's Sample ID	Matrix
06011852-01A	1413-MW04	Aqueous
06011852-02A	1413-MW05	Aqueous
06011852-03A	1413-MW05DUP	Aqueous
06011852-04A	1413-MW06	Aqueous
06011852-05A	1413-MW07	Aqueous
06011852-06A	1413-MW08	Aqueous
06011852-07A	1413-MW09	Aqueous

Enclosed please find the analytical results of the samples received by Alpha Analytical, Inc. under the above mentioned Work Order/Chain-of-Custody.

Alpha Analytical, Inc. has a formal Quality Assurance/Quality Control program, which is designed to meet or exceed the EPA requirements. All relevant QC met quality assurance objectives for this project unless otherwise stated in the footnotes.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 01/19/06

Job#: TO102-1413

Total Petroleum Hydrocarbons - Extractable (TPH-E) EPA Method SW8015B/DHS LUFT Manual

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1413-QCEB	TPH-E (Diesel)	ND	0.050 mg/L	01/17/06	01/20/06
Lab ID :	BMI06011905-03A	TPH-E (Oil)	ND	0.50 mg/L	01/17/06	01/20/06
		Surr: Nonane	101	%REC	01/17/06	01/20/06
Client ID :	1413-MW04	TPH-E (Diesel)	0.15	0.050 mg/L	01/17/06	01/20/06
Lab ID :	BMI06011905-04A	TPH-E (Oil)	ND	0.50 mg/L	01/17/06	01/20/06
		Surr: Nonane	100	%REC	01/17/06	01/20/06
Client ID :	1413-MW05	TPH-E (Diesel)	0.23	0.050 mg/L	01/17/06	01/20/06
Lab ID :	BMI06011905-05A	TPH-E (Oil)	ND	0.50 mg/L	01/17/06	01/20/06
		Surr: Nonane	73	%REC	01/17/06	01/20/06
Client ID :	1413-MW05DUP	TPH-E (Diesel)	0.24	0.050 mg/L	01/17/06	01/20/06
Lab ID :	BMI06011905-06A	TPH-E (Oil)	ND	0.50 mg/L	01/17/06	01/20/06
		Surr: Nonane	86	%REC	01/17/06	01/20/06
Client ID :	1413-MW06	TPH-E (Diesel)	ND	0.050 mg/L	01/17/06	01/20/06
Lab ID :	BMI06011905-07A	TPH-E (Oil)	ND	0.50 mg/L	01/17/06	01/20/06
		Surr: Nonane	100	%REC	01/17/06	01/20/06
Client ID :	1413-MW07	TPH-E (Diesel)	ND	0.050 mg/L	01/17/06	01/21/06
Lab ID :	BMI06011905-08A	TPH-E (Oil)	ND	0.50 mg/L	01/17/06	01/21/06
		Surr: Nonane	101	%REC	01/17/06	01/21/06
Client ID :	1413-MW08	TPH-E (Diesel)	0.081	0.050 mg/L	01/17/06	01/21/06
Lab ID :	BMI06011905-09A	TPH-E (Oil)	ND	0.50 mg/L	01/17/06	01/21/06
		Surr: Nonane	63	%REC	01/17/06	01/21/06
Client ID :	1413-MW09	TPH-E (Diesel)	0.36	0.050 mg/L	01/17/06	01/21/06
Lab ID :	BMI06011905-10A	TPH-E (Oil)	ND	0.50 mg/L	01/17/06	01/21/06
		Surr: Nonane	98	%REC	01/17/06	01/21/06

Alpha Analytical, Inc.

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ND = Not Detected

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2/1/06
Report Date

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI06011905-04A
Client I.D. Number: 1413-MW04

Sampled: 01/17/06
Received: 01/19/06
Analyzed: 01/23/06

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	1.0	µg/L	36	m,p-Xylene	ND	0.50	µg/L
2	Chloromethane	ND	2.0	µg/L	37	Bromoform	ND	1.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L	38	Styrene	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L	39	o-Xylene	ND	0.50	µg/L
5	Bromomethane	ND	2.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L	41	1,2,3-Trichloropropane	ND	2.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L	42	Isopropylbenzene	ND	1.0	µg/L
8	Dichloromethane	ND	2.0	µg/L	43	Bromobenzene	ND	1.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L	44	n-Propylbenzene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L	45	4-Chlorotoluene	ND	1.0	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L	46	2-Chlorotoluene	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L	47	1,3,5-Trimethylbenzene	ND	1.0	µg/l
13	Bromochloromethane	ND	1.0	µg/L	48	tert-Butylbenzene	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L	49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
15	2,2-Dichloropropane	ND	1.0	µg/L	50	sec-Butylbenzene	ND	1.0	µg/L
16	1,2-Dichloroethane	ND	1.0	µg/l	51	1,3-Dichlorobenzene	ND	1.0	µg/l
17	1,1,1-Trichloroethane	ND	1.0	µg/L	52	1,4-Dichlorobenzene	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L	53	4-Isopropyltoluene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L	54	1,2-Dichlorobenzene	ND	1.0	µg/L
20	Benzene	ND *	0.50	µg/L	55	n-Butylbenzene	ND	1.0	µg/l
21	Dibromomethane	ND	1.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L	57	1,2,4-Trichlorobenzene	ND	2.0	µg/L
23	Trichloroethene	ND	1.0	µg/L	58	Naphthalene	ND	2.0	µg/L
24	Bromodichloromethane	ND	1.0	µg/l	59	Hexachlorobutadiene	ND	2.0	µg/L
25	cis-1,3-Dichloropropene	ND	1.0	µg/L	60	1,2,3-Trichlorobenzene	ND	2.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	99		%REC
27	1,1,2-Trichloroethane	ND	1.0	µg/L	62	Surr: Toluene-d8	98		%REC
28	Toluene	ND	0.50	µg/L	63	Surr: 4-Bromofluorobenzene	94		%REC
29	1,3-Dichloropropane	ND	1.0	µg/L					
30	Dibromochloromethane	ND	1.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND	2.0	µg/L					
32	Tetrachloroethene	ND	1.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L					
34	Chlorobenzene	ND	1.0	µg/L					
35	Ethylbenzene	ND	0.50	µg/L					

*No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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2/1/06
Report Date

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI06011905-05A
Client I.D. Number: 1413-MW05

Sampled: 01/17/06
Received: 01/19/06
Analyzed: 01/23/06

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	1.0	µg/L	36	m,p-Xylene	ND	0.50	µg/L
2	Chloromethane	ND	2.0	µg/L	37	Bromoform	ND	1.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L	38	Styrene	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L	39	o-Xylene	ND	0.50	µg/L
5	Bromomethane	ND	4.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L	41	1,2,3-Trichloropropane	ND	4.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L	42	Isopropylbenzene	ND	1.0	µg/L
8	Dichloromethane	ND	4.0	µg/L	43	Bromobenzene	ND	1.0	µg/L
9	trans 1,2 Dichloroethene	ND	1.0	µg/L	44	n-Propylbenzene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L	45	4-Chlorotoluene	ND	1.0	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L	46	2-Chlorotoluene	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L	47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L	48	tert-Butylbenzene	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L	49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
15	2,2-Dichloropropane	ND	1.0	µg/L	50	sec-Butylbenzene	ND	1.0	µg/L
16	1,2-Dichloroethane	ND	1.0	µg/L	51	1,3-Dichlorobenzene	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L	52	1,4-Dichlorobenzene	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L	53	4-Isopropyltoluene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L	54	1,2-Dichlorobenzene	ND	1.0	µg/L
20	Benzene	0.54	0.50	µg/L	55	n-Butylbenzene	ND	1.0	µg/L
21	Dibromomethane	ND	1.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	6.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L	57	1,2,4-Trichlorobenzene	ND	4.0	µg/L
23	Trichloroethene	ND	1.0	µg/L	58	Naphthalene	ND	4.0	µg/l
24	Bromodichloromethane	ND	1.0	µg/L	59	Hexachlorobutadiene	ND	4.0	µg/L
25	cis-1,3-Dichloropropene	ND	1.0	µg/L	60	1,2,3-Trichlorobenzene	ND	4.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	102		%REC
27	1,1,2-Trichloroethane	ND	1.0	µg/L	62	Surr: Toluene-d8	96		%REC
28	Toluene	ND	0.50	µg/L	63	Surr: 4-Bromofluorobenzene	94		%REC
29	1,3-Dichloropropane	ND	1.0	µg/L					
30	Dibromochloromethane	ND	1.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND	4.0	µg/L					
32	Tetrachloroethene	ND	1.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L					
34	Chlorobenzene	ND	1.0	µg/L					
35	Ethylbenzene	ND	0.50	µg/L					

Some Reporting Limits were increased due to sample foaming.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

2/1/06
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI06011905-06A
Client I.D. Number: 1413-MW05DUP

Sampled: 01/17/06
Received: 01/19/06
Analyzed: 01/23/06

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	1.0	µg/L	36	m,p-Xylene	ND	0.50	µg/L
2	Chloromethane	ND	2.0	µg/L	37	Bromoform	ND	1.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L	38	Styrene	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L	39	o-Xylene	ND	0.50	µg/L
5	Bromomethane	ND	4.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L	41	1,2,3-Trichloropropane	ND	4.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L	42	Isopropylbenzene	ND	1.0	µg/L
8	Dichloromethane	ND	4.0	µg/L	43	Bromobenzene	ND	1.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L	44	n-Propylbenzene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L	45	4-Chlorotoluene	ND	1.0	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L	46	2-Chlorotoluene	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L	47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L	48	tert-Butylbenzene	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L	49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
15	2,2-Dichloropropane	ND	1.0	µg/L	50	sec-Butylbenzene	ND	1.0	µg/L
16	1,2-Dichloroethane	ND	1.0	µg/L	51	1,3-Dichlorobenzene	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L	52	1,4-Dichlorobenzene	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L	53	4-Isopropyltoluene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L	54	1,2-Dichlorobenzene	ND	1.0	µg/L
20	Benzene	0.52	0.50	µg/L	55	n-Butylbenzene	ND	1.0	µg/L
21	Dibromomethane	ND	1.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	6.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L	57	1,2,4-Trichlorobenzene	ND	4.0	µg/L
23	Trichloroethene	ND	1.0	µg/L	58	Naphthalene	ND	4.0	µg/L
24	Bromodichloromethane	ND	1.0	µg/L	59	Hexachlorobutadiene	ND	4.0	µg/L
25	cis-1,3-Dichloropropene	ND	1.0	µg/L	60	1,2,3-Trichlorobenzene	ND	4.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	101		%REC
27	1,1,2-Trichloroethane	ND	1.0	µg/L	62	Surr: Toluene-d8	97		%REC
28	Toluene	ND	0.50	µg/L	63	Surr: 4-Bromofluorobenzene	97		%REC
29	1,3-Dichloropropane	ND	1.0	µg/L					
30	Dibromochloromethane	ND	1.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND	4.0	µg/L					
32	Tetrachloroethene	ND	1.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L					
34	Chlorobenzene	ND	1.0	µg/L					
35	Ethylbenzene	ND	0.50	µg/L					

Some Reporting Limits were increased due to sample foaming.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer
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2/1/06
Report Date

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI06011905-07A
Client I.D. Number: 1413-MW06

Sampled: 01/17/06
Received: 01/19/06
Analyzed: 01/23/06

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	1.0	µg/L	36	m,p-Xylene	ND	0.50	µg/L
2	Chloromethane	ND	2.0	µg/L	37	Bromoform	ND	1.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L	38	Styrene	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L	39	o-Xylene	ND	0.50	µg/L
5	Bromomethane	ND	2.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L	41	1,2,3-Trichloropropane	ND	2.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L	42	Isopropylbenzene	ND	1.0	µg/L
8	Dichloromethane	ND	2.0	µg/L	43	Bromobenzene	ND	1.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L	44	n-Propylbenzene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L	45	4-Chlorotoluene	ND	1.0	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L	46	2-Chlorotoluene	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L	47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L	48	tert-Butylbenzene	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L	49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
15	2,2-Dichloropropane	ND	1.0	µg/L	50	sec-Butylbenzene	ND	1.0	µg/L
16	1,2-Dichloroethane	ND	1.0	µg/L	51	1,3-Dichlorobenzene	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L	52	1,4-Dichlorobenzene	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L	53	4-Isopropyltoluene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L	54	1,2-Dichlorobenzene	ND	1.0	µg/L
20	Benzene	ND *	0.50	µg/L	55	n-Butylbenzene	ND	1.0	µg/L
21	Dibromomethane	ND	1.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L	57	1,2,4-Trichlorobenzene	ND	2.0	µg/L
23	Trichloroethene	ND	1.0	µg/L	58	Naphthalene	ND	2.0	µg/L
24	Bromodichloromethane	ND	1.0	µg/L	59	Hexachlorobutadiene	ND	2.0	µg/L
25	cis 1,3 Dichloropropene	ND	1.0	µg/L	60	1,2,3-Trichlorobenzene	ND	2.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	102		%REC
27	1,1,2-Trichloroethane	ND	1.0	µg/L	62	Surr: Toluene-d8	94		%REC
28	Toluene	ND	0.50	µg/L	63	Surr: 4-Bromofluorobenzene	98		%REC
29	1,3-Dichloropropane	ND	1.0	µg/L					
30	Dibromochloromethane	ND	1.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND	2.0	µg/L					
32	Tetrachloroethene	ND	1.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L					
34	Chlorobenzene	ND	1.0	µg/L					
35	Ethylbenzene	ND	0.50	µg/L					

*No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hutchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hutchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

2/1/06
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI06011905-08A
Client I.D. Number: 1413-MW07

Sampled: 01/17/06
Received: 01/19/06
Analyzed: 01/23/06

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	1.0	µg/L	36	m,p-Xylene	ND	0.50	µg/L
2	Chloromethane	ND	2.0	µg/L	37	Bromoform	ND	1.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L	38	Styrene	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L	39	o-Xylene	ND	0.50	µg/L
5	Bromomethane	ND	2.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L	41	1,2,3-Trichloropropane	ND	2.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L	42	Isopropylbenzene	ND	1.0	µg/L
8	Dichloromethane	ND	2.0	µg/L	43	Bromobenzene	ND	1.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L	44	n Propylbenzene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L	45	4-Chlorotoluene	ND	1.0	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L	46	2-Chlorotoluene	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L	47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L	48	tert-Butylbenzene	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L	49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
15	2,2-Dichloropropane	ND	1.0	µg/L	50	sec-Butylbenzene	ND	1.0	µg/L
16	1,2-Dichloroethane	ND	1.0	µg/L	51	1,3-Dichlorobenzene	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L	52	1,4-Dichlorobenzene	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L	53	4-Isopropyltoluene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L	54	1,2-Dichlorobenzene	ND	1.0	µg/L
20	Benzene	ND *	0.50	µg/L	55	n-Butylbenzene	ND	1.0	µg/L
21	Dibromomethane	ND	1.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L	57	1,2,4-Trichlorobenzene	ND	2.0	µg/L
23	Trichloroethene	ND	1.0	µg/L	58	Naphthalene	ND	2.0	µg/L
24	Bromodichloromethane	ND	1.0	µg/l	59	Hexachlorobutadiene	ND	2.0	µg/L
25	cis-1,3-Dichloropropene	ND	1.0	µg/L	60	1,2,3-Trichlorobenzene	ND	2.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	103		%REC
27	1,1,2-Trichloroethane	ND	1.0	µg/L	62	Surr: Toluene-d8	96		%REC
28	Toluene	ND	0.50	µg/l	63	Surr: 4-Bromofluorobenzene	97		%REC
29	1,3-Dichloropropane	ND	1.0	µg/L					
30	Dibromochloromethane	ND	1.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND	2.0	µg/L					
32	Tetrachloroethene	ND	1.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L					
34	Chlorobenzene	ND	1.0	µg/L					
35	Ethylbenzene	ND	0.50	µg/L					

*No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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2/1/06
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BM106011905-09A
Client I.D. Number: 1413-MW08

Sampled: 01/17/06
Received: 01/19/06
Analyzed: 01/23/06

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	1.0	µg/L	36	m,p-Xylene	ND	0.50	µg/L
2	Chloromethane	ND	2.0	µg/L	37	Bromoform	ND	1.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L	38	Styrene	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L	39	o-Xylene	ND	0.50	µg/L
5	Bromomethane	ND	4.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L	41	1,2,3-Trichloropropane	ND	4.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L	42	Isopropylbenzene	ND	1.0	µg/L
8	Dichloromethane	ND	4.0	µg/L	43	Bromobenzene	ND	1.0	µg/L
9	trans 1,2 Dichloroethene	ND	1.0	µg/L	44	n-Propylbenzene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L	45	4-Chlorotoluene	ND	1.0	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L	46	2-Chlorotoluene	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L	47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L	48	tert-Butylbenzene	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L	49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
15	2,2-Dichloropropane	ND	1.0	µg/L	50	sec-Butylbenzene	ND	1.0	µg/l
16	1,2-Dichloroethane	ND	1.0	µg/L	51	1,3-Dichlorobenzene	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L	52	1,4-Dichlorobenzene	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L	53	4-Isopropyltoluene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L	54	1,2-Dichlorobenzene	ND	1.0	µg/l
20	Benzene	ND *	0.50	µg/L	55	n-Butylbenzene	ND	1.0	µg/L
21	Dibromomethane	ND	1.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	6.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L	57	1,2,4-Trichlorobenzene	ND	4.0	µg/L
23	Trichloroethene	ND	1.0	µg/L	58	Naphthalene	ND	4.0	µg/l
24	Bromodichloromethane	ND	1.0	µg/L	59	Hexachlorobutadiene	ND	4.0	µg/L
25	cis-1,3-Dichloropropene	ND	1.0	µg/L	60	1,2,3-Trichlorobenzene	ND	4.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	102		%REC
27	1,1,2-Trichloroethane	ND	1.0	µg/L	62	Surr: Toluene-d8	95		%REC
28	Toluene	ND	0.50	µg/L	63	Surr: 4 Bromofluorobenzene	97		%REC
29	1,3-Dichloropropane	ND	1.0	µg/L					
30	Dibromochloromethane	ND	1.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND	4.0	µg/L					
32	Tetrachloroethene	ND	1.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L					
34	Chlorobenzene	ND	1.0	µg/L					
35	Ethylbenzene	ND	0.50	µg/L					

Some Reporting Limits were increased due to sample foaming.

*No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

2/1/06
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI06011905-10A
Client I.D. Number: 1413-MW09

Sampled: 01/17/06
Received: 01/19/06
Analyzed: 01/23/06

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	2.0	µg/L	36	m,p-Xylene	ND	1.0	µg/L
2	Chloromethane	ND	4.0	µg/L	37	Bromoform	ND	2.0	µg/L
3	Vinyl chloride	ND	2.0	µg/L	38	Styrene	ND	2.0	µg/L
4	Chloroethane	ND	2.0	µg/L	39	o-Xylene	ND	1.0	µg/L
5	Bromomethane	ND	8.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	2.0	µg/L
6	Trichlorofluoromethane	ND	2.0	µg/L	41	1,2,3-Trichloropropane	ND	8.0	µg/L
7	1,1-Dichloroethene	ND	2.0	µg/L	42	Isopropylbenzene	ND	2.0	µg/L
8	Dichloromethane	ND	8.0	µg/l	43	Bromobenzene	ND	2.0	µg/L
9	trans-1,2-Dichloroethene	ND	2.0	µg/L	44	n-Propylbenzene	ND	2.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	1.0	µg/L	45	4-Chlorotoluene	ND	2.0	µg/L
11	1,1-Dichloroethane	ND	2.0	µg/L	46	2-Chlorotoluene	ND	2.0	µg/L
12	cis-1,2-Dichloroethene	ND	2.0	µg/L	47	1,3,5-Trimethylbenzene	ND	2.0	µg/L
13	Bromochloromethane	ND	2.0	µg/L	48	tert-Butylbenzene	ND	2.0	µg/L
14	Chloroform	ND	2.0	µg/L	49	1,2,4-Trimethylbenzene	ND	2.0	µg/L
15	2,2-Dichloropropane	ND	2.0	µg/L	50	sec-Butylbenzene	ND	2.0	µg/L
16	1,2-Dichloroethane	ND	2.0	µg/L	51	1,3-Dichlorobenzene	ND	2.0	µg/L
17	1,1,1-Trichloroethane	ND	2.0	µg/L	52	1,4-Dichlorobenzene	ND	2.0	µg/L
18	1,1-Dichloropropene	ND	2.0	µg/L	53	4-Isopropyltoluene	ND	2.0	µg/L
19	Carbon tetrachloride	ND	2.0	µg/L	54	1,2-Dichlorobenzene	ND	2.0	µg/L
20	Benzene	ND *	1.0	µg/L	55	n-Butylbenzene	ND	2.0	µg/L
21	Dibromomethane	ND	2.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	12	µg/L
22	1,2-Dichloropropane	ND	2.0	µg/L	57	1,2,4-Trichlorobenzene	ND	8.0	µg/L
23	Trichloroethene	ND	2.0	µg/L	58	Naphthalene	ND	8.0	µg/L
24	Bromodichloromethane	ND	2.0	µg/L	59	Hexachlorobutadiene	ND	8.0	µg/L
25	cis-1,3-Dichloropropene	ND	2.0	µg/L	60	1,2,3-Trichlorobenzene	ND	8.0	µg/L
26	trans-1,3-Dichloropropene	ND	2.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	100		%REC
27	1,1,2-Trichloroethane	ND	2.0	µg/L	62	Surr: Toluene-d8	98		%REC
28	Toluene	ND	1.0	µg/L	63	Surr: 4-Bromofluorobenzene	96		%REC
29	1,3-Dichloropropane	ND	2.0	µg/L					
30	Dibromochloromethane	ND	2.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND	8.0	µg/L					
32	Tetrachloroethene	ND	2.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND	2.0	µg/L					
34	Chlorobenzene	ND	2.0	µg/L					
35	Ethylbenzene	ND	1.0	µg/L					

Reporting Limits were increased due to sample foaming.

*No Benzene was observed above an estimated reporting limit of 0.5 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

2/1/06
Report Date

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI06011905-01A
Client I.D. Number: 1413-QCTB

Sampled: 01/17/06
Received: 01/19/06
Analyzed: 01/23/06

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	1.0	µg/L	36	m,p-Xylene	ND	0.50	µg/L
2	Chloromethane	ND	2.0	µg/L	37	Bromoform	ND	1.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L	38	Styrene	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L	39	o-Xylene	ND	0.50	µg/L
5	Bromomethane	ND	2.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L	41	1,2,3-Trichloropropane	ND	2.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L	42	Isopropylbenzene	ND	1.0	µg/L
8	Dichloromethane	ND	2.0	µg/L	43	Bromobenzene	ND	1.0	µg/L
9	trans 1,2 Dichloroethene	ND	1.0	µg/L	44	n-Propylbenzene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L	45	4-Chlorotoluene	ND	1.0	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L	46	2-Chlorotoluene	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L	47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L	48	tert-Butylbenzene	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L	49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
15	2,2-Dichloropropane	ND	1.0	µg/L	50	sec-Butylbenzene	ND	1.0	µg/L
16	1,2-Dichloroethane	ND	1.0	µg/L	51	1,3-Dichlorobenzene	ND	1.0	µg/L
17	1,1,1 Trichloroethane	ND	1.0	µg/L	52	1,4-Dichlorobenzene	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L	53	4-Isopropyltoluene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L	54	1,2-Dichlorobenzene	ND	1.0	µg/L
20	Benzene	ND *	0.50	µg/L	55	n-Butylbenzene	ND	1.0	µg/L
21	Dibromomethane	ND	1.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L	57	1,2,4-Trichlorobenzene	ND	2.0	µg/L
23	Trichloroethene	ND	1.0	µg/L	58	Naphthalene	ND	2.0	µg/L
24	Bromodichloromethane	ND	1.0	µg/L	59	Hexachlorobutadiene	ND	2.0	µg/L
25	cis-1,3-Dichloropropene	ND	1.0	µg/L	60	1,2,3-Trichlorobenzene	ND	2.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	97		%REC
27	1,1,2-Trichloroethane	ND	1.0	µg/L	62	Surr: Toluene-d8	98		%REC
28	Toluene	ND	0.50	µg/L	63	Surr: 4-Bromofluorobenzene	100		%REC
29	1,3-Dichloropropane	ND	1.0	µg/L					
30	Dibromochloromethane	ND	1.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND	2.0	µg/L					
32	Tetrachloroethene	ND	1.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L					
34	Chlorobenzene	ND	1.0	µg/L					
35	Ethylbenzene	ND	0.50	µg/L					

*No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hutchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hutchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

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Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI06011905-02A
Client I.D. Number: 1413-QCFB

Sampled: 01/17/06
Received: 01/19/06
Analyzed: 01/23/06

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	1.0	µg/L	36	m,p-Xylene	ND	0.50	µg/L
2	Chloromethane	ND	2.0	µg/L	37	Bromoform	ND	1.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L	38	Styrene	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L	39	o-Xylene	ND	0.50	µg/L
5	Bromomethane	ND	2.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L	41	1,2,3-Trichloropropane	ND	2.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L	42	Isopropylbenzene	ND	1.0	µg/L
8	Dichloromethane	ND	2.0	µg/L	43	Bromobenzene	ND	1.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L	44	n-Propylbenzene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L	45	4-Chlorotoluene	ND	1.0	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L	46	2-Chlorotoluene	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L	47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L	48	tert-Butylbenzene	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L	49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
15	2,2-Dichloropropane	ND	1.0	µg/L	50	sec-Butylbenzene	ND	1.0	µg/L
16	1,2-Dichloroethane	ND	1.0	µg/L	51	1,3-Dichlorobenzene	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L	52	1,4-Dichlorobenzene	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L	53	4-Isopropyltoluene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L	54	1,2-Dichlorobenzene	ND	1.0	µg/L
20	Benzene	ND *	0.50	µg/L	55	n-Butylbenzene	ND	1.0	µg/L
21	Dibromomethane	ND	1.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L	57	1,2,4-Trichlorobenzene	ND	2.0	µg/L
23	Trichloroethene	ND	1.0	µg/L	58	Naphthalene	ND	2.0	µg/L
24	Bromodichloromethane	ND	1.0	µg/L	59	Hexachlorobutadiene	ND	2.0	µg/L
25	cis-1,3-Dichloropropene	ND	1.0	µg/L	60	1,2,3-Trichlorobenzene	ND	2.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	101		%REC
27	1,1,2-Trichloroethane	ND	1.0	µg/L	62	Surr: Toluene-d8	98		%REC
28	Toluene	ND	0.50	µg/L	63	Surr: 4-Bromofluorobenzene	98		%REC
29	1,3-Dichloropropane	ND	1.0	µg/L					
30	Dibromochloromethane	ND	1.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND	2.0	µg/L					
32	Tetrachloroethene	ND	1.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L					
34	Chlorobenzene	ND	1.0	µg/L					
35	Ethylbenzene	ND	0.50	µg/L					

*No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer
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2/1/06
Report Date

Alpha Analytical, Inc.

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VOC Sample Preservation Report

Work Order: BMI06011905 **Project:** TO102 1413

Alpha's Sample ID	Client's Sample ID	Matrix	pH
06011905-01A	1413-QCTB	Aqueous	
06011905-02A	1413-QCFB	Aqueous	2
06011905-04A	1413-MW04	Aqueous	2
06011905-05A	1413-MW05	Aqueous	2
06011905-06A	1413-MW05DUP	Aqueous	2
06011905-07A	1413-MW06	Aqueous	2
06011905-08A	1413-MW07	Aqueous	2
06011905-09A	1413-MW08	Aqueous	2
06011905-10A	1413-MW09	Aqueous	2

2/1/06
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI06011905-04A
Client I.D. Number: 1413-MW04

Sampled: 01/17/06
Received: 01/19/06
Analyzed: 01/20/06

Semivolatile Organics by GC/MS
EPA Method SW8270C

	Compound	Concentration	Reporting Limit
1	Naphthalene	ND	10 µg/L
2	Acenaphthylene	ND	10 µg/L
3	Acenaphthene	ND	10 µg/L
4	Fluorene	ND	10 µg/L
5	Phenanthrene	ND	10 µg/L
6	Anthracene	ND	10 µg/L
7	Fluoranthene	ND	10 µg/L
8	Pyrene	ND	10 µg/L
9	Benzo(a)anthracene	ND	10 µg/L
10	Chrysene	ND	10 µg/L
11	Benzo(b)fluoranthene	ND	10 µg/L
12	Benzo(k)fluoranthene	ND	10 µg/L
13	Benzo(a)pyrene	ND	10 µg/L
14	Indeno(1,2,3-cd)pyrene	ND	10 µg/L
15	Dibenz(a,h)anthracene	ND	10 µg/L
16	Benzo(g,h,i)perylene	ND	10 µg/L
17	Surr: Nitrobenzene-d5	110	%REC
18	Surr: 2-Fluorobiphenyl	114 *	%REC
19	Surr: 4-Terphenyl-d14	107	%REC

*2-Fluorobiphenly surrogate recovery was 114%, with 54-113% criteria. The other surrogates met criteria.

ND -- Not Detected

Roger L. Scholl, Ph D, Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer
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2/1/06
Report Date

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI06011905-05A
Client I.D. Number: 1413-MW05

Sampled: 01/17/06
Received: 01/19/06
Analyzed: 01/20/06

Semivolatile Organics by GC/MS
EPA Method SW8270C

	Compound	Concentration	Reporting Limit
1	Naphthalene	ND	10 µg/L
2	Acenaphthylene	ND	10 µg/L
3	Acenaphthene	ND	10 µg/L
4	Fluorene	ND	10 µg/L
5	Phenanthrene	ND	10 µg/L
6	Anthracene	ND	10 µg/L
7	Fluoranthene	ND	10 µg/L
8	Pyrene	ND	10 µg/L
9	Benzo(a)anthracene	ND	10 µg/L
10	Chrysene	ND	10 µg/L
11	Benzo(b)fluoranthene	ND	10 µg/L
12	Benzo(k)fluoranthene	ND	10 µg/L
13	Benzo(a)pyrene	ND	10 µg/L
14	Indeno(1,2,3-cd)pyrene	ND	10 µg/L
15	Dibenz(a,h)anthracene	ND	10 µg/L
16	Benzo(g,h,i)perylene	ND	10 µg/L
17	Surr: Nitrobenzene-d5	107	%REC
18	Surr: 2-Fluorobiphenyl	111	%REC
19	Surr: 4-Terphenyl-d14	107	%REC

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer
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2/1/06
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI06011905-06A
Client I.D. Number: 1413-MW05DUP

Sampled: 01/17/06
Received: 01/19/06
Analyzed: 01/20/06

Semivolatile Organics by GC/MS
EPA Method SW8270C

	Compound	Concentration	Reporting Limit
1	Naphthalene	ND	10 µg/L
2	Acenaphthylene	ND	10 µg/L
3	Acenaphthene	ND	10 µg/L
4	Fluorene	ND	10 µg/L
5	Phenanthrene	ND	10 µg/L
6	Anthracene	ND	10 µg/L
7	Fluoranthene	ND	10 µg/L
8	Pyrene	ND	10 µg/L
9	Benzo(a)anthracene	ND	10 µg/L
10	Chrysene	ND	10 µg/L
11	Benzo(b)fluoranthene	ND	10 µg/L
12	Benzo(k)fluoranthene	ND	10 µg/L
13	Benzo(a)pyrene	ND	10 µg/L
14	Indeno(1,2,3-cd)pyrene	ND	10 µg/L
15	Dibenz(a,h)anthracene	ND	10 µg/L
16	Benzo(g,h,i)perylene	ND	10 µg/L
17	Surr: Nitrobenzene-d5	115	%REC
18	Surr: 2-Fluorobiphenyl	122 *	%REC
19	Surr: 4-Terphenyl-d14	113	%REC

*2-Fluorobiphenly surrogate recovery was 122%, with 54-113% criteria. The other surrogates met criteria.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI06011905-07A
Client I.D. Number: 1413-MW06

Sampled: 01/17/06
Received: 01/19/06
Analyzed: 01/20/06

Semivolatile Organics by GC/MS
EPA Method SW8270C

	Compound	Concentration	Reporting Limit
1	Naphthalene	ND	10 µg/L
2	Acenaphthylene	ND	10 µg/L
3	Acenaphthene	ND	10 µg/L
4	Fluorene	ND	10 µg/L
5	Phenanthrene	ND	10 µg/L
6	Anthracene	ND	10 µg/L
7	Fluoranthene	ND	10 µg/L
8	Pyrene	ND	10 µg/L
9	Benzo(a)anthracene	ND	10 µg/L
10	Chrysene	ND	10 µg/L
11	Benzo(b)fluoranthene	ND	10 µg/L
12	Benzo(k)fluoranthene	ND	10 µg/L
13	Benzo(a)pyrene	ND	10 µg/L
14	Indeno(1,2,3-cd)pyrene	ND	10 µg/L
15	Dibenz(a,h)anthracene	ND	10 µg/L
16	Benzo(g,h,i)perylene	ND	10 µg/L
17	Surr: Nitrobenzene-d5	108	%REC
18	Surr: 2-Fluorobiphenyl	115 *	%REC
19	Surr: 4-Terphenyl-d14	107	%REC

*2-Fluorobiphenly surrogate recovery was 115%, with 54-113% criteria. The other surrogates met criteria.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hirschman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hirschman, Quality Assurance Officer
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2/1/06
Report Date

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255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI06011905-08A
Client I.D. Number: 1413-MW07

Sampled: 01/17/06
Received: 01/19/06
Analyzed: 01/20/06

Semivolatile Organics by GC/MS
EPA Method SW8270C

	Compound	Concentration	Reporting Limit
1	Naphthalene	ND	10 µg/L
2	Acenaphthylene	ND	10 µg/L
3	Acenaphthene	ND	10 µg/L
4	Fluorene	ND	10 µg/L
5	Phenanthrene	ND	10 µg/L
6	Anthracene	ND	10 µg/L
7	Fluoranthene	ND	10 µg/L
8	Pyrene	ND	10 µg/L
9	Benzo(a)anthracene	ND	10 µg/L
10	Chrysene	ND	10 µg/L
11	Benzo(b)fluoranthene	ND	10 µg/L
12	Benzo(k)fluoranthene	ND	10 µg/L
13	Benzo(a)pyrene	ND	10 µg/L
14	Indeno(1,2,3-cd)pyrene	ND	10 µg/L
15	Dibenz(a,h)anthracene	ND	10 µg/L
16	Benzo(g,h,i)perylene	ND	10 µg/L
17	Surr: Nitrobenzene-d5	107	%REC
18	Surr: 2-Fluorobiphenyl	112	%REC
19	Surr: 4-Terphenyl-d14	102	%REC

ND = Not Detected

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

2/1/06
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI06011905-09A
Client I.D. Number: 1413-MW08

Sampled: 01/17/06
Received: 01/19/06
Analyzed: 01/20/06

Semivolatile Organics by GC/MS
EPA Method SW8270C

	Compound	Concentration	Reporting Limit
1	Naphthalene	ND	10 µg/L
2	Acenaphthylene	ND	10 µg/L
3	Acenaphthene	ND	10 µg/L
4	Fluorene	ND	10 µg/L
5	Phenanthrene	ND	10 µg/L
6	Anthracene	ND	10 µg/L
7	Fluoranthene	ND	10 µg/L
8	Pyrene	ND	10 µg/L
9	Benzo(a)anthracene	ND	10 µg/L
10	Chrysene	ND	10 µg/L
11	Benzo(b)fluoranthene	ND	10 µg/L
12	Benzo(k)fluoranthene	ND	10 µg/L
13	Benzo(a)pyrene	ND	10 µg/L
14	Indeno(1,2,3-cd)pyrene	ND	10 µg/L
15	Dibenz(a,h)anthracene	ND	10 µg/L
16	Benzo(g,h,i)perylene	ND	10 µg/L
17	Surr: Nitrobenzene-d5	111	%REC
18	Surr: 2-Fluorobiphenyl	99	%REC
19	Surr: 4-Terphenyl-d14	111	%REC

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI06011905-10A
Client I.D. Number: 1413-MW09

Sampled: 01/17/06
Received: 01/19/06
Analyzed: 01/20/06

Semivolatile Organics by GC/MS
EPA Method SW8270C

	Compound	Concentration	Reporting Limit
1	Naphthalene	ND	10 µg/L
2	Acenaphthylene	ND	10 µg/L
3	Acenaphthene	ND	10 µg/L
4	Fluorene	ND	10 µg/L
5	Phenanthrene	ND	10 µg/L
6	Anthracene	ND	10 µg/L
7	Fluoranthene	ND	10 µg/L
8	Pyrene	ND	10 µg/L
9	Benzo(a)anthracene	ND	10 µg/L
10	Chrysene	ND	10 µg/L
11	Benzo(b)fluoranthene	ND	10 µg/L
12	Benzo(k)fluoranthene	ND	10 µg/L
13	Benzo(a)pyrene	ND	10 µg/L
14	Indeno(1,2,3-cd)pyrene	ND	10 µg/L
15	Dibenz(a,h)anthracene	ND	10 µg/L
16	Benzo(g,h,i)perylene	ND	10 µg/L
17	Surr: Nitrobenzene-d5	109	%REC
18	Surr: 2-Fluorobiphenyl	94	%REC
19	Surr: 4-Terphenyl-d14	112	%REC

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 01/18/06

Job#: TO102: 1413

Alkalinity
EPA Method 310.1

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1413-MW04**					
Lab ID :	BMI06011852-01A	Alkalinity, Total (As CaCO3 at pH 4.5)	270	1.0 mg/L	01/17/06	01/23/06
Client ID :	**1413-MW05**					
Lab ID :	BMI06011852-02A	Alkalinity, Total (As CaCO3 at pH 4.5)	310	1.0 mg/L	01/17/06	01/23/06
Client ID :	**1413-MW05DUP**					
Lab ID :	BMI06011852-03A	Alkalinity, Total (As CaCO3 at pH 4.5)	310	1.0 mg/L	01/17/06	01/23/06
Client ID :	**1413-MW06**					
Lab ID :	BMI06011852-04A	Alkalinity, Total (As CaCO3 at pH 4.5)	400	1.0 mg/L	01/17/06	01/23/06
Client ID :	**1413-MW07**					
Lab ID :	BMI06011852-05A	Alkalinity, Total (As CaCO3 at pH 4.5)	280	1.0 mg/L	01/17/06	01/23/06
Client ID :	**1413-MW08**					
Lab ID :	BMI06011852-06A	Alkalinity, Total (As CaCO3 at pH 4.5)	310	1.0 mg/L	01/17/06	01/23/06
Client ID :	**1413-MW09**					
Lab ID :	BMI06011852-07A	Alkalinity, Total (As CaCO3 at pH 4.5)	280	1.0 mg/L	01/17/06	01/23/06

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1/31/06
Report Date

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Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 01/18/06

Job#: TO102: 1413

Iron by Spectrophotometer
SM3500-Fe D

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1413-MW04**					
Lab ID :	BMI0601 1852-01A	Iron, Ferrous (+2)	ND	0.050 mg/L	01/17/06	01/18/06
Client ID :	**1413-MW05**					
Lab ID :	BMI0601 1852-02A	Iron, Ferrous (+2)	0.11	0.050 mg/L	01/17/06	01/18/06
Client ID :	**1413-MW05DUP**					
Lab ID :	BMI0601 1852-03A	Iron, Ferrous (+2)	0.073	0.050 mg/L	01/17/06	01/18/06
Client ID :	**1413-MW06**					
Lab ID :	BMI0601 1852-04A	Iron, Ferrous (+2)	ND	0.050 mg/L	01/17/06	01/18/06
Client ID :	**1413-MW07**					
Lab ID :	BMI0601 1852-05A	Iron, Ferrous (+2)	0.061	0.050 mg/L	01/17/06	01/18/06
Client ID :	**1413-MW08**					
Lab ID :	BMI0601 1852-06A	Iron, Ferrous (+2)	ND	0.050 mg/L	01/17/06	01/18/06
Client ID :	**1413-MW09**					
Lab ID :	BMI0601 1852-07A	Iron, Ferrous (+2)	0.22	0.050 mg/L	01/17/06	01/18/06

ND = Not Detected

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Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 01/18/06

Job#: TO102-1413

Total Dissolved Solids (TDS)
EPA Method 160.1 / SM 2540 C

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1413-MW04					
Lab ID :	BMI06011852-01A	Solids, Total Dissolved (TDS)	2,900	10 mg/L	01/17/06	01/26/06
Client ID :	1413-MW05					
Lab ID :	BMI06011852-02A	Solids, Total Dissolved (TDS)	7,500	50 mg/L	01/17/06	01/26/06
Client ID :	1413-MW05DUP					
Lab ID :	BMI06011852-03A	Solids, Total Dissolved (TDS)	7,000	25 mg/L	01/17/06	01/26/06
Client ID :	1413-MW06					
Lab ID :	BMI06011852-04A	Solids, Total Dissolved (TDS)	3,600	25 mg/L	01/17/06	01/26/06
Client ID :	1413-MW07					
Lab ID :	BMI06011852-05A	Solids, Total Dissolved (TDS)	5,700	25 mg/L	01/17/06	01/26/06
Client ID :	1413-MW08					
Lab ID :	BMI06011852-06A	Solids, Total Dissolved (TDS)	9,600	50 mg/L	01/17/06	01/26/06
Client ID :	1413-MW09					
Lab ID :	BMI06011852-07A	Solids, Total Dissolved (TDS)	740	10 mg/L	01/17/06	01/26/06

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102: 1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Anions by Ion Chromatography (IC) EPA Method 300.0 / SW9056

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1413-MW04**					
Lab ID :	BMI06011852-01A	Nitrite (NO2) - N	ND	0.25 mg/L	01/17/06	01/18/06
		Nitrate (NO3) - N	1.1	0.25 mg/L	01/17/06	01/18/06
		Sulfate (SO4)	250	2.5 mg/L	01/17/06	01/20/06
Client ID :	**1413-MW05**					
Lab ID :	BMI06011852-02A	Nitrite (NO2) - N	ND	0.25 mg/L	01/17/06	01/18/06
		Nitrate (NO3) - N	ND	0.25 mg/L	01/17/06	01/18/06
		Sulfate (SO4)	740	13 mg/L	01/17/06	01/20/06
Client ID :	**1413-MW05DUP**					
Lab ID :	BMI06011852-03A	Nitrite (NO2) - N	ND	0.25 mg/L	01/17/06	01/18/06
		Nitrate (NO3) - N	ND	0.25 mg/L	01/17/06	01/18/06
		Sulfate (SO4)	700	13 mg/L	01/17/06	01/20/06
Client ID :	**1413-MW06**					
Lab ID :	BMI06011852-04A	Nitrite (NO2) - N	ND	0.25 mg/L	01/17/06	01/18/06
		Nitrate (NO3) - N	1.5	0.25 mg/L	01/17/06	01/18/06
		Sulfate (SO4)	330	13 mg/L	01/17/06	01/20/06
Client ID :	**1413-MW07**					
Lab ID :	BMI06011852-05A	Nitrite (NO2) N	ND	0.25 mg/L	01/17/06	01/18/06
		Nitrate (NO3) - N	4.5	0.25 mg/L	01/17/06	01/18/06
		Sulfate (SO4)	490	13 mg/L	01/17/06	01/21/06
Client ID :	**1413-MW08**					
Lab ID :	BMI06011852-06A	Nitrite (NO2) - N	ND	0.25 mg/L	01/17/06	01/18/06
		Nitrate (NO3) - N	1.5	0.25 mg/L	01/17/06	01/18/06
		Sulfate (SO4)	850	13 mg/L	01/17/06	01/21/06
Client ID :	**1413-MW09**					
Lab ID :	BMI06011852-07A	Nitrite (NO2) - N	ND	0.25 mg/L	01/17/06	01/18/06
		Nitrate (NO3) - N	ND	0.25 mg/L	01/17/06	01/18/06
		Sulfate (SO4)	100	2.5 mg/L	01/17/06	01/21/06

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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1/31/06
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ANALYTICAL REPORT

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Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 01/18/06

Job#: TO102-1413

Dissolved Metals by ICPMS
EPA Method SW6020

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1413-MW04					
Lab ID :	BMI06011852-01A	Manganese (Mn), Dissolved	0.29	0.0050 mg/L	01/17/06	02/15/06
Client ID :	1413-MW05					
Lab ID :	BMI06011852-02A	Manganese (Mn), Dissolved	0.42	0.0050 mg/L	01/17/06	02/15/06
Client ID :	1413-MW05DUP					
Lab ID :	BMI06011852-03A	Manganese (Mn), Dissolved	0.45	0.0050 mg/L	01/17/06	02/15/06
Client ID :	1413-MW06					
Lab ID :	BMI06011852-04A	Manganese (Mn), Dissolved	0.16	0.0050 mg/L	01/17/06	02/15/06
Client ID :	1413-MW07					
Lab ID :	BMI06011852-05A	Manganese (Mn), Dissolved	0.40	0.0050 mg/L	01/17/06	02/15/06
Client ID :	1413-MW08					
Lab ID :	BMI06011852-06A	Manganese (Mn), Dissolved	0.42	0.0050 mg/L	01/17/06	02/15/06
Client ID :	1413-MW09					
Lab ID :	BMI06011852-07A	Manganese (Mn), Dissolved	0.31	0.0050 mg/L	01/17/06	02/15/06

Roger Scholl Randy Gardner Walter Hinchman

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2/16/06
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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
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Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 01/18/06

Job#: TO102-1413

Metals by ICPMS
EPA Method SW6020

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1413-MW04					
Lab ID :	BMI0601 1852-01A	Lead (Pb)	ND	0.0050 mg/L	01/17/06	02/14/06
Client ID :	1413-MW05					
Lab ID :	BMI0601 1852-02A	Lead (Pb)	ND	0.0050 mg/L	01/17/06	02/14/06
Client ID :	1413-MW05DUP					
Lab ID :	BMI0601 1852-03A	Lead (Pb)	ND	0.0050 mg/L	01/17/06	02/14/06
Client ID :	1413-MW06					
Lab ID :	BMI0601 1852-04A	Lead (Pb)	ND	0.0050 mg/L	01/17/06	02/14/06
Client ID :	1413-MW07					
Lab ID :	BMI0601 1852-05A	Lead (Pb)	ND	0.0050 mg/L	01/17/06	02/14/06
Client ID :	1413-MW08					
Lab ID :	BMI0601 1852-06A	Lead (Pb)	ND	0.0050 mg/L	01/17/06	02/14/06
Client ID :	1413-MW09					
Lab ID :	BMI0601 1852-07A	Lead (Pb)	ND	0.0050 mg/L	01/17/06	02/14/06

ND = Not Detected

Roger Scholl Randy Gardner Walter Hindman

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2/16/06
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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
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Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 01/19/06

Job#: TO102-1413

Dissolved Gases
Modified Method RSK-175 GC/FID

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1413-MW04**					
Lab ID :	BMI06011905-04A	Methane	0.079	0.010 mg/L	01/17/06	01/25/06
Client ID :	**1413-MW05**					
Lab ID :	BMI06011905-05A	Methane	0.48	0.010 mg/L	01/17/06	01/25/06
Client ID :	**1413-MW05DUP**					
Lab ID :	BMI06011905-06A	Methane	0.39	0.010 mg/L	01/17/06	01/25/06
Client ID :	**1413-MW06**					
Lab ID :	BMI06011905-07A	Methane	ND	0.010 mg/L	01/17/06	01/25/06
Client ID :	**1413-MW07**					
Lab ID :	BMI06011905-08A	Methane	ND	0.010 mg/L	01/17/06	01/25/06
Client ID :	**1413-MW08**					
Lab ID :	BMI06011905-09A	Methane	ND	0.010 mg/L	01/17/06	01/25/06
Client ID :	**1413-MW09**					
Lab ID :	BMI06011905-10A	Methane	0.57	0.010 mg/L	01/17/06	01/25/06

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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ANALYTICAL REPORT

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Columbus, OH 43201

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 01/19/06

Job#: TO102: 1413

Total Organic Carbon as NonPurgeable Organic Carbon
EPA Method SW9060/415.1/SM-5310C

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1413-MW04**					
Lab ID :	BMI06011905-04A	Total Organic Carbon	8.1	1.0 mg/L	01/17/06	01/23/06
Client ID :	**1413-MW05**					
Lab ID :	BMI06011905-05A	Total Organic Carbon	10	1.0 mg/L	01/17/06	01/23/06
Client ID :	**1413-MW05DUP**					
Lab ID :	BMI06011905-06A	Total Organic Carbon	9.9	1.0 mg/L	01/17/06	01/23/06
Client ID :	**1413-MW06**					
Lab ID :	BMI06011905-07A	Total Organic Carbon	5.7	1.0 mg/L	01/17/06	01/23/06
Client ID :	**1413-MW07**					
Lab ID :	BMI06011905-08A	Total Organic Carbon	12	1.0 mg/L	01/17/06	01/23/06
Client ID :	**1413-MW08**					
Lab ID :	BMI06011905-09A	Total Organic Carbon	9.5	1.0 mg/L	01/17/06	01/23/06
Client ID :	**1413-MW09**					
Lab ID :	BMI06011905-10A	Total Organic Carbon	15	1.0 mg/L	01/17/06	01/23/06

Roger Scholl Randy Gardner Walter Hinchman

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2/1/06
Report Date

APPENDIX D

LABORATORY QA/QC ANALYTICAL RESULTS

OCTOBER 2005

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *11-Nov-05*

QC Summary Report

Work Order: 05102803

Method Blank

Type: **MBLK** Test Code: **EPA Method SW8015**

File ID: Batch ID: **13421** Analysis Date: **10/31/2005 16:43**

Sample ID: **MBLK-13421** Units : **mg/L** Run ID: **FID_4_051031A** Prep Date: **10/31/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH-E (Diesel)	ND	0.05								
TPH-E (Oil)	ND	0.5								
Surr: Nonane	125		100		125	47	141			

Laboratory Control Spike

Type: **LCS** Test Code: **EPA Method SW8015**

File ID: Batch ID: **13421** Analysis Date: **11/02/2005 13:09**

Sample ID: **LCS-13421** Units : **mg/L** Run ID: **FID_4_051031A** Prep Date: **10/31/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH-E (Diesel)	2.65	0.5	2.5		106	64	129			
Surr: Nonane	126		100		126	47	141			

Sample Matrix Spike

Type: **MS** Test Code: **EPA Method SW8015**

File ID: Batch ID: **13421** Analysis Date: **10/31/2005 23:00**

Sample ID: **05102803-02AMS** Units : **mg/L** Run ID: **FID_4_051031A** Prep Date: **10/31/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH-E (Diesel)	2.92	0.5	2.5	0.1987	109	56	147			
Surr: Nonane	108		100		108	47	141			

Sample Matrix Spike Duplicate

Type: **MSD** Test Code: **EPA Method SW8015**

File ID: Batch ID: **13421** Analysis Date: **10/31/2005 00:00**

Sample ID: **05102803-02AMSD** Units : **mg/L** Run ID: **FID_4_051031A** Prep Date: **10/31/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH-E (Diesel)	2.59	0.5	2.5	0.1987	96	56	147	2.918	12.0(25)	
Surr: Nonane	117		100		117	47	141			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

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Date: *11-Nov-05*

QC Summary Report

Work Order: 05102803

Method Blank Type: **MBLK** Test Code: **EPA Method SW8260B**

File ID: **C:\HPCHEM\MS07\DATA\051104\05110443.D** Batch ID: **MS07W1104A** Analysis Date: **11/04/2005 23:45**

Sample ID: **MBLK MS07W1104A** Units : **µg/L** Run ID: **MSD_07_051104B** Prep Date: **11/04/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	ND	1								
Chloromethane	ND	2								
Vinyl chloride	ND	1								
Chloroethane	ND	1								
Bromomethane	ND	2								
Trichlorofluoromethane	ND	1								
1,1-Dichloroethene	ND	1								
Dichloromethane	ND	2								
trans-1,2-Dichloroethene	ND	1								
Methyl tert-butyl ether (MTBE)	ND	0.5								
1,1-Dichloroethane	ND	1								
cis 1,2-Dichloroethene	ND	1								
Bromochloromethane	ND	1								
Chloroform	ND	1								
2,2-Dichloropropane	ND	1								
1,2-Dichloroethane	ND	1								
1,1,1-Trichloroethane	ND	1								
1,1-Dichloropropene	ND	1								
Carbon tetrachloride	ND	1								
Benzene	ND	0.5								
Dibromomethane	ND	1								
1,2-Dichloropropane	ND	1								
Trichloroethene	ND	1								
Bromodichloromethane	ND	1								
cis-1,3-Dichloropropene	ND	1								
trans-1,3-Dichloropropene	ND	1								
1,1,2-Trichloroethane	ND	1								
Toluene	ND	0.5								
1,3-Dichloropropane	ND	1								
Dibromochloromethane	ND	1								
1,2-Dibromoethane (EDB)	ND	2								
Tetrachloroethene	ND	1								
1,1,1,2-Tetrachloroethane	ND	1								
Chlorobenzene	ND	1								
Ethylbenzene	ND	0.5								
m,p-Xylene	ND	0.5								
Bromoform	ND	1								
Styrene	ND	1								
o-Xylene	ND	0.5								
1,1,2,2-Tetrachloroethane	ND	1								
1,2,3-Trichloropropane	ND	2								
Isopropylbenzene	ND	1								
Bromobenzene	ND	1								
n-Propylbenzene	ND	1								
4-Chlorotoluene	ND	1								
2-Chlorotoluene	ND	1								
1,3,5-Trimethylbenzene	ND	1								
tert-Butylbenzene	ND	1								
1,2,4-Trimethylbenzene	ND	1								
sec-Butylbenzene	ND	1								
1,3-Dichlorobenzene	ND	1								
1,4-Dichlorobenzene	ND	1								
4-Isopropyltoluene	ND	1								
1,2-Dichlorobenzene	ND	1								
n-Butylbenzene	ND	1								
1,2-Dibromo-3-chloropropane (DBCP)	ND	5								
1,2,4-Trichlorobenzene	ND	2								
Naphthalene	ND	2								
Hexachlorobutadiene	ND	2								
1,2,3-Trichlorobenzene	ND	2								
Surr: 1,2-Dichloroethane-d4	10.4		10		104	76	127			
Surr: Toluene-d8	9.75		10		98	84	113			
Surr: 4-Bromofluorobenzene	10.3		10		103	79	119			

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Date: 11-Nov-05

QC Summary Report

Work Order: 05102803

Laboratory Control Spike Type: **LCS** Test Code: **EPA Method SW8260B**

File ID: **C:\HPCHEM\MS07\DATA\051104\05110439.D** Batch ID: **MS07W1104A** Analysis Date: **11/04/2005 22:19**

Sample ID: **LCS MS07W1104A** Units : **µg/L** Run ID: **MSD_07_051104B** Prep Date: **11/04/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	7.05	1	10		71	32	129			
Chloromethane	9	2	10		90	44	121			
Vinyl chloride	8.96	1	10		90	80	120			
Chloroethane	12.4	1	10		124	52	142			
Bromomethane	13	2	10		130	5	151			
Trichlorofluoromethane	10.6	1	10		106	70	141			
1,1-Dichloroethene	10.4	1	10		104	80	120			
Dichloromethane	9.18	2	10		92	73	117			
trans-1,2-Dichloroethene	9.95	1	10		100	74	129			
Methyl tert-butyl ether (MTBE)	9.28	0.5	10		93	62	138			
1,1-Dichloroethane	9.73	1	10		97	78	125			
cis-1,2-Dichloroethene	9.89	1	10		99	79	126			
Bromochloromethane	9.55	1	10		96	76	126			
Chloroform	9.71	1	10		97	80	120			
2,2-Dichloropropane	8.81	1	10		88	71	156			
1,2-Dichloroethane	10.1	1	10		101	72	135			
1,1,1-Trichloroethane	10	1	10		100	74	132			
1,1-Dichloropropene	10.1	1	10		101	83	129			
Carbon tetrachloride	10.3	1	10		103	68	137			
Benzene	9.44	0.5	10		94	81	122			
Dibromomethane	9.24	1	10		92	75	127			
1,2-Dichloropropane	9.81	1	10		98	80	120			
Trichloroethene	10.1	1	10		101	74	125			
Bromodichloromethane	9.57	1	10		96	75	130			
cis-1,3-Dichloropropene	9.22	1	10		92	78	128			
trans-1,3-Dichloropropene	9.08	1	10		91	74	134			
1,1,2-Trichloroethane	8.96	1	10		90	75	129			
Toluene	9.17	0.5	10		92	80	120			
1,3-Dichloropropane	9.25	1	10		93	73	129			
Dibromochloromethane	9.6	1	10		96	71	130			
1,2-Dibromoethane (EDB)	18.6	2	20		93	75	132			
Tetrachloroethene	9.48	1	10		95	73	131			
1,1,1,2-Tetrachloroethane	9.44	1	10		94	78	125			
Chlorobenzene	9.27	1	10		93	79	124			
Ethylbenzene	9.45	0.5	10		95	80	120			
m,p-Xylene	9.36	0.5	10		94	80	129			
Bromoform	9.83	1	10		98	66	138			
Styrene	9.9	1	10		99	79	130			
o-Xylene	9.69	0.5	10		97	80	129			
1,1,2,2-Tetrachloroethane	8.12	1	10		81	63	142			
1,2,3-Trichloropropane	17.8	2	20		89	73	132			
Isopropylbenzene	9.99	1	10		99.9	78	133			
Bromobenzene	9.41	1	10		94	76	127			
n-Propylbenzene	9.38	1	10		94	78	130			
4-Chlorotoluene	9.49	1	10		95	80	129			
2-Chlorotoluene	9.59	1	10		96	79	129			
1,3,5-Trimethylbenzene	9.79	1	10		98	77	134			
tert-Butylbenzene	9.87	1	10		99	80	129			
1,2,4-Trimethylbenzene	9.82	1	10		98	77	133			
sec-Butylbenzene	9.69	1	10		97	79	129			
1,3-Dichlorobenzene	9.72	1	10		97	80	125			
1,4-Dichlorobenzene	9.72	1	10		97	79	125			
4-Isopropyltoluene	10	1	10		100	77	133			
1,2-Dichlorobenzene	9.4	1	10		94	79	119			
n-Butylbenzene	9.71	1	10		97	72	138			
1,2-Dibromo-3-chloropropane (DBCP)	45.3	3	50		91	61	138			
1,2,4-Trichlorobenzene	8.16	2	10		82	55	139			
Naphthalene	7.03	2	10		70	35	150			
Hexachlorobutadiene	20.7	2	20		103	65	135			
1,2,3-Trichlorobenzene	8.49	2	10		85	39	147			
Surr: 1,2-Dichloroethane-d4	11.4		10		114	76	127			
Surr: Toluene-d8	9.55		10		96	84	113			
Surr: 4-Bromofluorobenzene	9.64		10		96	79	119			

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Date: 11-Nov-05

QC Summary Report

Work Order: 05102803

Sample Matrix Spike Type: **MS** Test Code: **EPA Method SW8260B**

File ID: **C:\HPCHEM\MS07\DATA\051104\05110450.D** Batch ID: **MS07W1104A** Analysis Date: **11/05/2005 02:16**

Sample ID: **05102803-02AMS** Units : µg/L Run ID: **MSD_07_051104B** Prep Date: **11/05/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	37.5	2.5	50	0	75	17	130			
Chloromethane	46.2	5	50	0	92	31	127			
Vinyl chloride	42.9	2.5	50	0	86	52	131			
Chloroethane	58.7	2.5	50	0	117	40	146			
Bromomethane	67.7	10	50	0	135	4	152			
Trichlorofluoromethane	53	2.5	50	0	106	57	143			
1,1-Dichloroethene	46.4	2.5	50	0	93	65	127			
Dichloromethane	43.1	10	50	0	86	68	119			
trans-1,2-Dichloroethene	44.4	2.5	50	0	89	67	131			
Methyl tert-butyl ether (MTBE)	44.4	1.3	50	0	89	59	145			
1,1-Dichloroethane	44.1	2.5	50	0	88	71	128			
cis-1,2-Dichloroethene	47.8	2.5	50	0	96	73	129			
Bromochloromethane	46.3	2.5	50	0	93	71	130			
Chloroform	47.3	2.5	50	0	95	71	124			
2,2-Dichloropropane	37.3	2.5	50	0	75	52	157			
1,2-Dichloroethane	50.1	2.5	50	0	100	68	139			
1,1,1-Trichloroethane	46.8	2.5	50	0	94	67	134			
1,1-Dichloropropene	46.4	2.5	50	0	93	75	130			
Carbon tetrachloride	47.2	2.5	50	0	94	62	137			
Benzene	43.7	1.3	50	0	87	74	125			
Dibromomethane	44.7	2.5	50	0	89	73	130			
1,2-Dichloropropane	48.5	2.5	50	0	97	72	130			
Trichloroethene	43	2.5	50	0	86	66	126			
Bromodichloromethane	48.1	2.5	50	0	96	70	133			
cis-1,3-Dichloropropene	42.9	2.5	50	0	86	61	130			
trans-1,3-Dichloropropene	43.2	2.5	50	0	86	67	134			
1,1,2-Trichloroethane	43.5	2.5	50	0	87	72	132			
Toluene	43.1	1.3	50	0	86	76	120			
1,3-Dichloropropane	43	2.5	50	0	86	73	129			
Dibromochloromethane	45.2	2.5	50	0	90	70	130			
1,2-Dibromoethane (EDB)	89.6	10	100	0	90	75	133			
Tetrachloroethene	40.9	2.5	50	0	82	66	131			
1,1,1,2-Tetrachloroethane	45.5	2.5	50	0	91	76	125			
Chlorobenzene	43.3	2.5	50	0	87	76	124			
Ethylbenzene	42.1	1.3	50	0	84	77	124			
m,p-Xylene	43	1.3	50	0	86	73	130			
Bromoform	48.4	2.5	50	0	97	66	140			
Styrene	44.7	2.5	50	0	89	73	131			
o-Xylene	46	1.3	50	0	92	74	131			
1,1,2,2-Tetrachloroethane	43.9	2.5	50	0	88	63	146			
1,2,3-Trichloropropane	96.6	10	100	0	97	73	136			
Isopropylbenzene	46.1	2.5	50	0	92	73	133			
Bromobenzene	45.3	2.5	50	0	91	75	127			
n-Propylbenzene	42.7	2.5	50	0	85	73	130			
4-Chlorotoluene	44.1	2.5	50	0	88	76	129			
2-Chlorotoluene	45.4	2.5	50	0	91	76	129			
1,3,5-Trimethylbenzene	45.5	2.5	50	0	91	70	135			
tert-Butylbenzene	45.6	2.5	50	0	91	74	129			
1,2,4-Trimethylbenzene	45.7	2.5	50	0	91	70	134			
sec-Butylbenzene	44.2	2.5	50	0	88	74	129			
1,3-Dichlorobenzene	45.2	2.5	50	0	90	77	125			
1,4-Dichlorobenzene	45.8	2.5	50	0	92	76	126			
4-Isopropyltoluene	45.8	2.5	50	0	92	71	133			
1,2-Dichlorobenzene	44.8	2.5	50	0	90	77	120			
n-Butylbenzene	43.6	2.5	50	0	87	63	138			
1,2-Dibromo-3-chloropropane (DBCP)	233	15	250	0	93	61	142			
1,2,4-Trichlorobenzene	39.6	10	50	0	79	54	143			
Naphthalene	36.1	10	50	0	72	35	159			
Hexachlorobutadiene	95.4	10	100	0	95	60	136			
1,2,3-Trichlorobenzene	42.7	10	50	0	85	38	154			
Surr: 1,2-Dichloroethane-d4	54		50		108	76	127			
Surr: Toluene-d8	46.5		50		93	84	113			
Surr: 4-Bromofluorobenzene	48.2		50		96	79	119			

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Date: 11-Nov-05

QC Summary Report

Work Order: 05102803

Sample Matrix Spike Duplicate Type: **MSD** Test Code: **EPA Method SW8260B**

File ID: **C:\HPCHEM\MS07\DATA\051104\05110451.D** Batch ID: **MS07W1104A** Analysis Date: **11/05/2005 02:38**

Sample ID: **05102803-02AMSD** Units : **µg/L** Run ID: **MSD_07_051104B** Prep Date: **11/05/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	38.5	2.5	50	0	77	17	130	37.47	2.7(16)	
Chloromethane	48.7	5	50	0	97	31	127	46.18	5.3(20)	
Vinyl chloride	44.9	2.5	50	0	90	52	131	42.87	4.6(16)	
Chloroethane	59.5	2.5	50	0	119	40	146	58.72	1.3(40)	
Bromomethane	72.7	10	50	0	145	4	152	67.66	7.2(32)	
Trichlorofluoromethane	52	2.5	50	0	104	57	143	52.95	1.8(22)	
1,1-Dichloroethene	46.1	2.5	50	0	92	65	127	46.42	0.8(17)	
Dichloromethane	44.2	10	50	0	88	68	119	43.08	2.6(15)	
trans-1,2-Dichloroethene	45.6	2.5	50	0	91	67	131	44.42	2.5(30)	
Methyl tert-butyl ether (MTBE)	44.6	1.3	50	0	89	59	145	44.44	0.3(21)	
1,1-Dichloroethane	44.9	2.5	50	0	90	71	128	44.1	1.9(14)	
cis-1,2-Dichloroethene	45.7	2.5	50	0	91	73	129	47.81	4.6(23)	
Bromochloromethane	46.2	2.5	50	0	96	71	130	46.31	4.0(15)	
Chloroform	46.6	2.5	50	0	93	71	124	47.3	1.4(13)	
2,2-Dichloropropane	37.9	2.5	50	0	76	52	157	37.3	1.6(14)	
1,2-Dichloroethane	48.9	2.5	50	0	98	68	139	50.12	2.5(14)	
1,1,1-Trichloroethane	47	2.5	50	0	94	67	134	46.75	0.5(14)	
1,1-Dichloropropene	47.1	2.5	50	0	94	75	130	46.41	1.5(14)	
Carbon tetrachloride	47.6	2.5	50	0	95	62	137	47.22	0.8(15)	
Benzene	45.3	1.3	50	0	91	74	124	43.67	3.6(13)	
Dibromomethane	44.6	2.5	50	0	89	73	130	44.71	0.2(15)	
1,2-Dichloropropane	47.5	2.5	50	0	95	72	130	48.5	2.2(13)	
Trichloroethene	43.5	2.5	50	0	87	66	126	42.98	1.3(13)	
Bromodichloromethane	47.1	2.5	50	0	94	70	133	48.05	2.0(14)	
cis-1,3-Dichloropropene	42.2	2.5	50	0	84	61	130	42.86	1.5(15)	
trans-1,3-Dichloropropene	45.4	2.5	50	0	91	67	134	43.16	5.0(16)	
1,1,2-Trichloroethane	43.3	2.5	50	0	87	72	132	43.54	0.6(16)	
Toluene	44.8	1.3	50	0	90	76	119	43.09	4.0(13)	
1,3-Dichloropropane	45.4	2.5	50	0	91	73	129	43	5.4(15)	
Dibromochloromethane	47.2	2.5	50	0	94	70	130	45.16	4.5(15)	
1,2-Dibromoethane (EDB)	92.4	10	100	0	92	75	133	89.59	3.1(15)	
Tetrachloroethene	45.3	2.5	50	0	91	66	131	40.87	10.3(14)	
1,1,1,2-Tetrachloroethane	47.5	2.5	50	0	95	76	126	45.54	4.2(13)	
Chlorobenzene	45.9	2.5	50	0	92	76	120	43.3	5.8(12)	
Ethylbenzene	44.4	1.3	50	0	89	77	124	42.11	5.2(13)	
m,p-Xylene	45.2	1.3	50	0	90	73	130	43	4.9(14)	
Bromoform	51.8	2.5	50	0	104	66	140	48.39	6.8(16)	
Styrene	47.3	2.5	50	0	95	73	131	44.71	5.7(13)	
o-Xylene	49.5	1.3	50	0	99	74	131	46.03	7.2(13)	
1,1,2,2-Tetrachloroethane	44.3	2.5	50	0	89	63	146	43.91	1.0(17)	
1,2,3-Trichloropropane	87.2	10	100	0	87	73	136	98.59	10.3(19)	
Isopropylbenzene	47.9	2.5	50	0	96	73	133	46.13	3.8(15)	
Bromobenzene	46.8	2.5	50	0	94	75	127	45.25	3.4(18)	
n-Propylbenzene	44.3	2.5	50	0	89	73	130	42.68	3.6(14)	
4-Chlorotoluene	45.2	2.5	50	0	90	76	129	44.07	2.6(13)	
2-Chlorotoluene	47	2.5	50	0	94	76	129	45.41	3.4(13)	
1,3,5-Trimethylbenzene	46.7	2.5	50	0	93	70	135	45.48	2.5(14)	
tert-Butylbenzene	46.7	2.5	50	0	93	74	129	45.62	2.2(14)	
1,2,4-Trimethylbenzene	46.9	2.5	50	0	94	70	134	45.71	2.6(14)	
sec-Butylbenzene	45.7	2.5	50	0	91	74	129	44.22	3.4(14)	
1,3-Dichlorobenzene	46.5	2.5	50	0	93	77	125	45.23	2.7(12)	
1,4-Dichlorobenzene	46.9	2.5	50	0	94	76	126	45.76	2.5(12)	
4-Isopropyltoluene	47.1	2.5	50	0	94	71	133	45.75	2.8(15)	
1,2-Dichlorobenzene	46.5	2.5	50	0	93	77	120	44.76	3.8(12)	
n-Butylbenzene	45.1	2.5	50	0	90	63	138	43.6	3.3(15)	
1,2-Dibromo-3-chloropropane (DBCP)	236	15	250	0	94	61	142	233.3	0.9(17)	
1,2,4-Trichlorobenzene	41.2	10	50	0	82	54	143	39.63	3.9(21)	
Naphthalene	38.4	10	50	0	77	35	159	36.09	6.1(28)	
Hexachlorobutadiene	98.8	10	100	0	99	60	136	95.41	3.5(17)	
1,2,3-Trichlorobenzene	45.1	10	50	0	90	38	154	42.74	5.4(33)	
Surr: 1,2-Dichloroethane-d4	52.2		50		104	76	127			
Surr: Toluene-d8	46.4		50		97	84	113			
Surr: 4-Bromofluorobenzene	48.3		50		97	79	119			

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Date:
11-Nov-05

QC Summary Report

Work Order:
05102803

Comments:

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Date: *11-Nov-05*

QC Summary Report

Work Order: 05102803

Method Blank

Type: **MBLK** Test Code: **EPA Method SW8270C**

File ID: **C:\HPCHEM\MS02\DATA\051104\05110404.D** Batch ID: **13437** Analysis Date: **11/04/2005 15:11**

Sample ID: **MBLK 13437** Units : **µg/L** Run ID: **MSD_02_051102B** Prep Date: **11/02/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Naphthalene	ND	10								
Acenaphthylene	ND	10								
Acenaphthene	ND	10								
Fluorene	ND	10								
Phenanthrene	ND	10								
Anthracene	ND	10								
Fluoranthene	ND	10								
Pyrene	ND	10								
Benzo(a)anthracene	ND	10								
Chrysene	ND	10								
Benzo(b)fluoranthene	ND	10								
Benzo(k)fluoranthene	ND	10								
Benzo(a)pyrene	ND	10								
Indeno(1,2,3-cd)pyrene	ND	10								
Dibenz(a,h)anthracene	ND	10								
Benzo(g,h,i)perylene	ND	10								
Surr: Nitrobenzene-d5	98.2		100		98	62	124			
Surr: 2-Fluorobiphenyl	74.6		100		75	54	113			
Surr: 4-Terphenyl-d14	89.3		100		89	60	116			

Laboratory Control Spike

Type: **LCS** Test Code: **EPA Method SW8270C**

File ID: **C:\HPCHEM\MS02\DATA\051104\05110405.D** Batch ID: **13437** Analysis Date: **11/04/2005 16:02**

Sample ID: **LCS 13437** Units : **µg/L** Run ID: **MSD_02_051102B** Prep Date: **11/02/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Naphthalene	88.2	10	100		88	62	104			
Acenaphthylene	97.7	10	100		98	71	120			
Acenaphthene	99.5	10	100		99.5	67	109			
Fluorene	101	10	100		101	67	114			
Phenanthrene	113	10	100		113	69	117			
Anthracene	116	10	100		116	70	117			
Fluoranthene	121	10	100		121	64	123			
Pyrene	111	10	100		111	70	119			
Benzo(a)anthracene	113	10	100		113	69	115			
Chrysene	114	10	100		114	63	129			
Benzo(b)fluoranthene	109	10	100		109	69	117			
Benzo(k)fluoranthene	122	10	100		122	70	122			
Benzo(a)pyrene	111	10	100		111	71	119			
Indeno(1,2,3-cd)pyrene	113	10	100		113	65	119			
Dibenz(a,h)anthracene	120	10	100		120	59	125			
Benzo(g,h,i)perylene	118	10	100		118	65	122			
Surr: Nitrobenzene-d5	104		100		104	62	124			
Surr: 2-Fluorobiphenyl	76.4		100		76	54	113			
Surr: 4-Terphenyl-d14	104		100		104	60	116			

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Date: 11-Nov-05

QC Summary Report

Work Order: 05102803

Sample Matrix Spike

Type: **MS** Test Code: **EPA Method SW8270C**

File ID: **C:\HPCHEM\MS02\DATA\051104\05110415.D** Batch ID: **13437** Analysis Date: **11/05/2005 00:24**

Sample ID: **05102720-05AMS** Units : **µg/L** Run ID: **MSD_02_051102B** Prep Date: **11/02/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Naphthalene	35	10	100	0	35	30	116			
Acenaphthylene	76.6	10	100	0	77	57	120			
Acenaphthene	76	10	100	0	76	55	113			
Fluorene	90.5	10	100	0	90	57	116			
Phenanthrene	106	10	100	0	106	66	119			
Anthracene	107	10	100	0	107	61	120			
Fluoranthene	108	10	100	0	108	62	123			
Pyrene	104	10	100	0	104	63	120			
Benzo(a)anthracene	108	10	100	0	108	66	118			
Chrysene	104	10	100	0	104	58	130			
Benzo(b)fluoranthene	98.2	10	100	0	98	64	121			
Benzo(k)fluoranthene	111	10	100	0	111	65	122			
Benzo(a)pyrene	104	10	100	0	104	61	122			
Indeno(1,2,3-cd)pyrene	109	10	100	0	109	57	123			
Dibenz(a,h)anthracene	115	10	100	0	115	56	127			
Benzo(g,h,i)perylene	114	10	100	0	114	56	125			
Surr: Nitrobenzene-d5	103		100		103	62	124			
Surr: 2-Fluorobiphenyl	74.9		100		75	54	113			
Surr: 4-Terphenyl-d14	95.9		100		96	60	116			

Sample Matrix Spike Duplicate

Type: **MSD** Test Code: **EPA Method SW8270C**

File ID: **C:\HPCHEM\MS02\DATA\051104\05110416.D** Batch ID: **13437** Analysis Date: **11/05/2005 01:14**

Sample ID: **05102720-05AMSD** Units : **µg/L** Run ID: **MSD_02_051102B** Prep Date: **11/02/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Naphthalene	35.7	10	100	0	36	30	116	34.98	2.1(35)	
Acenaphthylene	79.2	10	100	0	79	57	120	76.55	3.3(18)	
Acenaphthene	80.8	10	100	0	81	55	113	76.01	6.2(16)	
Fluorene	90.7	10	100	0	91	57	116	90.46	0.2(15)	
Phenanthrene	101	10	100	0	101	66	119	106.1	4.5(16)	
Anthracene	102	10	100	0	102	61	120	106.5	3.9(18)	
Fluoranthene	102	10	100	0	102	62	123	108.5	6.2(23)	
Pyrene	93.8	10	100	0	94	63	120	104.1	10.4(23)	
Benzo(a)anthracene	99.5	10	100	0	99.5	66	118	108.1	8.3(16)	
Chrysene	99.5	10	100	0	99.5	58	130	104.4	4.8(16)	
Benzo(b)fluoranthene	95	10	100	0	95	64	121	98.18	3.3(19)	
Benzo(k)fluoranthene	108	10	100	0	108	65	122	111	2.3(13)	
Benzo(a)pyrene	98.4	10	100	0	98	61	122	103.7	5.2(18)	
Indeno(1,2,3-cd)pyrene	94.2	10	100	0	94	57	123	108.6	14.1(22)	
Dibenz(a,h)anthracene	100	10	100	0	100	56	127	115.3	14.2(23)	
Benzo(g,h,i)perylene	100	10	100	0	100	56	125	113.7	12.3(25)	
Surr: Nitrobenzene-d5	104		100		104	62	124			
Surr: 2-Fluorobiphenyl	78.7		100		79	54	113			
Surr: 4-Terphenyl-d14	85.5		100		85	60	116			

Comments:

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QC Summary Report

Work Order: 05102803

Method Blank

Type: MBLK Test Code: SM3500-Fe D
File ID: Batch ID: W051028FER Analysis Date: 10/28/2005 00:00
Sample ID: MBLK-W051028FER Units : mg/L Run ID: WETLAB_051028J Prep Date: 10/28/2005

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Iron, Ferrous (+2)	ND	0.05								

Laboratory Control Spike

Type: LCS Test Code: SM3500-Fe D
File ID: Batch ID: W051028FER Analysis Date: 10/28/2005 00:00
Sample ID: LCS-W051028FER Units : mg/L Run ID: WETLAB_051028J Prep Date: 10/28/2005

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Iron, Ferrous (+2)	1.42	0.05	1.5		95	85	115			

Sample Matrix Spike

Type: MS Test Code: SM3500-Fe D
File ID: Batch ID: W051028FER Analysis Date: 10/28/2005 00:00
Sample ID: 05102801-02AMS Units : mg/L Run ID: WETLAB_051028J Prep Date: 10/28/2005

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Iron, Ferrous (+2)	1.39	0.05	1.5	0	92	70	130			

Sample Matrix Spike Duplicate

Type: MSD Test Code: SM3500-Fe D
File ID: Batch ID: W051028FER Analysis Date: 10/28/2005 00:00
Sample ID: 05102801-02AMSD Units : mg/L Run ID: WETLAB_051028J Prep Date: 10/28/2005

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Iron, Ferrous (+2)	1.44	0.05	1.5	0	96	70	130	1.387	3.5(20)	

Comments:

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Date: *11-Nov-05*

QC Summary Report

Work Order: 05102803

Laboratory Control Spike Type: **LCS** Test Code: **EPA Method 310.1**

File ID: Batch ID: **W051109ALK** Analysis Date: **11/09/2005 00:00**

Sample ID: **LCS-W051109ALK** Units : **mg/L** Run ID: **WETLAB_051109B** Prep Date: **11/09/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Alkalinity, Total (As CaCO3 at pH 4.5)	5.05	1	5		101	90	110			

Comments:

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The Alkalinity LCS data presented is a reflection of the LCS pH QC measurement.

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Date: *11-Nov-05*

QC Summary Report

Work Order: 05102803

Method Blank

Type: **MBLK** Test Code: **EPA Method 300.0 / 9056**

File ID: **02805\A12675_002.DXD** Batch ID: **13419A** Analysis Date: **10/28/2005 19:02**

Sample ID: **MB-13419** Units : **mg/L** Run ID: **IC_1_051028A** Prep Date: **10/28/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Nitrite (NO2) - N	ND	0.25								
Nitrate (NO3) - N	ND	0.25								

Laboratory Fortified Blank

Type: **LFB** Test Code: **EPA Method 300.0 / 9056**

File ID: **02805\A12676_003.DXD** Batch ID: **13419A** Analysis Date: **10/28/2005 19:20**

Sample ID: **LFB-13419** Units : **mg/L** Run ID: **IC_1_051028A** Prep Date: **10/28/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Nitrite (NO2) - N	2.01	0.25	2		101	90	110			
Nitrate (NO3) - N	2.14	0.25	2		107	90	110			

Sample Matrix Spike

Type: **LFM** Test Code: **EPA Method 300.0 / 9056**

File ID: **02805\A12692_019.DXD** Batch ID: **13419A** Analysis Date: **10/28/2005 23:59**

Sample ID: **05102841-01ALFM** Units : **mg/L** Run ID: **IC_1_051028A** Prep Date: **10/28/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Nitrite (NO2) - N	20.3	0.25	20	0	101	80	120			
Nitrate (NO3) - N	24.9	0.25	20	3.032	110	80	120			

Sample Matrix Spike Duplicate

Type: **LFMD** Test Code: **EPA Method 300.0 / 9056**

File ID: **02805\A12693_020.DXD** Batch ID: **13419A** Analysis Date: **10/29/2005 00:17**

Sample ID: **05102841-01ALFMD** Units : **mg/L** Run ID: **IC_1_051028A** Prep Date: **10/29/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Nitrite (NO2) - N	20.3	0.25	20	0	101	80	120	20.29	0.1(2)	
Nitrate (NO3) - N	24.9	0.25	20	3.032	110	80	120	24.94	0.0(2)	

Comments:

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Date: *11-Nov-05*

QC Summary Report

Work Order: 05102803

Method Blank

Type: **MBLK** Test Code: **EPA Method 300.0 / 9056**

File ID: **02805\A12675_002.DXD** Batch ID: **13419B** Analysis Date: **10/28/2005 19:02**

Sample ID: **MB-13419** Units : **mg/L** Run ID: **IC_1_051028A** Prep Date: **10/28/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Sulfate (SO4)	ND	0.5								

Laboratory Fortified Blank

Type: **LFB** Test Code: **EPA Method 300.0 / 9056**

File ID: **02805\A12676_003.DXD** Batch ID: **13419B** Analysis Date: **10/28/2005 19:20**

Sample ID: **LFB-13419** Units : **mg/L** Run ID: **IC_1_051028A** Prep Date: **10/28/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Sulfate (SO4)	4.03	0.5	4		101	90	110			

Sample Matrix Spike

Type: **LFM** Test Code: **EPA Method 300.0 / 9056**

File ID: **02805\A12692_019.DXD** Batch ID: **13419B** Analysis Date: **10/28/2005 23:59**

Sample ID: **05102841-01ALFM** Units : **mg/L** Run ID: **IC_1_051028A** Prep Date: **10/28/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Sulfate (SO4)	91.3	1	40	49.21	105	80	120			

Sample Matrix Spike Duplicate

Type: **LFMD** Test Code: **EPA Method 300.0 / 9056**

File ID: **02805\A12693_020.DXD** Batch ID: **13419B** Analysis Date: **10/29/2005 00:17**

Sample ID: **05102841-01ALFMD** Units : **mg/L** Run ID: **IC_1_051028A** Prep Date: **10/29/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Sulfate (SO4)	91.9	1	40	49.21	107	80	120	91.32	0.6(2)	

Comments:

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Date: *11-Nov-05*

OC Summary Report

Work Order: 05102803

Method Blank

Type: **MBLK** Test Code: **EPA Method SW9060/415.1/SM-5310C**

File ID: **2** Batch ID: **TOC110405** Analysis Date: **11/04/2005 13:14**

Sample ID: **MBLK-110305-TOC** Units : **mg/L** Run ID: **TOC_051104A** Prep Date: **11/04/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Total Organic Carbon	ND	1								

Laboratory Control Spike

Type: **LCS** Test Code: **EPA Method SW9060/415.1/SM-5310C**

File ID: **1** Batch ID: **TOC110405** Analysis Date: **11/04/2005 12:51**

Sample ID: **LCS-110305-TOC** Units : **mg/L** Run ID: **TOC_051104A** Prep Date: **11/04/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Total Organic Carbon	4.98	1	5		99.6	81	132			

Sample Matrix Spike

Type: **MS** Test Code: **EPA Method SW9060/415.1/SM-5310C**

File ID: **4** Batch ID: **TOC110405** Analysis Date: **11/04/2005 19:00**

Sample ID: **05102720-05A-MS** Units : **mg/L** Run ID: **TOC_051104A** Prep Date: **11/04/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Total Organic Carbon	13.9	1	5	8.538	108	56	137			

Sample Matrix Spike Duplicate

Type: **MSD** Test Code: **EPA Method SW9060/415.1/SM-5310C**

File ID: **6** Batch ID: **TOC110405** Analysis Date: **11/04/2005 19:29**

Sample ID: **05102720-05A-MSD** Units : **mg/L** Run ID: **TOC_051104A** Prep Date: **11/04/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Total Organic Carbon	13.3	1	5	8.538	95	56	137	13.93	4.6(15)	

Comments:

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Date: *11-Nov-05*

QC Summary Report

Work Order: 05102803

Method Blank

Type: **MBLK** Test Code: **EPA Method 200.8**

File ID: **110305.B\148_ICB.D** Batch ID: **13443** Analysis Date: **11/03/2005 23:25**

Sample ID: **MB-13443** Units : **mg/L** Run ID: **ICP/MS_051103E** Prep Date: **11/03/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Lead (Pb)	ND	0.005								

Laboratory Control Spike

Type: **LCS** Test Code: **EPA Method 200.8**

File ID: **110305.B\156_LCS.D** Batch ID: **13443** Analysis Date: **11/04/2005 00:04**

Sample ID: **LCS-13443** Units : **mg/L** Run ID: **ICP/MS_051103E** Prep Date: **11/03/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Lead (Pb)	0.262	0.005	0.25		105	84	118			

Sample Matrix Spike

Type: **MS** Test Code: **EPA Method 200.8**

File ID: **110305.B\159SMPL.D** Batch ID: **13443** Analysis Date: **11/04/2005 00:18**

Sample ID: **05102503-04AMS** Units : **mg/L** Run ID: **ICP/MS_051103E** Prep Date: **11/03/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Lead (Pb)	0.27	0.005	0.25	0.01023	104	75	126			

Sample Matrix Spike Duplicate

Type: **MSD** Test Code: **EPA Method 200.8**

File ID: **110305.B\160SMPL.D** Batch ID: **13443** Analysis Date: **11/04/2005 00:23**

Sample ID: **05102503-04AMSD** Units : **mg/L** Run ID: **ICP/MS_051103E** Prep Date: **11/03/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Lead (Pb)	0.265	0.005	0.25	0.01023	102	75	126	0.2703	2.0(10)	

Comments:

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Date: *11-Nov-05*

QC Summary Report

Work Order: 05102803

Method Blank

Type: **MBLK** Test Code: **EPA Method 200.8**

File ID: **110305.B\204_ICB.D** Batch ID: **13427** Analysis Date: **11/04/2005 03:59**

Sample ID: **MB-13427** Units : **mg/L** Run ID: **ICP/MS_051104A** Prep Date: **10/31/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Manganese (Mn), Dissolved	ND	0.005								

Laboratory Control Spike

Type: **LCS** Test Code: **EPA Method 200.8**

File ID: **110305.B\205_LCS.D** Batch ID: **13427** Analysis Date: **11/04/2005 04:04**

Sample ID: **LCS-13427** Units : **mg/L** Run ID: **ICP/MS_051104A** Prep Date: **10/31/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Manganese (Mn), Dissolved	0.0481	0.005	0.05		96	84	118			

Sample Matrix Spike

Type: **MS** Test Code: **EPA Method 200.8**

File ID: **110305.B\215SMPL.D** Batch ID: **13427** Analysis Date: **11/04/2005 04:53**

Sample ID: **05102720-05AMS** Units : **mg/L** Run ID: **ICP/MS_051104A** Prep Date: **10/31/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Manganese (Mn), Dissolved	0.0517	0.005	0.05	0	103	75	126			

Sample Matrix Spike Duplicate

Type: **MSD** Test Code: **EPA Method 200.8**

File ID: **110305.B\216SMPL.D** Batch ID: **13427** Analysis Date: **11/04/2005 04:57**

Sample ID: **05102720-05AMSD** Units : **mg/L** Run ID: **ICP/MS_051104A** Prep Date: **10/31/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Manganese (Mn), Dissolved	0.0514	0.005	0.05	0	103	75	126	0.3535	149.0(10)	R5

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

R5 = MS/MSD RPD exceed the laboratory control limit. Recovery met acceptance criteria.

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Date: *11-Nov-05*

QC Summary Report

Work Order: 05102803

Method Blank

Type: **MBLK** Test Code: **Modified Method RSK-175 GC/FID**

File ID: Batch ID: **13425** Analysis Date: **10/31/2005 14:36**

Sample ID: **MBLK-13425** Units : **mg/L** Run ID: **FID_6_051031A** Prep Date: **10/31/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Methane	ND	0.01								

Laboratory Control Spike

Type: **LCS** Test Code: **Modified Method RSK-175 GC/FID**

File ID: Batch ID: **13425** Analysis Date: **10/31/2005 14:55**

Sample ID: **LCS-13425** Units : **mg/L** Run ID: **FID_6_051031A** Prep Date: **10/31/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Methane	0.519	0.01	0.532		98	70	130			

Sample Matrix Spike

Type: **MS** Test Code: **Modified Method RSK-175 GC/FID**

File ID: Batch ID: **13425** Analysis Date: **10/31/2005 16:29**

Sample ID: **05102803-02AMS** Units : **mg/L** Run ID: **FID_6_051031A** Prep Date: **10/31/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Methane	1.44	0.01	1.06	0.524	86	70	130			

Sample Matrix Spike Duplicate

Type: **MSD** Test Code: **Modified Method RSK-175 GC/FID**

File ID: Batch ID: **13425** Analysis Date: **10/31/2005 16:48**

Sample ID: **05102803-02AMSD** Units : **mg/L** Run ID: **FID_6_051031A** Prep Date: **10/31/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Methane	1.46	0.01	1.06	0.524	89	70	130	1.435	1.9(20)	

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

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Date: *11-Nov-05*

QC Summary Report

Work Order: 05102803

Method Blank

Type: **MBLK** Test Code: **EPA Method 160.1 / SM 2540 C**

File ID: Batch ID: **W051103TDS** Analysis Date: **11/03/2005 00:00**

Sample ID: **MBLK-W051103TDS** Units : **mg/L** Run ID: **WETLAB_051103C** Prep Date: **11/03/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Solids, Total Dissolved (TDS)	ND	10								

Laboratory Control Spike

Type: **LCS** Test Code: **EPA Method 160.1 / SM 2540 C**

File ID: Batch ID: **W051103TDS** Analysis Date: **11/03/2005 00:00**

Sample ID: **LCS-W051103TDS** Units : **mg/L** Run ID: **WETLAB_051103C** Prep Date: **11/03/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Solids, Total Dissolved (TDS)	208	10	200		104	84	116			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

JANUARY 2006

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Date: *01-Feb 06*

QC Summary Report

Work Order: 06011905

Method Blank

Type: **MBLK** Test Code: **EPA Method SW8015**

File ID:
Batch ID: **13946** Analysis Date: **01/20/2006 14:58**
Sample ID: **MBLK-13946** Units : **mg/L** Run ID: **FID_1_060120A** Prep Date: **01/20/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH-E (Diesel)	ND	0.05								
TPH-E (Oil)	ND	0.5								
Surr: Nonane	100		100		100	47	141			

Laboratory Control Spike

Type: **LCS** Test Code: **EPA Method SW8015**

File ID:
Batch ID: **13946** Analysis Date: **01/20/2006 15:34**
Sample ID: **LCS-13946** Units : **mg/L** Run ID: **FID_1_060120A** Prep Date: **01/20/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH-E (Diesel)	2.5	0.5	2.5		99.9	64	129			
Surr: Nonane	97.1		100		97	47	141			

Sample Matrix Spike

Type: **MS** Test Code: **EPA Method SW8015**

File ID:
Batch ID: **13946** Analysis Date: **01/20/2006 20:16**
Sample ID: **06011905-04AMS** Units : **mg/L** Run ID: **FID_1_060120A** Prep Date: **01/20/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH-E (Diesel)	2.49	0.5	2.5	0.1463	94	56	147			
Surr: Nonane	97		100		97	47	141			

Sample Matrix Spike Duplicate

Type: **MSD** Test Code: **EPA Method SW8015**

File ID:
Batch ID: **13946** Analysis Date: **01/20/2006 20:48**
Sample ID: **06011905-04AMSD** Units : **mg/L** Run ID: **FID_1_060120A** Prep Date: **01/20/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH-E (Diesel)	2.83	0.5	2.5	0.1463	107	56	147	2.488	12.8(25)	
Surr: Nonane	97.7		100		98	47	141			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

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Date: *01-Feb-06*

QC Summary Report

Work Order: 06011905

Method Blank Type: **MBLK** Test Code: **EPA Method SW8260B**

File ID: **C:\HPCHEM\MS10\DATA\060123\06012311.D** Batch ID: **MS10W0123A** Analysis Date: **01/23/2006 12:24**

Sample ID: **MBLK MS10W0123A** Units : **µg/L** Run ID: **MSD_10_060123A** Prep Date: **01/23/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	ND	1								
Chloromethane	ND	2								
Vinyl chloride	ND	1								
Chloroethane	ND	1								
Bromomethane	ND	2								
Trichlorofluoromethane	ND	1								
1,1-Dichloroethene	ND	1								
Dichloromethane	ND	2								
trans-1,2-Dichloroethene	ND	1								
Methyl tert-butyl ether (MTBE)	ND	0.5								
1,1-Dichloroethane	ND	1								
cis-1,2-Dichloroethene	ND	1								
Bromochloromethane	ND	1								
Chloroform	ND	1								
2,2-Dichloropropane	ND	1								
1,2-Dichloroethane	ND	1								
1,1,1-Trichloroethane	ND	1								
1,1-Dichloropropene	ND	1								
Carbon tetrachloride	ND	1								
Benzene	ND	0.5								
Dibromomethane	ND	1								
1,2-Dichloropropane	ND	1								
Trichloroethene	ND	1								
Bromodichloromethane	ND	1								
cis-1,3-Dichloropropene	ND	1								
trans-1,3-Dichloropropene	ND	1								
1,1,2-Trichloroethane	ND	1								
Toluene	ND	0.5								
1,3-Dichloropropane	ND	1								
Dibromochloromethane	ND	1								
1,2-Dibromoethane (EDB)	ND	2								
Tetrachloroethene	ND	1								
1,1,1,2-Tetrachloroethane	ND	1								
Chlorobenzene	ND	1								
Ethylbenzene	ND	0.5								
m,p-Xylene	ND	0.5								
Bromoform	ND	1								
Styrene	ND	1								
o-Xylene	ND	0.5								
1,1,2,2-Tetrachloroethane	ND	1								
1,2,3-Trichloropropane	ND	2								
Isopropylbenzene	ND	1								
Bromobenzene	ND	1								
n-Propylbenzene	ND	1								
4-Chlorotoluene	ND	1								
2-Chlorotoluene	ND	1								
1,3,5-Trimethylbenzene	ND	1								
tert-Butylbenzene	ND	1								
1,2,4-Trimethylbenzene	ND	1								
sec-Butylbenzene	ND	1								
1,3-Dichlorobenzene	ND	1								
1,4-Dichlorobenzene	ND	1								
4-Isopropyltoluene	ND	1								
1,2-Dichlorobenzene	ND	1								
n-Butylbenzene	ND	1								
1,2-Dibromo-3-chloropropane (DBCP)	ND	5								
1,2,4-Trichlorobenzene	ND	2								
Naphthalene	ND	2								
Hexachlorobutadiene	ND	2								
1,2,3-Trichlorobenzene	ND	2								
Surr: 1,2-Dichloroethane-d4	9.66		10		97	76	127			
Surr: Toluene-d8	10		10		100	84	113			
Surr: 4-Bromofluorobenzene	9.88		10		99	79	119			

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Date: *01-Feb-06*

QC Summary Report

Work Order: 06011905

Laboratory Control Spike Type: **LCS** Test Code: **EPA Method SW8260B**

File ID: **C:\HPCHEM\MS10\DATA\060123\06012310.D** Batch ID: **MS10W0123A** Analysis Date: **01/23/2006 12:02**

Sample ID: **LCS MS10W0123A** Units : **µg/L** Run ID: **MSD_10_060123A** Prep Date: **01/23/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	9.68	1	10		97	32	129			
Chloromethane	10.9	2	10		109	44	121			
Vinyl chloride	11	1	10		110	80	120			
Chloroethane	11.5	1	10		115	52	142			
Bromomethane	10.1	2	10		101	5	151			
Trichlorofluoromethane	9.21	1	10		92	70	141			
1,1-Dichloroethene	10.1	1	10		101	80	120			
Dichloromethane	10	2	10		100	73	117			
trans-1,2-Dichloroethene	10.6	1	10		106	74	129			
1,1-Dichloroethane	10.5	1	10		105	78	125			
cis-1,2-Dichloroethene	11.1	1	10		111	79	126			
Bromochloromethane	10.5	1	10		105	76	126			
Chloroform	9.43	1	10		94	80	120			
2,2-Dichloropropane	9.6	1	10		96	71	156			
1,2-Dichloroethane	9.58	1	10		96	72	135			
1,1,1-Trichloroethane	8.75	1	10		88	74	132			
1,1-Dichloropropene	10.8	1	10		108	83	129			
Carbon tetrachloride	8.61	1	10		86	68	137			
Benzene	10.5	0.5	10		105	81	122			
Dibromomethane	10.3	1	10		103	75	127			
1,2-Dichloropropane	9.58	1	10		96	80	120			
Trichloroethene	9.66	1	10		97	74	125			
Bromodichloromethane	9.86	1	10		99	75	130			
cis-1,3-Dichloropropene	11	1	10		110	78	128			
trans-1,3-Dichloropropene	10.9	1	10		109	74	134			
1,1,2-Trichloroethane	10.7	1	10		107	75	129			
Toluene	9.59	0.5	10		96	80	120			
1,3-Dichloropropane	10.3	1	10		103	73	129			
Dibromochloromethane	9.24	1	10		92	71	130			
1,2-Dibromoethane (EDB)	20.1	2	20		101	75	132			
Tetrachloroethene	8.79	1	10		88	73	131			
1,1,1,2-Tetrachloroethane	9.26	1	10		93	78	125			
Chlorobenzene	10.1	1	10		101	79	124			
Ethylbenzene	9.55	0.5	10		96	80	120			
m,p-Xylene	9.54	0.5	10		95	80	129			
Bromoform	9.16	1	10		92	66	138			
Styrene	9.66	1	10		97	79	130			
o-Xylene	9.45	0.5	10		95	80	129			
1,1,2,2-Tetrachloroethane	10.2	1	10		102	63	142			
1,2,3-Trichloropropane	19.9	2	20		99.6	73	132			
Isopropylbenzene	10.3	1	10		103	78	133			
Bromobenzene	10.5	1	10		105	76	127			
n-Propylbenzene	10.9	1	10		109	78	130			
4-Chlorotoluene	10.7	1	10		107	80	129			
2-Chlorotoluene	10.8	1	10		108	79	129			
1,3,5-Trimethylbenzene	10.8	1	10		108	77	134			
tert-Butylbenzene	9.84	1	10		98	80	129			
1,2,4-Trimethylbenzene	10.7	1	10		107	77	133			
sec-Butylbenzene	10.4	1	10		104	79	129			
1,3-Dichlorobenzene	10.1	1	10		101	80	125			
1,4-Dichlorobenzene	10.3	1	10		103	79	125			
4-Isopropyltoluene	10.3	1	10		103	77	133			
1,2-Dichlorobenzene	10.3	1	10		103	79	119			
n-Butylbenzene	11.3	1	10		113	72	138			
1,2-Dibromo-3-chloropropane (DBCP)	50.5	3	50		101	61	138			
1,2,4-Trichlorobenzene	9.36	2	10		94	55	139			
Naphthalene	10.1	2	10		101	35	150			
Hexachlorobutadiene	14.9	2	20		74	65	135			
1,2,3 Trichlorobenzene	9.18	2	10		92	39	147			
Surr: 1,2-Dichloroethane-d4	10.3		10		103	76	127			
Surr: Toluene-d8	9.64		10		96	84	113			
Surr: 4-Bromofluorobenzene	9.92		10		99	79	119			

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Date: *01-Feb-06*

QC Summary Report

Work Order: 06011905

Sample Matrix Spike Type: **MS** Test Code: **EPA Method SW8260B**

File ID: **C:\HPCHEM\MS10\DATA\060123\06012314.D** Batch ID: **MS10W0123A** Analysis Date: **01/23/2006 13:29**

Sample ID: **06011905-04AMS** Units : **µg/L** Run ID: **MSD_10_060123A** Prep Date: **01/23/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	41.8	2.5	50	0	84	17	130			
Chloromethane	49.7	5	50	0	99	31	127			
Vinyl chloride	49.1	2.5	50	0	98	52	131			
Chloroethane	56.9	2.5	50	0	114	40	146			
Bromomethane	51.1	10	50	0	102	4	152			
Trichlorofluoromethane	44.2	2.5	50	0	88	57	143			
1,1-Dichloroethene	45.4	2.5	50	0	91	65	127			
Dichloromethane	49	10	50	0	98	68	119			
trans-1,2-Dichloroethene	48.7	2.5	50	0	97	67	131			
1,1-Dichloroethane	50.6	2.5	50	0	101	71	128			
cis-1,2-Dichloroethene	53.1	2.5	50	0	106	73	129			
Bromochloromethane	50.7	2.5	50	0	101	71	130			
Chloroform	45.8	2.5	50	0	92	71	124			
2,2-Dichloropropane	42.6	2.5	50	0	85	52	157			
1,2-Dichloroethane	48.5	2.5	50	0	97	68	139			
1,1,1-Trichloroethane	40.9	2.5	50	0	82	67	134			
1,1-Dichloropropene	50.2	2.5	50	0	100	75	130			
Carbon tetrachloride	40.3	2.5	50	0	81	62	137			
Benzene	49.8	1.3	50	0	99.7	74	125			
Dibromomethane	52.7	2.5	50	0	105	73	130			
1,2-Dichloropropane	47.4	2.5	50	0	95	72	130			
Trichloroethene	43.8	2.5	50	0	88	66	126			
Bromodichloromethane	50.3	2.5	50	0	101	70	133			
cis-1,3-Dichloropropene	52.5	2.5	50	0	105	61	130			
trans-1,3-Dichloropropene	52.2	2.5	50	0	104	67	134			
1,1,2-Trichloroethane	55.9	2.5	50	0	112	72	132			
Toluene	44.1	1.3	50	0	88	76	120			
1,3-Dichloropropane	50.5	2.5	50	0	101	73	129			
Dibromochloromethane	45.3	2.5	50	0	91	70	130			
1,2-Dibromoethane (EDB)	99.9	10	100	0	99.9	75	133			
Tetrachloroethene	38.1	2.5	50	0	76	66	131			
1,1,1,2-Tetrachloroethane	44.8	2.5	50	0	90	76	126			
Chlorobenzene	48.9	2.5	50	0	98	76	124			
Ethylbenzene	44.6	1.3	50	0	89	77	124			
m,p-Xylene	43.3	1.3	50	0	87	73	130			
Bromoform	48	2.5	50	0	96	66	140			
Styrene	45.4	2.5	50	0	91	73	131			
o-Xylene	44.3	1.3	50	0	89	74	131			
1,1,2,2-Tetrachloroethane	56.2	2.5	50	0	112	63	146			
1,2,3-Trichloropropane	108	10	100	0	108	73	136			
Isopropylbenzene	46.7	2.5	50	0	93	73	133			
Bromobenzene	49.9	2.5	50	0	99.9	75	127			
n-Propylbenzene	49.1	2.5	50	0	98	73	130			
4-Chlorotoluene	49.9	2.5	50	0	99.8	76	129			
2-Chlorotoluene	50.3	2.5	50	0	101	76	129			
1,3,5-Trimethylbenzene	50.4	2.5	50	0	101	70	135			
tert-Butylbenzene	45.2	2.5	50	0	90	74	129			
1,2,4-Trimethylbenzene	49.9	2.5	50	0	99.7	70	134			
sec-Butylbenzene	46.7	2.5	50	0	93	74	129			
1,3-Dichlorobenzene	48.3	2.5	50	0	97	77	125			
1,4-Dichlorobenzene	49.4	2.5	50	0	99	76	126			
4-Isopropyltoluene	47.5	2.5	50	0	95	71	133			
1,2-Dichlorobenzene	50.5	2.5	50	0	101	77	120			
n-Butylbenzene	52.4	2.5	50	0	105	63	138			
1,2-Dibromo-3-chloropropane (DBCP)	276	15	250	0	110	61	142			
1,2,4-Trichlorobenzene	47.5	10	50	0	95	54	143			
Naphthalene	53.2	10	50	0	106	35	159			
Hexachlorobutadiene	73.2	10	100	0	73	60	136			
1,2,3-Trichlorobenzene	46.2	10	50	0	92	38	154			
Surr: 1,2-Dichloroethane-d4	54.1		50		108	76	127			
Surr: Toluene-d8	46.5		50		93	84	113			
Surr: 4-Bromofluorobenzene	48.2		50		96	79	119			

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Date: *01-Feb-06*

QC Summary Report

Work Order: 06011905

Sample Matrix Spike Duplicate Type: **MSD** Test Code: **EPA Method SW8260B**

File ID: **C:\HPCHEM\MS10\DATA\060123\06012315.D** Batch ID: **MS10W0123A** Analysis Date: **01/23/2006 13:51**

Sample ID: **06011905-04AMSD** Units : **µg/L** Run ID: **MSD_10_060123A** Prep Date: **01/23/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	42.1	2.5	50	0	84	17	130	41.83	0.5(16)	
Chloromethane	52.8	5	50	0	106	31	127	49.67	6.0(20)	
Vinyl chloride	50.8	2.5	50	0	102	52	131	49.14	3.3(16)	
Chloroethane	57.9	2.5	50	0	116	40	146	56.89	1.8(40)	
Bromomethane	53.1	10	50	0	106	4	152	51.08	3.8(32)	
Trichlorofluoromethane	43.6	2.5	50	0	87	57	143	44.16	1.3(22)	
1,1-Dichloroethene	45.4	2.5	50	0	91	65	127	45.37	0.0(17)	
Dichloromethane	50.1	10	50	0	100	68	119	49	2.1(15)	
trans-1,2-Dichloroethene	48.9	2.5	50	0	98	67	131	48.66	0.6(30)	
1,1-Dichloroethane	50.9	2.5	50	0	102	71	128	50.6	0.7(14)	
cis-1,2-Dichloroethene	53.6	2.5	50	0	107	73	129	53.12	0.9(23)	
Bromochloromethane	51.5	2.5	50	0	103	71	130	50.68	1.6(15)	
Chloroform	46.4	2.5	50	0	93	71	124	45.8	1.3(13)	
2,2-Dichloropropane	42.6	2.5	50	0	85	52	157	42.6	0.0(14)	
1,2-Dichloroethane	48.6	2.5	50	0	97	68	139	48.47	0.2(14)	
1,1,1-Trichloroethane	41	2.5	50	0	82	67	134	40.85	0.3(14)	
1,1-Dichloropropene	49.8	2.5	50	0	99.5	75	130	50.18	0.8(14)	
Carbon tetrachloride	40.3	2.5	50	0	81	62	137	40.31	0.1(15)	
Benzene	50.3	1.3	50	0	101	74	125	49.84	0.9(13)	
Dibromomethane	52.1	2.5	50	0	104	73	130	52.66	1.0(15)	
1,2-Dichloropropane	47.6	2.5	50	0	95	72	130	47.37	0.4(13)	
Trichloroethene	44.2	2.5	50	0	88	66	126	43.8	0.8(13)	
Bromodichloromethane	50	2.5	50	0	99.9	70	133	50.27	0.6(14)	
cis-1,3-Dichloropropene	53.1	2.5	50	0	106	61	130	52.5	1.0(15)	
trans-1,3-Dichloropropene	52.6	2.5	50	0	105	67	134	52.18	0.8(16)	
1,1,2-Trichloroethane	56.2	2.5	50	0	112	72	132	55.88	0.5(16)	
Toluene	44.6	1.3	50	0	89	76	120	44.07	1.1(13)	
1,3-Dichloropropane	50.7	2.5	50	0	101	73	129	50.48	0.4(15)	
Dibromochloromethane	45.1	2.5	50	0	90	70	130	45.3	0.5(15)	
1,2-Dibromoethane (EDB)	99.6	10	100	0	99.6	75	133	99.86	0.2(15)	
Tetrachloroethene	38.1	2.5	50	0	76	66	131	38.12	0.1(14)	
1,1,1,2-Tetrachloroethane	45.4	2.5	50	0	91	76	126	44.77	1.5(13)	
Chlorobenzene	49.8	2.5	50	0	99.7	76	124	48.85	2.0(12)	
Ethylbenzene	45.5	1.3	50	0	91	77	124	44.64	1.9(13)	
m,p-Xylene	45.3	1.3	50	0	91	73	130	43.27	4.6(14)	
Bromoform	49	2.5	50	0	98	66	140	47.99	2.0(16)	
Styrene	46.9	2.5	50	0	94	73	131	45.42	3.1(13)	
o-Xylene	45.4	1.3	50	0	91	74	131	44.33	2.4(13)	
1,1,2,2-Tetrachloroethane	56.5	2.5	50	0	113	63	146	56.15	0.7(17)	
1,2,3-Trichloropropane	110	10	100	0	110	73	136	107.6	1.8(19)	
Isopropylbenzene	47.7	2.5	50	0	95	73	133	46.7	2.2(15)	
Bromobenzene	51.1	2.5	50	0	102	75	127	49.94	2.2(18)	
n-Propylbenzene	50.1	2.5	50	0	100	73	130	49.11	1.9(14)	
4-Chlorotoluene	52.2	2.5	50	0	104	76	129	49.89	4.5(13)	
2-Chlorotoluene	51.8	2.5	50	0	104	76	129	50.3	3.0(13)	
1,3,5-Trimethylbenzene	51.2	2.5	50	0	102	70	135	50.35	1.8(14)	
tert-Butylbenzene	46	2.5	50	0	92	74	129	45.21	1.8(14)	
1,2,4-Trimethylbenzene	50.6	2.5	50	0	101	70	134	49.87	1.4(14)	
sec-Butylbenzene	47.9	2.5	50	0	96	74	129	46.65	2.5(14)	
1,3-Dichlorobenzene	49.7	2.5	50	0	99	77	125	48.33	2.8(12)	
1,4-Dichlorobenzene	50.4	2.5	50	0	101	76	126	49.44	2.0(12)	
4-Isopropyltoluene	47.9	2.5	50	0	96	71	133	47.51	0.8(15)	
1,2-Dichlorobenzene	51.6	2.5	50	0	103	77	120	50.51	2.2(12)	
n-Butylbenzene	53.2	2.5	50	0	106	63	138	52.4	1.6(15)	
1,2-Dibromo-3-chloropropane (DBCP)	276	15	250	0	110	61	142	275.8	0.2(17)	
1,2,4-Trichlorobenzene	47.7	10	50	0	95	54	143	47.47	0.5(21)	
Naphthalene	54.7	10	50	0	109	35	159	53.2	2.7(28)	
Hexachlorobutadiene	76.7	10	100	0	76	60	136	73.22	3.4(17)	
1,2,3-Trichlorobenzene	49.3	10	50	0	99	38	154	46.17	6.5(33)	
Surr: 1,2-Dichloroethane-d4	53.9		50		108	76	127			
Surr: Toluene-d8	46.6		50		93	84	113			
Surr: 4-Bromofluorobenzene	48.3		50		97	79	119			

Alpha Analytical, Inc.

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Date:
01-Feb-06

QC Summary Report

Work Order:
06011905

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

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Date: 02-Feb-06

QC Summary Report

Work Order: 06011905

Method Blank

Type: MBLK Test Code: EPA Method SW8270C

File ID: 06012004.D Batch ID: 13939 Analysis Date: 01/20/2006 12:30

Sample ID: MBLK 13939 Units : µg/L Run ID: MSD_14_060119A Prep Date: 01/19/2006

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Naphthalene	ND	10								
Acenaphthylene	ND	10								
Acenaphthene	ND	10								
Fluorene	ND	10								
Phenanthrene	ND	10								
Anthracene	ND	10								
Fluoranthene	ND	10								
Pyrene	ND	10								
Benzo(a)anthracene	ND	10								
Chrysene	ND	10								
Benzo(b)fluoranthene	ND	10								
Benzo(k)fluoranthene	ND	10								
Benzo(a)pyrene	ND	10								
Indeno(1,2,3-cd)pyrene	ND	10								
Dibenz(a,h)anthracene	ND	10								
Benzo(g,h,i)perylene	ND	10								
Surr: Nitrobenzene-d5	116		100		116	62	124			
Surr: 2-Fluorobiphenyl	112		100		112	54	113			
Surr: 4-Terphenyl-d14	113		100		113	60	116			

Laboratory Control Spike

Type: LCS Test Code: EPA Method SW8270C

File ID: 06012005.D Batch ID: 13939 Analysis Date: 01/20/2006 13:47

Sample ID: LCS 13939 Units : µg/L Run ID: MSD_14_060119A Prep Date: 01/19/2006

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Naphthalene	45.2	10	100		45	62	104			L50
Acenaphthylene	60.4	10	100		60	71	120			L50
Acenaphthene	55.7	10	100		56	67	109			L2
Fluorene	70.5	10	100		71	67	114			
Phenanthrene	73.4	10	100		73	69	117			
Anthracene	77.4	10	100		77	70	117			
Fluoranthene	82.5	10	100		83	64	123			
Pyrene	81.6	10	100		82	70	119			
Benzo(a)anthracene	89.4	10	100		89	69	115			
Chrysene	89.2	10	100		89	63	129			
Benzo(b)fluoranthene	76.5	10	100		77	69	117			
Benzo(k)fluoranthene	82.7	10	100		83	70	122			
Benzo(a)pyrene	76.7	10	100		77	71	119			
Indeno(1,2,3-cd)pyrene	79.4	10	100		79	65	119			
Dibenz(a,h)anthracene	91.5	10	100		92	59	125			
Benzo(g,h,i)perylene	79.2	10	100		79	65	122			
Surr: Nitrobenzene-d5	112		100		112	62	124			
Surr: 2-Fluorobiphenyl	91.6		100		92	54	113			
Surr: 4-Terphenyl-d14	92.4		100		92	60	116			

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Date: 02-Feb-06

QC Summary Report

Work Order: 06011905

Laboratory Control Spike Duplicate

Type: LCSD Test Code: EPA Method SW8270C

File ID: 06012006.D Batch ID: 13939 Analysis Date: 01/20/2006 14:25

Sample ID: LCSD 13939 Units : µg/L Run ID: MSD_14_060119A Prep Date: 01/19/2006

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Naphthalene	75.6	10	100		76	62	104	45.19	50.4(15)	R57
Acenaphthylene	88.4	10	100		88	71	120	60.37	37.7(13)	R57
Acenaphthene	82.4	10	100		82	67	109	55.73	38.6(12)	R56
Fluorene	86.4	10	100		86	67	114	70.5	20.3(15)	R57
Phenanthrene	79.6	10	100		80	69	117	73.4	8.0(11)	
Anthracene	82.9	10	100		83	70	117	77.38	6.9(11)	
Fluoranthene	88	10	100		88	64	123	82.52	6.4(18)	
Pyrene	87.7	10	100		88	70	119	81.56	7.3(13)	
Benzo(a)anthracene	96.8	10	100		97	69	115	89.39	7.9(12)	
Chrysene	99.9	10	100		99.9	63	129	89.17	11.3(12)	
Benzo(b)fluoranthene	83.8	10	100		84	69	117	76.53	9.1(15)	
Benzo(k)fluoranthene	89.5	10	100		89	70	122	82.66	7.9(12)	
Benzo(a)pyrene	82.8	10	100		83	71	119	76.73	7.6(12)	
Indeno(1,2,3-cd)pyrene	86.3	10	100		86	65	119	79.38	8.3(16)	
Dibenz(a,h)anthracene	96.8	10	100		97	59	125	91.52	5.6(15)	
Benzo(g,h,i)perylene	85.6	10	100		86	65	122	79.22	7.8(18)	
Surr: Nitrobenzene-d5	114		100		114	62	124			
Surr: 2-Fluorobiphenyl	98.5		100		98	54	113			
Surr: 4-Terphenyl-d14	99.8		100		99.8	60	116			

Sample Matrix Spike

Type: MS Test Code: EPA Method SW8270C

File ID: 06012014.D Batch ID: 13939 Analysis Date: 01/20/2006 19:05

Sample ID: 06011905-05AMS Units : µg/L Run ID: MSD_14_060119A Prep Date: 01/19/2006

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Naphthalene	34.7	10	100	0	35	30	116			
Acenaphthylene	57.8	10	100	0	58	57	120			
Acenaphthene	51.2	10	100	0	51	55	113			M57
Fluorene	73.5	10	100	0	73	57	116			
Phenanthrene	78.6	10	100	0	79	66	119			
Anthracene	83.9	10	100	0	84	61	120			
Fluoranthene	90.6	10	100	0	91	62	123			
Pyrene	89.7	10	100	0	90	63	120			
Benzo(a)anthracene	97.7	10	100	0	98	66	118			
Chrysene	94.2	10	100	0	94	58	130			
Benzo(b)fluoranthene	85.4	10	100	0	85	64	121			
Benzo(k)fluoranthene	85.7	10	100	0	86	65	122			
Benzo(a)pyrene	85	10	100	0	85	61	122			
Indeno(1,2,3-cd)pyrene	87.1	10	100	0	87	57	123			
Dibenz(a,h)anthracene	84.4	10	100	0	84	56	127			
Benzo(g,h,i)perylene	80.6	10	100	0	81	56	125			
Surr: Nitrobenzene-d5	116		100		116	62	124			
Surr: 2-Fluorobiphenyl	93.3		100		93	54	113			
Surr: 4-Terphenyl-d14	102		100		102	60	116			

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Date: 02-Feb-06

QC Summary Report

Work Order: 06011905

Sample Matrix Spike Duplicate Type: **MSD** Test Code: **EPA Method SW8270C**

File ID: **06012015.D** Batch ID: **13939** Analysis Date: **01/20/2006 19:40**

Sample ID: **06011905-05AMSD** Units : **µg/L** Run ID: **MSD_14_060119A** Prep Date: **01/19/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Naphthalene	66.3	10	100	0	66	30	116	34.74	62.4(35)	R5
Acenaphthylene	86	10	100	0	86	57	120	57.76	39.3(18)	R5
Acenaphthene	79.3	10	100	0	79	55	113	51.19	43.0(16)	R58
Fluorene	90.3	10	100	0	90	57	116	73.47	20.5(15)	R5
Phenanthrene	85.9	10	100	0	86	66	119	78.59	8.9(16)	
Anthracene	87.2	10	100	0	87	61	120	83.92	3.9(18)	
Fluoranthene	95	10	100	0	95	62	123	90.64	4.7(23)	
Pyrene	93.9	10	100	0	94	63	120	89.72	4.6(23)	
Benzo(a)anthracene	101	10	100	0	101	66	118	97.68	3.0(16)	
Chrysene	93.8	10	100	0	94	58	130	94.22	0.4(16)	
Benzo(b)fluoranthene	85.4	10	100	0	85	64	121	85.38	0.1(19)	
Benzo(k)fluoranthene	89	10	100	0	89	65	122	85.66	3.9(13)	
Benzo(a)pyrene	86.7	10	100	0	87	61	122	84.99	2.0(18)	
Indeno(1,2,3-cd)pyrene	89.9	10	100	0	90	57	123	87.13	3.1(22)	
Dibenz(a,h)anthracene	95.5	10	100	0	95	56	127	84.42	12.3(23)	
Benzo(g,h,i)perylene	83.1	10	100	0	83	56	125	80.59	3.1(25)	
Surr: Nitrobenzene-d5	120		100		120	62	124			
Surr: 2-Fluorobiphenyl	83.7		100		84	54	113			
Surr: 4-Terphenyl-d14	106		100		106	60	116			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

L2 = The associated blank spike recovery was below laboratory acceptance limits.

L50 = Analyte recovery was below acceptance limits for the LCS, but was acceptable in the MS/MSD.

M57 = Matrix spike recovery was below laboratory acceptance limits.

R5 = MS/MSD RPD exceed the laboratory control limit. Recovery met acceptance criteria.

R56 = LCS/LCSD RPD exceeded the laboratory control limit.

R57 = LCS/LCSD RPD exceed the laboratory control limit. Recovery met acceptance criteria.

R58 = MS/MSD RPD exceeded the laboratory control limit.

Alpha Analytical, Inc.

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Date: *01-Feb-06*

QC Summary Report

Work Order: 06011905

Method Blank

Type: **MBLK** Test Code: **EPA Method SW9060/415.1/SM-5310C**

File ID: **2** Batch ID: **TOC012306** Analysis Date: **01/23/2006 15:53**

Sample ID: **MBLK-012306-TOC** Units : **mg/L** Run ID: **TOC_060124A** Prep Date: **01/23/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Total Organic Carbon	ND	1								

Laboratory Control Spike

Type: **LCS** Test Code: **EPA Method SW9060/415.1/SM-5310C**

File ID: **1** Batch ID: **TOC012306** Analysis Date: **01/23/2006 15:30**

Sample ID: **LCS-012306-TOC** Units : **mg/L** Run ID: **TOC_060124A** Prep Date: **01/23/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Total Organic Carbon	5.13	1	5		103	71	125			

Sample Matrix Spike

Type: **MS** Test Code: **EPA Method SW9060/415.1/SM-5310C**

File ID: **4** Batch ID: **TOC012306** Analysis Date: **01/23/2006 18:44**

Sample ID: **06011905-07A-MS** Units : **mg/L** Run ID: **TOC_060124A** Prep Date: **01/23/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Total Organic Carbon	11	1	5	5.715	105	56	137			

Sample Matrix Spike Duplicate

Type: **MSD** Test Code: **EPA Method SW9060/415.1/SM-5310C**

File ID: **6** Batch ID: **TOC012306** Analysis Date: **01/23/2006 19:13**

Sample ID: **06011905-07A-MSD** Units : **mg/L** Run ID: **TOC_060124A** Prep Date: **01/23/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Total Organic Carbon	10.6	1	5	5.715	98	56	137	10.96	3.2(15)	

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

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Date: *01-Feb-06*

QC Summary Report

Work Order: 06011905

Method Blank

Type: **MBLK** Test Code: **Modified Method RSK-175 GC/FID**

File ID: Batch ID: **13962** Analysis Date: **01/24/2006 15:28**

Sample ID: **MBLK-13962** Units : **mg/L** Run ID: **FID_6_060124A** Prep Date: **01/24/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Methane	ND	0.01								

Laboratory Control Spike

Type: **LCS** Test Code: **Modified Method RSK-175 GC/FID**

File ID: Batch ID: **13962** Analysis Date: **01/24/2006 15:47**

Sample ID: **LCS-13962** Units : **mg/L** Run ID: **FID_6_060124A** Prep Date: **01/24/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Methane	0.442	0.01	0.532		83	70	130			

Sample Matrix Spike

Type: **MS** Test Code: **Modified Method RSK-175 GC/FID**

File ID: Batch ID: **13962** Analysis Date: **01/25/2006 13:09**

Sample ID: **06011905-10AMS** Units : **mg/L** Run ID: **FID_6_060124A** Prep Date: **01/24/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Methane	1.56	0.01	1.06	0.567	94	70	130			

Sample Matrix Spike Duplicate

Type: **MSD** Test Code: **Modified Method RSK-175 GC/FID**

File ID: Batch ID: **13962** Analysis Date: **01/25/2006 13:26**

Sample ID: **06011905-10AMSD** Units : **mg/L** Run ID: **FID_6_060124A** Prep Date: **01/24/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Methane	1.52	0.01	1.06	0.567	90	70	130	1.561	2.8(20)	

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

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Date: 18-Feb-06

QC Summary Report

Work Order: 06011852

Method Blank

Type: MBLK Test Code: EPA Method 300.0 / 9056
File ID: 17 Batch ID: 13938A Analysis Date: 01/18/2006 17:27
Sample ID: MB-13938 Units : mg/L Run ID: IC_2_060118A Prep Date: 01/18/2006

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Nitrite (NO2) - N	ND	0.25								
Nitrate (NO3) - N	ND	0.25								

Laboratory Fortified Blank

Type: LFB Test Code: EPA Method 300.0 / 9056
File ID: 18 Batch ID: 13938A Analysis Date: 01/18/2006 17:46
Sample ID: LFB-13938 Units : mg/L Run ID: IC_2_060118A Prep Date: 01/18/2006

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Nitrite (NO2) - N	0.502	0.25	0.5		100	90	110			
Nitrate (NO3) - N	0.533	0.25	0.5		107	90	110			

Sample Matrix Spike

Type: LFM Test Code: EPA Method 300.0 / 9056
File ID: 22 Batch ID: 13938A Analysis Date: 01/18/2006 19:00
Sample ID: 06011852-02ALFM Units : mg/L Run ID: IC_2_060118A Prep Date: 01/18/2006

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Nitrite (NO2) - N	9.43	0.25	10	0	94	80	120			
Nitrate (NO3) - N	10.6	0.25	10	0	106	80	120			

Sample Matrix Spike Duplicate

Type: LFMD Test Code: EPA Method 300.0 / 9056
File ID: 23 Batch ID: 13938A Analysis Date: 01/18/2006 19:18
Sample ID: 06011852-02ALFMD Units : mg/L Run ID: IC_2_060118A Prep Date: 01/18/2006

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Nitrite (NO2) - N	9.18	0.25	10	0	92	80	120	9.425	2.6(2)	R5
Nitrate (NO3) - N	10.6	0.25	10	0	106	80	120	10.84	2.3(2)	R5

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

R5 = MS/MSD RPD exceed the laboratory control limit. Recovery met acceptance criteria.

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: 22-Feb-06

QC Summary Report

Work Order: 06011852

Method Blank

Type: MBLK Test Code: EPA Method SW6020
File ID: 021406.B\14049ICB.D Batch ID: 14049 Analysis Date: 02/14/2006 14:26
Sample ID: MB-14049 Units : mg/L Run ID: ICP/MS_060215A Prep Date: 02/13/2006

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Lead (Pb)	ND	0.005								

Laboratory Control Spike

Type: LCS Test Code: EPA Method SW6020
File ID: 021406.B\011ALCS.D\ Batch ID: 14049 Analysis Date: 02/14/2006 14:31
Sample ID: LCS-14049 Units : mg/L Run ID: ICP/MS_060215A Prep Date: 02/13/2006

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Lead (Pb)	0.28	0.005	0.25		112	84	118			

Sample Matrix Spike

Type: MS Test Code: EPA Method SW6020
File ID: 021406.B\014MS.D\ Batch ID: 14049 Analysis Date: 02/14/2006 14:45
Sample ID: 06011852-01AMS Units : mg/L Run ID: ICP/MS_060215A Prep Date: 02/13/2006

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Lead (Pb)	0.276	0.005	0.25	0	111	75	126			

Sample Matrix Spike Duplicate

Type: MSD Test Code: EPA Method SW6020
File ID: 021406.B\015MSD.D\ Batch ID: 14049 Analysis Date: 02/14/2006 14:50
Sample ID: 06011852-01AMSD Units : mg/L Run ID: ICP/MS_060215A Prep Date: 02/13/2006

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Lead (Pb)	0.272	0.005	0.25	0	109	75	126	0.2764	1.5(10)	

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

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Date: *18-Feb-06*

QC Summary Report

Work Order: 06011852

Method Blank

Type: **MBLK** Test Code: **EPA Method 160.1 / SM 2540 C**

File ID:
Batch ID: **W060120TDS** Analysis Date: **01/20/2006 00:00**

Sample ID: **MBLK-W060120TDS** Units : **mg/L** Run ID: **WETLAB_060120F** Prep Date: **01/20/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Solids, Total Dissolved (TDS)	ND	10								

Laboratory Control Spike

Type: **LCS** Test Code: **EPA Method 160.1 / SM 2540 C**

File ID:
Batch ID: **W060120TDS** Analysis Date: **01/20/2006 00:00**

Sample ID: **LCS-W060120TDS** Units : **mg/L** Run ID: **WETLAB_060120F** Prep Date: **01/20/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Solids, Total Dissolved (TDS)	193	10	200		97	84	116			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

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Date: *18-Feb-06*

QC Summary Report

Work Order: 06011852

Method Blank

Type: **MBLK** Test Code: **SM3500-Fe D**
File ID: Batch ID: **W060118FER** Analysis Date: **01/18/2006 00:00**
Sample ID: **MBLK-W060118FER** Units : **mg/L** Run ID: **WETLAB_060118B** Prep Date: **01/18/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Iron, Ferrous (+2)	ND	0.05								

Laboratory Control Spike

Type: **LCS** Test Code: **SM3500-Fe D**
File ID: Batch ID: **W060118FER** Analysis Date: **01/18/2006 00:00**
Sample ID: **LCS-W060118FER** Units : **mg/L** Run ID: **WETLAB_060118B** Prep Date: **01/18/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Iron, Ferrous (+2)	1.52	0.05	1.5		102	85	115			

Sample Matrix Spike

Type: **MS** Test Code: **SM3500-Fe D**
File ID: Batch ID: **W060118FER** Analysis Date: **01/18/2006 00:00**
Sample ID: **06011852-01AMS** Units : **mg/L** Run ID: **WETLAB_060118B** Prep Date: **01/18/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Iron, Ferrous (+2)	1.32	0.05	1.5	0	88	70	130			

Sample Matrix Spike Duplicate

Type: **MSD** Test Code: **SM3500-Fe D**
File ID: Batch ID: **W060118FER** Analysis Date: **01/18/2006 00:00**
Sample ID: **06011852-01AMSD** Units : **mg/L** Run ID: **WETLAB_060118B** Prep Date: **01/18/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Iron, Ferrous (+2)	1.34	0.05	1.5	0	90	70	130	1.321	1.6(20)	

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

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Date: *18-Feb-06*

QC Summary Report

Work Order: 06011852

Laboratory Control Spike Type: **LCS** Test Code: **EPA Method 310.1**

File ID: Batch ID: **W060123ALK** Analysis Date: **01/23/2006 00:00**

Sample ID: **LCS-W060123ALK** Units : **mg/L** Run ID: **WETLAB_060123B** Prep Date: **01/23/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Alkalinity, Total (As CaCO3 at pH 4.5)	5.06	1	5		101	90	110			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

The Alkalinity LCS data presented is a reflection of the LCS pH QC measurement.

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Date: *18-Feb-06*

QC Summary Report

Work Order: 06011852

Method Blank

Type: **MBLK** Test Code: **EPA Method 300.0 / 9056**

File ID: **17** Batch ID: **13950B** Analysis Date: **01/20/2006 18:22**

Sample ID: **MB-13950** Units : **mg/L** Run ID: **IC_2_060120A** Prep Date: **01/20/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Sulfate (SO4)	ND	0.5								

Laboratory Fortified Blank

Type: **LFB** Test Code: **EPA Method 300.0 / 9056**

File ID: **18** Batch ID: **13950B** Analysis Date: **01/20/2006 18:40**

Sample ID: **LFB-13950** Units : **mg/L** Run ID: **IC_2_060120A** Prep Date: **01/20/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Sulfate (SO4)	0.963	0.5	1		96	90	110			

Sample Matrix Spike

Type: **LFM** Test Code: **EPA Method 300.0 / 9056**

File ID: **35** Batch ID: **13950B** Analysis Date: **01/20/2006 23:55**

Sample ID: **06011852-04ALFM** Units : **mg/L** Run ID: **IC_2_060120A** Prep Date: **01/20/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Sulfate (SO4)	810	13	500	331.2	96	80	120			

Sample Matrix Spike Duplicate

Type: **LFMD** Test Code: **EPA Method 300.0 / 9056**

File ID: **36** Batch ID: **13950B** Analysis Date: **01/21/2006 00:14**

Sample ID: **06011852-04ALFMD** Units : **mg/L** Run ID: **IC_2_060120A** Prep Date: **01/20/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Sulfate (SO4)	852	13	500	331.2	104	80	120	809.6	5.1(2)	R5

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

R5 = MS/MSD RPD exceed the laboratory control limit. Recovery met acceptance criteria.

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Date: 23-Feb-06

QC Summary Report

Work Order: 06011852

Method Blank

Type MBLK Test Code: EPA Method 200.8
File ID: 021406.B\201_ICB.D\ Batch ID: 14046 Analysis Date: 02/15/2006 06:00
Sample ID: MB-14046 Units : mg/L Run ID: ICP/MS_060215D Prep Date: 02/08/2006

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Manganese (Mn), Dissolved	ND	0.005								

Laboratory Control Spike

Type LCS Test Code: EPA Method 200.8
File ID: 021406.B\202_LCS.D\ Batch ID: 14046 Analysis Date: 02/15/2006 06:05
Sample ID: LCS-14046 Units : mg/L Run ID: ICP/MS_060215D Prep Date: 02/08/2006

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Manganese (Mn), Dissolved	0.0476	0.005	0.05		95	84	118			

Sample Matrix Spike

Type MS Test Code: EPA Method 200.8
File ID: 021406.B\213MSL.D\ Batch ID: 14046 Analysis Date: 02/15/2006 06:59
Sample ID: 06011852-01AMS Units : mg/L Run ID: ICP/MS_060215D Prep Date: 02/08/2006

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Manganese (Mn), Dissolved	0.351	0.005	0.05	0.2933	114	75	126			

Sample Matrix Spike Duplicate

Type MSD Test Code: EPA Method 200.8
File ID: 021406.B\214MSDL.D\ Batch ID: 14046 Analysis Date: 02/15/2006 07:04
Sample ID: 06011852-01AMSD Units : mg/L Run ID: ICP/MS_060215D Prep Date: 02/08/2006

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Manganese (Mn), Dissolved	0.321	0.005	0.05	0.2933	56	75	126	3.5	166.0(10)	M3 R58

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

M3 = The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to the spike level. The method control sample recovery was acceptable.

R58 = MS/MSD RPD exceeded the laboratory control limit.

APPENDIX E

LABORATORY DATA VALIDATION REPORTS

OCTOBER 2005

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Camp Pendleton, CTO 102

Collection Date: October 27, 2005

LDC Report Date: December 13, 2005

Matrix: Water

Parameters: Total Petroleum Hydrocarbons as Extractables

Validation Level: EPA Level III & IV

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): BMI05102803

Sample Identification

1413-MW04
1413-MW05**
1413-MW06
1413-MW07
1413-MW08
1413-MW09
1413-MW09 Dup
1413-QCEB
1413-MW05MS
1413-MW05MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 10 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Petroleum Hydrocarbons (TPH) as Extractables.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified a P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent a EPA Level IV review. A EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for all compounds were less than or equal to 20.0% .

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent recoveries (%R) of amounts in continuing standard mixtures were within the 85-115% QC limits.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as extractable contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

All target compound identifications were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VI. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VII. System Performance

The system performance was acceptable for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

IX. Field Duplicates

Samples 1413-MW09 and 1413-MW09 Dup were identified as field duplicates. No total petroleum hydrocarbons as extractables were detected in any of the samples with the following exceptions:

Compound	Concentration (mg/L)		RPD
	1413-MW09	1413-MW09 Dup	
TPH as diesel	0.43	0.44	2

X. Field Blanks

Sample 1413-QCEB was identified as an equipment blank. No total petroleum hydrocarbons as extractable contaminants were found in this blank.

Camp Pendleton, CTO 102
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG BMI05102803

No Sample Data Qualified in this SDG

Camp Pendleton, CTO 102
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG BMI05102803

No Sample Data Qualified in this SDG

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 10/28/05

Job#: TO102:14133

Total Petroleum Hydrocarbons - Extractable (TPH-E) EPA Method SW8015B/DHS LUFT Manual

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1413-MW04	TPH-E (Diesel)	0.072	0.050 mg/L	10/27/05	10/31/05
Lab ID :	BMI05102803-01A	TPH-E (Oil)	ND	0.50 mg/L	10/27/05	10/31/05
		Surr: Nonane	118	%REC	10/27/05	10/31/05
Client ID :	1413-MW05	TPH-E (Diesel)	0.20	0.050 mg/L	10/27/05	10/31/05
Lab ID :	BMI05102803-02A	TPH-E (Oil)	ND	0.50 mg/L	10/27/05	10/31/05
		Surr: Nonane	118	%REC	10/27/05	10/31/05
Client ID :	1413-MW06	TPH-E (Diesel)	ND	0.050 mg/L	10/27/05	11/01/05
Lab ID :	BMI05102803-03A	TPH-E (Oil)	ND	0.50 mg/L	10/27/05	11/01/05
		Surr: Nonane	120	%REC	10/27/05	11/01/05
Client ID :	1413-MW07	TPH-E (Diesel)	ND	0.050 mg/L	10/27/05	11/01/05
Lab ID :	BMI05102803-04A	TPH-E (Oil)	ND	0.50 mg/L	10/27/05	11/01/05
		Surr: Nonane	122	%REC	10/27/05	11/01/05
Client ID :	1413-MW08	TPH-E (Diesel)	0.052	0.050 mg/L	10/27/05	11/01/05
Lab ID :	BMI05102803-05A	TPH-E (Oil)	ND	0.50 mg/L	10/27/05	11/01/05
		Surr: Nonane	121	%REC	10/27/05	11/01/05
Client ID :	1413-MW09	TPH-E (Diesel)	0.43	0.050 mg/L	10/27/05	11/01/05
Lab ID :	BMI05102803-06A	TPH-E (Oil)	ND	0.50 mg/L	10/27/05	11/01/05
		Surr: Nonane	120	%REC	10/27/05	11/01/05
Client ID :	1413-MW09DUP	TPH-E (Diesel)	0.44	0.050 mg/L	10/27/05	11/01/05
Lab ID :	BMI05102803-07A	TPH-E (Oil)	ND	0.50 mg/L	10/27/05	11/01/05
		Surr: Nonane	115	%REC	10/27/05	11/01/05
Client ID :	1413-QCEB	TPH-E (Diesel)	ND	0.050 mg/L	10/27/05	11/01/05
Lab ID :	BMI05102803-09A	TPH-E (Oil)	ND	0.50 mg/L	10/27/05	11/01/05
		Surr: Nonane	127	%REC	10/27/05	11/01/05

LDC #: 14359B8

SDG #: BMI05102803

Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 12/12/05

Page: 1 of 1

Reviewer: SVL

2nd Reviewer: CJ

METHOD: GC TPH as Extractables (EPA SW 846 Method 8015)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/27/05
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	A	
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	A	Not reviewed for Level III validation.
VI.	Compound Quantitation and CRQLs	A	Not reviewed for Level III validation.
VII.	System Performance	A	Not reviewed for Level III validation.
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	D = 6, 7
X.	Field blanks	ND	EB = 8

Note: A = Acceptable ND = No compounds detected D = Duplicate
N = Not provided/applicable R = Rinsate TB = Trip blank
SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation

1	1413-MW04	11	MBLK - 13421	21		31	
2	1413-MW05**	12		22		32	
3	1413-MW06	13		23		33	
4	1413-MW07	14		24		34	
5	1413-MW08	15		25		35	
6	1413-MW09	16		26		36	
7	1413-MW09 Dup	17		27		37	
8	1413-QCEB	18		28		38	
9	1413-MW05MS	19		29		39	
10	1413-MW05MSD	20		30		40	

Notes:

LDC #: 14359 B8
SDG #: BMI05 102803

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: JVC
2nd Reviewer: [illegible]

Method: ✓ GC | HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Was a linear fit used for evaluation? If yes, were all percent relative standard deviations (%RSD) < 20%?	✓			
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?		✓		
Did the initial calibration meet the curve fit acceptance criteria?			✓	
Were the RT windows properly established?	✓			
III. Continuing calibration				
What type of continuing calibration calculation was performed? ____ %D or ✓ %R	✓			
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 15%.0 or percent recoveries 85-115%?	✓			
Were all the retention times within the acceptance windows?	✓			
IV. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %R within the QC limits?	✓			
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			

LDC #: 12359 B8
SDG #: BMT 05107803

VALIDATION FINDINGS CHECKLIST

Reviewer: JR
2nd Reviewer: A

Validation Area	Yes	No	NA	Findings/Comments
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XI. Compound quantitation/CRQLs				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XII. System performance				
System performance was found to be acceptable.	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XIV. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?		✓		
XV. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		

LDC #: 14359 D8
SDG #: DMI05102803

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: JR
2nd reviewer: 4

METHOD: ✓ GC __ HPLC

(Y) N N/A Were field duplicate pairs identified in this SDG?
(Y) N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (mg/L)		%RPD Limit NA	Qualification Parent only / All Samples
	6	7		
Diesel	0.43	0.44	✓	

Compound	Concentration ( )		%RPD Limit _____	Qualification Parent only / All Samples

FLDUPNew.wpd

LDC #: 14359 B8
SDG #: BMI 05 102803

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: JG
2nd Reviewer: ✓

METHOD: GC ✓ HPLC ____

The calibration Factor (CF), average CF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

A = Area of compound,
C = Concentration of compound,
S = Standard deviation of the CF
X = Mean of the CFs

#	Standard ID	Calibration Date	Compound	Reported CF (100 std)	Recalculated CF (100 std)	Reported Average CF (Initial)	Recalculated Average CF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL	8/26/05	Diesel	1.3766e-4	1.3766e-4	1.35986e-4	1.35986e-4	9.63	9.63
2									
3									
4									

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14359 B8
SDG #: BMI 05 (02807)

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: JVC
2nd Reviewer: CL

METHOD: GC_____ HPLC_____

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF - CF)/ave. CF
CF = A/C

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(Ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %D	Recalculated %D
1	4 A 102801.D\5		Diesel	250	253.67	253.67	101.47	101.35
2								
3								
4								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14359 B8
SDG #: BMZ05102803

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: [illegible]
2nd reviewer: [illegible]

METHOD: ✓ GC ___ HPLC

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: # 2

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nonane	DB-1	100	118.4838	118	118	0

Sample ID: ___

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference

Sample ID: ___

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference

LDC #: 14259 D0
SDG #: BMI 05/16/2003

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: JR
2nd Reviewer:

METHOD: ✓ GC ___HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA

RPD =((SSCMS - SSCMSD) * 2) / (SSCMS + SSCMSD))*100

Where SSC = Spiked sample concentration; SA = Spike added; MS = Matrix spike; SC = Sample concentration; MSD = Matrix spike duplicate

MS/MSD samples: 9/10

Compound	Spike Added (mg/L)		Sample Conc. (mg/L)	Spike Sample Concentration (mg/L)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	—	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)	2.5	2.5	0.1987	2.92	2.59	109	109	96	96	12.0	12.8
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14359 B8

SDG #: BMI05102803

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Page: 1 of 1

Reviewer: JVG

2nd Reviewer: [illegible]

METHOD: ✓ GC ___ HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA

RPD =(((SSCLCS - SSCLCSD) * 2) / (SSCLCS + SSCLCSD))*100

Where SSC = Spiked sample concentration
SA = Spike added
LCS = Laboratory Control Sample
SC = Sample concentration
LCSD = Laboratory Control Sample duplicate

LCS/LCSD samples: LCS - 13421

Compound	Spike Added (mg/L)		Sample Conc. (mg/L)	Spike Sample Concentration (mg/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	—	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)	2.5	NA	0	2.65	NA	106	106				
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14759 B6
SDG #: BMI051078B3

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ✓ GC __ HPLC

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10% of the reported results?

Concentration= (A)(Fv)(Df) / (RF)(Vs or Ws)(%S/100)

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound in the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. # 2 Compound Name Diesel

Concentration = (58459) (1.35986 e-4) (1 ml) / (40 ml) = 0.1987 x 0.200 mg/L

#	Sample ID	Compound	Reported Concentrations ( )	Recalculated Results Concentrations ( )	Qualifications

Comments:

SAMPCA.xlsx

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Camp Pendleton, CTO 102

Collection Date: October 27, 2005

LDC Report Date: December 13, 2005

Matrix: Water

Parameters: Volatiles

Validation Level: EPA Level III & IV

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): BMI05102803

Sample Identification

1413-MW04
1413-MW05**
1413-MW06
1413-MW07
1413-MW08
1413-MW09
1413-MW09 Dup
1413-QCFB
1413-QCEB
1413-QCTB
1413-MW05MS
1413-MW05MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 12 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified a P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Samples indicated by a double asterisk on the front cover underwent a EPA Level IV review. A EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met

All samples were received in good condition with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
1413-QCTB	All TCL compounds	Air bubbles were apparent in the sample containers.	There should be no air bubbles in the sample containers.	J (all detects) UJ (all non-detects)	A

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

In the case where %RSD was greater than 15.0%, the laboratory used a calibration curve to evaluate the compound. All coefficients of determination (r^2) were greater than or equal to 0.990 .

For the purposes of technical evaluation, all compounds were evaluated against the 30.0% (%RSD) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

Average relative response factors (RRF) for all volatile target compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs).

For the purposes of technical evaluation, all compounds were evaluated against the 25.0% (%D) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
11/4/05	Bromomethane	30.3	All samples in SDG BMI05102803	J (all detects) UJ (all non-detects)	A

All of the continuing calibration RRF values were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All samples in SDG BMI05102803	All TCL compounds	The LCS was analyzed as a continuing calibration standard.	The LCS should be analyzed independently from the calibration.	None	P

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XII. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory.

XIV. System Performance

The system performance was within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

Samples 1413-MW09 and 1413-MW09 Dup were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	1413-MW09	1413-MW09 Dup	
1,2,4-Trimethylbenzene	2.5	2.5	0

XVII. Field Blanks

Sample 1413-QCTB was identified as a trip blank. No volatile contaminants were found in this blank.

Sample 1413-QCEB was identified as an equipment blank. No volatile contaminants were found in this blank with the following exceptions:

Equipment Blank ID	Compound	Concentration (ug/L)
1413-QCEB	Toluene	0.57

Sample 1413-QCFB was identified as a field blank. No volatile contaminants were found in this blank with the following exceptions:

Field Blank ID	Compound	Concentration (ug/L)
1413-QCFB	Toluene	0.58

Camp Pendleton, CTO 102
Volatiles - Data Qualification Summary - SDG BMI05102803

SDG	Sample	Compound	Flag	A or P	Reason
BMI05102803	1413-QCTB	All TCL compounds	J (all detects) UJ (all non-detects)	A	Sample condition
BMI05102803	1413-MW04 1413-MW05** 1413-MW06 1413-MW07 1413-MW08 1413-MW09 1413-MW09 Dup 1413-QCFB 1413-QCEB 1413-QCTB	Bromomethane	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
BMI05102803	1413-MW04 1413-MW05** 1413-MW06 1413-MW07 1413-MW08 1413-MW09 1413-MW09 Dup 1413-QCFB 1413-QCEB 1413-QCTB	All TCL compounds	None	P	Laboratory control samples

Camp Pendleton, CTO 102
Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI05102803

No Sample Data Qualified in this SDG

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-01A
Client I.D. Number: 1413-MW04

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/05/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit		
1	Dichlorodifluoromethane	ND	1.0	µg/L	
2	Chloromethane	ND	2.0	µg/L	
3	Vinyl chloride	ND	1.0	µg/L	
4	Chloroethane	ND	1.0	µg/L	
5	Bromomethane	ND	2.0	µg/L	UJ
6	Trichlorofluoromethane	ND	1.0	µg/L	
7	1,1-Dichloroethene	ND	1.0	µg/L	
8	Dichloromethane	ND	2.0	µg/L	
9	trans-1,2-Dichloroethene	ND	1.0	µg/L	
10	Methyl tert butyl ether (MTBE)	ND	0.50	µg/L	
11	1,1-Dichloroethane	ND	1.0	µg/L	
12	cis-1,2-Dichloroethene	ND	1.0	µg/L	
13	Bromochloromethane	ND	1.0	µg/L	
14	Chloroform	ND	1.0	µg/L	
15	2,2-Dichloropropane	ND	1.0	µg/L	
16	1,2-Dichloroethane	ND	1.0	µg/L	
17	1,1,1-Trichloroethane	ND	1.0	µg/L	
18	1,1-Dichloropropene	ND	1.0	µg/L	
19	Carbon tetrachloride	ND	1.0	µg/L	
20	Benzene	ND	0.50	µg/L	
21	Dibromomethane	ND	1.0	µg/L	
22	1,2-Dichloropropane	ND	1.0	µg/L	
23	Trichloroethene	ND	1.0	µg/L	
24	Bromodichloromethane	ND	1.0	µg/L	
25	cis-1,3-Dichloropropene	ND	1.0	µg/L	
26	trans-1,3-Dichloropropene	ND	1.0	µg/L	
27	1,1,2-Trichloroethane	ND	1.0	µg/L	
28	Toluene	ND	0.50	µg/L	
29	1,3-Dichloropropane	ND	1.0	µg/L	
30	Dibromochloromethane	ND	1.0	µg/L	
31	1,2-Dibromoethane (EDB)	ND	2.0	µg/L	
32	Tetrachloroethene	ND	1.0	µg/L	
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L	
34	Chlorobenzene	ND	1.0	µg/L	
35	Ethylbenzene	ND	0.50	µg/L	
36	m,p-Xylene	ND	0.50	µg/L	
37	Bromoform	ND	1.0	µg/L	
38	Styrene	ND	1.0	µg/L	
39	o-Xylene	ND	0.50	µg/L	
40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L	
41	1,2,3-Trichloropropane	ND	2.0	µg/L	
42	Isopropylbenzene	ND	1.0	µg/L	
43	Bromobenzene	ND	1.0	µg/L	
44	n-Propylbenzene	ND	1.0	µg/L	
45	4-Chlorotoluene	ND	1.0	µg/L	
46	2-Chlorotoluene	ND	1.0	µg/L	
47	1,3,5-Trimethylbenzene	ND	1.0	µg/L	
48	tert-Butylbenzene	ND	1.0	µg/L	
49	1,2,4-Trimethylbenzene	ND	1.0	µg/L	
50	sec-Butylbenzene	ND	1.0	µg/L	
51	1,3-Dichlorobenzene	ND	1.0	µg/L	
52	1,4-Dichlorobenzene	ND	1.0	µg/L	
53	4-Isopropyltoluene	ND	1.0	µg/L	
54	1,2-Dichlorobenzene	ND	1.0	µg/L	
55	n-Butylbenzene	ND	1.0	µg/L	
56	1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L	
57	1,2,4-Trichlorobenzene	ND	2.0	µg/L	
58	Naphthalene	ND	2.0	µg/L	
59	Hexachlorobutadiene	ND	2.0	µg/L	
60	1,2,3-Trichlorobenzene	ND	2.0	µg/L	
61	Surr: 1,2-Dichloroethane-d4	105		%REC	
62	Surr: Toluene-d8	94		%REC	
63	Surr: 4-Bromofluorobenzene	103		%REC	

No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hirchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hirchman, Quality Assurance Officer
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11/10/05
Report Date

Page 1 of 1

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-02A
Client I.D. Number: 1413-MW05

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/05/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration		Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND		1.0	µg/L	36	m,p-Xylene	ND	0.50	µg/L
2	Chloromethane	ND		2.0	µg/L	37	Bromoform	ND	1.0	µg/L
3	Vinyl chloride	ND		1.0	µg/L	38	Styrene	ND	1.0	µg/L
4	Chloroethane	ND		1.0	µg/L	39	o-Xylene	ND	0.50	µg/L
5	Bromomethane	ND	uJ	4.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
6	Trichlorofluoromethane	ND		1.0	µg/L	41	1,2,3-Trichloropropane	ND	4.0	µg/L
7	1,1-Dichloroethene	ND		1.0	µg/L	42	Isopropylbenzene	ND	1.0	µg/L
8	Dichloromethane	ND		4.0	µg/L	43	Bromobenzene	ND	1.0	µg/L
9	trans-1,2-Dichloroethene	ND		1.0	µg/L	44	n-Propylbenzene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND		0.50	µg/L	45	4-Chlorotoluene	ND	1.0	µg/L
11	1,1-Dichloroethane	ND		1.0	µg/L	46	2-Chlorotoluene	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND		1.0	µg/L	47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
13	Bromochloromethane	ND		1.0	µg/L	48	tert-Butylbenzene	ND	1.0	µg/L
14	Chloroform	ND		1.0	µg/L	49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
15	2,2-Dichloropropane	ND		1.0	µg/L	50	sec-Butylbenzene	ND	1.0	µg/L
16	1,2-Dichloroethane	ND		1.0	µg/L	51	1,3-Dichlorobenzene	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND		1.0	µg/L	52	1,4-Dichlorobenzene	ND	1.0	µg/L
18	1,1-Dichloropropene	ND		1.0	µg/L	53	4-Isopropyltoluene	ND	1.0	µg/L
19	Carbon tetrachloride	ND		1.0	µg/L	54	1,2-Dichlorobenzene	ND	1.0	µg/L
20	Benzene	0.39	J	0.50	µg/L	55	n-Butylbenzene	ND	1.0	µg/L
21	Dibromomethane	ND		1.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	6.0	µg/L
22	1,2 Dichloropropane	ND		1.0	µg/L	57	1,2,4-Trichlorobenzene	ND	4.0	µg/L
23	Trichloroethene	ND		1.0	µg/L	58	Naphthalene	ND	4.0	µg/L
24	Bromodichloromethane	ND		1.0	µg/L	59	Hexachlorobutadiene	ND	4.0	µg/L
25	cis-1,3-Dichloropropene	ND		1.0	µg/L	60	1,2,3-Trichlorobenzene	ND	4.0	µg/L
26	trans-1,3-Dichloropropene	ND		1.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	104		%REC
27	1,1,2-Trichloroethane	ND		1.0	µg/L	62	Surr: Toluene-d8	98		%REC
28	Toluene	ND		0.50	µg/L	63	Surr: 4-Bromofluorobenzene	96		%REC
29	1,3-Dichloropropane	ND		1.0	µg/L					
30	Dibromochloromethane	ND		1.0	µg/L					
31	1,2 Dibromoethane (EDB)	ND		4.0	µg/L					
32	Tetrachloroethene	ND		1.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND		1.0	µg/L					
34	Chlorobenzene	ND		1.0	µg/L					
35	Ethylbenzene	ND		0.50	µg/L					

Some Reporting Limits were increased due to sample foaming.

J- The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hirschman

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11/10/05
Report Date

11/11/1905

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-03A
Client I.D. Number: 1413-MW06

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/05/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	1.0	µg/L
2	Chloromethane	ND	2.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L
5	Bromomethane	ND	UJ 2.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L
8	Dichloromethane	ND	2.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L
15	2,2-Dichloropropane	ND	1.0	µg/L
16	1,2-Dichloroethane	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L
20	Benzene	ND	0.50	µg/L
21	Dibromomethane	ND	1.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L
23	Trichloroethene	ND	1.0	µg/L
24	Bromodichloromethane	ND	1.0	µg/L
25	cis-1,3-Dichloropropene	ND	1.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L
27	1,1,2-Trichloroethane	ND	1.0	µg/L
28	Toluene	ND	0.50	µg/L
29	1,3-Dichloropropane	ND	1.0	µg/L
30	Dibromochloromethane	ND	1.0	µg/L
31	1,2-Dibromoethane (EDB)	ND	2.0	µg/L
32	Tetrachloroethene	ND	1.0	µg/L
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L
34	Chlorobenzene	ND	1.0	µg/L
35	Ethylbenzene	ND	0.50	µg/L
36	m,p-Xylene	ND	0.50	µg/L
37	Bromoform	ND	1.0	µg/L
38	Styrene	ND	1.0	µg/L
39	o-Xylene	ND	0.50	µg/L
40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
41	1,2,3-Trichloropropane	ND	2.0	µg/L
42	Isopropylbenzene	ND	1.0	µg/L
43	Bromobenzene	ND	1.0	µg/L
44	n-Propylbenzene	ND	1.0	µg/L
45	4-Chlorotoluene	ND	1.0	µg/L
46	2-Chlorotoluene	ND	1.0	µg/L
47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
48	tert-Butylbenzene	ND	1.0	µg/L
49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
50	sec-Butylbenzene	ND	1.0	µg/L
51	1,3-Dichlorobenzene	ND	1.0	µg/L
52	1,4-Dichlorobenzene	ND	1.0	µg/L
53	4-Isopropyltoluene	ND	1.0	µg/L
54	1,2-Dichlorobenzene	ND	1.0	µg/L
55	n-Butylbenzene	ND	1.0	µg/L
56	1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L
57	1,2,4-Trichlorobenzene	ND	2.0	µg/L
58	Naphthalene	ND	2.0	µg/L
59	Hexachlorobutadiene	ND	2.0	µg/L
60	1,2,3-Trichlorobenzene	ND	2.0	µg/L
61	Surr: 1,2-Dichloroethane-d4	105		%REC
62	Surr: Toluene-d8	95		%REC
63	Surr: 4-Bromofluorobenzene	107		%REC

No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

11/10/05
Report Date

11/11/05

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-04A
Client I.D. Number: 1413-MW07

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/05/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration		Reporting Limit	
1	Dichlorodifluoromethane	ND		1.0	µg/L
2	Chloromethane	ND		2.0	µg/L
3	Vinyl chloride	ND		1.0	µg/L
4	Chloroethane	ND		1.0	µg/L
5	Bromomethane	ND	UJ	4.0	µg/L
6	Trichlorofluoromethane	ND		1.0	µg/L
7	1,1-Dichloroethene	ND		1.0	µg/L
8	Dichloromethane	ND		4.0	µg/L
9	trans-1,2-Dichloroethene	ND		1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND		0.50	µg/L
11	1,1-Dichloroethane	ND		1.0	µg/L
12	cis-1,2-Dichloroethene	ND		1.0	µg/L
13	Bromochloromethane	ND		1.0	µg/L
14	Chloroform	ND		1.0	µg/L
15	2,2-Dichloropropane	ND		1.0	µg/L
16	1,2-Dichloroethane	ND		1.0	µg/L
17	1,1,1-Trichloroethane	ND		1.0	µg/L
18	1,1-Dichloropropene	ND		1.0	µg/L
19	Carbon tetrachloride	ND		1.0	µg/L
20	Benzene	ND		0.50	µg/L
21	Dibromomethane	ND		1.0	µg/L
22	1,2-Dichloropropane	ND		1.0	µg/L
23	Trichloroethene	ND		1.0	µg/L
24	Bromodichloromethane	ND		1.0	µg/L
25	cis-1,3-Dichloropropene	ND		1.0	µg/L
26	trans-1,3-Dichloropropene	ND		1.0	µg/L
27	1,1,2-Trichloroethane	ND		1.0	µg/L
28	Toluene	ND		0.50	µg/L
29	1,3-Dichloropropane	ND		1.0	µg/L
30	Dibromochloromethane	ND		1.0	µg/L
31	1,2-Dibromoethane (EDB)	ND		4.0	µg/L
32	Tetrachloroethene	ND		1.0	µg/L
33	1,1,1,2-Tetrachloroethane	ND		1.0	µg/L
34	Chlorobenzene	ND		1.0	µg/L
35	Ethylbenzene	ND		0.50	µg/L
36	m,p-Xylene	ND		0.50	µg/L
37	Bromoform	ND		1.0	µg/L
38	Styrene	ND		1.0	µg/L
39	o-Xylene	ND		0.50	µg/L
40	1,1,2,2-Tetrachloroethane	ND		1.0	µg/L
41	1,2,3-Trichloropropane	ND		4.0	µg/L
42	Isopropylbenzene	ND		1.0	µg/L
43	Bromobenzene	ND		1.0	µg/L
44	n-Propylbenzene	ND		1.0	µg/L
45	4-Chlorotoluene	ND		1.0	µg/L
46	2-Chlorotoluene	ND		1.0	µg/L
47	1,3,5-Trimethylbenzene	ND		1.0	µg/L
48	tert-Butylbenzene	ND		1.0	µg/L
49	1,2,4-Trimethylbenzene	ND		1.0	µg/L
50	sec-Butylbenzene	ND		1.0	µg/L
51	1,3-Dichlorobenzene	ND		1.0	µg/L
52	1,4-Dichlorobenzene	ND		1.0	µg/L
53	4-Isopropyltoluene	ND		1.0	µg/L
54	1,2-Dichlorobenzene	ND		1.0	µg/L
55	n-Butylbenzene	ND		1.0	µg/L
56	1,2-Dibromo-3-chloropropane (DBCP)	ND		6.0	µg/L
57	1,2,4-Trichlorobenzene	ND		4.0	µg/L
58	Naphthalene	ND		4.0	µg/L
59	Hexachlorobutadiene	ND		4.0	µg/L
60	1,2,3-Trichlorobenzene	ND		4.0	µg/L
61	Surr: 1,2-Dichloroethane-d4	106			%REC
62	Surr: Toluene-d8	95			%REC
63	Surr: 4-Bromofluorobenzene	105			%REC

Some Reporting Limits were increased due to sample foaming.

No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Henchman, Quality Assurance Officer
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11/10/05
Report Date

W41x1905

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-05A
Client I.D. Number: 1413-MW08

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/05/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	1.0	µg/L
2	Chloromethane	ND	2.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L
5	Bromomethane	ND	4.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L
8	Dichloromethane	ND	4.0	µg/L
9	trans-1,2-Dichloroethane	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L
12	cis 1,2-Dichloroethene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L
15	2,2-Dichloropropane	ND	1.0	µg/L
16	1,2-Dichloroethane	ND	1.0	µg/l
17	1,1,1-Trichloroethane	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L
20	Benzene	ND	0.50	µg/L
21	Dibromomethane	ND	1.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L
23	Trichloroethene	ND	1.0	µg/L
24	Bromodichloromethane	ND	1.0	µg/l
25	cis-1,3-Dichloropropene	ND	1.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L
27	1,1,2-Trichloroethane	ND	1.0	µg/L
28	Toluene	ND	0.50	µg/L
29	1,3-Dichloropropane	ND	1.0	µg/L
30	Dibromochloromethane	ND	1.0	µg/L
31	1,2-Dibromoethane (EDB)	ND	4.0	µg/L
32	Tetrachloroethene	ND	1.0	µg/L
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L
34	Chlorobenzene	ND	1.0	µg/L
35	Ethylbenzene	ND	0.50	µg/l
36	m,p-Xylene	ND	0.50	µg/L
37	Bromoform	ND	1.0	µg/L
38	Styrene	ND	1.0	µg/L
39	o-Xylene	ND	0.50	µg/L
40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
41	1,2,3-Trichloropropane	ND	4.0	µg/L
42	Isopropylbenzene	ND	1.0	µg/L
43	Bromobenzene	ND	1.0	µg/L
44	n-Propylbenzene	ND	1.0	µg/L
45	4-Chlorotoluene	ND	1.0	µg/L
46	2-Chlorotoluene	ND	1.0	µg/L
47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
48	tert-Butylbenzene	ND	1.0	µg/l
49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
50	sec-Butylbenzene	ND	1.0	µg/L
51	1,3-Dichlorobenzene	ND	1.0	µg/L
52	1,4-Dichlorobenzene	ND	1.0	µg/L
53	4-Isopropyltoluene	ND	1.0	µg/L
54	1,2-Dichlorobenzene	ND	1.0	µg/L
55	n-Butylbenzene	ND	1.0	µg/L
56	1,2-Dibromo-3-chloropropane (DBCP)	ND	6.0	µg/L
57	1,2,4-Trichlorobenzene	ND	4.0	µg/L
58	Naphthalene	ND	4.0	µg/L
59	Hexachlorobutadiene	ND	4.0	µg/L
60	1,2,3-Trichlorobenzene	ND	4.0	µg/L
61	Surr: 1,2-Dichloroethane-d4	108		%REC
62	Surr: Toluene-d8	96		%REC
63	Surr: 4-Bromofluorobenzene	106		%REC

Some Reporting Limits were increased due to sample foaming.

No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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11/10/05
Report Date

MH 12/9/05

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-06A
Client I.D. Number: 1413-MW09

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/05/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	2.0	µg/L
2	Chloromethane	ND	4.0	µg/L
3	Vinyl chloride	ND	2.0	µg/L
4	Chloroethane	ND	2.0	µg/L
5	Bromomethane	ND	8.0	µg/L
6	Trichlorofluoromethane	ND	2.0	µg/L
7	1,1-Dichloroethene	ND	2.0	µg/L
8	Dichloromethane	ND	8.0	µg/L
9	trans-1,2-Dichloroethene	ND	2.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	1.0	µg/L
11	1,1-Dichloroethane	ND	2.0	µg/L
12	cis-1,2-Dichloroethene	ND	2.0	µg/L
13	Bromochloromethane	ND	2.0	µg/L
14	Chloroform	ND	2.0	µg/L
15	2,2-Dichloropropane	ND	2.0	µg/L
16	1,2-Dichloroethane	ND	2.0	µg/L
17	1,1,1-Trichloroethane	ND	2.0	µg/L
18	1,1-Dichloropropene	ND	2.0	µg/L
19	Carbon tetrachloride	ND	2.0	µg/L
20	Benzene	ND	1.0	µg/L
21	Dibromomethane	ND	2.0	µg/L
22	1,2-Dichloropropane	ND	2.0	µg/L
23	Trichloroethene	ND	2.0	µg/L
24	Bromodichloromethane	ND	2.0	µg/L
25	cis-1,3-Dichloropropene	ND	2.0	µg/L
26	trans-1,3-Dichloropropene	ND	2.0	µg/L
27	1,1,2-Trichloroethane	ND	2.0	µg/L
28	Toluene	ND	1.0	µg/L
29	1,3-Dichloropropane	ND	2.0	µg/L
30	Dibromochloromethane	ND	2.0	µg/L
31	1,2-Dibromoethane (EDB)	ND	8.0	µg/L
32	Tetrachloroethene	ND	2.0	µg/L
33	1,1,1,2-Tetrachloroethane	ND	2.0	µg/L
34	Chlorobenzene	ND	2.0	µg/L
35	Ethylbenzene	ND	1.0	µg/L
36	m,p Xylene	ND	1.0	µg/L
37	Bromoform	ND	2.0	µg/L
38	Styrene	ND	2.0	µg/L
39	o-Xylene	ND	1.0	µg/L
40	1,1,2,2-Tetrachloroethane	ND	2.0	µg/L
41	1,2,3-Trichloropropane	ND	8.0	µg/L
42	Isopropylbenzene	ND	2.0	µg/L
43	Bromobenzene	ND	2.0	µg/L
44	n-Propylbenzene	ND	2.0	µg/L
45	4-Chlorotoluene	ND	2.0	µg/L
46	2-Chlorotoluene	ND	2.0	µg/L
47	1,3,5-Trimethylbenzene	ND	2.0	µg/L
48	tert-Butylbenzene	ND	2.0	µg/L
49	1,2,4-Trimethylbenzene	2.5	2.0	µg/L
50	sec-Butylbenzene	ND	2.0	µg/L
51	1,3-Dichlorobenzene	ND	2.0	µg/L
52	1,4-Dichlorobenzene	ND	2.0	µg/L
53	4-Isopropyltoluene	ND	2.0	µg/L
54	1,2-Dichlorobenzene	ND	2.0	µg/L
55	n-Butylbenzene	ND	2.0	µg/L
56	1,2-Dibromo-3-chloropropane (DBCP)	ND	12	µg/L
57	1,2,4-Trichlorobenzene	ND	8.0	µg/L
58	Naphthalene	ND	8.0	µg/L
59	Hexachlorobutadiene	ND	8.0	µg/L
60	1,2,3-Trichlorobenzene	ND	8.0	µg/L
61	Surr: 1,2-Dichloroethane-d4	108		%REC
62	Surr: Toluene-d8	95		%REC
63	Surr: 4-Bromofluorobenzene	96		%REC

UJ

Reporting Limits were increased due to sample foaming.

No Benzene was observed above an estimated reporting limit of 0.50 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer
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11/10/05
Report Date

MH 12/19/05

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-07A
Client I.D. Number: 1413-MW09DUP

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/05/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration		Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND		2.0	µg/L	36	m,p-Xylene	ND	1.0	µg/L
2	Chloromethane	ND		4.0	µg/L	37	Bromoform	ND	2.0	µg/L
3	Vinyl chloride	ND		2.0	µg/L	38	Styrene	ND	2.0	µg/L
4	Chloroethane	ND		2.0	µg/L	39	o-Xylene	ND	1.0	µg/L
5	Bromomethane	ND	UJ	8.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	2.0	µg/l
6	Trichlorofluoromethane	ND		2.0	µg/L	41	1,2,3-Trichloropropane	ND	8.0	µg/L
7	1,1-Dichloroethene	ND		2.0	µg/L	42	Isopropylbenzene	ND	2.0	µg/L
8	Dichloromethane	ND		8.0	µg/L	43	Bromobenzene	ND	2.0	µg/L
9	trans-1,2-Dichloroethane	ND		2.0	µg/L	44	n-Propylbenzene	ND	2.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND		1.0	µg/L	45	4-Chlorotoluene	ND	2.0	µg/L
11	1,1-Dichloroethane	ND		2.0	µg/L	46	2-Chlorotoluene	ND	2.0	µg/L
12	cis-1,2-Dichloroethene	ND		2.0	µg/L	47	1,3,5-Trimethylbenzene	ND	2.0	µg/L
13	Bromochloromethane	ND		2.0	µg/L	48	tert-Butylbenzene	ND	2.0	µg/L
14	Chloroform	ND		2.0	µg/L	49	1,2,4-Trimethylbenzene	2.5	2.0	µg/L
15	2,2-Dichloropropane	ND		2.0	µg/L	50	sec-Butylbenzene	ND	2.0	µg/L
16	1,2-Dichloroethane	ND		2.0	µg/L	51	1,3-Dichlorobenzene	ND	2.0	µg/L
17	1,1,1-Trichloroethane	ND		2.0	µg/L	52	1,4-Dichlorobenzene	ND	2.0	µg/L
18	1,1-Dichloropropene	ND		2.0	µg/L	53	4-Isopropyltoluene	ND	2.0	µg/L
19	Carbon tetrachloride	ND		2.0	µg/L	54	1,2-Dichlorobenzene	ND	2.0	µg/L
20	Benzene	ND		1.0	µg/L	55	n-Butylbenzene	ND	2.0	µg/L
21	Dibromomethane	ND		2.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	12	µg/L
22	1,2-Dichloropropane	ND		2.0	µg/L	57	1,2,4-Trichlorobenzene	ND	8.0	µg/L
23	Trichloroethene	ND		2.0	µg/L	58	Naphthalene	ND	8.0	µg/L
24	Bromodichloromethane	ND		2.0	µg/L	59	Hexachlorobutadiene	ND	8.0	µg/L
25	cis-1,3-Dichloropropene	ND		2.0	µg/L	60	1,2,3-Trichlorobenzene	ND	8.0	µg/L
26	trans-1,3-Dichloropropene	ND		2.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	103		%REC
27	1,1,2-Trichloroethane	ND		2.0	µg/L	62	Surr: Toluene-d8	95		%REC
28	Toluene	ND		1.0	µg/L	63	Surr: 4-Bromofluorobenzene	97		%REC
29	1,3-Dichloropropane	ND		2.0	µg/L					
30	Dibromochloromethane	ND		2.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND		8.0	µg/L					
32	Tetrachloroethene	ND		2.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND		2.0	µg/L					
34	Chlorobenzene	ND		2.0	µg/L					
35	Ethylbenzene	ND		1.0	µg/L					

Reporting Limits were increased due to sample foaming.

No Benzene was observed above an estimated reporting limit of 0.50 µg/L.

ND – Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

11/10/05
Report Date

11/11/05

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-08A
Client I.D. Number: 1413-QCFB

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/05/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	1.0	µg/L
2	Chloromethane	ND	2.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L
5	Bromomethane	ND	2.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L
7	1,1 Dichloroethene	ND	1.0	µg/L
8	Dichloromethane	ND	2.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L
15	2,2-Dichloropropane	ND	1.0	µg/L
16	1,2-Dichloroethane	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L
20	Benzene	ND	0.50	µg/L
21	Dibromomethane	ND	1.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L
23	Trichloroethene	ND	1.0	µg/L
24	Bromodichloromethane	ND	1.0	µg/L
25	cis-1,3-Dichloropropene	ND	1.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L
27	1,1,2-Trichloroethane	ND	1.0	µg/L
28	Toluene	0.58	0.50	µg/L
29	1,3-Dichloropropane	ND	1.0	µg/L
30	Dibromochloromethane	ND	1.0	µg/L
31	1,2-Dibromoethane (EDB)	ND	2.0	µg/L
32	Tetrachloroethene	ND	1.0	µg/L
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L
34	Chlorobenzene	ND	1.0	µg/L
35	Ethylbenzene	ND	0.50	µg/L

	Compound	Concentration	Reporting Limit	
36	m,p-Xylene	ND	0.50	µg/L
37	Bromoform	ND	1.0	µg/L
38	Styrene	ND	1.0	µg/L
39	o Xylene	ND	0.50	µg/L
40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
41	1,2,3-Trichloropropane	ND	2.0	µg/L
42	Isopropylbenzene	ND	1.0	µg/L
43	Bromobenzene	ND	1.0	µg/L
44	n-Propylbenzene	ND	1.0	µg/L
45	4-Chlorotoluene	ND	1.0	µg/L
46	2-Chlorotoluene	ND	1.0	µg/L
47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
48	tert-Butylbenzene	ND	1.0	µg/L
49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
50	sec-Butylbenzene	ND	1.0	µg/L
51	1,3-Dichlorobenzene	ND	1.0	µg/L
52	1,4-Dichlorobenzene	ND	1.0	µg/L
53	4-Isopropyltoluene	ND	1.0	µg/L
54	1,2-Dichlorobenzene	ND	1.0	µg/L
55	n-Butylbenzene	ND	1.0	µg/L
56	1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L
57	1,2,4-Trichlorobenzene	ND	2.0	µg/L
58	Naphthalene	ND	2.0	µg/L
59	Hexachlorobutadiene	ND	2.0	µg/L
60	1,2,3-Trichlorobenzene	ND	2.0	µg/L
61	Surr: 1,2-Dichloroethane-d4	107		%REC
62	Surr: Toluene-d8	95		%REC
63	Surr: 4-Bromofluorobenzene	105		%REC

No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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11/10/05
Report Date

WH1>1905

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-09A
Client I.D. Number: 1413-QCEB

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/05/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	1.0	µg/L
2	Chloromethane	ND	2.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L
5	Bromomethane	ND	2.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L
8	Dichloromethane	ND	2.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L
15	2,2-Dichloropropane	ND	1.0	µg/L
16	1,2-Dichloroethane	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L
20	Benzene	ND	0.50	µg/L
21	Dibromomethane	ND	1.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L
23	Trichloroethene	ND	1.0	µg/L
24	Bromodichloromethane	ND	1.0	µg/L
25	cis-1,3-Dichloropropene	ND	1.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L
27	1,1,2-Trichloroethane	ND	1.0	µg/L
28	Toluene	0.57	0.50	µg/L
29	1,3-Dichloropropane	ND	1.0	µg/L
30	Dibromochloromethane	ND	1.0	µg/L
31	1,2-Dibromoethane (EDB)	ND	2.0	µg/L
32	Tetrachloroethene	ND	1.0	µg/L
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L
34	Chlorobenzene	ND	1.0	µg/L
35	Ethylbenzene	ND	0.50	µg/L

	Compound	Concentration	Reporting Limit	
36	m,p-Xylene	ND	0.50	µg/L
37	Bromoform	ND	1.0	µg/L
38	Styrene	ND	1.0	µg/L
39	o-Xylene	ND	0.50	µg/L
40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
41	1,2,3-Trichloropropane	ND	2.0	µg/L
42	Isopropylbenzene	ND	1.0	µg/L
43	Bromobenzene	ND	1.0	µg/L
44	n-Propylbenzene	ND	1.0	µg/L
45	4-Chlorotoluene	ND	1.0	µg/L
46	2-Chlorotoluene	ND	1.0	µg/L
47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
48	tert-Butylbenzene	ND	1.0	µg/L
49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
50	sec-Butylbenzene	ND	1.0	µg/L
51	1,3-Dichlorobenzene	ND	1.0	µg/L
52	1,4-Dichlorobenzene	ND	1.0	µg/L
53	4-Isopropyltoluene	ND	1.0	µg/L
54	1,2-Dichlorobenzene	ND	1.0	µg/L
55	n-Butylbenzene	ND	1.0	µg/L
56	1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/l
57	1,2,4-Trichlorobenzene	ND	2.0	µg/L
58	Naphthalene	ND	2.0	µg/L
59	Hexachlorobutadiene	ND	2.0	µg/L
60	1,2,3-Trichlorobenzene	ND	2.0	µg/L
61	Surr: 1,2-Dichloroethane-d4	105		%REC
62	Surr: Toluene-d8	92		%REC
63	Surr: 4-Bromofluorobenzene	104		%REC

No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hirschman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hirschman, Quality Assurance Officer
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11/10/05
Report Date

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MH1/1/05

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-10A
Client I.D. Number: 1413-QCTB

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/05/05

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND	UJ 1.0	µg/L
2	Chloromethane	ND	2.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L
5	Bromomethane	ND	2.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L
8	Dichloromethane	ND	2.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L
15	2,2-Dichloropropane	ND	1.0	µg/L
16	1,2-Dichloroethane	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L
20	Benzene	ND	0.50	µg/L
21	Dibromomethane	ND	1.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L
23	Trichloroethene	ND	1.0	µg/L
24	Bromodichloromethane	ND	1.0	µg/L
25	cis-1,3-Dichloropropene	ND	1.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L
27	1,1,2-Trichloroethane	ND	1.0	µg/L
28	Toluene	ND	0.50	µg/L
29	1,3-Dichloropropane	ND	1.0	µg/L
30	Dibromochloromethane	ND	1.0	µg/L
31	1,2-Dibromoethane (EDB)	ND	2.0	µg/L
32	Tetrachloroethene	ND	1.0	µg/L
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L
34	Chlorobenzene	ND	1.0	µg/L
35	Ethylbenzene	ND	0.50	µg/L
36	m,p-Xylene	ND	UJ 0.50	µg/L
37	Bromoform	ND	1.0	µg/L
38	Styrene	ND	1.0	µg/l
39	o-Xylene	ND	0.50	µg/L
40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
41	1,2,3-Trichloropropane	ND	2.0	µg/L
42	Isopropylbenzene	ND	1.0	µg/L
43	Bromobenzene	ND	1.0	µg/L
44	n-Propylbenzene	ND	1.0	µg/L
45	4-Chlorotoluene	ND	1.0	µg/L
46	2-Chlorotoluene	ND	1.0	µg/L
47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
48	tert-Butylbenzene	ND	1.0	µg/L
49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
50	sec-Butylbenzene	ND	1.0	µg/L
51	1,3-Dichlorobenzene	ND	1.0	µg/L
52	1,4-Dichlorobenzene	ND	1.0	µg/L
53	4-Isopropyltoluene	ND	1.0	µg/L
54	1,2-Dichlorobenzene	ND	1.0	µg/L
55	n-Butylbenzene	ND	1.0	µg/L
56	1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L
57	1,2,4-Trichlorobenzene	ND	2.0	µg/L
58	Naphthalene	ND	2.0	µg/L
59	Hexachlorobutadiene	ND	2.0	µg/L
60	1,2,3-Trichlorobenzene	ND	2.0	µg/L
61	Surr: 1,2-Dichloroethane-d4	104		%REC
62	Surr: Toluene-d8	96		%REC
63	Surr: 4-Bromofluorobenzene	107		%REC

No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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11/10/05
Report Date

Page 1 of 1

6/4/1905

LDC #: 14359B1

SDG #: BMI05102803

Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 12/12/05

Page: 1 of 1

Reviewer: JR

2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 10/27/05
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	%RSD, r²
IV.	Continuing calibration	SW	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	SW	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation/CRQLs	A	Not reviewed for Level III validation.
XIII.	Tentitatively identified compounds (TICs)	N	Not reviewed for Level III validation.
XIV	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	D = 6, 7
XVII.	Field blanks	SW	FB = 8 EB = 9 TB = 10

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; * ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: ** indicates sample underwent Level IV validation

Water

1	1413-MW04	11	1413-MW05MS	21		31	
2	1413-MW05**	12	1413-MW05MSD	22		32	
3	1413-MW06	13	MBLK MS07W1104A	23		33	
4	1413-MW07	14		24		34	
5	1413-MW08	15		25		35	
6	1413-MW09	16		26		36	
7	1413-MW09 Dup	17		27		37	
8	1413-QCFB	18		28		38	
9	1413-QCEB	19		29		39	
10	1413-QCTB	20		30		40	

LDC #: 14359 B1
SDG #: BMI 05 102803

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: JVC
2nd Reviewer: [illegible]

Method: Volatiles (EPA SW 846 Method 8260B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Was a curve fit used for evaluation?	✓	✓		
Did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?	✓			
Were all percent relative standard deviations (%RSD) ≤ 30% and relative response factors (RRF) ≥ 0.05?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Were all percent differences (%D) ≤ 25% and relative response factors (RRF) ≥ 0.05?		✓		
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %R within QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
VIII. Laboratory control samples (LCS)				
Was an LCS analyzed for this SDG?		✓		

LDC #: 14359 B1
SDG #: BMI05102803

VALIDATION FINDINGS CHECKLIST

Reviewer: JTB
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Internal Standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds of the associated calibration standard?	✓			
XI. Compound Identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XII. Compound Quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Tentatively Identified Compounds (TICs)				
Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?			✓	
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?			✓	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?		✓		
XIV. System Performance				
System performance was found to be acceptable.	✓			
XV. Overall Assessment of Data				
Overall assessment of data was found to be acceptable.	✓			
XVI. Field Duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target compounds were detected in the field duplicates.		✓		
XVII. Field Blanks				
Field blanks were identified in this SDG.	✓			
Target compounds were detected in the field blanks.	✓			

TARGET COMPOUND WORKSHEET

IETHOD: VOA (EPA SW 846 Method 8260B)

A. Chloromethane*	S. Trichloroethene	KK. Trichlorofluoromethane	CCC. tert-Butylbenzene	UUU. 1,2-Dichlorotetrafluoroethane
B. Bromomethane	T. Dibromochloromethane	LL. Methyl-tert-butyl ether	DDD. 1,2,4-Trimethylbenzene	VVV. 4-Ethyltoluene
C. Vinyl chloride**	U. 1,1,2-Trichloroethane	MM. 1,2-Dibromo-3-chloropropane	EEE. sec-Butylbenzene	WWW. Ethanol
D. Chloroethane	V. Benzene	NN. Methyl ethyl ketone	FFF. 1,3-Dichlorobenzene	XXX. Di-isopropyl ether
E. Methylene chloride	W. trans-1,3-Dichloropropene	OO. 2,2-Dichloropropane	GGG. p-Isopropyltoluene	YYY. tert-Butanol
F. Acetone	X. Bromoform*	PP. Bromochloromethane	HHH. 1,4-Dichlorobenzene	ZZZ. tert-Butyl alcohol
G. Carbon disulfide	Y. 4-Methyl-2-pentanone	QQ. 1,1-Dichloropropene	III. n-Butylbenzene	AAAA. Ethyl tert-butyl ether
H. 1,1-Dichloroethene**	Z. 2-Hexanone	RR. Dibromomethane	JJJ. 1,2-Dichlorobenzene	BBBB. tert-Amyl methyl ether
I. 1,1-Dichloroethane*	AA. Tetrachloroethene	SS. 1,3-Dichloropropane	KKK. 1,2,4-Trichlorobenzene	CCCC.1-Chlorohexane
J. 1,2-Dichloroethene, total	BB. 1,1,2,2-Tetrachloroethane*	TT. 1,2-Dibromoethane	LLL. Hexachlorobutadiene	DDDD. Isopropyl alcohol
K. Chloroform**	CC. Toluene**	UU. 1,1,1,2-Tetrachloroethane	MMM. Naphthalene	EEEE. Acetonitrile
L. 1,2-Dichloroethane	DD. Chlorobenzene*	VV. Isopropylbenzene	NNN. 1,2,3-Trichlorobenzene	FFFF. Acrolein
M. 2-Butanone	EE. Ethylbenzene**	WW. Bromobenzene	OOO. 1,3,5-Trichlorobenzene	GGGG. Acrylonitrile
N. 1,1,1-Trichloroethane	FF. Styrene	XX. 1,2,3-Trichloropropane	PPP. trans-1,2-Dichloroethene	HHHH. 1,4-Dioxane
O. Carbon tetrachloride	GG. Xylenes, total	YY. n-Propylbenzene	QQQ. cis-1,2-Dichloroethene	IIII. Isobutyl alcohol
P. Bromodichloromethane	HH. Vinyl acetate	ZZ. 2-Chlorotoluene	RRR. m,p-Xylenes	JJJJ. Methacrylonitrile
Q. 1,2-Dichloropropane**	II. 2-Chloroethylvinyl ether	AAA. 1,3,5-Trimethylbenzene	SSS. o-Xylene	KKKK. Propionitrile
R. cis-1,3-Dichloropropene	JJ. Dichlorodifluoromethane	BBB. 4-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	LLLL.

* = System performance check compounds (SPCC) for RRF ; ** = Calibration check compounds (CCC) for %RSD.

LDC #: 14359B1
SDG #: bMI05102803

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: [illegible]

All circled dates have exceeded the technical holding times.
(Y) N N/A Were all cooler temperatures within validation criteria?

METHOD : GC/MS VOA (EPA SW 846 Method 8260B)

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
10	W	Y	10/27/05	- contained bubble > 6 mm			J/UJ/A

TECHNICAL HOLDING TIME CRITERIA

Water unpreserved:	Aromatic within 7 days, non-aromatic within 14 days of sample collection.
Water preserved:	Both within 14 days of sample collection.
Soil:	Both within 14 days of sample collection.

LDC #: 14359 B1
SDG #: BM105102803

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: JVC
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y N N/A Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤25.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	11/04/05	05 110439	B	30.3		All + Blk	J/UJ/A

LDC #: 14359 B1
SDG #: B/MI 05/03803

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: DTC
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a LCS required?
Y N N/A Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
				( )	( )	( )		
		Lab reported CCV		as (LCS)	( )	( )	All + BLK	None P
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 14359 B1
SDG #: BMI05102803

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: JVG
2nd reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (ug/L)		RPD
	6	7	
DDD	2.5	2.5	0

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

FLDUP4.1SB

LDC #: 14359 B1
SDG #: BMI05107803

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: JVG
2nd reviewer: R

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds detected in the field blanks?

Sample: 8 Field Blank / Trip Blank / Rinsate / Other _____ (circle one)

Compound	Concentration Units (ug/L)
CC	0.58

Sample: 9 Field Blank / Trip Blank / Rinsate / Other EB (circle one)

Compound	Concentration Units (ug/L)
CC	0.54

Sample: _____ Field Blank / Trip Blank / Rinsate / Other _____ (circle one)

Compound	Concentration Units ( )

LDC #: 14359 B1
SDG #: BMI05102803

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: JVL
2nd Reviewer: a

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

RRF = $(A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs
X = Mean of the RRFs

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (1.0 std)	Recalculated RRF (1.0 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL	10/29/05	Methylene chloride (1st internal standard)	3.518 e-1	0.3518	0.3197	0.3192	9.9	9.9
			~~Trichlorethene~~ CF (2nd internal standard)	3.199	3.199	3.259	0.259	3.1	3.1
			~~Toluene~~ AAA (3rd internal standard)	3.926	3.926	3.740	2.730	7.1	7.3
2			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						
3			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						
4			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14359 B1
SDG #: BMI05102803

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = $(A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	05 110439	11/04/05	Methylene chloride (1st internal standard)	0.3192	0.293	0.293	8.2	8.2
			~~Trichlorethene~~ CC (2nd internal standard)	3.259	2.989	2.989	8.3	8.3
			~~Toluene~~ AAA (3rd internal standard)	3.740	3.660	3.660	2.1	2.1
2			Methylene chloride (1st internal standard)					
			Trichlorethene (2nd internal standard)					
			Toluene (3rd internal standard)					
3			Methylene chloride (1st internal standard)					
			Trichlorethene (2nd internal standard)					
			Toluene (3rd internal standard)					
4			Methylene chloride (1st internal standard)					
			Trichlorethene (2nd internal standard)					
			Toluene (3rd internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

CONCLC.1SB

LDC #: 14359 B1
SDG #: BMI05102803

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: JVL
2nd reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: # 2

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8	20	19.66	98	98	0
Bromofluorobenzene	↓	19.15	96	96	↓
1,2-Dichloroethane-d4	↓	20.81	104	104	↓
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

LDC #: 14359 B1
SDG #: BMI.05102803

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: JVC
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA

Where: SSC = Spiked sample concentration
SA = Spike added
SC = Sample concentration

RPD = | MSC - MSDC | * 2/(MSC + MSDC)

MSC = Matrix spike percent recovery
MSDC = Matrix spike duplicate percent recovery

MS/MSD sample: 11/12

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)	Spiked Sample Concentration (ug/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	—	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene	50	50	0	46.4	46.1	93	93	92	92	0.8	0.6
Trichloroethene				43	43.5	86	86	87	87	1.3	1.2
Benzene				43.7	45.3	87	87	91	91	3.6	3.6
Toluene				43.1	44.8	86	86	90	90	4.0	4.0
Chlorobenzene				43.3	45.9	87	87	92	92	5.8	5.8

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

MSDCLC.1S8

LDC #: 14359#1
SDG #: BMI05102803

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Page: 1 of 1
Reviewer: JVC
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA

Where: SSC = Spiked sample concentration
SA = Spike added

RPD = | LCS - LCSD | * 2/(LCS + LCSD)

LCS = Laboratory control sample percent recovery

LCSD = Laboratory control sample duplicate percent recovery

LCS ID: LCS MS07W1104A

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene	10	NA	10.4	NA	104	104				
Trichloroethene			10.1		101	101				
Benzene			9.44		94	94				
Toluene			9.17		92	92				
Chlorobenzene			9.27		93	93				

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LCSCLC.1SB

LDC #: 14359 B1
SDG #: BMS 05102803

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer:
2nd reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

RRF = Relative response factor of the calibration standard.

V_o = Volume or weight of sample pruged in milliliters (ml) or grams (g).

Df = Dilution factor.

%S = Percent solids, applicable to soils and solid matrices only.

Example:

Sample I.D. #2 ✓

Conc. = (15190)(10)(2) / (659990)(1.175)( )( )

= 0.3917

≈ 0.39 ug/L

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Camp Pendleton, CTO 102

Collection Date: October 27, 2005

LDC Report Date: December 13, 2005

Matrix: Water

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: EPA Level III & IV

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): BMI05102803

Sample Identification

1413-MW04
1413-MW05**
1413-MW06
1413-MW07
1413-MW08
1413-MW09
1413-MW09 Dup

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 7 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per a modification of EPA SW 846 Method 8270C for Polynuclear Aromatic Hydrocarbons.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified a P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Samples indicated by a double asterisk on the front cover underwent a EPA Level IV review. A EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals. All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

For the purposes of technical evaluation, all compounds were evaluated against the 30.0% (%RSD) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

Average relative response factors (RRF) for all target compounds were greater than or equal to 0.05 as required.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs).

For the purposes of technical evaluation, all compounds were evaluated against the 25.0% (%D) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

All of the continuing calibration RRF values were greater than or equal to 0.05 .

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polynuclear aromatic hydrocarbon contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XII. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory.

XIV. System Performance

The system performance was within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XV. Overall Assessment

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

Samples 1413-MW09 and 1413-MW09 Dup were identified as field duplicates. No polynuclear aromatic hydrocarbons were detected in any of the samples.

XVII. Field Blanks

No field blanks were identified in this SDG.

Camp Pendleton, CTO 102
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG BMI05102803

No Sample Data Qualified in this SDG

Camp Pendleton, CTO 102
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG BMI05102803

No Sample Data Qualified in this SDG

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-01A
Client I.D. Number: 1413-MW04

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/08/05

Semivolatile Organics by GC/MS
EPA Method SW8270C

	Compound	Concentration	Reporting Limit
1	Naphthalene	ND	10 µg/L
2	Acenaphthylene	ND	10 µg/L
3	Acenaphthene	ND	10 µg/L
4	Fluorene	ND	10 µg/L
5	Phenanthrene	ND	10 µg/L
6	Anthracene	ND	10 µg/L
7	Fluoranthene	ND	10 µg/L
8	Pyrene	ND	10 µg/L
9	Benzo(a)anthracene	ND	10 µg/L
10	Chrysene	ND	10 µg/L
11	Benzo(b)fluoranthene	ND	10 µg/L
12	Benzo(k)fluoranthene	ND	10 µg/L
13	Benzo(a)pyrene	ND	10 µg/L
14	Indeno(1,2,3-cd)pyrene	ND	10 µg/L
15	Dibenz(a,h)anthracene	ND	10 µg/L
16	Benzo(g,h,i)perylene	ND	10 µg/L
17	Surr: Nitrobenzene-d5	94	%REC
18	Surr: 2-Fluorobiphenyl	71	%REC
19	Surr: 4-Terphenyl-d14	89	%REC

ND - Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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11/10/05
Report Date

WH12/1905

8

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-02A
Client I.D. Number: 1413-MW05

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/08/05

Semivolatile Organics by GC/MS
EPA Method SW8270C

	Compound	Concentration	Reporting Limit
1	Naphthalene	ND	10 µg/L
2	Acenaphthylene	ND	10 µg/L
3	Acenaphthene	ND	10 µg/L
4	Fluorene	ND	10 µg/L
5	Phenanthrene	ND	10 µg/L
6	Anthracene	ND	10 µg/L
7	Fluoranthene	ND	10 µg/L
8	Pyrene	ND	10 µg/L
9	Benzo(a)anthracene	ND	10 µg/L
10	Chrysene	ND	10 µg/L
11	Benzo(b)fluoranthene	ND	10 µg/L
12	Benzo(k)fluoranthene	ND	10 µg/L
13	Benzo(a)pyrene	ND	10 µg/L
14	Indeno(1,2,3-cd)pyrene	ND	10 µg/L
15	Dibenz(a,h)anthracene	ND	10 µg/L
16	Benzo(g,h,i)perylene	ND	10 µg/L
17	Surr: Nitrobenzene-d5	96	%REC
18	Surr: 2-Fluorobiphenyl	67	%REC
19	Surr: 4-Terphenyl-d14	94	%REC

ND = Not Detected

Roger Scholl Randy Gardner Walter Henchman

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11/10/05
Report Date

11/11/1905

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-03A
Client I.D. Number: 1413-MW06

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/08/05

Semivolatile Organics by GC/MS
EPA Method SW8270C

	Compound	Concentration	Reporting Limit
1	Naphthalene	ND	10 µg/L
2	Acenaphthylene	ND	10 µg/L
3	Acenaphthene	ND	10 µg/L
4	Fluorene	ND	10 µg/L
5	Phenanthrene	ND	10 µg/L
6	Anthracene	ND	10 µg/L
7	Fluoranthene	ND	10 µg/L
8	Pyrene	ND	10 µg/L
9	Benzo(a)anthracene	ND	10 µg/L
10	Chrysene	ND	10 µg/L
11	Benzo(b)fluoranthene	ND	10 µg/L
12	Benzo(k)fluoranthene	ND	10 µg/L
13	Benzo(a)pyrene	ND	10 µg/L
14	Indeno(1,2,3-cd)pyrene	ND	10 µg/L
15	Dibenz(a,h)anthracene	ND	10 µg/l
16	Benzo(g,h,i)perylene	ND	10 µg/L
17	Surr: Nitrobenzene-d5	84	%REC
18	Surr: 2-Fluorobiphenyl	60	%REC
19	Surr: 4-Terphenyl-d14	81	%REC

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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11/10/05
Report Date

11/12/05

10

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-04A
Client I.D. Number: 1413-MW07

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/08/05

Semivolatile Organics by GC/MS
EPA Method SW8270C

	Compound	Concentration	Reporting Limit
1	Naphthalene	ND	10 µg/L
2	Acenaphthylene	ND	10 µg/L
3	Acenaphthene	ND	10 µg/L
4	Fluorene	ND	10 µg/L
5	Phenanthrene	ND	10 µg/L
6	Anthracene	ND	10 µg/L
7	Fluoranthene	ND	10 µg/L
8	Pyrene	ND	10 µg/L
9	Benzo(a)anthracene	ND	10 µg/l
10	Chrysene	ND	10 µg/L
11	Benzo(b)fluoranthene	ND	10 µg/L
12	Benzo(k)fluoranthene	ND	10 µg/L
13	Benzo(a)pyrene	ND	10 µg/L
14	Indeno(1,2,3-cd)pyrene	ND	10 µg/L
15	Dibenz(a,h)anthracene	ND	10 µg/L
16	Benzo(g,h,i)perylene	ND	10 µg/L
17	Surr: Nitrobenzene-d5	93	%REC
18	Surr: 2-Fluorobiphenyl	73	%REC
19	Surr: 4-Terphenyl-d14	93	%REC

ND = Not Detected

Roger Scholl Randy Gardner Walter Hutchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hutchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 291-4848 / info@alpha-analytical.com

11/10/05
Report Date

11/17/1905

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
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Alpha Analytical Number: BMI05102803-05A
Client I.D. Number: 1413-MW08

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/08/05

Semivolatile Organics by GC/MS
EPA Method SW8270C

	Compound	Concentration	Reporting Limit
1	Naphthalene	ND	10 µg/L
2	Acenaphthylene	ND	10 µg/L
3	Acenaphthene	ND	10 µg/L
4	Fluorene	ND	10 µg/L
5	Phenanthrene	ND	10 µg/L
6	Anthracene	ND	10 µg/L
7	Fluoranthene	ND	10 µg/L
8	Pyrene	ND	10 µg/L
9	Benzo(a)anthracene	ND	10 µg/L
10	Chrysene	ND	10 µg/L
11	Benzo(b)fluoranthene	ND	10 µg/L
12	Benzo(k)fluoranthene	ND	10 µg/L
13	Benzo(a)pyrene	ND	10 µg/L
14	Indeno(1,2,3-cd)pyrene	ND	10 µg/L
15	Dibenz(a,h)anthracene	ND	10 µg/L
16	Benzo(g,h,i)perylene	ND	10 µg/L
17	Surr: Nitrobenzene-d5	90	%REC
18	Surr: 2-Fluorobiphenyl	68	%REC
19	Surr: 4-Terphenyl-d14	88	%REC

ND = Not Detected

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

11/10/05
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-06A
Client I.D. Number: 1413-MW09

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/08/05

Semivolatile Organics by GC/MS
EPA Method SW8270C

	Compound	Concentration	Reporting Limit
1	Naphthalene	ND	20 µg/L
2	Acenaphthylene	ND	20 µg/L
3	Acenaphthene	ND	20 µg/L
4	Fluorene	ND	20 µg/L
5	Phenanthrene	ND	20 µg/L
6	Anthracene	ND	20 µg/L
7	Fluoranthene	ND	20 µg/L
8	Pyrene	ND	20 µg/L
9	Benzo(a)anthracene	ND	20 µg/L
10	Chrysene	ND	20 µg/L
11	Benzo(b)fluoranthene	ND	20 µg/L
12	Benzo(k)fluoranthene	ND	20 µg/L
13	Benzo(a)pyrene	ND	20 µg/L
14	Indeno(1,2,3-cd)pyrene	ND	20 µg/L
15	Dibenz(a,h)anthracene	ND	20 µg/L
16	Benzo(g,h,i)perylene	ND	20 µg/L
17	Surr: Nitrobenzene-d5	84	%REC
18	Surr: 2-Fluorobiphenyl	70	%REC
19	Surr: 4-Terphenyl-d14	88	%REC

Reporting Limits were increased due to the hydrocarbons present in the sample.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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11/10/05
Report Date

WH12/905

13

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI05102803-07A
Client I.D. Number: 1413-MW09DUP

Sampled: 10/27/05
Received: 10/28/05
Analyzed: 11/08/05

Semivolatile Organics by GC/MS
EPA Method SW8270C

	Compound	Concentration	Reporting Limit
1	Naphthalene	ND	20 µg/L
2	Acenaphthylene	ND	20 µg/L
3	Acenaphthene	ND	20 µg/L
4	Fluorene	ND	20 µg/L
5	Phenanthrene	ND	20 µg/L
6	Anthracene	ND	20 µg/L
7	Fluoranthene	ND	20 µg/L
8	Pyrene	ND	20 µg/L
9	Benzo(a)anthracene	ND	20 µg/L
10	Chrysene	ND	20 µg/L
11	Benzo(b)fluoranthene	ND	20 µg/L
12	Benzo(k)fluoranthene	ND	20 µg/L
13	Benzo(a)pyrene	ND	20 µg/L
14	Indeno(1,2,3-cd)pyrene	ND	20 µg/L
15	Dibenz(a,h)anthracene	ND	20 µg/L
16	Benzo(g,h,i)perylene	ND	20 µg/L
17	Surr: Nitrobenzene-d5	85	%REC
18	Surr: 2-Fluorobiphenyl	68	%REC
19	Surr: 4-Terphenyl-d14	88	%REC

Reporting Limits were increased due to the hydrocarbons present in the sample.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hirchman

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Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

11/10/05
Report Date

LDC #: 14359B2

SDG #: BMI05102803

Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 12/12/05

Page: 1 of 1

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/27/05
II.	GC/MS instrument performance check	A	
III.	Initial calibration	A	
IV.	Continuing calibration	SW	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	1523-MW04 from BMI05102720
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation/CRQLs	A	Not reviewed for Level III validation.
XIII.	Tentitatively identified compounds (TICs)	N	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	
XVI.	Field duplicates	ND	D = 6, 7
XVII.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation

Water

1	1413-MW04	11		21		31	
2	1413-MW05**	12		22		32	
3	1413-MW06	13		23		33	
4	1413-MW07	14		24		34	
5	1413-MW08	15		25		35	
6	1413-MW09	16		26		36	
7	1413-MW09 Dup	17		27		37	
8	MBLK 13437	18		28		38	
9		19		29		39	
10		20		30		40	

LDC #: 14359 B2
SDG #: BME 05 10 2803

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: JMG
2nd Reviewer: [illegible]

Method: Semivolatiles (EPA SW 846 Method 8270C)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Was a curve fit used for evaluation?		✓		
Did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?			✓	
Were all percent relative standard deviations (%RSD) ≤ 30% and relative response factors (RRF) ≥ 0.05?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Were all percent differences (%D) ≤ 25% and relative response factors (RRF) ≥ 0.05?	✓			
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %R within QC limits?	✓			
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			

LDC #: 14359 B2
SDG #: BMI05102803

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: JVG
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds from the associated calibration standard?	✓			
XI. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?				
XII. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?			✓	
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?			✓	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?		✓		
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target compounds were detected in the field duplicates.		✓		
XVII. Field blanks				
Field blanks were identified in this SDG.		✓		
Target compounds were detected in the field blanks.			✓	

LDC #: 14759 BV
SDG #: DMI05/02803

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs,

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard
X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (40 std)	Recalculated RRF (40 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL	9/20/05	Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)	0.974	0.974	1.024	1.024	6.8	6.8
			Fluorene (3rd internal standard)	1.321	1.321	1.379	1.379	4.0	4.0
			Pentachlorophenol (4th internal standard) UU	1.099	1.099	1.129	1.129	5.9	5.9
			Bis(2-ethylhexyl)phthalate (5th internal standard) DDD	1.214	1.214	1.236	1.236	2.95	3.0
			Benzo(a)pyrene (6th internal standard)	1.263	1.263	1.277	1.277	2.3	2.3
2			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
3			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14359B2
SDG #: BMI05102803

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: JVL
2nd Reviewer: ✓

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = $(A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	05110805	11/08/05	Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)	1.024	not provided			
			Fluorene (3rd internal standard)	1.379				
			Pentachlorophenol (4th internal standard)	1.129		(power outage)		
			Bis(2-ethylhexyl)phthalate (5th internal standard)	1.236				
			Benzo(a)pyrene (6th internal standard)	1.277				
2	05110804	11/8/05	Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)	1.024	not	0.967	not	5.6 ~~18.15~~
			Fluorene (3rd internal standard)	1.379	provided	1.308	provided	5.2
			Pentachlorophenol (4th internal standard) UU	1.129		1.093		3.2
			Bis(2-ethylhexyl)phthalate (5th internal standard) DPD	1.236		1.203		2.6
			Benzo(a)pyrene (6th internal standard)	1.277		1.238		3.0
3			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14459 B2
SDG #: BMT 0570803

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: JVB
2nd reviewer: A

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #2

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5	100	95.86	96	96	0
2-Fluorobiphenyl	↓	67.38	67	67	↓
Terphenyl-d14	↓	93.86	94	94	↓
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

LDC #: 14359 B2
SDG #: DMI05102803

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: JR
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentration

RPD = | MS - MSD | * 2/(MS + MSD) MS = Matrix spike percent recovery MSD = Matrix spike duplicate percent recovery

MS/MSD samples: 1523- MW04 MS/MSD

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)	Spiked Sample Concentration ( )		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	—	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
Phenol											
2-Chlorophenol											
1,4-Dichlorobenzene											
N-Nitroso-di-n-propylamine											
1,2,4-Trichlorobenzene											
4-Chloro-3-methylphenol											
Acenaphthene	100	100	0	76	80.8	76	76	81	81	6.2	6.1
4-Nitrophenol											
2,4-Dinitrotoluene											
Pentachlorophenol											
Pyrene	100	100	0	104	93.8	104	104	94	94	10.4	10.3

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

MSDCLC.2S

LDC #: 14359 B2
SDG #: DMI05/02803

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Page: 1 of 1
Reviewer: JVC
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SC/SA Where: SSC = Spike concentration, SA = Spike added

RPD = | LCS - LCSD | * 2/(LCS + LCSD) LCS = Laboratory control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: LCS 3737

Compound	Spike Added (ug/L)		Spike Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
Phenol										
2-Chlorophenol										
1,4-Dichlorobenzene										
N-Nitroso-di-n-propylamine										
1,2,4-Trichlorobenzene										
4-Chloro-3-methylphenol										
Acenaphthene	100	NA	99.5	NA	99.5	99.5				
4-Nitrophenol										
2,4-Dinitrotoluene										
Pentachlorophenol										
Pyrene	100	NA	111	NA	111	111				

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14359 B2
SDG #: BMI05102803

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: JVL
2nd reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

$$\text{Concentration} = \frac{(A_x)(I_s)(V_i)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_t)(\%S)}$$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

V_i = Volume of extract injected in microliters (ul)

V_t = Volume of the concentrated extract in microliters (ul)

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

2.0 = Factor of 2 to account for GPC cleanup

Example:

Sample I.D. _____, ND:

Conc. = ( )( )( )( )( )( )
( )( )( )( )( )

=

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Camp Pendleton, CTO 102

Collection Date: October 27, 2005

LDC Report Date: December 13, 2005

Matrix: Water

Parameters: Lead & Dissolved Manganese

Validation Level: EPA Level III & IV

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): BMI05102803

Sample Identification

1413-MW04
1413-MW05**
1413-MW06
1413-MW07
1413-MW08
1413-MW09
1413-MW09 Dup
1413-MW04F
1413-MW05F**
1413-MW06F
1413-MW07F
1413-MW08F
1413-MW09F
1413-MW09 DupF

Sample IDs ending in "F" were analyzed for dissolved manganese.
**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 14 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6020 for Lead & Dissolved Manganese.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified a P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Samples indicated by a double asterisk on the front cover underwent a EPA Level IV review. A EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

III. Blanks

Method blanks were reviewed for each matrix as applicable.

Data qualification by the initial, continuing and preparation blanks (ICB/CCB/PBs) was based on the maximum contaminant concentration in the ICB/CCB/PBs in the analysis of each analyte. No contaminant concentrations were found in the initial, continuing and preparation blanks.

IV. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

V. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Internal Standards

All internal standard percent recoveries (%R) were within QC limits for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

ICP serial dilution was not performed by the laboratory.

XI. Sample Result Verification

All sample result verifications met validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIII. Field Duplicates

Samples 1413-MW09 and 1413-MW09 Dup and samples 1413-MW09F and 1413-MW09 DupF were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/L)		RPD
	1413-MW09F	1413-MW09 DupF	
Manganese	0.55	0.40	32

XIV. Field Blanks

No field blanks were identified in this SDG.

Camp Pendleton, CTO 102
Lead & Dissolved Manganese - Data Qualification Summary - SDG BMI05102803

No Sample Data Qualified in this SDG

Camp Pendleton, CTO 102
Lead & Dissolved Manganese - Laboratory Blank Data Qualification Summary - SDG BMI05102803

No Sample Data Qualified in this SDG

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 10/28/05

Job#: TO102:14133

Metals by ICPMS
EPA Method SW6020

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1413-MW04**					
Lab ID :	BMI05102803-01A	Lead (Pb)	ND	0.0050 mg/L	10/27/05	11/04/05
Client ID :	**1413-MW05**					
Lab ID :	BMI05102803-02A	Lead (Pb)	ND	0.0050 mg/L	10/27/05	11/04/05
Client ID :	**1413-MW06**					
Lab ID :	BMI05102803-03A	Lead (Pb)	ND	0.0050 mg/L	10/27/05	11/04/05
Client ID :	**1413-MW07**					
Lab ID :	BMI05102803-04A	Lead (Pb)	ND	0.0050 mg/L	10/27/05	11/04/05
Client ID :	**1413-MW08**					
Lab ID :	BMI05102803-05A	Lead (Pb)	ND	0.0050 mg/L	10/27/05	11/04/05
Client ID :	**1413-MW09**					
Lab ID :	BMI05102803-06A	Lead (Pb)	ND	0.0050 mg/L	10/27/05	11/04/05
Client ID :	**1413-MW09DUP**					
Lab ID :	BMI05102803-07A	Lead (Pb)	ND	0.0050 mg/L	10/27/05	11/04/05

ND = Not Detected

Roger Scholl Randy Gardner Walter Hirschman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hirschman, Quality Assurance Officer
Sacramento, CA • (916) 366-9059 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

11/10/05
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 10/28/05

Job#: TO102:14133

Dissolved Metals by ICPMS
EPA Method SW6020

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1413-MW04					
Lab ID :	BMI05102803-01A	Manganese (Mn), Dissolved	0.13	0.0050 mg/L	10/27/05	11/04/05
Client ID :	1413-MW05					
Lab ID :	BMI05102803-02A	Manganese (Mn), Dissolved	0.33	0.0050 mg/L	10/27/05	11/04/05
Client ID :	1413-MW06					
Lab ID :	BMI05102803-03A	Manganese (Mn), Dissolved	0.084	0.0050 mg/L	10/27/05	11/04/05
Client ID :	1413-MW07					
Lab ID :	BMI05102803-04A	Manganese (Mn), Dissolved	0.41	0.0050 mg/L	10/27/05	11/04/05
Client ID :	1413-MW08					
Lab ID :	BMI05102803-05A	Manganese (Mn), Dissolved	0.44	0.0050 mg/L	10/27/05	11/08/05
Client ID :	1413-MW09					
Lab ID :	BMI05102803-06A	Manganese (Mn), Dissolved	0.55	0.0050 mg/L	10/27/05	11/04/05
Client ID :	1413-MW09DUP					
Lab ID :	BMI05102803-07A	Manganese (Mn), Dissolved	0.40	0.0050 mg/L	10/27/05	11/04/05

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11/10/05
Report Date

LDC #: 14359B4

VALIDATION COMPLETENESS WORKSHEET

Date: 12-13-05

SDG #: BMI05102803

Level III/IV

Page: 1 of 1

Laboratory: Alpha Analytical, Inc.

Reviewer: MG

2nd Reviewer: WM

METHOD: Lead & Dissolved Manganese (EPA SW 846 Method 6020)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10-27-05
II.	Calibration	A	
III.	Blanks	A	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	A	MS/MSD (SDG: BMI05102503, BMI05102720)
VI.	Duplicate Sample Analysis	N	
VII.	Laboratory Control Samples (LCS)	A	LCS
VIII.	Internal Standard (ICP-MS)	A	
IX.	Furnace Atomic Absorption QC	N	Not utilized
X.	ICP Serial Dilution	N	Not performed
XI.	Sample Result Verification	A	Not reviewed for Level III validation.
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	SW	D=6*+7*, D=13+14
XIV.	Field Blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; * = ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation

all water

1	1413-MW04	11	1413-MW07F	21		31	
2	1413-MW05**	12	1413-MW08F	22		32	
3	1413-MW06	13	1413-MW09F	23		33	
4	1413-MW07	14	1413-MW09 DupF	24		34	
5	1413-MW08	15	PBW1	25		35	
6	1413-MW09	16	PBW2	26		36	
7	1413 MW09 Dup	17		27		37	
8	1413-MW04F	18		28		38	
9	1413-MW05F**	19		29		39	
10	1413-MW06F	20		30		40	

Notes: Samples appended with "F" were analyzed for Dissolved Manganese

LDC #: 14359B4
SDG #: BMI051028003

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: MG
2nd Reviewer: HM

Method: Metals (EPA SW 846 Method 6010/7000/6020)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Calibrations				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% (80-120% for mercury and 85-115% for cyanide) QC limits?	✓			
Were all initial calibration correlation coefficients > 0.995? (Level IV only)	✓			
III. Blank				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. ICP Interference Check Sample				
Were ICP interference check samples performed daily?	✓			
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?	✓			
V. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of +/- RL(+/-2X RL for soil) was used for samples that were ≤ 5X the RL, including when only one of the duplicate sample values were < 5X the RL.	✓			
VI. Laboratory control samples				
Was an LCS anayized for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% QC limits for water samples and laboratory established QC limits for soils?	✓			
VII. Furnace Atomic Absorption QC				
If MSA was performed, was the correlation coefficients > 0.995?			✓	
Do all applicable analysies have duplicate injections? (Level IV only)			✓	
For sample concentrations > RL, are applicable duplicate injection RSD values < 20%? (Level IV only)			✓	
Were analytical spike recoveries within the 85-115% QC limits?			✓	

LDC #: 14359B4
SDG #: BMI051028O3

VALIDATION FINDINGS CHECKLIST

Reviewer: MG
2nd Reviewer: HM

Validation Area	Yes	No	NA	Findings/Comments
VII. ICP Serial Dilution				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the IDL?		✓		
Were all percent differences (%Ds) < 10%?			✓	
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.			✓	
VIII. Internal Standards (EPA SW 846 Method 6020)				
Were all the percent recoveries (%R) within the 30-120% of the intensity of the internal standard in the associated initial calibration?	✓			
If the %Rs were outside the criteria, was a reanalysis performed?			✓	
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Overall Assessment of Data				
Overall assessment of data was found to be acceptable.	✓			
XII. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target analytes were detected in the field duplicates.	✓			
XIII. Field blanks				
Field blanks were identified in this SDG.		✓		
Target analytes were detected in the field blanks.			✓	

LDC #: 143584
SDG #: BMI05102803

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer: MM

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1→7	W	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, (Pb), Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
8→14	↓	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, (Mn), Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
ICP Trace		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
ICP-MS	W	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, (Pb), Mg, (Mn), Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___

Comments: Mercury by CVAA if performed

LDC #: 14359B4
SDG #: BMI05102803

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: MG
2nd reviewer: MM

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target analytes detected in the field duplicate pairs?

Analyte	Concentration (mg/L)		RPD (Limits)	Difference (Limits)	Qualifications
	13	14			
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Cadmium					
Calcium					
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Magnesium					
Manganese	0.55	0.40	32		
Mercury					
Nickel					
Potassium					
Selenium					
Silver					
Sodium					
Thallium					
Vanadium					
Zinc					
Cyanide					
Boron					
Molybdenum					
Strontium					
Silicon					

Notes:

LDC #: 14359B4
SDG #: BMI05102803

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Reviewer: MG
2nd Reviewer: LH

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

An initial and continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

$\%R = \frac{Found}{True} \times 100$

Where, Found = concentration (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution
True = concentration (in ug/L) of each analyte in the ICV or CCV source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated %R	Reported %R	Acceptable (Y/N)
	ICP (Initial calibration)						
	GFAA (Initial calibration)						
	CVAA (Initial calibration)						
	ICP (Continuing calibration)						
	GFAA (Continuing calibration)						
	CVAA (Continuing calibration)						
1159 ICV	ICP/MS (Initial calibration)	Pb	51.02	50.00	102	not reported	Y
1113 CCV II	ICP/MS (Continuing calibration)	Mn	81.16	80.00	101	101	↓

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14359B4
SDG #: BMI05102803

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: MG
2nd Reviewer: Mn

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Percent recoveries (%R) for an ICP interference check sample, a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$\%R = \frac{Found}{True} \times 100$

Where, Found = Concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = Concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

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

Where, S = Original sample concentration
D = Duplicate sample concentraton

An ICP serial dilution percent difference (%D) was recalculated using the following formula:

$\%D = \frac{|I-SDR|}{I} \times 100$

Where, I = Initial Sample Result (mg/L)
SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

Sample ID	Type of Analysis	Element	Found / S / I (units)	True / D / SDR (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
0003 ICSAB	ICP interference check	Mn	204.30 (µg/L)	200.00 (µg/L)	102	not reported	Y
0004 LCS	Laboratory control sample	Pb	0.2623 (mg/L)	0.25 (mg/L)	105	105	↓
1523-MW04 MS	Matrix spike	Mn	(SSR-SR) 0.05165 (mg/L)	0.05 (mg/L)	103	103	↓
1415-MW07 MS/MSD	Duplicate	Pb	0.2703 (mg/L)	0.2649 (mg/L)	2.0	2.0	↓
—	ICP serial dilution	—	—	—	—	—	—

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

TOTCLC.4SW

LDC #: 14359B4
SDG #: BMI05102803

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: MG
2nd reviewer: MM

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Have results been reported and calculated correctly?
Y N N/A Are results within the calibrated range of the instruments and within the linear range of the ICP?
Y N N/A Are all detection limits below the CRDL?

Detected analyte results for # 9, Mn were recalculated and verified using the following equation:

Concentration = (RD)(FV)(Dil) / (In. Vol.)(%S)

RD = Raw data concentration
FV = Final volume (ml)
In. Vol. = Initial volume (ml) or weight (G)
Dil = Dilution factor
%S = Decimal percent solids

Recalculation:
a dilution factor of 5 was already applied by software.
From raw data: Mn = 0.331450 mg/L

Sample ID	Analyte	Reported Concentration (mg/L)	Calculated Concentration (mg/L)	Acceptable (Y/N)
~~9~~ 9	Mn	0.33	0.33	Y

RECALC.4S2

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Camp Pendleton, CTO 102

Collection Date: October 27, 2005

LDC Report Date: December 18, 2005

Matrix: Water

Parameters: Methane

Validation Level: EPA Level III & IV

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): BMI05102803

Sample Identification

1413-MW04
1413-MW05**
1413-MW06
1413-MW07
1413-MW08
1413-MW09
1413-MW09 Dup
1413-MW05MS
1413-MW05MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per Method RSK-175 for Methane.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified a P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent a EPA Level IV review. A EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 30.0% .

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent recoveries (%R) of amounts in continuing standard mixtures were within the 70-130% QC limits.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No methane contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were not required by the method.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

All target compound identifications were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VI. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VII. System Performance

The system performance was within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

IX. Field Duplicates

Samples 1413-MW09 and 1413-MW09 Dup were identified as field duplicates. No methane contaminants were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/L)		RPD
	1413-MW09	1413-MW09 Dup	
Methane	0.41	0.42	2

X. Field Blanks

No field blanks were identified in this SDG.

Camp Pendleton, CTO 102
Methane - Data Qualification Summary - SDG BMI05102803

No Sample Data Qualified in this SDG

Camp Pendleton, CTO 102
Methane - Laboratory Blank Data Qualification Summary - SDG BMI05102803

No Sample Data Qualified in this SDG

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201

Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 10/28/05

Dissolved Gases
Modified Method RSK-175 GC/FID

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1413-MW04					
Lab ID :	BMI05102803-01A	Methane	0.037	0.010 mg/L	10/27/05	10/31/05
Client ID :	1413-MW05					
Lab ID :	BMI05102803-02A	Methane	0.52	0.010 mg/L	10/27/05	10/31/05
Client ID :	1413-MW06					
Lab ID :	BMI05102803-03A	Methane	ND	0.010 mg/L	10/27/05	10/31/05
Client ID :	1413-MW07					
Lab ID :	BMI05102803-04A	Methane	ND	0.010 mg/L	10/27/05	10/31/05
Client ID :	1413-MW08					
Lab ID :	BMI05102803-05A	Methane	ND	0.010 mg/L	10/27/05	10/31/05
Client ID :	1413-MW09					
Lab ID :	BMI05102803-06A	Methane	0.41	0.010 mg/L	10/27/05	10/31/05
Client ID :	1413-MW09DUP					
Lab ID :	BMI05102803-07A	Methane	0.42	0.010 mg/L	10/27/05	10/31/05

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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11/10/05
Report Date

TO102:14133

MH 12/9/05

LDC #: 14359B51

SDG #: BMI05102803

Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 12/12/05

Page: 1 of 1

Reviewer: JVL

2nd Reviewer: 9

METHOD: GC Methane (Method RSK-175)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10/27/05
IIa.	Initial calibration	A	
IIb.	Calibration verification	~~SW~~ A	~~%R = 85 - 115 %~~
III.	Blanks	A	
IVa.	Surrogate recovery	N	Not reqd.
IVb.	Matrix spike/Matrix spike duplicates	A	
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	A	Not reviewed for Level III validation.
VI.	Compound Quantitation and CRQLs	A	Not reviewed for Level III validation.
VII.	System Performance	A	Not reviewed for Level III validation.
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	D = 6,7
X.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation

Water

1	1413-MW04	11		21		31	
2	1413-MW05**	12		22		32	
3	1413-MW06	13		23		33	
4	1413-MW07	14		24		34	
5	1413-MW08	15		25		35	
6	1413-MW09	16		26		36	
7	1413-MW09 Dup	17		27		37	
8	1413-MW05MS	18		28		38	
9	1413 MW05MSD	19		29		39	
10	MOLK - 13425	20		30		40	

Notes:

LDC #: 14359 B51
SDG #: BMT 05/07803

VALIDATION FINDINGS CHECKLIST

Reviewer: JVL
2nd Reviewer: [illegible]

Method: ✓ GC | HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Was a linear fit used for evaluation? If yes, were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?		✓		
Did the initial calibration meet the curve fit acceptance criteria?			✓	
Were the RT windows properly established?	✓			
III. Continuing calibration				
What type of continuing calibration calculation was performed? ____%D or ✓ %R	✓			
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 15%.0 or percent recoveries 85-115%?		✓		
Were all the retention times within the acceptance windows?	✓			
IV. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %R within the QC limits?			✓	
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			

LDC #: 14359B51
SDG #: BMT05102803

VALIDATION FINDINGS CHECKLIST

Reviewer: JG
2nd Reviewer: Q

Validation Area	Yes	No	NA	Findings/Comments
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XI. Compound quantitation/CRQLs				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XII. System performance				
System performance was found to be acceptable.	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XIV. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds idetected in the field duplicates?	✓			
XV. Field blanks				
Were field blanks identified in this SDG?		✓		
Were target compounds detected in the field blanks?			✓	

LDC #: 14259 B51
SDG #: BMI05 102803

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: [illegible]
2nd reviewer: [illegible]

METHOD: ✓ GC __ HPLC

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (mg/L)		%RPD Limit NA	Qualification Parent only / All Samples
	6	7		
Methane	0.41	0.42	✓	

Compound	Concentration ( )		%RPD Limit _____	Qualification Parent only / All Samples

FLDUPNew.wpd

LDC #: 14359 B5

SDG #: BMI 05 102803

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: [illegible]

METHOD: GC ✓ HPLC_____

The calibration Factor (CF), average CF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

A = Area of compound,
C = Concentration of compound,
S = Standard deviation of the CF
X = Mean of the CFs

#	Standard ID	Calibration Date	Compound	Reported CF (0.5% std)	Recalculated CF (0.5% std)	Reported Average CF (Initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	7/20/05	Methane	3.7182 e+6	3.7182 e+6	3.291 e+6	3.291 e+6	12.27	12.27
2									
3									
4									

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14359351
SDG #: BMI05107803

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: JVR
2nd Reviewer: [illegible]

METHOD: GC ✓ HPLC ____

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF - CF)/ave. CF
CF = A/C

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %R	Recalculated %R
1	6A 10340503	10/31/05	Methane	2.66	3.10	3.10	116.58	116.54
2								
3								
4								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14359 B51
SDG #: BMI05/02803

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: JVL
2nd Reviewer: CJ

METHOD: ✓ GC ___ HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA Where SSC = Spiked sample concentration SC = Sample concentration
SA = Spike added
RPD =(([SSCMS - SSCMSD] * 2) / (SSCMS + SSCMSD))*100 MS = Matrix spike MSD = Matrix spike duplicate

MS/MSD samples: 8/9

Compound	Spike Added (mg/L)		Sample Conc. (mg/L)	Spike Sample Concentration (mg/L)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	—	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)	1.06	1.06	0.524	1.44	1.46	86	86	89	88	1.9	1.4
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14359 B51
SDG #: BMI 05102813

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Page: 1 of 1
Reviewer: JVB
2nd Reviewer: CL

____METHOD: ✓ GC ___HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA

RPD =(((SSCLCS - SSCLCSD) * 2) / (SSCLCS + SSCLCSD))*100

Where SSC = Spiked sample concentration
SA = Spike added
LCS = Laboratory Control Sample
SC = Sample concentration
LCSD = Laboratory Control Sample duplicate

LCS/LCSD samples: LCS - 13425

Compound	Spike Added (mg/L)		Sample Conc. (mg/L)	Spike Sample Concentration (mg/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	—	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)	0.532	NA	0	0.519	NA	98	98				
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14359 B51
SDG #: BMI05 102803

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: JVR
2nd Reviewer: [illegible]

METHOD: ✓ GC __ HPLC

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10% of the reported results?

Concentration= $\frac{(A)(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound in the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. #2 Compound Name Methane

Concentration = $\frac{(1725713)}{(3.291 \text{ e+6})}$ = 0.524 mg/L

#	Sample ID	Compound	Reported Concentrations ( )	Recalculated Results Concentrations ( )	Qualifications

Comments:

SAMPCAL.xls v1.0

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Camp Pendleton, CTO 102

Collection Date: October 27, 2005

LDC Report Date: December 13, 2005

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level III & IV

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): BMI05102803

Sample Identification

1413-MW04
1413-MW05**
1413-MW06
1413-MW07
1413-MW08
1413-MW09
1413-MW09 Dup
1413-MW05MS
1413-MW05MSD
1413-MW05DUP

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 10 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 for Total Dissolved Solids, EPA Method 300.0 for Nitrate as Nitrogen, Nitrite as Nitrogen, and Sulfate, EPA Method 310.1 for Alkalinity, EPA Method 415.1 for Total Organic Carbon, and Standard Method 3500FE for Total Iron.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified a P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent a EPA Level IV review. A EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

All criteria for the initial calibration of each method were met.

b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the method blanks.

IV. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
1413-MW05MS/MSD (1413-MW04 1413-MW05** 1413-MW06 1413-MW07 1413-MW08)	Sulfate	-	-	6.7 (≤2)	J (all detects) UJ (all non-detects)	A

V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VI. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable with the following exceptions:

Sample	Analyte	Finding	Criteria	Flag	A or P
All samples in SDG BMI05102803	Alkalinity	No LCS analysis associated with these samples.	LCS analysis required.	None	P

Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Sample Result Verification

All sample result verifications were within validation criteria for samples on which a EPA Level IV review was performed with the following exceptions:

Sample	Analyte	Finding	Criteria	Flag	A or P
All samples in SDG BMI05102803	Total organic carbon	The sample concentrations were calculated without using the y-intercept while the CCV standards were calculated with the y-intercept.	Samples and standards should be calculated with the same calibration curve.	None	P

Raw data were not evaluated for the samples reviewed by Level III criteria.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

IX. Field Duplicates

Samples 1413-MW09 and 1413-MW09 Dup were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/L)		RPD
	1413-MW09	1413-MW09 Dup	
Total alkalinity	390	350	11
Sulfate	95	87	9
Total dissolved solids	980	920	6
Total organic carbon	31	25	31

X. Field Blanks

No field blanks were identified in this SDG.

Camp Pendleton, CTO 102
Wet Chemistry - Data Qualification Summary - SDG BMI05102803

SDG	Sample	Analyte	Flag	A or P	Reason
BMI05102803	1413-MW04 1413-MW05** 1413-MW06 1413-MW07 1413-MW08	Sulfate	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (RPD)
BMI05102803	1413-MW04 1413-MW05** 1413-MW06 1413-MW07 1413-MW08 1413-MW09 1413-MW09 Dup	Alkalinity	None	P	Laboratory control samples
BMI05102803	1413-MW04 1413-MW05** 1413-MW06 1413-MW07 1413-MW08 1413-MW09 1413-MW09 Dup	Total organic carbon	None	P	Sample result verification

Camp Pendleton, CTO 102
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG BMI05102803

No Sample Data Qualified in this SDG

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 10/28/05

Job#: TO102:14133

Total Organic Carbon as NonPurgeable Organic Carbon
EPA Method SW9060/415.1/SM-5310C

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1413-MW04					
Lab ID :	BMI05102803-01A	Total Organic Carbon	11	1.0 mg/L	10/27/05	11/04/05
Client ID :	1413-MW05					
Lab ID :	BMI05102803-02A	Total Organic Carbon	18	1.0 mg/L	10/27/05	11/04/05
Client ID :	1413-MW06					
Lab ID :	BMI05102803-03A	Total Organic Carbon	9.1	1.0 mg/L	10/27/05	11/04/05
Client ID :	1413-MW07					
Lab ID :	BMI05102803-04A	Total Organic Carbon	14	1.0 mg/L	10/27/05	11/04/05
Client ID :	1413-MW08					
Lab ID :	BMI05102803-05A	Total Organic Carbon	13	1.0 mg/L	10/27/05	11/04/05
Client ID :	1413-MW09					
Lab ID :	BMI05102803-06A	Total Organic Carbon	34	4.0 mg/L	10/27/05	11/05/05
Client ID :	1413-MW09DUP					
Lab ID :	BMI05102803-07A	Total Organic Carbon	25	4.0 mg/L	10/27/05	11/10/05

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

11/10/05
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 10/28/05

Job#: TO102:14133

Iron by Spectrophotometer
SM3500-Fe D

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1413-MW04**					
Lab ID :	BMI05102803-01A	Iron, Ferrous (+2)	0.059	0.050 mg/L	10/27/05	10/28/05
Client ID :	**1413-MW05**					
Lab ID :	BMI05102803-02A	Iron, Ferrous (+2)	ND	0.050 mg/L	10/27/05	10/28/05
Client ID :	**1413-MW06**					
Lab ID :	BMI05102803-03A	Iron, Ferrous (+2)	ND	0.050 mg/L	10/27/05	10/28/05
Client ID :	**1413-MW07**					
Lab ID :	BMI05102803-04A	Iron, Ferrous (+2)	ND	0.050 mg/L	10/27/05	10/28/05
Client ID :	**1413-MW08**					
Lab ID :	BMI05102803-05A	Iron, Ferrous (+2)	ND	0.050 mg/L	10/27/05	10/28/05
Client ID :	**1413-MW09**					
Lab ID :	BMI05102803-06A	Iron, Ferrous (+2)	ND	0.050 mg/L	10/27/05	10/28/05
Client ID :	**1413-MW09DUP**					
Lab ID :	BMI05102803-07A	Iron, Ferrous (+2)	ND	0.050 mg/L	10/27/05	10/28/05

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

11/10/05
Report Date

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 10/28/05

Job#: TO102:14133

Total Dissolved Solids (TDS)
EPA Method 160.1 / SM 2540 C

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1413-MW04					
Lab ID :	BMI05102803-01A	Solids, Total Dissolved (TDS)	2,500	25 mg/L	10/27/05	11/07/05
Client ID :	1413-MW05					
Lab ID :	BMI05102803-02A	Solids, Total Dissolved (TDS)	5,100	25 mg/L	10/27/05	11/07/05
Client ID :	1413-MW06					
Lab ID :	BMI05102803-03A	Solids, Total Dissolved (TDS)	3,400	25 mg/L	10/27/05	11/04/05
Client ID :	1413-MW07					
Lab ID :	BMI05102803-04A	Solids, Total Dissolved (TDS)	5,400	25 mg/L	10/27/05	11/07/05
Client ID :	1413-MW08					
Lab ID :	BMI05102803-05A	Solids, Total Dissolved (TDS)	8,300	50 mg/L	10/27/05	11/07/05
Client ID :	1413-MW09					
Lab ID :	BMI05102803-06A	Solids, Total Dissolved (TDS)	980	10 mg/L	10/27/05	11/04/05
Client ID :	1413-MW09DUP					
Lab ID :	BMI05102803-07A	Solids, Total Dissolved (TDS)	920	10 mg/L	10/27/05	11/04/05

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11/10/05
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102:14133

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Anions by Ion Chromatography (IC) EPA Method 300.0 / SW9056

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1413-MW04					
Lab ID :	BMI05102803-01A	Nitrite (NO2) - N	ND	0.25 mg/L	10/27/05	10/28/05
		Nitrate (NO3) - N	1.3	0.25 mg/L	10/27/05	10/28/05
		Sulfate (SO4)	270 J	5.0 mg/L	10/27/05	11/10/05
Client ID :	1413-MW05					
Lab ID :	BMI05102803-02A	Nitrite (NO2) - N	ND	0.25 mg/L	10/27/05	10/28/05
		Nitrate (NO3) - N	ND	0.25 mg/L	10/27/05	10/28/05
		Sulfate (SO4)	760 J	10 mg/L	10/27/05	11/10/05
Client ID :	1413-MW06					
Lab ID :	BMI05102803-03A	Nitrite (NO2) - N	ND	0.25 mg/L	10/27/05	10/28/05
		Nitrate (NO3) - N	1.6	0.25 mg/L	10/27/05	10/28/05
		Sulfate (SO4)	340 J	5.0 mg/L	10/27/05	11/10/05
Client ID :	1413-MW07					
Lab ID :	BMI05102803 04A	Nitrite (NO2) - N	ND	0.25 mg/L	10/27/05	10/28/05
		Nitrate (NO3) - N	3.6	0.25 mg/L	10/27/05	10/28/05
		Sulfate (SO4)	580 J	10 mg/L	10/27/05	11/10/05
Client ID :	1413-MW08					
Lab ID :	BMI05102803 05A	Nitrite (NO2) - N	ND	0.25 mg/L	10/27/05	10/28/05
		Nitrate (NO3) - N	1.5	0.25 mg/L	10/27/05	10/28/05
		Sulfate (SO4)	910 J	10 mg/L	10/27/05	11/10/05
Client ID :	1413-MW09					
Lab ID :	BMI05102803-06A	Nitrite (NO2) - N	ND	0.25 mg/L	10/27/05	10/28/05
		Nitrate (NO3) - N	ND	0.25 mg/L	10/27/05	10/28/05
		Sulfate (SO4)	95	1.0 mg/L	10/27/05	10/28/05
Client ID :	1413-MW09DUP					
Lab ID :	BMI05102803-07A	Nitrite (NO2) - N	ND	0.25 mg/L	10/27/05	10/28/05
		Nitrate (NO3) - N	ND	0.25 mg/L	10/27/05	10/28/05
		Sulfate (SO4)	87	1.0 mg/L	10/27/05	10/28/05

ND = Not Detected

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11/10/05
Report Date

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 10/28/05

Job#: TO102:14133

Alkalinity
EPA Method 310.1

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1413-MW04					
Lab ID :	BMI05102803-01A	Alkalinity, Total (As CaCO3 at pH 4.5)	290	1.0 mg/L	10/27/05	11/09/05
Client ID :	1413-MW05					
Lab ID :	BMI05102803-02A	Alkalinity, Total (As CaCO3 at pH 4.5)	410	1.0 mg/L	10/27/05	11/09/05
Client ID :	1413-MW06					
Lab ID :	BMI05102803-03A	Alkalinity, Total (As CaCO3 at pH 4.5)	350	1.0 mg/L	10/27/05	11/09/05
Client ID :	1413-MW07					
Lab ID :	BMI05102803-04A	Alkalinity, Total (As CaCO3 at pH 4.5)	340	1.0 mg/L	10/27/05	11/09/05
Client ID :	1413-MW08					
Lab ID :	BMI05102803-05A	Alkalinity, Total (As CaCO3 at pH 4.5)	340	1.0 mg/L	10/27/05	11/09/05
Client ID :	1413-MW09					
Lab ID :	BMI05102803-06A	Alkalinity, Total (As CaCO3 at pH 4.5)	390	1.0 mg/L	10/27/05	11/09/05
Client ID :	1413-MW09DUP					
Lab ID :	BMI05102803-07A	Alkalinity, Total (As CaCO3 at pH 4.5)	350	1.0 mg/L	10/27/05	11/09/05

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11/10/05
Report Date

TO102:14133

11/12/1905

LDC #: 14359B6
SDG #: BMI05102803
Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 12-13-05
Page: 1 of 1
Reviewer: MG
2nd Reviewer: [illegible]

METHOD: (Analyte) Alkalinity (EPA Method 310.1), Nitrate-N, Nitrite-N, Sulfate (EPA Method 300.0), TDS (EPA Method 160.1), Ferrous Iron (SM3500FE), TOC (EPA Meth. 415.1)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 10-27-05
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	SW	MS/MSD (SDG: BMI05102720)
V	Duplicates	A	DUP
VI.	Laboratory control samples	SW	LCS/LCSD
VII.	Sample result verification	SW	Not reviewed for Level III validation.
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	D=6+7
X	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation
all water

1	1413-MW04	11	PBW1	21		31	
2	1413-MW05**	12	PBW2	22		32	
3	1413-MW06	13		23		33	
4	1413-MW07	14		24		34	
5	1413-MW08	15		25		35	
6	1413-MW09	16		26		36	
7	1413-MW09 Dup	17		27		37	
8	1413-MW05MS	18		28		38	
9	1413-MW05MSD	19		29		39	
10	1413-MW05DUP	20		30		40	

Notes:

LDC #: 1435986
SDG #: BMI05102803

VALIDATION FINDINGS CHECKLIST

Reviewer: MG
2nd Reviewer: MM

Method: Inorganics (EPA Method see cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial calibration correlation coefficients ≥ 0.995?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?	✓			
Were titrant checks performed as required? (Level IV only)	✓			
Were balance checks performed as required? (Level IV only)	✓			
III. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
V. Matrix spike/Matrix spike duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of ≤ CRDL(≤ 2X CRDL for soil) was used for samples that were ≤ 5X the CRDL, including when only one of the duplicate sample values were < 5X the CRDL.		✓		
VI. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	✓			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	

LDC #: 14359B6
SDG #: BMI05102803

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: MG
2nd Reviewer: MM

Validation Area	Yes	No	NA	Findings/Comments
VII. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were detection limits < RL?	✓			
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target analytes were detected in the field duplicates.	✓			
X. Field blanks				
Field blanks were identified in this SDG.		✓		
Target analytes were detected in the field blanks.			✓	

LDC #: 14359B6
SDG #: BMI05102803

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer: [illegible]

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1→7	w	pH (TDS) Cl F (NO3) (NO2) (SO4) PO4 (ALK) CN- NH3 TKN (TOC) CR6+ ClO4 Br (Ferrous Iron)
QC 8,9	↓	pH TDS Cl F NO3 NO2 (SO4) PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
↓ 10	↓	pH (TDS) Cl F NO3 NO2 SO4 PO4 (ALK) CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br

Comments:

LDC #: 14359B6
SDG #: BMI05102803

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: MG
2nd Reviewer: [illegible]

METHOD: Inorganics, EPA Method see cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y N N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤35% for soil samples?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
1	8/9	water	SO_4			6.7 (≤2)	1→5	J/UJ/A

Comments:

MSD.8

LDC #: 14359B6
SDG #: BMI0510 2803

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Reviewer: MG
2nd Reviewer: [illegible]

METHOD: Inorganics, Method See cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Was a laboratory control sample (LCS) analyzed for each matrix in this SDG?

(Y) N N/A Were all LCS percent recoveries (%R) within the control limits of 80-120% (85-115% for Method 300.0)?

LEVEL IV ONLY:

(Y) N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	LCS ID	Matrix	Analyte	%R (limits)	Associated Samples	Qualifications
1	No LCS	water	Alk		all	None / P

Comments: a pH buffer was used in place of a true LCS

LDC #: 14357 36
SDG #: BMI05102803

VALIDATION FINDINGS WORKSHEET
Sample Result Verification

Page: 1 of 1
Reviewer: MG
2nd Reviewer: [illegible]

METHOD: Inorganics, Method see cover

#	Sample ID	Analyte	Lab Reporting Limit (units)	RDL (units)	Finding	Qualifications
1	all	TOC	Sample concentrations were based on a different calibration curve than the one used on CCV std's.			None / P
			Criteria: * The same calibration curve should be used for all samples, QC samples and standards in an analytical batch.			

Comments: * The y intercept was used to calculate the CCV std's. but the intercept was not used to calculate sample concentrations.

ABVCRDL_6

LDC #: 14359B6
SDG #: BMI05102803

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: MG
2nd reviewer: [illegible]

METHOD: Inorganics, Method see cover

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target analytes detected in the field duplicate pairs?

Analyte	Concentration (mg/L)		RPD (Limit)	Difference (Limit)	Qualifier
	6	7			
tot. Alk	390	350	11		
SO_4	95	87	9		
TDS	980	920	6		
TOC	34	25	31		

Analyte	Concentration ( )		RPD (Limit)	Difference (Limit)	Qualifier

Analyte	Concentration ( )		RPD (Limit)	Difference (Limit)	Qualifier

Analyte	Concentration ( )		RPD (Limit)	Difference (Limit)	Qualifier

LDC #: 1435986
SDG #: BMI05102803

Validatin Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Reviewer: MG
2nd Reviewer: [illegible]

Method: Inorganics, Method see cover

The correlation coefficient (r) for the calibration of NO_2-N was recalculated.Calibration date: 10-20-05

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = Found X 100 / True

Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Area	Conc. (mg/L)	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration Calibration verification	NO2-N	0	15546	0.025	0.999990	0.999982 (forced through zero)	Y
		s1	33353	0.05			
		s2	74714	0.1			
		s3	180571	0.25			
		s4	363870	0.5			
		s5	1556816	2			
		s6	3305695	4			
Calibration verification	NO_3-N	1845 CCV 1	0.490 (mg/L)	0.50 (mg/L)	98	98	
Calibration verification	SO_4	2102 CCV	1.977 (mg/L)	2.00 (mg/L)	99	99	
Calibration verification	Ferrous Fe	ICV	1.448 (mg/L)	1.5 (mg/L)	97	not reported	

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14359B6
SDG #: BMI05102803

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: MG
2nd Reviewer: [illegible]

METHOD: Inorganics, Method see cover

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$\%R = \frac{Found}{True} \times 100$ Where Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$ Where, S = Original sample concentration
D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS	Laboratory control sample	NO_3-N	2.139 (mg/L)	2 (mg/L)	107	107	Y
8	Matrix spike sample	SO_4	(SSR-SR) 401.07 (mg/L)	400 (mg/L)	100	100	↓
10	Duplicate sample	tot. Alk	405 (mg/L)	408 (mg/L)	1	not reported	↓

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

TOTOLC.6

LDC #: 14359B6
SDG #: BMI05102803

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: MG
2nd reviewer: JM

METHOD: Inorganics, Method see cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Have results been reported and calculated correctly?
(Y) N N/A Are results within the calibrated range of the instruments?
(Y) N N/A Are all detection limits below the CRQL?

Compound (analyte) results for #2, tot. Alk. reported with a positive detect were recalculated and verified using the following equation:

Concentration =

Recalculation:

$$\frac{(8.45\ ml)(0.0957\ N)(50000)}{100\ ml} = 404.3\ mg/L$$

#	Sample ID	Analyte	Reported Concentration (mg/L)	Calculated Concentration (mg/L)	Acceptable (Y/N)
1	2	tot. Alk	410	400	Y
		SO4	760	760	↓
		TDS	5100	5100	↓
		TOC	18	18	↓

Note:

RECALC.6

JANUARY 2006

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Camp Pendleton, CTO 102

Collection Date: January 17, 2006

LDC Report Date: March 7, 2006

Matrix: Water

Parameters: Total Petroleum Hydrocarbons as Extractables

Validation Level: EPA Level III & IV

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): BMI06011905

Sample Identification

1413-QCEB
1413-MW04
1413-MW05**
1413-MW05Dup
1413-MW06
1413-MW07
1413-MW08
1413-MW09
1413-MW04MS
1413-MW04MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 10 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 for Total Petroleum Hydrocarbons (TPH) as Extractables.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified a P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent a EPA Level IV review. A EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for all compounds were less than or equal to 20.0% .

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

The percent difference (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as extractable contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

All target compound identifications were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VI. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VII. System Performance

The system performance was acceptable for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

IX. Field Duplicates

Samples 1413-MW05** and 1413-MW05Dup were identified as field duplicates. No total petroleum hydrocarbons as extractables were detected in any of the samples with the following exceptions:

Compound	Concentration (mg/L)		RPD
	1413-MW05**	1413-MW05Dup	
TPH as diesel	0.23	0.24	4

X. Field Blanks

Sample 1413-QCEB was identified as an equipment blank. No total petroleum hydrocarbons as extractable contaminants were found in this blank.

Camp Pendleton, CTO 102
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG BMI06011905

No Sample Data Qualified in this SDG

Camp Pendleton, CTO 102
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG BMI06011905

No Sample Data Qualified in this SDG

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 01/19/06

Job#: TO102-1413

Total Petroleum Hydrocarbons - Extractable (TPH-E) EPA Method SW8015B/DHS LUFT Manual

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1413-QCEB	TPH-E (Diesel)	ND u	0.050 mg/L	01/17/06	01/20/06
Lab ID :	BMI06011905 03A	TPH-E (Oil)	ND ↓	0.50 mg/L	01/17/06	01/20/06
		Surr: Nonane	101	%REC	01/17/06	01/20/06
Client ID :	1413-MW04	TPH-E (Diesel)	0.15	0.050 mg/L	01/17/06	01/20/06
Lab ID :	BMI06011905-04A	TPH-E (Oil)	ND u	0.50 mg/L	01/17/06	01/20/06
		Surr: Nonane	100	%REC	01/17/06	01/20/06
Client ID :	1413 MW05	TPH-E (Diesel)	0.23	0.050 mg/L	01/17/06	01/20/06
Lab ID :	BMI06011905-05A	TPH-E (Oil)	ND u	0.50 mg/L	01/17/06	01/20/06
		Surr: Nonane	73	%REC	01/17/06	01/20/06
Client ID :	1413-MW05DUP	TPH-E (Diesel)	0.24	0.050 mg/L	01/17/06	01/20/06
Lab ID :	BMI06011905-06A	TPH-E (Oil)	ND u	0.50 mg/L	01/17/06	01/20/06
		Surr: Nonane	86	%REC	01/17/06	01/20/06
Client ID :	1413-MW06	TPH-E (Diesel)	ND u	0.050 mg/L	01/17/06	01/20/06
Lab ID :	BMI06011905-07A	TPH-E (Oil)	ND ↓	0.50 mg/L	01/17/06	01/20/06
		Surr: Nonane	100	%REC	01/17/06	01/20/06
Client ID :	1413-MW07	TPH-E (Diesel)	ND u	0.050 mg/L	01/17/06	01/21/06
Lab ID :	BMI06011905-08A	TPH-E (Oil)	ND ↓	0.50 mg/L	01/17/06	01/21/06
		Surr: Nonane	101	%REC	01/17/06	01/21/06
Client ID :	1413-MW08	TPH-E (Diesel)	0.081	0.050 mg/L	01/17/06	01/21/06
Lab ID :	BMI06011905-09A	TPH-E (Oil)	ND u	0.50 mg/L	01/17/06	01/21/06
		Surr: Nonane	63	%REC	01/17/06	01/21/06
Client ID :	1413-MW09	TPH-E (Diesel)	0.36	0.050 mg/L	01/17/06	01/21/06
Lab ID :	BMI06011905-10A	TPH-E (Oil)	ND u	0.50 mg/L	01/17/06	01/21/06
		Surr: Nonane	98	%REC	01/17/06	01/21/06

3/10/06

LDC #: 14702D8

SDG #: BMI06011905

Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 3/7/06

Page: 1 of 1

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC TPH as Extractables (EPA SW 846 Method 8015)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/17/06
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	ICV ≤ 15
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	A	
IVc.	Laboratory control samples	A	
V.	Target compound identification	A	Not reviewed for Level III validation.
VI.	Compound Quantitation and CRQLs	A	Not reviewed for Level III validation.
VII.	System Performance	A	Not reviewed for Level III validation.
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	D = 3+4
X.	Field blanks	ND	EB = 1

Note: A = Acceptable; ND = No compounds detected; D = Duplicate; N = Not provided/applicable; R = Rinsate; TB = Trip blank; SW = See worksheet; FB = Field blank; EB = Equipment blank

Validated Samples: Water ** Indicates sample underwent Level IV validation

1	1413-QCEB	11	MBLK-13946	21		31	
2	1413-MW04	12		22		32	
3	1413-MW05**	13		23		33	
4	1413-MW05Dup	14		24		34	
5	1413-MW06	15		25		35	
6	1413-MW07	16		26		36	
7	1413-MW08	17		27		37	
8	1413-MW09	18		28		38	
9	1413-MW04MS	19		29		39	
10	1413-MW04MSD	20		30		40	

Notes:

LDC #: 1470208
SDG #: BM1060119OS

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: B
2nd Reviewer: G

Method: ____ GC ____ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Was a linear fit used for evaluation? If yes, were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?		✓		
Did the initial calibration meet the curve fit acceptance criteria?			✓	
Were the RT windows properly established?	✓			
IV. Continuing calibration				
What type of continuing calibration calculation was performed? ____%D or ____%R	✓			
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 15%.0 or percent recoveries 85-115%?	✓			
Were all the retention times within the acceptance windows?	✓			
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %R within the QC limits?	✓			
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			

LDC #: 14702D8
SDG #: BM1060119 05

VALIDATION FINDINGS CHECKLIST

Reviewer: B
2nd Reviewer: A

Validation Area	Yes	No	NA	Findings/Comments
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XI. Compound quantitation/CRQL				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XII. System performance				
System performance was found to be acceptable.	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XIV. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds idetected in the field duplicates?	✓			
XV. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		

LDC #: 14J02D8
SDG #: BM106011905

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer:
2nd reviewer:

METHOD: ___ GC ___ HPLC

Y N N/A Were field duplicate pairs identified in this SDG?

Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (mg/L)		%RPD Limit_____	Qualification Parent only / All Samples
	3	4		
Diesel	0.23	0.24	4	

Compound	Concentration ( )		%RPD Limit _____	Qualification Parent only / All Samples

LDC #: 14702D8
SDG #: BM1060 11905

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC ✓ HPLC ____

The calibration Factor (CF), average CF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

A = Area of compound,
C = Concentration of compound,
S = Standard deviation of the CF
X = Mean of the CFs

#	Standard ID	Calibration Date	Compound	Reported CF (100 std)	Recalculated CF (100 std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL-GC2	5/27/05	Diesel	8.7072×10^{-5}	8.7072×10^{-5}	8.7678×10^{-5}	8.7678×10^{-5}	3.19	3.19
2									
3									
4									

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within ±0.0% of the recalculated results.

LDC #: 14702P8
SDG #: BM1060 11905

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: G
2nd Reviewer: D

METHOD: GC ✓ HPLC

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF - CF)/ave. CF
CF = A/C

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %R	Recalculated %R
1	2A012001. D18		Diesel	250	262.30	262.30	104.92	104.92
2								
3								
4								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

CONCLC.1S

LDC #: 1470208
SDG #: BM10601905

METHOD: ✓ GC __ HPLC

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: [illegible]
2nd reviewer: [illegible]

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 3

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
no name	DB-1	100	73.0669	73	73	0

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

LDC #: 14702D8
SDG #: BM106011905

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ✓ GC ___ HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA

Where SSC = Spiked concentration; SA = Spike added; MS = Matrix spike percent recovery; SC = Sample concentration; MSD = Matrix spike duplicate percent recovery

RPD =(((SSCMS - SSCMSD) * 2) / (SSCMS + SSCMSD))*100

MS/MSD samples: 9 & 10

Compound	Spike Added (mg/L)		Sample Conc. (mg/L)	Spike Sample Concentration (mg/L)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	—	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)	2.5	2.5	0.1463	2.49	2.83	94	94	107	107	12.8	12.8
Benzene (80218)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 1470208
SDG #: BM106011905

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA Where SSC = Spiked concentration, SA = Spike added, SC = Sample concentration

RPD =(((SSCLCS - SSCLCSD) * 2) / (SSCLCS + SSCLCSD))*100 LCS = Laboratory Control Sample percent recovery LCSD = Laboratory Control Sample duplicate percent recovery

LCS/LCSD samples: LCS - 13946

Compound	Spike Added (mg/L)		Sample Conc. (mg/L)	Spike Sample Concentration (mg/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	—	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)	2.5	NA	0	2.5	NA	99.9	100	NA	—	—	—
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14702D8
SDG #: BM106011905

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: ✓ GC __ HPLC

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds within 10% of the reported results?

Concentration= (A)(Fv)(Df) / (RF)(Vs or Ws)(%S/100)

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound in the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID #3 Compound Name Diesel

Concentration = 106978 × 8.7678 × 10^-5 × 1 / ~~8.76~~ 40

0.23 mg/L

#	Sample ID	Compound	Reported Concentrations ( )	Recalculated Results Concentrations ( )	Qualifications

Comments:

SAMPCALew.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Camp Pendleton, CTO 102

Collection Date: January 17, 2006

LDC Report Date: March 9, 2006

Matrix: Water

Parameters: Volatiles

Validation Level: EPA Level III & IV

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): BMI06011905

Sample Identification

1413-QCTB
1413-QCFB
1413-MW04
1413-MW05**
1413-MW05Dup
1413-MW06
1413-MW07
1413-MW08
1413-MW09
1413-MW04MS
1413-MW04MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 11 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified a P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Samples indicated by a double asterisk on the front cover underwent a EPA Level IV review. A EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

In the case where %RSD was greater than 15.0%, the laboratory used a calibration curve to evaluate the compound. All coefficients of determination (r^2) were greater than or equal to 0.990 .

For the purposes of technical evaluation, all compounds were evaluated against the 30.0% (%RSD) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

Average relative response factors (RRF) for all volatile target compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs).

For the purposes of technical evaluation, all compounds were evaluated against the 25.0% (%D) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
1/23/06	Hexachlorobutadiene	25.5	All samples in SDG BMI06011905	J (all detects) UJ (all non-detects)	A

All of the continuing calibration RRF values were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All samples in SDG BMI06011905	All TCL compounds	The LCS was analyzed as a continuing calibration standard.	The LCS should be analyzed independently from the calibration.	None	P

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XII. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory.

XIV. System Performance

The system performance was within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

Samples 1413-MW05** and 1413-MW05Dup were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	1413-MW05**	1413-MW05Dup	
Benzene	0.54	0.52	4

XVII. Field Blanks

Sample 1413-QCTB was identified as a trip blank. No volatile contaminants were found in this blank.

Sample 1413-QCFB was identified as a field blank. No volatile contaminants were found in this blank.

Camp Pendleton, CTO 102
Volatiles - Data Qualification Summary - SDG BMI06011905

SDG	Sample	Compound	Flag	A or P	Reason
BMI06011905	1413-QCTB 1413-QCFB 1413-MW04 1413-MW05** 1413-MW05Dup 1413-MW06 1413-MW07 1413-MW08 1413-MW09	Hexachlorobutadiene	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
BMI06011905	1413-QCTB 1413-QCFB 1413-MW04 1413-MW05** 1413-MW05Dup 1413-MW06 1413-MW07 1413-MW08 1413-MW09	All TCL compounds	None	P	Laboratory control samples

Camp Pendleton, CTO 102
Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI06011905

No Sample Data Qualified in this SDG

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI06011905 01A
Client I.D. Number: 1413-QCTB

Sampled: 01/17/06
Received: 01/19/06
Analyzed: 01/23/06

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration		Reporting Limit			Compound	Concentration		Reporting Limit	
1	Dichlorodifluoromethane	ND	U	1.0	µg/L	36	m,p-Xylene	ND	U	0.50	µg/L
2	Chloromethane	ND		2.0	µg/L	37	Bromoform	ND		1.0	µg/L
3	Vinyl chloride	ND		1.0	µg/L	38	Styrene	ND		1.0	µg/L
4	Chloroethane	ND		1.0	µg/L	39	o-Xylene	ND		0.50	µg/L
5	Bromomethane	ND		2.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND		1.0	µg/L
6	Trichlorofluoromethane	ND		1.0	µg/L	41	1,2,3 Trichloropropane	ND		2.0	µg/L
7	1,1-Dichloroethene	ND		1.0	µg/L	42	Isopropylbenzene	ND		1.0	µg/L
8	Dichloromethane	ND		2.0	µg/L	43	Bromobenzene	ND		1.0	µg/L
9	trans-1,2-Dichloroethene	ND		1.0	µg/L	44	n-Propylbenzene	ND		1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND		0.50	µg/L	45	4-Chlorotoluene	ND		1.0	µg/L
11	1,1-Dichloroethane	ND		1.0	µg/L	46	2-Chlorotoluene	ND		1.0	µg/L
12	cis-1,2-Dichloroethene	ND		1.0	µg/L	47	1,3,5-Trimethylbenzene	ND		1.0	µg/L
13	Bromochloromethane	ND		1.0	µg/L	48	tert-Butylbenzene	ND		1.0	µg/L
14	Chloroform	ND		1.0	µg/L	49	1,2,4 Trimethylbenzene	ND		1.0	µg/L
15	2,2-Dichloropropane	ND		1.0	µg/L	50	sec-Butylbenzene	ND		1.0	µg/L
16	1,2-Dichloroethane	ND		1.0	µg/L	51	1,3-Dichlorobenzene	ND		1.0	µg/L
17	1,1,1-Trichloroethane	ND		1.0	µg/L	52	1,4-Dichlorobenzene	ND		1.0	µg/L
18	1,1-Dichloropropene	ND		1.0	µg/L	53	4 Isopropyltoluene	ND		1.0	µg/L
19	Carbon tetrachloride	ND		1.0	µg/L	54	1,2-Dichlorobenzene	ND		1.0	µg/L
20	Benzene	ND		0.50	µg/L	55	n-Butylbenzene	ND		1.0	µg/L
21	Dibromomethane	ND		1.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND		5.0	µg/L
22	1,2-Dichloropropane	ND		1.0	µg/L	57	1,2,4-Trichlorobenzene	ND		2.0	µg/L
23	Trichloroethene	ND		1.0	µg/L	58	Naphthalene	ND		2.0	µg/L
24	Bromodichloromethane	ND		1.0	µg/L	59	Hexachlorobutadiene	ND	UJ	2.0	µg/L
25	cis-1,3-Dichloropropene	ND		1.0	µg/L	60	1,2,3-Trichlorobenzene	ND	U	2.0	µg/L
26	trans-1,3-Dichloropropene	ND		1.0	µg/L	61	Surr: 1,2 Dichloroethane d4	97			%REC
27	1,1,2-Trichloroethane	ND		1.0	µg/L	62	Surr: Toluene-d8	98			%REC
28	Toluene	ND		0.50	µg/L	63	Surr: 4-Bromofluorobenzene	100			%REC
29	1,3-Dichloropropane	ND		1.0	µg/L						
30	Dibromochloromethane	ND		1.0	µg/L						
31	1,2-Dibromoethane (EDB)	ND		2.0	µg/L						
32	Tetrachloroethene	ND		1.0	µg/L						
33	1,1,1,2-Tetrachloroethane	ND		1.0	µg/L						
34	Chlorobenzene	ND		1.0	µg/L						
35	Ethylbenzene	ND		0.50	µg/L						

*No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director - - Randy Gardner, Laboratory Manager - - Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

2/1/06
Report Date

3/10/06

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI06011905-02A
Client I.D. Number: 1413-QCFB

Sampled: 01/17/06
Received: 01/19/06
Analyzed: 01/23/06

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND U	1.0	µg/l	36	m,p-Xylene	ND U	0.50	µg/L
2	Chloromethane	ND	2.0	µg/L	37	Bromoform	ND	1.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L	38	Styrene	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L	39	o-Xylene	ND	0.50	µg/L
5	Bromomethane	ND	2.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L	41	1,2,3-Trichloropropane	ND	2.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L	42	Isopropylbenzene	ND	1.0	µg/L
8	Dichloromethane	ND	2.0	µg/L	43	Bromobenzene	ND	1.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L	44	n-Propylbenzene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L	45	4-Chlorotoluene	ND	1.0	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L	46	2-Chlorotoluene	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L	47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L	48	tert-Butylbenzene	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L	49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
15	2,2-Dichloropropane	ND	1.0	µg/L	50	sec-Butylbenzene	ND	1.0	µg/L
16	1,2-Dichloroethane	ND	1.0	µg/L	51	1,3-Dichlorobenzene	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L	52	1,4-Dichlorobenzene	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L	53	4-Isopropyltoluene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L	54	1,2-Dichlorobenzene	ND	1.0	µg/L
20	Benzene	ND *	0.50	µg/L	55	n-Butylbenzene	ND	1.0	µg/L
21	Dibromomethane	ND	1.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L	57	1,2,4-Trichlorobenzene	ND	2.0	µg/L
23	Trichloroethene	ND	1.0	µg/L	58	Naphthalene	ND	2.0	µg/L
24	Bromodichloromethane	ND	1.0	µg/L	59	Hexachlorobutadiene	ND U5	2.0	µg/L
25	cis-1,3-Dichloropropene	ND	1.0	µg/L	60	1,2,3-Trichlorobenzene	ND U	2.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	101		%REC
27	1,1,2-Trichloroethane	ND	1.0	µg/L	62	Surr: Toluene-d8	98		%REC
28	Toluene	ND	0.50	µg/L	63	Surr: 4-Bromofluorobenzene	98		%REC
29	1,3-Dichloropropane	ND	1.0	µg/L					
30	Dibromochloromethane	ND	1.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND	2.0	µg/L					
32	Tetrachloroethene	ND	1.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L					
34	Chlorobenzene	ND	1.0	µg/L					
35	Ethylbenzene	ND	0.50	µg/L					

*No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer
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Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI06011905-04A
Client I.D. Number: 1413-MW04

Sampled: 01/17/06
Received: 01/19/06
Analyzed: 01/23/06

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND U	1.0	µg/L	36	m,p-Xylene	ND U	0.50	µg/L
2	Chloromethane	ND	2.0	µg/L	37	Bromoform	ND	1.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L	38	Styrene	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L	39	o-Xylene	ND	0.50	µg/L
5	Bromomethane	ND	2.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L	41	1,2,3-Trichloropropane	ND	2.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L	42	Isopropylbenzene	ND	1.0	µg/L
8	Dichloromethane	ND	2.0	µg/L	43	Bromobenzene	ND	1.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L	44	n-Propylbenzene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L	45	4-Chlorotoluene	ND	1.0	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L	46	2-Chlorotoluene	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L	47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L	48	tert-Butylbenzene	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L	49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
15	2,2-Dichloropropane	ND	1.0	µg/L	50	sec-Butylbenzene	ND	1.0	µg/L
16	1,2-Dichloroethane	ND	1.0	µg/L	51	1,3-Dichlorobenzene	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L	52	1,4-Dichlorobenzene	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L	53	4-Isopropyltoluene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L	54	1,2-Dichlorobenzene	ND	1.0	µg/L
20	Benzene	ND	0.50	µg/L	55	n-Butylbenzene	ND	1.0	µg/L
21	Dibromomethane	ND	1.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L	57	1,2,4-Trichlorobenzene	ND	2.0	µg/L
23	Trichloroethene	ND	1.0	µg/L	58	Naphthalene	ND	2.0	µg/L
24	Bromodichloromethane	ND	1.0	µg/L	59	Hexachlorobutadiene	ND UJ	2.0	µg/L
25	cis-1,3-Dichloropropene	ND	1.0	µg/L	60	1,2,3-Trichlorobenzene	ND U	2.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	99		%REC
27	1,1,2-Trichloroethane	ND	1.0	µg/L	62	Surr: Toluene-d8	98		%REC
28	Toluene	ND	0.50	µg/L	63	Surr: 4-Bromofluorobenzene	94		%REC
29	1,3-Dichloropropane	ND	1.0	µg/L					
30	Dibromochloromethane	ND	1.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND	2.0	µg/L					
32	Tetrachloroethene	ND	1.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L					
34	Chlorobenzene	ND	1.0	µg/L					
35	Ethylbenzene	ND	0.50	µg/L					

*No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger L. Scholl, Ph.D. Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281 4848 / info@alpha-analytical.com

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Report Date

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Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI06011905-05A
Client I.D. Number: 1413-MW05

Sampled: 01/17/06
Received: 01/19/06
Analyzed: 01/23/06

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration		Reporting Limit			Compound	Concentration		Reporting Limit	
1	Dichlorodifluoromethane	ND	U	1.0	µg/L	36	m,p-Xylene	ND	U	0.50	µg/L
2	Chloromethane	ND		2.0	µg/L	37	Bromoform	ND		1.0	µg/L
3	Vinyl chloride	ND		1.0	µg/L	38	Styrene	ND		1.0	µg/L
4	Chloroethane	ND		1.0	µg/L	39	o-Xylene	ND		0.50	µg/L
5	Bromomethane	ND		4.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND		1.0	µg/L
6	Trichlorofluoromethane	ND		1.0	µg/L	41	1,2,3-Trichloropropane	ND		4.0	µg/L
7	1,1-Dichloroethene	ND		1.0	µg/L	42	Isopropylbenzene	ND		1.0	µg/L
8	Dichloromethane	ND		4.0	µg/L	43	Bromobenzene	ND		1.0	µg/L
9	trans-1,2-Dichloroethene	ND		1.0	µg/L	44	n-Propylbenzene	ND		1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND		0.50	µg/L	45	4-Chlorotoluene	ND		1.0	µg/L
11	1,1-Dichloroethane	ND		1.0	µg/L	46	2-Chlorotoluene	ND		1.0	µg/L
12	cis-1,2-Dichloroethene	ND		1.0	µg/L	47	1,3,5-Trimethylbenzene	ND		1.0	µg/L
13	Bromochloromethane	ND		1.0	µg/L	48	tert-Butylbenzene	ND		1.0	µg/L
14	Chloroform	ND		1.0	µg/L	49	1,2,4-Trimethylbenzene	ND		1.0	µg/L
15	2,2-Dichloropropane	ND		1.0	µg/L	50	sec-Butylbenzene	ND		1.0	µg/L
16	1,2-Dichloroethane	ND		1.0	µg/L	51	1,3-Dichlorobenzene	ND		1.0	µg/L
17	1,1,1-Trichloroethane	ND		1.0	µg/L	52	1,4-Dichlorobenzene	ND		1.0	µg/L
18	1,1-Dichloropropene	ND		1.0	µg/L	53	4-Isopropyltoluene	ND		1.0	µg/L
19	Carbon tetrachloride	ND		1.0	µg/L	54	1,2-Dichlorobenzene	ND		1.0	µg/L
20	Benzene	0.54		0.50	µg/L	55	n-Butylbenzene	ND		1.0	µg/L
21	Dibromomethane	ND	U	1.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND		6.0	µg/L
22	1,2-Dichloropropane	ND		1.0	µg/L	57	1,2,4-Trichlorobenzene	ND		4.0	µg/L
23	Trichloroethene	ND		1.0	µg/L	58	Naphthalene	ND		4.0	µg/L
24	Bromodichloromethane	ND		1.0	µg/L	59	Hexachlorobutadiene	ND	UJ	4.0	µg/L
25	cis-1,3-Dichloropropene	ND		1.0	µg/L	60	1,2,3-Trichlorobenzene	ND	U	4.0	µg/L
26	trans-1,3-Dichloropropene	ND		1.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	102			%REC
27	1,1,2-Trichloroethane	ND		1.0	µg/L	62	Surr: Toluene-d8	96			%REC
28	Toluene	ND		0.50	µg/L	63	Surr: 4-Bromofluorobenzene	94			%REC
29	1,3-Dichloropropane	ND		1.0	µg/L						
30	Dibromochloromethane	ND		1.0	µg/L						
31	1,2-Dibromoethane (EDB)	ND		4.0	µg/L						
32	Tetrachloroethene	ND		1.0	µg/L						
33	1,1,1,2-Tetrachloroethane	ND		1.0	µg/L						
34	Chlorobenzene	ND		1.0	µg/L						
35	Ethylbenzene	ND		0.50	µg/L						

Some Reporting Limits were increased due to sample foaming.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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Report Date

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BM106011905-06A
Client I.D. Number: 1413-MW05DUP

Sampled: 01/17/06
Received: 01/19/06
Analyzed: 01/23/06

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND U	1.0	µg/L	36	m,p-Xylene	ND U	0.50	µg/L
2	Chloromethane	ND	2.0	µg/L	37	Bromoform	ND	1.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L	38	Styrene	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L	39	o-Xylene	ND	0.50	µg/L
5	Bromomethane	ND	4.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L	41	1,2,3-Trichloropropane	ND	4.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L	42	Isopropylbenzene	ND	1.0	µg/L
8	Dichloromethane	ND	4.0	µg/L	43	Bromobenzene	ND	1.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L	44	n-Propylbenzene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L	45	4-Chlorotoluene	ND	1.0	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L	46	2-Chlorotoluene	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L	47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L	48	tert-Butylbenzene	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L	49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
15	2,2-Dichloropropane	ND	1.0	µg/L	50	sec-Butylbenzene	ND	1.0	µg/L
16	1,2-Dichloroethane	ND	1.0	µg/L	51	1,3-Dichlorobenzene	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L	52	1,4-Dichlorobenzene	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L	53	4-Isopropyltoluene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L	54	1,2-Dichlorobenzene	ND	1.0	µg/L
20	Benzene	0.52	0.50	µg/L	55	n-Butylbenzene	ND	1.0	µg/L
21	Dibromomethane	ND U	1.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	6.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L	57	1,2,4-Trichlorobenzene	ND	4.0	µg/L
23	Trichloroethene	ND	1.0	µg/L	58	Naphthalene	ND	4.0	µg/L
24	Bromodichloromethane	ND	1.0	µg/L	59	Hexachlorobutadiene	ND UJ	4.0	µg/L
25	cis-1,3-Dichloropropene	ND	1.0	µg/L	60	1,2,3-Trichlorobenzene	ND U	4.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	101		%REC
27	1,1,2-Trichloroethane	ND	1.0	µg/L	62	Surr: Toluene-d8	97		%REC
28	Toluene	ND	0.50	µg/L	63	Surr: 4-Bromofluorobenzene	97		%REC
29	1,3-Dichloropropane	ND	1.0	µg/L					
30	Dibromochloromethane	ND	1.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND	4.0	µg/L					
32	Tetrachloroethene	ND	1.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L					
34	Chlorobenzene	ND	1.0	µg/L					
35	Ethylbenzene	ND	0.50	µg/L					

Some Reporting Limits were increased due to sample foaming.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI06011905-07A
Client I.D. Number: 1413-MW06

Sampled: 01/17/06
Received: 01/19/06
Analyzed: 01/23/06

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration		Reporting Limit			Compound	Concentration		Reporting Limit	
1	Dichlorodifluoromethane	ND	U	1.0	µg/L	36	m,p-Xylene	ND	U	0.50	µg/L
2	Chloromethane	ND		2.0	µg/L	37	Bromoform	ND		1.0	µg/L
3	Vinyl chloride	ND		1.0	µg/L	38	Styrene	ND		1.0	µg/L
4	Chloroethane	ND		1.0	µg/L	39	o-Xylene	ND		0.50	µg/L
5	Bromomethane	ND		2.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND		1.0	µg/L
6	Trichlorofluoromethane	ND		1.0	µg/L	41	1,2,3-Trichloropropane	ND		2.0	µg/L
7	1,1-Dichloroethene	ND		1.0	µg/L	42	Isopropylbenzene	ND		1.0	µg/L
8	Dichloromethane	ND		2.0	µg/L	43	Bromobenzene	ND		1.0	µg/L
9	trans-1,2-Dichloroethene	ND		1.0	µg/L	44	n-Propylbenzene	ND		1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND		0.50	µg/L	45	4-Chlorotoluene	ND		1.0	µg/L
11	1,1-Dichloroethane	ND		1.0	µg/L	46	2-Chlorotoluene	ND		1.0	µg/L
12	cis-1,2-Dichloroethene	ND		1.0	µg/L	47	1,3,5-Trimethylbenzene	ND		1.0	µg/L
13	Bromochloromethane	ND		1.0	µg/L	48	tert-Butylbenzene	ND		1.0	µg/L
14	Chloroform	ND		1.0	µg/L	49	1,2,4-Trimethylbenzene	ND		1.0	µg/L
15	2,2-Dichloropropane	ND		1.0	µg/L	50	sec-Butylbenzene	ND		1.0	µg/L
16	1,2-Dichloroethane	ND		1.0	µg/L	51	1,3-Dichlorobenzene	ND		1.0	µg/L
17	1,1,1-Trichloroethane	ND		1.0	µg/L	52	1,4-Dichlorobenzene	ND		1.0	µg/L
18	1,1-Dichloropropene	ND		1.0	µg/L	53	4-Isopropyltoluene	ND		1.0	µg/L
19	Carbon tetrachloride	ND		1.0	µg/L	54	1,2-Dichlorobenzene	ND		1.0	µg/L
20	Benzene	ND	*	0.50	µg/L	55	n-Butylbenzene	ND		1.0	µg/L
21	Dibromomethane	ND		1.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND		5.0	µg/L
22	1,2-Dichloropropane	ND		1.0	µg/L	57	1,2,4-Trichlorobenzene	ND		2.0	µg/L
23	Trichloroethene	ND		1.0	µg/L	58	Naphthalene	ND		2.0	µg/L
24	Bromodichloromethane	ND		1.0	µg/L	59	Hexachlorobutadiene	ND	U J	2.0	µg/L
25	cis-1,3-Dichloropropene	ND		1.0	µg/L	60	1,2,3-Trichlorobenzene	ND	U	2.0	µg/L
26	trans-1,3-Dichloropropene	ND		1.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	102			%REC
27	1,1,2-Trichloroethane	ND		1.0	µg/L	62	Surr: Toluene-d8	94			%REC
28	Toluene	ND		0.50	µg/L	63	Surr: 4-Bromofluorobenzene	98			%REC
29	1,3-Dichloropropane	ND		1.0	µg/L						
30	Dibromochloromethane	ND		1.0	µg/L						
31	1,2-Dibromoethane (EDB)	ND		2.0	µg/L						
32	Tetrachloroethene	ND		1.0	µg/L						
33	1,1,1,2-Tetrachloroethane	ND		1.0	µg/L						
34	Chlorobenzene	ND		1.0	µg/L						
35	Ethylbenzene	ND		0.50	µg/L						

*No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer
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2/1/06
Report Date

3/10/06

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI0601 1905-08A
Client I.D. Number: 1413-MW07

Sampled: 01/17/06
Received: 01/19/06
Analyzed: 01/23/06

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND U	1.0	µg/L	36	m,p-Xylene	ND U	0.50	µg/L
2	Chloromethane	ND	2.0	µg/L	37	Bromoform	ND	1.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L	38	Styrene	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L	39	o-Xylene	ND	0.50	µg/L
5	Bromomethane	ND	2.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L	41	1,2,3-Trichloropropane	ND	2.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L	42	Isopropylbenzene	ND	1.0	µg/L
8	Dichloromethane	ND	2.0	µg/L	43	Bromobenzene	ND	1.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L	44	n-Propylbenzene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L	45	4-Chlorotoluene	ND	1.0	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L	46	2-Chlorotoluene	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L	47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L	48	tert-Butylbenzene	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L	49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
15	2,2-Dichloropropane	ND	1.0	µg/L	50	sec-Butylbenzene	ND	1.0	µg/L
16	1,2-Dichloroethane	ND	1.0	µg/L	51	1,3-Dichlorobenzene	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L	52	1,4-Dichlorobenzene	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L	53	4-Isopropyltoluene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L	54	1,2-Dichlorobenzene	ND	1.0	µg/L
20	Benzene	ND	0.50	µg/L	55	n-Butylbenzene	ND	1.0	µg/L
21	Dibromomethane	ND	1.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L	57	1,2,4-Trichlorobenzene	ND	2.0	µg/L
23	Trichloroethene	ND	1.0	µg/L	58	Naphthalene	ND	2.0	µg/L
24	Bromodichloromethane	ND	1.0	µg/L	59	Hexachlorobutadiene	ND U J	2.0	µg/L
25	cis-1,3-Dichloropropene	ND	1.0	µg/L	60	1,2,3-Trichlorobenzene	ND U	2.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	103		%REC
27	1,1,2-Trichloroethane	ND	1.0	µg/L	62	Surr: Toluene-d8	96		%REC
28	Toluene	ND	0.50	µg/L	63	Surr: 4-Bromofluorobenzene	97		%REC
29	1,3-Dichloropropane	ND	1.0	µg/L					
30	Dibromochloromethane	ND	1.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND	2.0	µg/L					
32	Tetrachloroethene	ND	1.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L					
34	Chlorobenzene	ND	1.0	µg/L					
35	Ethylbenzene	ND	0.50	µg/L					

*No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer
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Report Date

3/10/06

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI06011905-09A
Client I.D. Number: 1413-MW08

Sampled: 01/17/06
Received: 01/19/06
Analyzed: 01/23/06

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND U	1.0	µg/L	36	m,p-Xylene	ND U	0.50	µg/L
2	Chloromethane	ND	2.0	µg/L	37	Bromoform	ND	1.0	µg/L
3	Vinyl chloride	ND	1.0	µg/L	38	Styrene	ND	1.0	µg/L
4	Chloroethane	ND	1.0	µg/L	39	o-Xylene	ND	0.50	µg/L
5	Bromomethane	ND	4.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	1.0	µg/L
6	Trichlorofluoromethane	ND	1.0	µg/L	41	1,2,3-Trichloropropane	ND	4.0	µg/L
7	1,1-Dichloroethene	ND	1.0	µg/L	42	Isopropylbenzene	ND	1.0	µg/L
8	Dichloromethane	ND	4.0	µg/L	43	Bromobenzene	ND	1.0	µg/L
9	trans-1,2-Dichloroethene	ND	1.0	µg/L	44	n-Propylbenzene	ND	1.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	0.50	µg/L	45	4-Chlorotoluene	ND	1.0	µg/L
11	1,1-Dichloroethane	ND	1.0	µg/L	46	2-Chlorotoluene	ND	1.0	µg/L
12	cis-1,2-Dichloroethene	ND	1.0	µg/L	47	1,3,5-Trimethylbenzene	ND	1.0	µg/L
13	Bromochloromethane	ND	1.0	µg/L	48	tert-Butylbenzene	ND	1.0	µg/L
14	Chloroform	ND	1.0	µg/L	49	1,2,4-Trimethylbenzene	ND	1.0	µg/L
15	2,2-Dichloropropane	ND	1.0	µg/L	50	sec-Butylbenzene	ND	1.0	µg/L
16	1,2-Dichloroethane	ND	1.0	µg/L	51	1,3-Dichlorobenzene	ND	1.0	µg/L
17	1,1,1-Trichloroethane	ND	1.0	µg/L	52	1,4-Dichlorobenzene	ND	1.0	µg/L
18	1,1-Dichloropropene	ND	1.0	µg/L	53	4-Isopropyltoluene	ND	1.0	µg/L
19	Carbon tetrachloride	ND	1.0	µg/L	54	1,2-Dichlorobenzene	ND	1.0	µg/L
20	Benzene	ND	0.50	µg/L	55	n-Butylbenzene	ND	1.0	µg/L
21	Dibromomethane	ND	1.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	6.0	µg/L
22	1,2-Dichloropropane	ND	1.0	µg/L	57	1,2,4-Trichlorobenzene	ND	4.0	µg/L
23	Trichloroethene	ND	1.0	µg/L	58	Naphthalene	ND	4.0	µg/L
24	Bromodichloromethane	ND	1.0	µg/L	59	Hexachlorobutadiene	ND UJ	4.0	µg/L
25	cis-1,3-Dichloropropene	ND	1.0	µg/L	60	1,2,3-Trichlorobenzene	ND	4.0	µg/L
26	trans-1,3-Dichloropropene	ND	1.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	102		%REC
27	1,1,2-Trichloroethane	ND	1.0	µg/L	62	Surr: Toluene-d8	95		%REC
28	Toluene	ND	0.50	µg/L	63	Surr: 4-Bromofluorobenzene	97		%REC
29	1,3-Dichloropropane	ND	1.0	µg/L					
30	Dibromochloromethane	ND	1.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND	4.0	µg/L					
32	Tetrachloroethene	ND	1.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND	1.0	µg/L					
34	Chlorobenzene	ND	1.0	µg/L					
35	Ethylbenzene	ND	0.50	µg/L					

Some Reporting Limits were increased due to sample foaming.

*No Benzene was observed above an estimated reporting limit of 0.25 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer
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Report Date

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI06011905-10A
Client I.D. Number: 1413-MW09

Sampled: 01/17/06
Received: 01/19/06
Analyzed: 01/23/06

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit			Compound	Concentration	Reporting Limit	
1	Dichlorodifluoromethane	ND U	2.0	µg/L	36	m,p-Xylene	ND U	1.0	µg/L
2	Chloromethane	ND	4.0	µg/L	37	Bromoform	ND	2.0	µg/L
3	Vinyl chloride	ND	2.0	µg/L	38	Styrene	ND	2.0	µg/L
4	Chloroethane	ND	2.0	µg/L	39	o-Xylene	ND	1.0	µg/L
5	Bromomethane	ND	8.0	µg/L	40	1,1,2,2-Tetrachloroethane	ND	2.0	µg/L
6	Trichlorofluoromethane	ND	2.0	µg/L	41	1,2,3-Trichloropropane	ND	8.0	µg/L
7	1,1-Dichloroethene	ND	2.0	µg/L	42	Isopropylbenzene	ND	2.0	µg/L
8	Dichloromethane	ND	8.0	µg/L	43	Bromobenzene	ND	2.0	µg/L
9	trans-1,2-Dichloroethene	ND	2.0	µg/L	44	n-Propylbenzene	ND	2.0	µg/L
10	Methyl tert-butyl ether (MTBE)	ND	1.0	µg/L	45	4-Chlorotoluene	ND	2.0	µg/L
11	1,1-Dichloroethane	ND	2.0	µg/L	46	2-Chlorotoluene	ND	2.0	µg/L
12	cis-1,2-Dichloroethene	ND	2.0	µg/L	47	1,3,5-Trimethylbenzene	ND	2.0	µg/L
13	Bromochloromethane	ND	2.0	µg/L	48	tert-Butylbenzene	ND	2.0	µg/L
14	Chloroform	ND	2.0	µg/l	49	1,2,4-Trimethylbenzene	ND	2.0	µg/L
15	2,2-Dichloropropane	ND	2.0	µg/L	50	sec-Butylbenzene	ND	2.0	µg/L
16	1,2-Dichloroethane	ND	2.0	µg/L	51	1,3-Dichlorobenzene	ND	2.0	µg/L
17	1,1,1-Trichloroethane	ND	2.0	µg/L	52	1,4-Dichlorobenzene	ND	2.0	µg/L
18	1,1-Dichloropropene	ND	2.0	µg/L	53	4-Isopropyltoluene	ND	2.0	µg/L
19	Carbon tetrachloride	ND	2.0	µg/L	54	1,2-Dichlorobenzene	ND	2.0	µg/L
20	Benzene	ND	1.0	µg/L	55	n-Butylbenzene	ND	2.0	µg/L
21	Dibromomethane	ND	2.0	µg/L	56	1,2-Dibromo-3-chloropropane (DBCP)	ND	12	µg/L
22	1,2-Dichloropropane	ND	2.0	µg/L	57	1,2,4-Trichlorobenzene	ND	8.0	µg/L
23	Trichloroethene	ND	2.0	µg/L	58	Naphthalene	ND	8.0	µg/L
24	Bromodichloromethane	ND	2.0	µg/L	59	Hexachlorobutadiene	ND UJ	8.0	µg/L
25	cis-1,3-Dichloropropene	ND	2.0	µg/L	60	1,2,3-Trichlorobenzene	ND U	8.0	µg/L
26	trans-1,3-Dichloropropene	ND	2.0	µg/l	61	Surr: 1,2-Dichloroethane-d4	100		%REC
27	1,1,2-Trichloroethane	ND	2.0	µg/L	62	Surr: Toluene-d8	98		%REC
28	Toluene	ND	1.0	µg/L	63	Surr: 4-Bromofluorobenzene	96		%REC
29	1,3-Dichloropropane	ND	2.0	µg/L					
30	Dibromochloromethane	ND	2.0	µg/L					
31	1,2-Dibromoethane (EDB)	ND	8.0	µg/L					
32	Tetrachloroethene	ND	2.0	µg/L					
33	1,1,1,2-Tetrachloroethane	ND	2.0	µg/L					
34	Chlorobenzene	ND	2.0	µg/L					
35	Ethylbenzene	ND	1.0	µg/L					

Reporting Limits were increased due to sample foaming.

*No Benzene was observed above an estimated reporting limit of 0.5 µg/L.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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2/1/06
Report Date

3/10/06

LDC #: 14702D1

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 3/08/06

SDG #: BMI06011905

Page: 1 of 1

Laboratory: Alpha Analytical, Inc.

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/17/06
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	% RSD, r
IV.	Continuing calibration	SW	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	SW	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation/CRQLs	A	Not reviewed for Level III validation.
XIII.	Tentitatively identified compounds (TICs)	N	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	D = 4, 5
XVII.	Field blanks	ND	TB = 1 FB = 2

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation

Water

1	1413-QCTB	11	1413-MW04MSD	21		31	
2	1413-QCFB	12	MBLK MS/MSD/DMA	22		32	
3	1413-MW04	13		23		33	
4	1413-MW05**	14		24		34	
5	1413-MW05Dup	15		25		35	
6	1413-MW06	16		26		36	
7	1413 MW07	17		27		37	
8	1413-MW08	18		28		38	
9	1413-MW09	19		29		39	
10	1413-MW04MS	20		30		40	

LDC #: 14702 D1
SDG #: BMI 0611905

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: JVG
2nd Reviewer: [illegible]

Method: Volatiles (EPA SW 846 Method 8260B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Was a curve fit used for evaluation?	✓			
Did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?	✓			
Were all percent relative standard deviations (%RSD) ≤ 30% and relative response factors (RRF) ≥ 0.05?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Were all percent differences (%D) ≤ 25% and relative response factors (RRF) ≥ 0.05?		✓		
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %R within QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			

LDC #: 14702 D1
SDG #: BMI 06 11 905

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: JVC
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds of the associated calibration standard?	✓			
XI. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XII. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?			✓	
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?			✓	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?		✓		
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target compounds were detected in the field duplicates.	✓			
XVII. Field blanks				
Field blanks were identified in this SDG.	✓			
Target compounds were detected in the field blanks.		✓		

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA SW 846 Method 8260B)

A. Chloromethane*	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC. 1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl chloride**	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform*	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene**	BB. 1,1,2,2-Tetrachloroethane*	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane*	CC. Toluene**	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene*	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform**	EE. Ethylbenzene**	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN.
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane**	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

* = System performance check compounds (SPCC) for RRF ; ** = Calibration check compounds (CCC) for %RSD.

LDC #: 14702 D1
SDG #: BMI0601905

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: NG
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y N N/A Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: <25.0%)	Finding RRF (Limit: >0.05)	Associated Samples	Qualifications
	1/23/06	06012310	LLL	25.5		All + Blk	J/UJ/A

CONCAL.1S

LDC #: 14702 D1
SDG #: BMI 06 01905

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: JR
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a LCS required?
Y N N/A Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
				( )	( )	( )		
		Lab	reported	CCV as	LCS ( )	( )	All + Blk	None/P
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 14702 D1
SDG #: BMI 06011905

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: JVG
2nd reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (ug/L)		RPD
	4	5	
V	0.54	0.52	4

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

LDC #: 14702 D1
SDG #: BNI 06011905

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: JM
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

RRF = $(A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs
X = Mean of the RRFs

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (8 std)	Recalculated RRF (8 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL	12/09/05	Methylene chloride (1st internal standard)	0.1995	0.1995	0.1938	0.1938	14.5	14.6
			~~Trichlorethene~~ CC (2nd internal standard)	3.550	3.550	3.416	3.416	6.6	6.3
			Toluene BB (3rd internal standard)	4.201	4.201	3.722	3.722	10.6	10.6
2			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						
3			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						
4			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14702 D1
SDG #: BMI0601905

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: JR
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = $(A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	06012310	1/23/06	Methylene chloride (1st internal standard)	0.194	0.194	0.1941	0.1	0.1
			~~Trichlorethene~~ CC (2nd internal standard)	3.416	3.275	3.275	4.1	4.1
			~~Toluene~~ AAA (3rd internal standard)	3.722	4.029	4.029	8.3	8.2
2			Methylene chloride (1st internal standard)					
			Trichlorethene (2nd internal standard)					
			Toluene (3rd internal standard)					
3			Methylene chloride (1st internal standard)					
			Trichlorethene (2nd internal standard)					
			Toluene (3rd internal standard)					
4			Methylene chloride (1st internal standard)					
			Trichlorethene (2nd internal standard)					
			Toluene (3rd internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14702 D1
SDG #: BMI 06 01195

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: JR
2nd reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #4

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8	20	19.12	96	96	0
Bromofluorobenzene	↓	18.83	94	94	↓
1,2-Dichloroethane-d4	↓	20.49	102	102	↓
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

LDC #: 14702D1
SDG #: BM1060195

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: JK
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentration

RPD = | MSC - MSDC | * 2/(MSC + MSDC) MSC = Matrix spike percent recovery; MSDC = Matrix spike duplicate percent recovery

MS/MSD sample: 10/11

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)	Spiked Sample Concentration (ug/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	----	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene	50	50	0	45.4	45.4	91	91	91	91	0	0
Trichloroethene	↓	↓	↓	43.8	44.2	88	88	88	88	0.8	0.9
Benzene	↓	↓	↓	49.8	50.3	99.7	99.6	101	101	0.9	0.9
Toluene	↓	↓	↓	44.1	44.6	88	88	89	89	1.1	1.1
Chlorobenzene	↓	↓	↓	48.9	49.8	98	98	99.7	99.6	2.0	1.8

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14702J1
SDG #: BMI0601195

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Page: 1 of 1
Reviewer: JW
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the labcratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA

Where: SSC = Spiked sample concentration
SA = Spike added

RPD = | LCS - LCSD | * 2/(LCS + LCSD)

LCS = Laboratry control sample percent recovery

LCSD = Laboratory control sample duplicate percent recovery

LCS ID: LCS MS 10W0123A

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene	10	NA	10.1	NA	101	101		—		
Trichloroethene			9.66		97	97				
Benzene			10.5		105	105				
Toluene			9.59		96	96				
Chlorobenzene			10.1		101	101				

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14702D1
SDG #: BMI 06011905

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: JVC
2nd reviewer: OK

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

$$\text{Concentration} = \frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

RRF = Relative response factor of the calibration standard.

V_o = Volume or weight of sample pruged in milliliters (ml) or grams (g).

Df = Dilution factor.

%S = Percent solids, applicable to soils and solid matrices only.

Example:

Sample I.D. #4, V

Conc. = ( )( )( )
( )( )( )( )

$$* \frac{(14267)}{(534827)} = (-1.34e-2X^2) + 1.06X - 0.00386$$

X ≐ 0.027

final conc. = 0.027 (10) (25) = 0.54 ug/L
(12.5)

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Camp Pendleton, CTO 102

Collection Date: January 17, 2006

LDC Report Date: March 9, 2006

Matrix: Water

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: EPA Level III & IV

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): BMI06011905

Sample Identification

1413-MW04
1413-MW05**
1413-MW05Dup
1413-MW06
1413-MW07
1413-MW08
1413-MW09
1413-MW05MS
1413-MW05MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Polynuclear Aromatic Hydrocarbons.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified a P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Samples indicated by a double asterisk on the front cover underwent a EPA Level IV review. A EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals. All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for selected compounds.

A curve fit, based on the initial calibration, was established for quantitation for selected compounds. The coefficient of determination (r^2) was greater than or equal to 0.990 .

Average relative response factors (RRF) for all target compounds and system monitoring compounds were within validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 25.0% .

All of the continuing calibration RRF values were within validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polynuclear aromatic hydrocarbon contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
1413-MW05MS/MSD (1413-MW05**)	Acenaphthene	51 (55-113)	-	43.0 (≤16)	J (all detects)	A
	Naphthalene	-	-	62.4 (≤35)	UJ (all non-detects)	
	Acenaphthylene	-	-	39.3 (≤18)		
	Fluorene	-	-	20.5 (≤15)		

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
LCS/D 13939 (All samples in SDG BMI06011905)	Naphthalene	45 (62-104)	-	50.4 (≤15)	J (all detects)	P
	Acenaphthylene	60 (71-120)	-	37.7 (≤13)	UJ (all non-detects)	
	Acenaphthene	56 (67-109)	-	38.6 (<12)		
	Fluorene	-	-	20.3 (≤15)		

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XII. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory.

XIV. System Performance

The system performance was within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XV. Overall Assessment

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

Samples 1413-MW05** and 1413-MW05Dup were identified as field duplicates. No polynuclear aromatic hydrocarbons were detected in any of the samples.

XVII. Field Blanks

No field blanks were identified in this SDG.

Camp Pendleton, CTO 102
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG BMI06011905

SDG	Sample	Compound	Flag	A or P	Reason
BMI06011905	1413-MW05**	Acenaphthene	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)(RPD)
BMI06011905	1413-MW05**	Naphthalene Acenaphthylene Fluorene	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (RPD)
BMI06011905	1413-MW04 1413-MW05** 1413-MW05Dup 1413-MW06 1413-MW07 1413-MW08 1413-MW09	Naphthalene Acenaphthylene Acenaphthene	J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R)(RPD)
BMI06011905	1413-MW04 1413-MW05** 1413 MW05Dup 1413-MW06 1413-MW07 1413-MW08 1413-MW09	Fluorene	J (all detects) UJ (all non-detects)	P	Laboratory control samples (RPD)

Camp Pendleton, CTO 102
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG BMI06011905

No Sample Data Qualified in this SDG

Alpha Analytical, Inc.

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D2

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI06011905-04A
Client I.D. Number: 1413-MW04

Sampled: 01/17/06
Received: 01/19/06
Analyzed: 01/20/06

Semivolatile Organics by GC/MS
EPA Method SW8270C

	Compound	Concentration	Reporting Limit
1	Naphthalene	ND UJ	10 µg/L
2	Acenaphthylene	ND	10 µg/L
3	Acenaphthene	ND	10 µg/L
4	Fluorene	ND	10 µg/L
5	Phenanthrene	ND U	10 µg/L
6	Anthracene	ND	10 µg/L
7	Fluoranthene	ND	10 µg/L
8	Pyrene	ND	10 µg/L
9	Benzo(a)anthracene	ND	10 µg/L
10	Chrysene	ND	10 µg/L
11	Benzo(b)fluoranthene	ND	10 µg/L
12	Benzo(k)fluoranthene	ND	10 µg/L
13	Benzo(a)pyrene	ND	10 µg/L
14	Indeno(1,2,3-cd)pyrene	ND	10 µg/L
15	Dibenz(a,h)anthracene	ND	10 µg/L
16	Benzo(g,h,i)perylene	ND	10 µg/L
17	Surr: Nitrobenzene-d5	110	%REC
18	Surr: 2-Fluorobiphenyl	114 *	%REC
19	Surr: 4-Terphenyl-d14	107	%REC

*2 Fluorobiphenyl surrogate recovery was 114%, with 54-113% criteria. The other surrogates met criteria.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer
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2/1/06
Report Date

Page 1 of 1

2/10/06

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI06011905-05A
Client I.D. Number: 1413-MW05

Sampled: 01/17/06
Received: 01/19/06
Analyzed: 01/20/06

Semivolatile Organics by GC/MS
EPA Method SW8270C

	Compound	Concentration	Reporting Limit
1	Naphthalene	ND	10 µg/L
2	Acenaphthylene	ND	10 µg/L
3	Acenaphthene	ND	10 µg/L
4	Fluorene	ND	10 µg/L
5	Phenanthrene	ND	10 µg/L
6	Anthracene	ND	10 µg/L
7	Fluoranthene	ND	10 µg/L
8	Pyrene	ND	10 µg/L
9	Benzo(a)anthracene	ND	10 µg/L
10	Chrysene	ND	10 µg/L
11	Benzo(b)fluoranthene	ND	10 µg/L
12	Benzo(k)fluoranthene	ND	10 µg/L
13	Benzo(a)pyrene	ND	10 µg/L
14	Indeno(1,2,3-cd)pyrene	ND	10 µg/L
15	Dibenz(a,h)anthracene	ND	10 µg/L
16	Benzo(g,h,i)perylene	ND	10 µg/L
17	Surr: Nitrobenzene-d5	107	%REC
18	Surr: 2-Fluorobiphenyl	111	%REC
19	Surr: 4-Terphenyl-d14	107	%REC

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

2/1/06
Report Date

2/10/06

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102 1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI06011905-06A
Client I.D. Number: 1413-MW05DUP

Sampled: 01/17/06
Received: 01/19/06
Analyzed: 01/20/06

Semivolatile Organics by GC/MS
EPA Method SW8270C

	Compound	Concentration	Reporting Limit
1	Naphthalene	ND	10 µg/L
2	Acenaphthylene	ND	10 µg/L
3	Acenaphthene	ND	10 µg/L
4	Fluorene	ND	10 µg/L
5	Phenanthrene	ND	10 µg/L
6	Anthracene	ND	10 µg/L
7	Fluoranthene	ND	10 µg/L
8	Pyrene	ND	10 µg/L
9	Benzo(a)anthracene	ND	10 µg/L
10	Chrysene	ND	10 µg/L
11	Benzo(b)fluoranthene	ND	10 µg/L
12	Benzo(k)fluoranthene	ND	10 µg/L
13	Benzo(a)pyrene	ND	10 µg/L
14	Indeno(1,2,3-cd)pyrene	ND	10 µg/L
15	Dibenz(a,h)anthracene	ND	10 µg/L
16	Benzo(g,h,i)perylene	ND	10 µg/L
17	Surr: Nitrobenzene-d5	115	%REC
18	Surr: 2-Fluorobiphenyl	122 *	%REC
19	Surr: 4-Terphenyl-d14	113	%REC

*2-Fluorobiphenyl surrogate recovery was 122%, with 54-113% criteria. The other surrogates met criteria.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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2/1/06
Report Date

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Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1413

Attn: Chris Zimmerman
Phone: (614) 424 3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI06011905-07A
Client I.D. Number: 1413-MW06

Sampled: 01/17/06
Received: 01/19/06
Analyzed: 01/20/06

Semivolatile Organics by GC/MS
EPA Method SW8270C

	Compound	Concentration	Reporting Limit
1	Naphthalene	ND	10 µg/L
2	Acenaphthylene	ND	10 µg/L
3	Acenaphthene	ND	10 µg/L
4	Fluorene	ND	10 µg/L
5	Phenanthrene	ND	10 µg/L
6	Anthracene	ND	10 µg/L
7	Fluoranthene	ND	10 µg/L
8	Pyrene	ND	10 µg/L
9	Benzo(a)anthracene	ND	10 µg/L
10	Chrysene	ND	10 µg/L
11	Benzo(b)fluoranthene	ND	10 µg/L
12	Benzo(k)fluoranthene	ND	10 µg/L
13	Benzo(a)pyrene	ND	10 µg/L
14	Indeno(1,2,3-cd)pyrene	ND	10 µg/L
15	Dibenz(a,h)anthracene	ND	10 µg/L
16	Benzo(g,h,i)perylene	ND	10 µg/L
17	Surr: Nitrobenzene-d5	108	%REC
18	Surr: 2-Fluorobiphenyl	115 *	%REC
19	Surr: 4-Terphenyl-d14	107	%REC

*2 Fluorobiphenly surrogate recovery was 115%, with 54-113% criteria. The other surrogates met criteria.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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2/1/06
Report Date

Page 1 of 1

3/10/06

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI06011905-08A
Client I.D. Number: 1413-MW07

Sampled: 01/17/06
Received: 01/19/06
Analyzed: 01/20/06

Semivolatile Organics by GC/MS
EPA Method SW8270C

	Compound	Concentration	Reporting Limit
1	Naphthalene	ND UJ	10 µg/L
2	Acenaphthylene	ND	10 µg/L
3	Acenaphthene	ND	10 µg/L
4	Fluorene	ND	10 µg/L
5	Phenanthrene	ND U	10 µg/L
6	Anthracene	ND	10 µg/L
7	Fluoranthene	ND	10 µg/L
8	Pyrene	ND	10 µg/L
9	Benzo(a)anthracene	ND	10 µg/L
10	Chrysene	ND	10 µg/L
11	Benzo(b)fluoranthene	ND	10 µg/L
12	Benzo(k)fluoranthene	ND	10 µg/L
13	Benzo(a)pyrene	ND	10 µg/L
14	Indeno(1,2,3-cd)pyrene	ND	10 µg/L
15	Dibenz(a,h)anthracene	ND	10 µg/l
16	Benzo(g,h,i)perylene	ND	10 µg/L
17	Surr: Nitrobenzene-d5	107	%REC
18	Surr: 2-Fluorobiphenyl	112	%REC
19	Surr: 4-Terphenyl-d14	102	%REC

ND = Not Detected

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2/1/06
Report Date

3/10/06

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI06011905-09A
Client I.D. Number: 1413-MW08

Sampled: 01/17/06
Received: 01/19/06
Analyzed: 01/20/06

Semivolatile Organics by GC/MS
EPA Method SW8270C

	Compound	Concentration	Reporting Limit
1	Naphthalene	ND UJ	10 µg/L
2	Acenaphthylene	ND	10 µg/L
3	Acenaphthene	ND	10 µg/L
4	Fluorene	ND	10 µg/L
5	Phenanthrene	ND U	10 µg/L
6	Anthracene	ND	10 µg/L
7	Fluoranthene	ND	10 µg/L
8	Pyrene	ND	10 µg/L
9	Benzo(a)anthracene	ND	10 µg/L
10	Chrysene	ND	10 µg/L
11	Benzo(b)fluoranthene	ND	10 µg/L
12	Benzo(k)fluoranthene	ND	10 µg/L
13	Benzo(a)pyrene	ND	10 µg/L
14	Indeno(1,2,3-cd)pyrene	ND	10 µg/L
15	Dibenz(a,h)anthracene	ND	10 µg/L
16	Benzo(g,h,i)perylene	ND	10 µg/L
17	Surr: Nitrobenzene-d5	111	%REC
18	Surr: 2-Fluorobiphenyl	99	%REC
19	Surr: 4-Terphenyl-d14	111	%REC

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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2/1/06
Report Date

2/10/06

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ANALYTICAL REPORT

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Job#: TO102-1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Alpha Analytical Number: BMI06011905-10A
Client I.D. Number: 1413-MW09

Sampled: 01/17/06
Received: 01/19/06
Analyzed: 01/20/06

Semivolatile Organics by GC/MS
EPA Method SW8270C

	Compound	Concentration	Reporting Limit
1	Naphthalene	ND	10 µg/L
2	Acenaphthylene	ND	10 µg/L
3	Acenaphthene	ND	10 µg/L
4	Fluorene	ND	10 µg/L
5	Phenanthrene	ND	10 µg/L
6	Anthracene	ND	10 µg/L
7	Fluoranthene	ND	10 µg/L
8	Pyrene	ND	10 µg/L
9	Benzo(a)anthracene	ND	10 µg/L
10	Chrysene	ND	10 µg/L
11	Benzo(b)fluoranthene	ND	10 µg/L
12	Benzo(k)fluoranthene	ND	10 µg/L
13	Benzo(a)pyrene	ND	10 µg/L
14	Indeno(1,2,3-cd)pyrene	ND	10 µg/L
15	Dibenz(a,h)anthracene	ND	10 µg/L
16	Benzo(g,h,i)perylene	ND	10 µg/L
17	Surr: Nitrobenzene-d5	109	%REC
18	Surr: 2-Fluorobiphenyl	94	%REC
19	Surr: 4-Terphenyl-d14	112	%REC

ND = Not Detected

Roger Scholl Randy Gardner Walter Hirchman

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2/1/06
Report Date

2/10/06

LDC #: 14702D2

SDG #: BMI06011905

Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 3/8/06

Page: 1 of 1

Reviewer: JVG

2nd Reviewer:

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/17/06
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	% RSD, r²
IV.	Continuing calibration	~~SW~~ A	
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation/CRQLs	A	Not reviewed for Level III validation.
XIII.	Tentitatively identified compounds (TICs)	N	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	
XVI.	Field duplicates	ND	D = 2 & 3
XVII.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation

Water

1	1413-MW04	11	MBLK 13939	21		31	
2	1413-MW05**	12		22		32	
3	1413-MW05Dup	13		23		33	
4	1413-MW06	14		24		34	
5	1413-MW07	15		25		35	
6	1413-MW08	16		26		36	
7	1413-MW09	17		27		37	
8	1413-MW05MS	18		28		38	
9	1413-MW05MSD	19		29		39	
10		20		30		40	

LDC #: 470202
SDG #: BM1060119055

VALIDATION FINDINGS CHECKLIST

Reviewer: 7/16
2nd Reviewer:

Method: Semivolatiles (EPA SW 846 Method 8270C)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS instrument performance check				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Was a curve fit used for evaluation?	✓			
Did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?	✓			
Were all percent relative standard deviations (%RSD) ≤ 30% and relative response factors (RRF) ≥ 0.05?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Were all percent differences (%D) ≤ 25% and relative response factors (RRF) ≥ 0.05?	✓			
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %R within QC limits?		✓		
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicate				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			

LDC #: 14702D2
SDG #: BM10601/905

VALIDATION FINDINGS CHECKLIST

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?		✓		
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds from the associated calibration standard?	✓			
XI. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XII. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?			✓	
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?			✓	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?		✓		
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target compounds were detected in the field duplicates.		✓		
XVII. Field blanks				
Field blanks were identified in this SDG.		✓		
Target compounds were detected in the field blanks.			✓	

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

LDC #: 14702 D2
SDG #: BMI06D11905

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer: JVR
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)
Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were percent recoveries (%R) for surrogates within QC limits?
Y N N/A If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
Y N N/A If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		1	FBP	114 (54-113)	no qual
				( )	
		3	↓	122 (↓)	↓
				( )	
		4	↓	115 (↓)	↓
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

* QC limits are advisory	QC Limits (Soil)	QC Limits (Water)		QC Limits (Soil)	QC Limits (Water)
S1 (NBZ) = Nitrobenzene-d5	23-120	35-114	S5 (2FP) = 2-Fluorophenol	25-121	21-100
S2 (FBP) = 2-Fluorobiphenyl	30-115	43-116	S6 (TBP) = 2,4,6-Tribromophenol	19-122	10-123
S3 (TPH) = Terphenyl-d14	18-137	33-141	S7 (2CP) = 2-Chlorophenol-d4	20-130*	33-110*
S4 (PHL) = Phenol-d5	24-113	10-94	S8 (DCB) = 1,2-Dichlorobenzene-d4	20-130*	16-110*

SUR.2S

LDC #: 14702 D2
SDG #: BMT06611905

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: JJG
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

Y N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		8+9	GG	51 (55-113)	( )	43.0 (16)	2	J/UJ/A
			S	( )	( )	62.4 (35)		
			DD	( )	( )	39.3 (18)		
			NN	( )	( )	20.5 (15)		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)		Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A.	Phenol	26-90%	≤ 35%	12-110%	≤ 42%	GG.	Acenaphthene	31-137%	≤ 19%	46-118%	≤ 31%
C.	2-Chlorophenol	25-102%	≤ 50%	27-123%	≤ 40%	II.	4-Nitrophenol	11-114%	≤ 50%	10-80%	≤ 50%
E.	1,4-Dichlorobenzene	28-104%	≤ 27%	36-97%	≤ 28%	KK.	2,4-Dinitrotoluene	28-89%	≤ 47%	24-96%	≤ 38%
J.	N-Nitroso-di-n-propylamine	41-126%	≤ 38%	41-116%	≤ 38%	TT.	Pentachlorophenol	17-109%	≤ 47%	9-103%	≤ 50%
R.	1,2,4-Trichlorobenzene	38-107%	≤ 23%	39-98%	≤ 28%	ZZ.	Pyrene	35-142%	≤ 36%	26-127%	≤ 31%
V.	4-Chloro-3-methylphenol	26-103%	≤ 33%	23-97%	≤ 42%						

LDC #: 14702D2
SDG #: DMI06011908

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: JR
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a LCS required?

Y N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		LCS/D 13939	S	45 (62-104)	( )	50.4 (15)	All + BLK	J/UJ/P
			DD	60 (71-120)	( )	37.7 (13)		
			GG	56 (67-109)	( )	38.6 (12)		
			NN	( )	( )	20.3 (15)		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 14702D2
SDG #: BM1060111905

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer:
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

RRF = $(A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard
S = Standard deviation of the RRFs, X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (5 std)	Recalculated RRF (5 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	IC41	12/12/05	Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)	1.381	1.381	1.331	1.331	4.55	4.55
			Fluorene (3rd internal standard)	1.572	1.572	1.480	1.480	7.69	7.70
			~~Pentachlorophenol~~ Phenanthrene (4th internal standard)	1.605	1.605	1.509	1.509	6.66	6.66
			~~Bis(2-ethylhexyl)phthalate~~ Chrysene (5th internal standard)	1.278	1.278	1.254	1.254	2.62	2.61
			Benzo(a)pyrene (6th internal standard)	1.669	1.669	1.539	1.539	13.04	13.35
2			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
3			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14702D2
SDG #: BM10601|905

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = $(A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	06012007	1/20/06	Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)	1.331	1.371	1.371	3.0	3.04
			Fluorene (3rd internal standard)	1.480	1.594	1.594	7.7	7.70
			~~Pentachlorophenol~~ Phenanthrene (4th internal standard)	1.509	1.579	1.579	4.6	4.6
			~~Bis(2-ethylhexyl)phthalate~~ Chrysene (5th internal standard)	1.224	1.269	1.269	1.2	1.2
			Benzo(a)pyrene (6th internal standard)	1.539	1.547	1.547	0.6	0.5
2			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
3			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

CONCLC.2S

LDC #: 14702D2
SDG #: BM16601190S

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: [illegible]
2nd reviewer: [illegible]

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #2

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5	5	5.37	107	107	0
2-Fluorobiphenyl	↓	5.57	111	111	↓
Terphenyl-d14	5	5.30	107	107	↓
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

LDC #: 14702 D2
SDG #: BMI06 01908

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentation

RPD = | MS - MSD | * 2/(MS + MSD) MS = Matrix spike percent recovery MSD = Matrix spike duplicate percent recovery

MS/MSD samples: 8/9

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)	Spiked Sample Concentration (ug/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	—	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
Phenol											
2-Chlorophenol											
1,4-Dichlorobenzene											
N-Nitroso-di-n-propylamine											
1,2,4-Trichlorobenzene											
4-Chloro-3-methylphenol											
Acenaphthene	100	100	0	51.2	79.3	51	51	79	79	43.0	43.1
4-Nitrophenol											
2,4-Dinitrotoluene											
Pentachlorophenol											
Pyrene	100	100	0	89.7	93.9	90	90	94	94	4.6	4.6

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

MSDCLC.2S

LDC #: 14702 D2

SDG #: BMI 06 011465

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: OR

2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SC/SA

Where: SSC = Spike concentration
SA = Spike added

RPD = | LCS - LCSD | * 2/(LCS + LCSD)

LCS = Laboratory control sample percent recovery

LCSD = Laboratory control sample cuplicate percent recovery

LCS/LCSD samples: LCS 13939

Compound	Spike Added (ug/L)		Spike Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
Phenol										
2-Chlorophenol										
1,4-Dichlorobenzene										
N-Nitroso-di-n-propylamine										
1,2,4-Trichlorobenzene										
4-Chloro-3-methylphenol										
Acenaphthene	100	100	55.7	82.4	56	56	82	82	38.6	38.7
4-Nitrophenol										
2,4-Dinitrotoluene										
Pentachlorophenol										
Pyrene	100	100	81.6	87.7	82	82	88	88	7.3	7.2

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14702 D2
SDG #: BMI06011905

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: [illegible]
2nd reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_x)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_x = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

V_i = Volume of extract injected in microliters (ul)

V_t = Volume of the concentrated extract in microliters (ul)

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

2.0 = Factor of 2 to account for GPC cleanup

Example:

Sample I.D. _____ , ND :

Conc. = ( )( )( )( )( )
( )( )( )( )( )

=

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Camp Pendleton, CTO 102

Collection Date: January 17, 2006

LDC Report Date: March 7, 2006

Matrix: Water

Parameters: Lead & Dissolved Manganese

Validation Level: EPA Level III & IV

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): BMI06011852

Sample Identification

1413-MW04
1413-MW05**
1413-MW05Dup
1413-MW06
1413-MW07
1413-MW08
1413-MW09
1413-MW04MS
1413-MW04MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6020 for Lead & Dissolved Manganese.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified a P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Samples indicated by a double asterisk on the front cover underwent a EPA Level IV review. A EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks.

IV. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

V. Matrix Spike Analysis

Recalculated results confirm the reported results with the following exceptions:

Spike ID (Associated Samples)	Analyte	Reported (RPD)	Recalculated (RPD)	Flag	A or P
1413-MW04MS/MSD (All samples in SDG BMI06011852)	Dissolved manganese	166.0	8.7	None	P

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Internal Standards

All internal standard percent recoveries (%R) were within QC limits for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

ICP serial dilution analysis was performed by the laboratory. The analysis criteria were met.

XI. Sample Result Verification

All sample result verifications met validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIII. Field Duplicates

Samples 1413-MW05** and 1413-MW05Dup were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/L)		RPD
	1413-MW05**	1413-MW05Dup	
Dissolved manganese	0.42	0.45	7

XIV. Field Blanks

No field blanks were identified in this SDG.

Camp Pendleton, CTO 102
Lead & Dissolved Manganese - Data Qualification Summary - SDG BMI06011852

SDG	Sample	Analyte	Flag	A or P	Reason
BMI06011852	1413-MW04 1413-MW05** 1413-MW05Dup 1413-MW06 1413-MW07 1413-MW08 1413-MW09	Dissolved manganese	None	P	Matrix spike/Matrix spike duplicates (Recalculation)

Camp Pendleton, CTO 102
Lead & Dissolved Manganese - Laboratory Blank Data Qualification Summary - SDG BMI06011852

No Sample Data Qualified in this SDG

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 01/18/06

Job#: TO102-1413

Metals by ICPMS
EPA Method SW6020

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1413-MW04					
Lab ID :	BMI06011852-01A	Lead (Pb)	ND	0.0050 mg/L	01/17/06	02/14/06
Client ID :	1413-MW05					
Lab ID :	BMI06011852-02A	Lead (Pb)	ND	0.0050 mg/L	01/17/06	02/14/06
Client ID	1413-MW05DUP					
Lab ID :	BMI06011852-03A	Lead (Pb)	ND	0.0050 mg/L	01/17/06	02/14/06
Client ID :	1413-MW06					
Lab ID :	BMI06011852-04A	Lead (Pb)	ND	0.0050 mg/L	01/17/06	02/14/06
Client ID :	1413-MW07					
Lab ID :	BMI06011852-05A	Lead (Pb)	ND	0.0050 mg/L	01/17/06	02/14/06
Client ID :	1413-MW08					
Lab ID :	BMI06011852-06A	Lead (Pb)	ND	0.0050 mg/L	01/17/06	02/14/06
Client ID :	1413-MW09					
Lab ID :	BMI06011852-07A	Lead (Pb)	ND	0.0050 mg/L	01/17/06	02/14/06

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366 9089 / Las Vegas, NV • (702) 281-4848 • info@alpha-analytical.com

2/16/06
Report Date

3/10/06

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 01/18/06

Job#: TO102-1413

Dissolved Metals by ICPMS
EPA Method SW6020

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1413-MW04					
Lab ID :	BM0601 1852-01A	Manganese (Mn), Dissolved	0.29	0.0050 mg/L	01/17/06	02/15/06
Client ID :	1413-MW05					
Lab ID :	BM0601 1852-02A	Manganese (Mn), Dissolved	0.42	0.0050 mg/L	01/17/06	02/15/06
Client ID :	1413-MW05DUP					
Lab ID :	BM0601 1852-03A	Manganese (Mn), Dissolved	0.45	0.0050 mg/L	01/17/06	02/15/06
Client ID :	1413-MW06					
Lab ID :	BM0601 1852-04A	Manganese (Mn), Dissolved	0.16	0.0050 mg/L	01/17/06	02/15/06
Client ID :	1413-MW07					
Lab ID	BM0601 1852-05A	Manganese (Mn), Dissolved	0.40	0.0050 mg/L	01/17/06	02/15/06
Client ID :	1413-MW08					
Lab ID :	BM0601 1852-06A	Manganese (Mn), Dissolved	0.42	0.0050 mg/L	01/17/06	02/15/06
Client ID :	1413-MW09					
Lab ID :	BM0601 1852-07A	Manganese (Mn), Dissolved	0.31	0.0050 mg/L	01/17/06	02/15/06

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

2/16/06
Report Date

3/10/06

LDC #: 14702C4 **VALIDATION COMPLETENESS WORKSHEET** Date: 3-7-06

SDG #: BMI06011852 Level III/IV Page: 1 of 1

Laboratory: Alpha Analytical, Inc. Reviewer: MG

2nd Reviewer: [illegible]

METHOD: Lead & Dissolved Manganese (EPA SW 846 Method 6020)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1-17-06
II.	Calibration	A	
III.	Blanks	A	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	SW	MS/MSD
VI.	Duplicate Sample Analysis	N	
VII.	Laboratory Control Samples (LCS)	A	LCS
VIII.	Internal Standard (ICP-MS)	A	
IX.	Furnace Atomic Absorption QC	N	Not utilized
X.	ICP Serial Dilution	A	
XI.	Sample Result Verification	A	Not reviewed for Level III validation.
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	SW	D = 2+3
XIV.	Field Blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: ** indicates sample underwent Level IV validation

all water

1	1413-MW04	11		21		31	
2	1413-MW05**	12		22		32	
3	1413-MW05Dup	13		23		33	
4	1413-MW06	14		24		34	
5	1413-MW07	15		25		35	
6	1413-MW08	16		26		36	
7	1413-MW09	17		27		37	
8	1413-MW04MS	18		28		38	
9	1413-MW04MSD	19		29		39	
10	PBW	20		30		40	

Notes:

LDC #: 14702C4
SDG #: BMI06011852

VALIDATION FINDINGS CHECKLIST

Reviewer: MG
2nd Reviewer: MM

Method: Metals (EPA SW 846 Method 6010/7000/6020)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% (80-120% for mercury and 85-115% for cyanide) QC limits?	✓			
Were all initial calibration correlation coefficients ≥ 0.995? (Level IV only)	✓			
III. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. ICP Interference Check Sample				
Were ICP interference check samples performed daily?	✓			
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?	✓			
V. Matrix Spike/Matrix Spike Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of +/- RL(+/-2X RL for soil) was used for samples that were ≤ 5X the RL, including when only one of the duplicate sample values were < 5X the RL.	✓			
VI. Laboratory Control Samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% QC limits for water samples and laboratory established QC limits for soils?	✓			
VII. Furnace Atomic Absorption QC				
If MSA was performed, was the correlation coefficients > 0.995?			✓	
Do all applicable analysies have duplicate injections? (Level IV only)			✓	
For sample concentrations > RL, are applicable duplicate injection RSD values < 20%? (Level IV only)			✓	
Were analytical spike recoveries within the 85-115% QC limits?			✓	

LDC #: 14702C4
SDG #: BMI06U11852

VALIDATION FINDINGS CHECKLIST

Reviewer: MG
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
VII. ICP Serial Dilution				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the IDL?	✓			
Were all percent differences (%Ds) < 10%?	✓			
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.		✓		
VIII. Internal Standards (EPA SW-846 Method 6020)				
Were all the percent recoveries (%R) within the 30-120% of the intensity of the internal standard in the associated initial calibration?	✓			
If the %Rs were outside the criteria, was a reanalysis performed?			✓	
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XII. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target analytes were detected in the field duplicates.	✓			
XIII. Field blanks				
Field blanks were identified in this SDG.		✓		
Target analytes were detected in the field blanks.			✓	

LDC #: 14702C4
SDG #: BMI060 11852

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer: MY

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-7 ~~0~~7	W	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
QC 8, 9	↓	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
ICP Trace		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
ICP-MS	W	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___

Comments: Mercury by CVAA if performed

LDC #: 14702CU
SDG #: 3MI06011852

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: MG
2nd Reviewer: [illegible]

METHOD: Trace metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y N N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤35% for soil samples?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
1	8/9	water	Mn	(recalculated	RPD > 10%	D)	all	None / P
				reported	RPD :	166.0 (≤10)		
				recalculated	RPD :	8.7 (≤10)		

Comments:

MSD.4S2

LDC #: 14702C4
SDG #: BMI06011852

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: MG
2nd reviewer: HM

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

(Y) N N/A Were field duplicate pairs identified in this SDG?
(Y) N N/A Were target analytes detected in the field duplicate pairs?

Analyte	Concentration (mg/L) 2	3	RPD (Limits)	Difference (Limits)	Qualifications
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Cadmium					
Calcium					
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Magnesium					
Manganese	0.42	0.45	7		
Mercury					
Nickel					
Potassium					
Selenium					
Silver					
Sodium					
Thallium					
Vanadium					
Zinc					
Cyanide					
Boron					
Molybdenum					
Strontium					
Silicon					

Notes:

LDC #: 14702C4
SDG #: BMI06011852

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Reviewer: MG
2nd Reviewer: MM

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

An initial and continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

$\%R = \frac{Found}{True} \times 100$

Where, Found = concentration (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution
True = concentration (in ug/L) of each analyte in the ICV or CCV source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated %R	Reported %R	Acceptable (Y/N)
	ICP (Initial calibration)						
	GFAA (Initial calibration)						
	CVAA (Initial calibration)						
	ICP (Continuing calibration)						
	GFAA (Continuing calibration)						
	CVAA (Continuing calibration)						
1355 ICV	ICP/MS (Initial calibration)	Pb	47.97	50.00	96	not reported	Y
0635 CCV	ICP/MS (Continuing calibation)	Mn	81.04	80.00	101	101	↓

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

CALCLC.4SW

LDC #: 14702C4
SDG #: BMI05011852

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: MG
2nd Reviewer: [illegible]

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Percent recoveries (%R) for an ICP interference check sample, a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$\%R = \frac{Found}{True} \times 100$

Where, Found = Concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) – SR (sample result).
True = Concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

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

Where, S = Original sample concentration
D = Duplicate sample concentration

An ICP serial dilution percent difference (%D) was recalculated using the following formula:

$\%D = \frac{|I-SDR|}{I} \times 100$

Where, I = Initial Sample Result (mg/L)
SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

Sample ID	Type of Analysis	Element	Found / S / I (units)	True / D / SDR (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
0136 ICSA3	ICP interference check	Mn	221.50 (µg/L)	200.00 (µg/L)	111	not reported	Y
1431 LCS	Laboratory control sample	Pb	0.2807 (mg/L)	0.25 (mg/L)	112	112	↓
0659 8	Matrix spike	Mn	(SSR-SR) 0.0572 (mg/L)	0.05 (mg/L)	114	114	↓
1445 / 1450 8/9	Duplicate	Pb	0.27665 (mg/L)	0.27255 (mg/L)	1.5	1.5	↓
0910 / 1459 1	ICP serial dilution	Pb	0.005U (mg/L)	ND (mg/L)	0.0	0.0	↓

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

TOTCLC.4SW

LDC #: 14702C4
SDG #: BMI06011852

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: MG
2nd reviewer: MG

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Have results been reported and calculated correctly?
(Y) N N/A Are results within the calibrated range of the instruments and within the linear range of the ICP?
(Y) N N/A Are all detection limits below the CRDL?

Detected analyte results for #2 were recalculated and verified using the following equation:

Concentration = (RD)(FV)(Dil) / (In. Vol.)(%S)

Recalculation:
(software has already applied a 5x dil. factor)

RD = Raw data concentration
FV = Final volume (ml)
In. Vol. = Initial volume (ml) or weight (G)
Dil = Dilution factor
%S = Decimal percent solids

from raw: (418.850 µg/L)(1 mg/1000 µg) = 0.418850 mg/L

Sample ID	Analyte	Reported Concentration (mg/L)	Calculated Concentration (mg/L)	Acceptable (Y/N)
2	Mn	0.42	0.42	Y

RECALC.1S2

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Camp Pendleton, CTO 102

Collection Date: January 17, 2006

LDC Report Date: March 7, 2006

Matrix: Water

Parameters: Methane

Validation Level: EPA Level III & IV

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): BMI06011905

Sample Identification

1413-MW04
1413-MW05**
1413-MW05Dup
1413-MW06
1413-MW07
1413-MW08
1413-MW09
1413-MW09MS
1413-MW09MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per Method RSK-175 for Methane.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified a P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent a EPA Level IV review. A EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 30.0% .

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 30.0% QC limits.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No methane contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were not required by the method.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

All target compound identifications were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VI. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VII. System Performance

The system performance was within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

IX. Field Duplicates

Samples 1413-MW05** and 1413-MW05Dup were identified as field duplicates. No methane was detected in any of the samples with the following exceptions:

Compound	Concentration (mg/L)		RPD
	1413-MW05**	1413-MW05Dup	
Methane	0.48	0.39	9

X. Field Blanks

No field blanks were identified in this SDG.

Camp Pendleton, CTO 102
Methane - Data Qualification Summary - SDG BMI06011905

No Sample Data Qualified in this SDG

Camp Pendleton, CTO 102
Methane - Laboratory Blank Data Qualification Summary - SDG BMI06011905

No Sample Data Qualified in this SDG

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 01/19/06

Job#: TO102-1413

Dissolved Gases
Modified Method RSK-175 GC/FID

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1413-MW04					
Lab ID :	BMI06011905-04A	Methane	0.079	0.010 mg/L	01/17/06	01/25/06
Client ID :	1413-MW05					
Lab ID :	BMI06011905-05A	Methane	0.48	0.010 mg/L	01/17/06	01/25/06
Client ID :	1413-MW05DUP					
Lab ID :	BMI06011905-06A	Methane	0.39	0.010 mg/L	01/17/06	01/25/06
Client ID :	1413-MW06					
Lab ID :	BMI06011905-07A	Methane	ND	0.010 mg/L	01/17/06	01/25/06
Client ID :	1413-MW07					
Lab ID :	BMI06011905-08A	Methane	ND	0.010 mg/L	01/17/06	01/25/06
Client ID :	1413-MW08					
Lab ID :	BMI06011905-09A	Methane	ND	0.010 mg/L	01/17/06	01/25/06
Client ID :	1413-MW09					
Lab ID :	BMI06011905-10A	Methane	0.57	0.010 mg/L	01/17/06	01/25/06

ND = Not Detected

Roger Scholl Randy Gardner Walter Hutchman

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hutchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas NV • (702) 381-4848 / info@alpha-analytical.com

2/1/06
Report Date

3/10/06

LDC #: 14702D51

SDG #: BMI06011905

Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 3/7/06

Page: 1 of 1

Reviewer: EZ

2nd Reviewer: [illegible]

METHOD: GC Methane (Method RSK-175)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/17/06
IIa.	Initial calibration	A	% RSD ≤ 30
IIb.	Calibration verification	A	% D ≤ 30
III.	Blanks	A	
IVa.	Surrogate recovery	N	not required
IVb.	Matrix spike/Matrix spike duplicates	A	
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	A	Not reviewed for Level III validation.
VI.	Compound Quantitation and CRQLs	A	Not reviewed for Level III validation.
VII.	System Performance	A	Not reviewed for Level III validation.
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	D = 2 & 3
X.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation

Water

1	1413-MW04	11	MBLK-13962	21		31	
2	1413-MW05**	12		22		32	
3	1413-MW05Dup	13		23		33	
4	1413-MW06	14		24		34	
5	1413-MW07	15		25		35	
6	1413-MW08	16		26		36	
7	1413-MW09	17		27		37	
8	1413-MW09MS	18		28		38	
9	1413-MW09MSD	19		29		39	
10		20		30		40	

Notes:

LDC #: 14702D51
SDG #: BM10601190S

VALIDATION FINDINGS CHECKLIST

Reviewer: [illegible]
2nd Reviewer: [illegible]

Method: ✓ GC ____ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Was a linear fit used for evaluation? If yes, were all percent relative standard deviations (%RSD) < 20%?	✓		NA	
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?	NA	✓		
Did the initial calibration meet the curve fit acceptance criteria?			✓	
Were the RT windows properly established?	✓			
III. Continuing calibration				
What type of continuing calibration calculation was performed? ____%D or ____%R	✓			
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 15%.0 or percent recoveries 85-115%?	✓			
Were all the retention times within the acceptance windows?	✓			
IV. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
V. Surrogate spikes				
Were all surrogate %R within the QC limits?			✓	
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VI. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
VII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			

LDC #: 14702D5 |
SDG #: BM|06011905

VALIDATION FINDINGS CHECKLIST

Reviewer: B
2nd Reviewer: Q

Validation Area	Yes	No	NA	Findings/Comments
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XI. Compound quantitation/CRQLs				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XII. System performance				
System performance was found to be acceptable.	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XIV. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?	✓			
XV. Field blanks				
Were field blanks identified in this SDG?		✓		
Were target compounds detected in the field blanks?			✓	

LDC #: 14702P51
SDG #: BM106011905

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: [illegible]
2nd reviewer: [illegible]

METHOD: ___ GC ___ HPLC
Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (mg/L)		%RPD Limit_____	Qualification Parent only / All Samples
	2	3		
Methane	0.48	0.39	9	

Compound	Concentration ( )		%RPD Limit _____	Qualification Parent only / All Samples

LDC #: 14702D51
SDG #: BM106011905

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC _____ HPLC _____

The calibration Factor (CF), average CF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

A = Area of compound,
C = Concentration of compound,
S = Standard deviation of the CF
X = Mean of the CFs

#	Standard ID	Calibration Date	Compound	Reported CF w/in 0.5%(std)	Recalculated CF (0.5%(std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	CAL-GC6	7/20/05	Methane	3.7182×10^6	3.7182×10^6	3.2910×10^6	3.2910×10^6	12.27	12.27
2									
3									
4									

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14702DS1
SDG #: BM1060119 05

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC ✓ HPLC ____

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF - CF)/ave. CF
CF = A/C

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %R	Recalculated %R
1	GA0124066	1/25/06	methane	2.66	2.83	2.83	106.32	106.32
2								
3								
4								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14702D51
SDG #: BM1060119D5

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: 5
2nd Reviewer: 4

METHOD: GC HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the matrix spike and matrix spike cuplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA Where SSC = Spiked concentration SC = Sample concentration
SA = Spike added
RPD =(((SSCMS - SSCMSD) * 2) / (SSCMS + SSCMSD))*100 MS = Matrix spike percent recovery MSD = Matrix spike duplicate percent recovery

MS/MSD samples: 8 + 9

Compound	Spike Added (mg/L)		Sample Conc. (mg/L)	Spike Sample Concentration (mg/L)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	—	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)	1.06	1.06	0.567	1.56	1.52	94	94	90	90	2.8	2.6
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

MSDCLCNew.wpd

LDC #: 14702D51
SDG #: BM106011905

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Page: 1 of 1
Reviewer: 5
2nd Reviewer: 4

____METHOD: ✓GC __HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA Where SSC = Spiked concentration, SA = Spike added SC = Sample concentration

RPD =(((SSCLCS - SSCLCSD) * 2) / (SSCLCS + SSCLCSD))*100 LCS = Laboratory Control Sample percent recovery LCSD = Laboratory Control Sample duplicate percent recovery

LCS/LCSD samples: LCS-13962

Compound	Spike Added (mg/L)		Sample Conc. (mg/L)	Spike Sample Concentration (mg/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	—	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)	0.532	NA	0	0.442	NA	83	83	NA			
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 14702D51
SDG #: BMI06011905

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ✓ GC __ HPLC

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds within 10% of the reported results?

Concentration= (A)(Fv)(Df) / (RF)(Vs or Ws)(%S/100)

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound in the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. # 2 Compound Name Methane

Concentration = 1586805 / 3.291×10^6

0.48 mg/L

#	Sample ID	Compound	Reported Concentrations ( )	Recalculated Results Concentrations ( )	Qualifications

Comments:

SAMPCALev.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	Camp Pendleton, CTO 102
Collection Date:	January 17, 2006
LDC Report Date:	March 7, 2006
Matrix:	Water
Parameters:	Wet Chemistry
Validation Level:	EPA Level III & IV
Laboratory:	Alpha Analytical, Inc.
Sample Delivery Group (SDG):	BMI06011852

Sample Identification

1413-MW04
1413-MW05**
1413-MW05Dup
1413-MW06
1413-MW07
1413-MW08
1413-MW09
1413-MW04MS
1413-MW04MSD
1413-MW04DUP
1413-MW05MS
1413-MW05MSD
1413-MW06MS
1413-MW06MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 12 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.1 for Total Dissolved Solids, EPA Method 300.0 for Nitrate as Nitrogen, Nitrite as Nitrogen, and Sulfate, EPA Method 310.1 for Alkalinity, and Standard Method 3500FE for Ferrous Iron.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified a P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent a EPA Level IV review. A EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

All criteria for the initial calibration of each method were met.

b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the method blanks.

IV. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
1413-MW05MS/MSD (All samples in SDG BMI06011852)	Nitrite as N	-	-	2.6 (≤2)	J (all detects) UJ (all non-detects)	A
	Nitrate as N	-	-	2.3 (≤2)	J (all detects) UJ (all non-detects)	
1413-MW06MS/MSD (All samples in SDG BMI06011852)	Sulfate	-	-	5.1 (≤2)	J (all detects) UJ (all non-detects)	A

V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VI. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable with the following exceptions:

Sample	Analyte	Finding	Criteria	Flag	A or P
All samples in SDG BMI06011852	Alkalinity	No LCS analysis associated with these samples.	LCS analysis required.	None	P

Percent recoveries (%R) were within QC limits.

VII. Sample Result Verification

All sample result verifications were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

IX. Field Duplicates

Samples 1413-MW05** and 1413-MW05Dup were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/L)		RPD
	1413-MW05**	1413-MW05Dup	
Alkalinity	310	310	0
Ferrous Iron	0.11	0.073	40
Total dissolved solids	7500	7000	7
Sulfate	740	700	6

X. Field Blanks

No field blanks were identified in this SDG.

Camp Pendleton, CTO 102
Wet Chemistry - Data Qualification Summary - SDG BMI06011852

SDG	Sample	Analyte	Flag	A or P	Reason
BMI06011852	1413-MW04 1413-MW05** 1413-MW05Dup 1413-MW06 1413-MW07 1413-MW08 1413-MW09	Nitrite as N Nitrate as N Sulfate	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (RPD)
BMI06011852	1413-MW04 1413-MW05** 1413-MW05Dup 1413-MW06 1413-MW07 1413-MW08 1413-MW09	Alkalinity	None	P	Laboratory control samples

Camp Pendleton, CTO 102
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG BMI06011852

No Sample Data Qualified in this SDG

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 01/18/06

Job#: TO102: 1413

Alkalinity
EPA Method 310.1

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1413-MW04**					
Lab ID :	BMI06011852-01A	Alkalinity, Total (As CaCO3 at pH 4.5)	270	1.0 mg/L	01/17/06	01/23/06
Client ID :	**1413-MW05**					
Lab ID :	BMI06011852-02A	Alkalinity, Total (As CaCO3 at pH 4.5)	310	1.0 mg/L	01/17/06	01/23/06
Client ID :	**1413-MW05DUP**					
Lab ID :	BMI06011852-03A	Alkalinity, Total (As CaCO3 at pH 4.5)	310	1.0 mg/L	01/17/06	01/23/06
Client ID :	**1413-MW06**					
Lab ID :	BMI06011852-04A	Alkalinity, Total (As CaCO3 at pH 4.5)	400	1.0 mg/L	01/17/06	01/23/06
Client ID :	**1413-MW07**					
Lab ID :	BMI06011852-05A	Alkalinity, Total (As CaCO3 at pH 4.5)	280	1.0 mg/L	01/17/06	01/23/06
Client ID :	**1413-MW08**					
Lab ID :	BMI06011852-06A	Alkalinity, Total (As CaCO3 at pH 4.5)	310	1.0 mg/L	01/17/06	01/23/06
Client ID :	**1413-MW09**					
Lab ID :	BMI06011852-07A	Alkalinity, Total (As CaCO3 at pH 4.5)	280	1.0 mg/L	01/17/06	01/23/06

Roger Scholl Randy Gardner Walter Hinchman

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1/31/06
Report Date

3/10/06

6

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102: 1413

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667

Anions by Ion Chromatography (IC) EPA Method 300.0 / SW9056

		Parameter	Concentration		Reporting Limit	Date Sampled	Date Analyzed
Client ID:	1413-MW04						
Lab ID:	BMI06011852-01A	Nitrite (NO2) - N	ND	UJ	0.25 mg/L	01/17/06	01/18/06
		Nitrate (NO3) - N	1.1	J	0.25 mg/L	01/17/06	01/18/06
		Sulfate (SO4)	250	J	2.5 mg/L	01/17/06	01/20/06
Client ID:	1413-MW05						
Lab ID:	BMI06011852-02A	Nitrite (NO2) - N	ND	UJ	0.25 mg/L	01/17/06	01/18/06
		Nitrate (NO3) - N	ND	UJ	0.25 mg/L	01/17/06	01/18/06
		Sulfate (SO4)	740	J	13 mg/L	01/17/06	01/20/06
Client ID:	1413-MW05DUP						
Lab ID:	BMI06011852-03A	Nitrite (NO2) - N	ND	UJ	0.25 mg/L	01/17/06	01/18/06
		Nitrate (NO3) - N	ND	UJ	0.25 mg/L	01/17/06	01/18/06
		Sulfate (SO4)	700	J	13 mg/L	01/17/06	01/20/06
Client ID:	1413-MW06						
Lab ID:	BMI06011852-04A	Nitrite (NO2) - N	ND	UJ	0.25 mg/L	01/17/06	01/18/06
		Nitrate (NO3) - N	1.5	J	0.25 mg/L	01/17/06	01/18/06
		Sulfate (SO4)	330	J	13 mg/L	01/17/06	01/20/06
Client ID:	1413-MW07						
Lab ID:	BMI06011852-05A	Nitrite (NO2) - N	ND	UJ	0.25 mg/L	01/17/06	01/18/06
		Nitrate (NO3) - N	4.5	J	0.25 mg/L	01/17/06	01/18/06
		Sulfate (SO4)	490	J	13 mg/L	01/17/06	01/21/06
Client ID:	1413-MW08						
Lab ID:	BMI06011852-06A	Nitrite (NO2) - N	ND	UJ	0.25 mg/L	01/17/06	01/18/06
		Nitrate (NO3) - N	1.5	J	0.25 mg/L	01/17/06	01/18/06
		Sulfate (SO4)	850	J	13 mg/L	01/17/06	01/21/06
Client ID:	1413-MW09						
Lab ID:	BMI06011852-07A	Nitrite (NO2) - N	ND	UJ	0.25 mg/L	01/17/06	01/18/06
		Nitrate (NO3) - N	ND	UJ	0.25 mg/L	01/17/06	01/18/06
		Sulfate (SO4)	100	J	2.5 mg/L	01/17/06	01/21/06

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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1/31/06
Report Date

2/10/06

Alpha Analytical, Inc.
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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 01/18/06

Job#: TO102-1413

Total Dissolved Solids (TDS)
EPA Method 160.1 / SM 2540 C

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1413-MW04					
Lab ID :	BMI0601 1852-01A	Solids, Total Dissolved (TDS)	2,900	10 mg/L	01/17/06	01/26/06
Client ID :	1413-MW05					
Lab ID :	BMI0601 1852-02A	Solids, Total Dissolved (TDS)	7,500	50 mg/L	01/17/06	01/26/06
Client ID :	1413-MW05DUP					
Lab ID :	BMI0601 1852-03A	Solids, Total Dissolved (TDS)	7,000	25 mg/L	01/17/06	01/26/06
Client ID :	1413-MW06					
Lab ID :	BMI0601 1852-04A	Solids, Total Dissolved (TDS)	3,600	25 mg/L	01/17/06	01/26/06
Client ID :	1413-MW07					
Lab ID :	BMI0601 1852-05A	Solids, Total Dissolved (TDS)	5,700	25 mg/L	01/17/06	01/26/06
Client ID :	1413-MW08					
Lab ID :	BMI0601 1852-06A	Solids, Total Dissolved (TDS)	9,600	50 mg/L	01/17/06	01/26/06
Client ID :	1413-MW09					
Lab ID :	BMI0601 1852-07A	Solids, Total Dissolved (TDS)	740	10 mg/L	01/17/06	01/26/06

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1/31/06
Report Date

2/10/06

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 01/18/06

Job#: TO102: 1413

Iron by Spectrophotometer
SM3500-Fe D

		Parameter	Concentration		Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1413-MW04						
Lab ID :	BMI06011852-01A	Iron, Ferrous (+2)	ND	U	0.050 mg/L	01/17/06	01/18/06
Client ID :	1413-MW05						
Lab ID :	BMI06011852-02A	Iron, Ferrous (+2)	0.11		0.050 mg/L	01/17/06	01/18/06
Client ID :	1413-MW05DUP						
Lab ID :	BMI06011852-03A	Iron, Ferrous (+2)	0.073		0.050 mg/L	01/17/06	01/18/06
Client ID :	1413-MW06						
Lab ID :	BMI06011852-04A	Iron, Ferrous (+2)	ND	U	0.050 mg/L	01/17/06	01/18/06
Client ID :	1413-MW07						
Lab ID :	BMI06011852-05A	Iron, Ferrous (+2)	0.061		0.050 mg/L	01/17/06	01/18/06
Client ID :	1413-MW08						
Lab ID :	BMI06011852-06A	Iron, Ferrous (+2)	ND	U	0.050 mg/L	01/17/06	01/18/06
Client ID :	1413-MW09						
Lab ID :	BMI06011852-07A	Iron, Ferrous (+2)	0.22		0.050 mg/L	01/17/06	01/18/06

ND = Not Detected

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1/31/06
Report Date

3/10/06

LDC #: 14702C6

SDG #: BMI06011852

Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 3-7-06

Page: 1 of 1

Reviewer: MG

2nd Reviewer: [illegible]

METHOD: (Analyte) Alkalinity (EPA Method 310.1), Nitrate-N, Nitrite-N, Sulfate (EPA Method 300.0), TDS (EPA Method 160.1), Ferrous Iron (SM3500FE)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1-17-06
IIa.	Initial calibration	A	
IIb.	Calibration verification	~~SW~~ A	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	SW	MS/MSD
V	Duplicates	~~SW~~ A	DUP
VI.	Laboratory control samples	SW	LCS
VII.	Sample result verification	A	Not reviewed for Level III validation.
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	D= 2+3
X.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation

all water

1	1413-MW04	11	1413-MW05MS	21		31	
2	1413-MW05**	12	1413-MW05MSD	22		32	
3	1413-MW05Dup	13	1413-MW06MS	23		33	
4	1413-MW06	14	1413-MW06MSD	24		34	
5	1413-MW07	15	TBW	25		35	
6	1413-MW08	16		26		36	
7	1413-MW09	17		27		37	
8	1413-MW04MS	18		28		38	
9	1413-MW04MSD	19		29		39	
10	1413-MW04DUP	20		30		40	

Notes:

LDC #: 14702C6
SDG #: BMI06011852

VALIDATION FINDINGS CHECKLIST

Reviewer: MG
2nd Reviewer: MM

Method: Inorganics (EPA Method see cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial calibration correlation coefficients ≥ 0.995?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?	✓			
Were titrant checks performed as required? (Level IV only)	✓			
Were balance checks performed as required? (Level IV only)	✓			
III. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix Spike/Matrix Spike Duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of ≤ CRDL(≤ 2X CRDL for soil) was used for samples that were ≤ 5X the CRDL, including when only one of the duplicate sample values were ≤ 5X the CRDL.		✓		
V. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?		✓		
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	✓			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	

LDC #: 14702C6
SDG #: BMI06011852

VALIDATION FINDINGS CHECKLIST

Reviewer: MG
2nd Reviewer: MM

Validation Area	Yes	No	NA	Findings/Comments
VII. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were detection limits < RL?	✓			
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target analytes were detected in the field duplicates.	✓			
X. Field blanks				
Field blanks were identified in this SDG.		✓		
Target analytes were detected in the field blanks.			✓	

LDC #: 14702C6
SDG #: BMI06011852

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: MG
2nd reviewer: MM

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1→7	W	pH (TDS) Cl F (NO3) (NO2) (SO4) PO4 (ALK) CN- NH3 TKN TOC CR6+ ClO4 Br (Ferrous Iron)
QC 8,9	↓	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br (Ferrous Iron)
10	↓	pH (TDS) Cl F NO3 NO2 SO4 PO4 (ALK) CN- NH3 TKN TOC CR6+ ClO4 Br
11,12	↓	pH TDS Cl F (NO3) (NO2) SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
13,14	↓	pH TDS Cl F NO3 NO2 (SO4) PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 Br

Comments:

LDC #: 470206
SDG #: BMI06011852

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: MG
2nd Reviewer: MY

METHOD: Inorganics, EPA Method see cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

(Y) N N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y (N) N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤35% for soil samples?

LEVEL IV ONLY:

(Y) N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
1	11/12	water	NO_2-N			2.6 (≤2)	all	J/UJ/A
	↓	↓	NO_3-N			2.3 (↓)	↓	↓
2	13/14	water	SO_4			5.1 (≤2)	all	J/UJ/A

Comments:

MSD.8

LDC #: 1470206
SDG #: BMI06011852

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: MG
2nd Reviewer: MM

METHOD: Inorganics, Method See cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Was a laboratory control sample (LCS) analyzed for each matrix in this SDG?

(Y) N N/A Were all LCS percent recoveries (%R) within the control limits of 80-120% (85-115% for Method 300.0)?

LEVEL IV ONLY:

(Y) N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	LCS ID	Matrix	Analyte	%R (limits)	Associated Samples	Qualifications
1	No LCS	water	Alk		all	None / P

Comments: a pH buffer was used in place of a true LCS

LCS.9

LDC #: 14702C6
SDG #: BMI06011852

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: MG
2nd reviewer: [illegible]

METHOD: Inorganics, Method see cover

(Y) N N/A Were field duplicate pairs identified in this SDG?
(Y) N N/A Were target analytes detected in the field duplicate pairs?

Analyte	Concentration (mg/L)		RPD (Limit)	Difference (Limit)	Qualifier
	2	3			
Alk	310	310	0		
Ferrous Fe	0.11	0.073	40		
TDS	7500.	7000.	7		
SO_4	740.	700.	6		

Analyte	Concentration ( )		RPD (Limit)	Difference (Limit)	Qualifier

Analyte	Concentration ( )		RPD (Limit)	Difference (Limit)	Qualifier

Analyte	Concentration ( )		RPD (Limit)	Difference (Limit)	Qualifier

LDC #: 14702C6
SDG #: BMI06011852

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: MG
2nd Reviewer: [illegible]

METHOD: Inorganics, Method See cover

The correlation coefficient (r) for the calibration of NO_2 - N was recalculated. Calibration date: 12-27-05

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = Found / True x 100 Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
True = concentration of each analyte in the ICV or CCV source

Type of Analysis	Analyte		Conc (units)	Area (units)	Recalculated r or %R	Reported r or %R	Acceptable (Y/N)
Initial calibration		Blank					
Calibration verification		Standard 1	0.0125 (mg/L)	0.016			
		Standard 2	0.025 ( )	0.028			
		Standard 3	0.050 ( )	0.056			
	NO_2-N	Standard 4	0.100 ( )	0.112	r=0.999798	r=0.999789	Y
		Standard 5	0.250 ( )	0.284			
		Standard 6	0.500 ( )	0.590			
		Standard 7					
Calibration verification	ICV ↔	Ferrous Fe	1.45519 (mg/L)	1.5 (mg/L)	97	not reported	
Calibration verification	NO_3-N	1709 CCV	0.1284 (mg/L)	0.125 (mg/L)	103	103	
Calibration verification	SO_4	2241 CCV	0.9446 (mg/L)	1.000 (mg/L)	94	mg 9594	↓

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

CALCLC.6

LDC #: 14702C6
SDG #: BMI06011852

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: MG
2nd Reviewer: MY

METHOD: Inorganics, Method See cover

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$\%R = \frac{Found}{True} \times 100$ Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$ Where, S = Original sample concentration
D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS	Laboratory control sample	Ferrous Iron	1.52395 (mg/L)	1.5 (mg/L)	102	102	Y
11	Matrix spike sample	NO_3-N	(SSR-SR) 10.8354 (mg/L)	10. (mg/L)	108	108	↓
10	Duplicate sample	TDS	2863.0 (mg/L)	2860.0 (mg/L)	0	not reported	↓

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

TOTCLC.6

LDC #: 14702C6
SDG #: BMI06011852

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: MG
2nd reviewer: MM

METHOD: Inorganics, Method See cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Have results been reported and calculated correctly?
Y N N/A Are results within the calibrated range of the instruments?
Y N N/A Are all detection limits below the CRQL?

Compound (analyte) results for #2, Ferrous Fe reported with a positive detect were recalculated and verified using the following equation:

Concentration = $y = mx + b$
where $m = 0.4479151$
$b = 0$
$dil = 1x$

Recalculation:
$0.050 = 0.4479151(x) + 0$
0.11163 mg/L $= X$

#	Sample ID	Analyte	Reported Concentration (mg/L)	Calculated Concentration (mg/L)	Acceptable (Y/N)
1	2	Alk	310	310	Y
		Ferrous Fe	0.11	0.11	
		TDS	7500.	7500.	
		SO_4	740.	740.	

Note:

RECALC.6

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Camp Pendleton, CTO 102

Collection Date: January 17, 2006

LDC Report Date: March 7, 2006

Matrix: Water

Parameters: Total Organic Carbon

Validation Level: EPA Level III & IV

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): BMI06011905

Sample Identification

1413-MW04
1413-MW05**
1413-MW05Dup
1413-MW06
1413-MW07
1413-MW08
1413-MW09
1413-MW06MS
1413-MW06MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 415.1 for Total Organic Carbon.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 1905) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified a P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent a EPA Level IV review. A EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

All criteria for the initial calibration of each method were met.

b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the method blanks.

IV. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VI. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VII. Sample Result Verification

All sample result verifications were within validation criteria for samples on which a EPA Level IV review was performed with the following exceptions:

Sample	Analyte	Finding	Criteria	Flag	A or P
All samples in SDG BMI06011905	Total organic carbon	The sample concentrations were calculated without using the y-intercept while the CCV standards were calculated with the y-intercept.	Samples and standards should be calculated with the same calibration curve.	None	P

Raw data were not evaluated for the samples reviewed by Level III criteria.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

IX. Field Duplicates

Samples 1413-MW05** and 1413-MW05Dup were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/L)		RPD
	1413-MW05**	1413-MW05Dup	
Total organic carbon	10	9.9	1

X. Field Blanks

No field blanks were identified in this SDG.

Camp Pendleton, CTO 102
Total Organic Carbon - Data Qualification Summary - SDG BMI06011905

SDG	Sample	Analyte	Flag	A or P	Reason
BMI06011905	1413-MW04 1413-MW05** 1413-MW05Dup 1413-MW06 1413-MW07 1413-MW08 1413-MW09	Total organic carbon	None	P	Sample result verification

Camp Pendleton, CTO 102
Total Organic Carbon - Laboratory Blank Data Qualification Summary - SDG BMI06011905

No Sample Data Qualified in this SDG

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 01/19/06

Job#: TO102: 1413

Total Organic Carbon as NonPurgeable Organic Carbon
EPA Method SW9060/415.1/SM-5310C

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1413-MW04					
Lab ID :	BMI06011905-04A	Total Organic Carbon	8.1	1.0 mg/L	01/17/06	01/23/06
Client ID :	1413-MW05					
Lab ID :	BMI06011905-05A	Total Organic Carbon	10	1.0 mg/L	01/17/06	01/23/06
Client ID :	1413-MW05DUP					
Lab ID :	BMI06011905-06A	Total Organic Carbon	9.9	1.0 mg/L	01/17/06	01/23/06
Client ID :	1413-MW06					
Lab ID :	BMI06011905-07A	Total Organic Carbon	5.7	1.0 mg/L	01/17/06	01/23/06
Client ID :	1413-MW07					
Lab ID :	BMI06011905-08A	Total Organic Carbon	12	1.0 mg/L	01/17/06	01/23/06
Client ID :	1413-MW08					
Lab ID :	BMI06011905-09A	Total Organic Carbon	9.5	1.0 mg/L	01/17/06	01/23/06
Client ID :	1413-MW09					
Lab ID :	BMI06011905-10A	Total Organic Carbon	15	1.0 mg/L	01/17/06	01/23/06

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

2/1/06
Report Date

2/10/06

LDC #: 14702D6

SDG #: BMI06011905

Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 3-7-06

Page: 1 of 1

Reviewer: MG

2nd Reviewer: MA

METHOD: (Analyte) TOC (EPA Method 415.1)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1-17-06
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	A	MS/MSD
V	Duplicates	N	
VI.	Laboratory control samples	A	LCS
VII.	Sample result verification	SW	Not reviewed for Level III validation.
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	D = 2 + 3
X.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation

all water

1	1413-MW04	11		21		31	
2	1413-MW05**	12		22		32	
3	1413-MW05Dup	13		23		33	
4	1413-MW06	14		24		34	
5	1413-MW07	15		25		35	
6	1413-MW08	16		26		36	
7	1413-MW09	17		27		37	
8	1413-MW06MS	18		28		38	
9	1413-MW06MSD	19		29		39	
10	FBW	20		30		40	

Notes:

LDC #: 14702DG
SDG #: BMI06011905

VALIDATION FINDINGS CHECKLIST

Reviewer: MG
2nd Reviewer: MM

Method: Inorganics (EPA Method 415.1)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial calibration correlation coefficients > 0.995?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?	✓			
Were titrant checks performed as required? (Level IV only)			✓	
Were balance checks performed as required? (Level IV only)			✓	
III. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix Spike/Matrix Spike Duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of ≤ CRDL(≤ 2X CRDL for soil) was used for samples that were ≤ 5X the CRDL, including when only one of the duplicate sample values were < 5X the CRDL.	✓			
V. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	✓			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	

LDC #: 14702D6
SDG #: BMI06011905

VALIDATION FINDINGS CHECKLIST

Reviewer: MG
2nd Reviewer: MM

Validation Area	Yes	No	NA	Findings/Comments
VII. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were detection limits < RL?	✓			
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target analytes were detected in the field duplicates.	✓			
X. Field blanks				
Field blanks were identified in this SDG.		✓		
Target analytes were detected in the field blanks.			✓	

LDC #: 14707D6
SDG #: BMI06011905

VALIDATION FINDINGS WORKSHEET
Sample Result Verification

Page: 1 of 1
Reviewer: MG
2nd Reviewer: MG

METHOD: Inorganics, Method ~~See cover~~ 415.1

#	Sample ID	Analyte	Lab Reporting Limit (units)	RDL (units)	Finding	Qualifications
1	all	TOC	Sample concentrations were based on a different calibration curve than the one used on CCV std's.			None / P
			Criteria: * The same calibration curve should be used for all samples, QC samples and standards in an analytical batch.			

Comments: * The y intercept was used to calculate the CCV std's. but the intercept was not used to calculate sample concentrations.

A8VCRDL6

LDC #: 14702D6
SDG #: BMI06011905

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: MG
2nd reviewer: My

METHOD: Inorganics, Method 415.1

(Y)N N/A Were field duplicate pairs identified in this SDG?
(Y)N N/A Were target analytes detected in the field duplicate pairs?

Analyte	Concentration (mg/L)		RPD (Limit)	Difference (Limit)	Qualifier
	2	3			
TOC	10.	9.9	1		

Analyte	Concentration ( )		RPD (Limit)	Difference (Limit)	Qualifier

Analyte	Concentration ( )		RPD (Limit)	Difference (Limit)	Qualifier

Analyte	Concentration ( )		RPD (Limit)	Difference (Limit)	Qualifier

LDC #: 14702D6
SDG #: BMI06011905

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: MG
2nd Reviewer: MY

METHOD: Inorganics, Method 415.1

The correlation coefficient (r) for the calibration of TOC was recalculated. Calibration date: 9-30-04

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

$\%R = \frac{Found}{True} \times 100$ Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
True = concentration of each analyte in the ICV or CCV source

Type of Analysis	Analyte		µg C (units)	Area (units)	Recalculated r or %R	Reported r or %R	Acceptable (Y/N)
Initial calibration	TOC	Blank	0. (µg C)	1290398	$r^2 = 0.99938$	$r^2 = 0.99938$	Y
Calibration verification		Standard 1	4. ( )	2347018			
		Standard 2	8. ( )	3329396			
		Standard 3	20. ( )	7521596			
		Standard 4	40. ( )	14662217			
		Standard 5	80. ( )	28524834			
		Standard 6	–	–			
		Standard 7	–	–			
Calibration verification	TOC	CCV1	9.574 (mg/L)	10. (mg/L)	95.7	95.7	
Calibration verification	TOC	CCV2	4.5995 (mg/L)	5. (mg/L)	92.0	92.0	
Calibration verification	–	–	–	–	–	–	–

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

CALCLC.6

LDC #: 14702D6
SDG #: BMI06011905

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: MG
2nd Reviewer: lum

METHOD: Inorganics, Method 415.1

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$\%R = \frac{Found}{True} \times 100$ Where Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$ Where, S = Original sample concentration
D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS	Laboratory control sample	TOC	5.1326 (mg/L)	5 (mg/L)	103	103	Y
8	Matrix spike sample	TOC	(SSR-SR) 5.2476 (mg/L)	5 (mg/L)	105	105	↓
8/9	Duplicate sample	TOC	10.9626 (mg/L)	10.6127 (mg/L)	3.2	3.2	↓

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

TOTCLC.6

LDC #: 14702D6
SDG #: BMI06011905

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: MG
2nd reviewer: MY

METHOD: Inorganics, Method 415.1

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Have results been reported and calculated correctly?
(Y) N N/A Are results within the calibrated range of the instruments?
(Y) N N/A Are all detection limits below the CRQL?

Compound (analyte) results for #2, TOC reported with a positive detect were recalculated and verified using the following equation:

Concentration = $y = mx + b$

where $m = 3.443e+05$
$b = 890640$
dil = 1x

Recalculation:

$13783803 = 3.443e+05(x) + 890640$

$37.447\ \mu g\ C = x$

then $\frac{37.447\ \mu g C}{4.0\ ml} = 9.36\ \mu g/ml$ or mg/L

#	Sample ID	Analyte	Reported Concentration (mg/L)	Calculated Concentration (mg/L)	Acceptable (Y/N)
1	2	TOC	10	9.4	Y

Note:

RECALC.6

APPENDIX F

CHAIN-OF-CUSTODY DOCUMENTATION

OCTOBER 2005

Billing Information:
Name: Gerald Tompkins
Address: 505 King Avenue
City, State, Zip: Columbus, OH 43201
Phone Number: 614-424-4849 Fax: 614-424-3667

LABORATORY
Name: ALPHA ANALYTICAL
Address: 255 GLENDALE AVE, ST. 21, SPARKS, NV 89431
Phone: 775-355-1044

Page # 1 of 1

Client Name: **Battelle Memorial Institute**
Address: **505 King Avenue**
City, State, Zip: **Columbus, OH 43201**
P.O. # 190907
D.O. 102
PWS #
DWR #
Phone # 6144028227
Fax # 6144243667
Sampled by: SCOTT LOWE
Report Attention: CHRIS ZIMMERMAN

DATA REPORT: ~~NEDTS FORMAT~~ ☐ NIRS X; EDF FORMAT X

Analyses Required

Time Sampled	Date Sampled	Matrix* See Key Below	Office Use Only / Lab ID Number	Sample Description	Total and type of containers **See below	TPH/E	~~DRO~~ PNAs	NO_2, NO_3, SO_4	Pb, Mn^{+2}, Fe^{+2}	TDS, AlK	TOC	VOC* see below	Other: METHANE	Other:	REMARKS
1040	10.27	AQ	BM105102803-01	1413-MW04	14	X	X	X	X	X	X	X	X		• TEMP BLANK
1140			02	1413-MW05* (Amber redd broken)	14	X	X	X	X	X	X	X	X		ENCLOSED
1140				1413-MW05 MS	1		X								•ALL SMPLS.
1140			–	1413-MW05 MSD	1		X								NOT FIELD FILTERED
910			03	1413-MW06	14	X	X	X	X	X	X	X	X	X	•REPORTS TO: BIS
1315			04	1413-MW07	14	X	X	X	X	X	X	X	X	X	SUBMITTED .PDF
1225			05	1413-MW08	14	X	X	X	X	X	X	X	X	X	FORMAT BY
945			06	1413-MW09	14	X	X	X	X	X	X	X	X	X	E-MAIL OR BY
945			07	1413-MW09 DUP	14	X	X	X	X	X	X	X	X	X	CD-ROM
1200			08	1413-QCFB	3V							X			
1205			09	1413-QCEB	6V	X						X			
—			10	1413-QCTB (rec'd w/ air bubble >6 mm)	1V							X			*EDF, NIRS NEEDED

ADDITIONAL INSTRUCTIONS: **Specific VOC Requirements (please specify):** STANDARD LIST OF 36 COMPOUNDS + MTBE + BTEX

ALL DATA TO BE FORWARDED TO LDC FOR DATA VALIDATION. *USE 1413-MW05 FOR LVL. IV DATA VALIDATION*

	Signature	Print Name	Company	Date	Time
Relinquished by	[signature]	SCOTT LOWE	BATTELLE	10.27.05	1500
Received by	[signature]	[illegible]	ALPHA	10-28-05	1:19
Relinquished by					
Received by					
Relinquished by					
Received by					

*Key: AQ - Aqueous SO - Soil WA - Waste OT - Other **: L- Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

CHAIN-OF-CUSTODY RECORD

CA

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : BMI05102803

Report Due By : 5:00 PM On : 11-Nov-05

Billing Information :
Battelle
505 King Avenue

Columbus, OH 43201

Client:
Battelle Memorial Institute
505 King Avenue

Columbus, OH 43201

Chris Zimmerman
TEL : (614) 424-3779
FAX : (614) 424-3667
EMail zimmerct@battelle.org

EDD Required : **Yes**

Sampled by : Scott Lowe

Report Attention : Chris Zimmerman
CC Report :

Job : TO102:14133
PO : 190907

Client's COC # : none

Cooler Temp : 4 °C

Date Printed: **28-Oct-05**

QC Level : DS3 = DOD QC Required : Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles ORG	SUB	TAT	PWS #	Requested Tests 3500FE_2OS_W	ALKALINITY	ANIONS(A)_W	ANIONS(B)_W	BNA_W	METALS_AQ	METALS_DS	METHANE_W	Sample Remarks
BMI05102803-01A	1413-MW04	AQ	10/27/05 10:40	14	0	10		FE+2	Alk	NO2,NO3,SO4	NO2,NO3,SO4	PNA/PAH	LEAD	Dissolved Mn	CH4	
BMI05102803-02A	1413-MW04	AQ	10/27/05 11:40	15	0	10		FE+2	Alk	NO2,NO3,SO4	NO2,NO3,SO4	PNA/PAH	LEAD	Dissolved Mn	CH4	
BMI05102803-03A	1413-MW06	AQ	10/27/05 09:10	14	0	10		FE+2	Alk	NO2,NO3,SO4	NO2,NO3,SO4	PNA/PAH	LEAD	Dissolved Mn	CH4	
BMI05102803-04A	1413-MW07	AQ	10/27/05 13:15	14	0	10		FE+2	Alk	NO2,NO3,SO4	NO2,NO3,SO4	PNA/PAH	LEAD	Dissolved Mn	CH4	
BMI05102803-05A	1413-MW08	AQ	10/27/05 12:25	14	0	10		FE+2	Alk	NO2,NO3,SO4	NO2,NO3,SO4	PNA/PAH	LEAD	Dissolved Mn	CH4	
BMI05102803-06A	1413-MW09	AQ	10/27/05 09:45	14	0	10		FE+2	Alk	NO2,NO3,SO4	NO2,NO3,SO4	PNA/PAH	LEAD	Dissolved Mn	CH4	
BMI05102803-07A	1413-MW09DUP	AQ	10/27/05 09:45	14	0	10		FE+2	Alk	NO2,NO3,SO4	NO2,NO3,SO4	PNA/PAH	LEAD	Dissolved Mn	CH4	
BMI05102803-08A	1413-QCFB	AQ	10/27/05 12:00	3	0	10										
BMI05102803-09A	1413-QCEB	AQ	10/27/05 12:05	6	0	10										
BMI05102803-10A	1413-QCTB	AQ	10/27/05 00:00	1	0	10										Reno Trip Blank 9/22/05

Comments: No security seals, frozen ice. 4-Temp Blanks received w/out serial numbers. Samples not field filtered. Samples should be used as the control spike sample if possible (I.E.: MS/MSD) pH=2 onTOC's. Level IV QC required on sample 02. : Report J-values forBenzene down to 0.25 ug/L. If Jet Fuel is seen, report as Diesel and Footnote report. 1amber received broken for sample 02 for PNA's analysis. Logged in as per w/o info for Voc's.

	Signature	Print Name	Company	Date/Time
Logged in by:	[illegible]	S. SIFUENTES	Alpha Analytical, Inc.	10/28/05 1:19

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.

Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

CHAIN-OF-CUSTODY RECORD

CA

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : BMI05102803

Report Due By : 5:00 PM On : 11-Nov-05

Billing Information :
Battelle
505 King Avenue

Columbus, OH 43201

Client:
Battelle Memorial Institute
505 King Avenue

Columbus, OH 43201

Chris Zimmerman
TEL : (614) 424-3779
FAX : (614) 424-3667
EMail zimmerct@battelle.org

EDD Required : **Yes**

Sampled by : Scott Lowe

Report Attention : Chris Zimmerman
CC Report :

Job : TO102:14133
PO : 190907

Client's COC # : none

Cooler Temp : **4 °C**

Date Printed: **28-Oct-05**

QC Level : DS3 = DOD QC Required : Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles ORG	SUB	TAT	PWS #	Requested Tests TDS	TOC_W	TPH/E_W	VOC_W					Sample Remarks
BMI05102803-01A	1413-MW04	AQ	10/27/05 10:40	14	0	10		TDS	TOC	TPH/E_C	8260/MTBE_C					
BMI05102803-02A	1413-MW04	AQ	10/27/05 11:40	15	0	10		TDS	TOC	TPH/E_C	8260/MTBE_C					
BMI05102803-03A	1413-MW06	AQ	10/27/05 09:10	14	0	10		TDS	TOC	TPH/E_C	8260/MTBE_C					
BMI05102803-04A	1413-MW07	AQ	10/27/05 13:15	14	0	10		TDS	TOC	TPH/E_C	8260/MTBE_C					
BMI05102803-05A	1413-MW08	AQ	10/27/05 12:25	14	0	10		TDS	TOC	TPH/E_C	8260/MTBE_C					
BMI05102803-06A	1413-MW09	AQ	10/27/05 09:45	14	0	10		TDS	TOC	TPH/E_C	8260/MTBE_C					
BMI05102803-07A	1413-MW09DUP	AQ	10/27/05 09:45	14	0	10		TDS	TOC	TPH/E_C	8260/MTBE_C					
BMI05102803-08A	1413-QCFB	AQ	10/27/05 12:00	3	0	10					8260/MTBE_C					
BMI05102803-09A	1413-QCEB	AQ	10/27/05 12:05	6	0	10				TPH/E_C	8260/MTBE_C					
BMI05102803-10A	1413-QCTB	AQ	10/27/05 00:00	1	0	10					8260/MTBE_C					Reno Trip Blank 9/22/05

Comments: No security seals, frozen ice. 4-Temp Blanks received w/out serial numbers. Samples not field filtered. Samples should be used as the control spike sample if possible (I.E.: MS/MSD) pH=2 onTOC's. Level IV QC required on sample 02. : Report J-values forBenzene down to 0.25 ug/L. If Jet Fuel is seen, report as Diesel and Footnote report. 1amber received broken for sample 02 for PNA's analysis. Logged in as per w/o info for Voc's.

	Signature	Print Name	Company	Date/Time
Logged in by:	[signature]	Y. SIFUENTES	Alpha Analytical, Inc.	10/28/05 1:19

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Billing Information :
Battelle
505 King Avenue

Columbus, OH 43201

Client:
Battelle Memorial Institute
505 King Avenue

Columbus, OH 43201

Report Attention : Chris Zimmerman
CC Report :

CHAIN-OF-CUSTODY RECORD

CA AMENDED

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL. (775) 355-1044 FAX: (775) 355-0406

Chris Zimmerman
TEL : (614) 424-3779 x
FAX : (614) 424-3667
EMail : zimmerct@battelle.org

Job TO102:14133
PO 190907

Client's COC # : none

WorkOrder : BMI05102803

Report Due By : 5:00 PM On : 11-Nov-05

EDD Required : **Yes**

Sampled by : Scott Lowe

Cooler Temp : 4 °C

Date Printed: **31-Oct-05**

QC Level DS3 = DOD QC Required Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles ORG	SUB	TAT	PWS #	Requested Tests 3500FE_2OS_W	ALKALINITY	ANIONS(A)_W	ANIONS(B)_W	BNA_W	METALS_AQ	METALS_DS	METHANE_W	Sample Remarks
BMI05102803-01A	1413-MW04	AQ	10/27/05 10:40	14	0	10		FE+2	Alk	NO2,NO3,SO4	NO2,NO3,SO4	PNA/PAH	LEAD	Dissolved Mn	CH4	
BMI05102803-02A	1413-MW05	AQ	10/27/05 11:40	15	0	10		FE+2	Alk	NO2,NO3,SO4	NO2,NO3,SO4	PNA/PAH	LEAD	Dissolved Mn	CH4	MS/MSD
BMI05102803-03A	1413-MW06	AQ	10/27/05 09:10	14	0	10		FE+2	Alk	NO2,NO3,SO4	NO2,NO3,SO4	PNA/PAH	LEAD	Dissolved Mn	CH4	
BMI05102803-04A	1413-MW07	AQ	10/27/05 13:15	14	0	10		FE+2	Alk	NO2,NO3,SO4	NO2,NO3,SO4	PNA/PAH	LEAD	Dissolved Mn	CH4	
BMI05102803-05A	1413-MW08	AQ	10/27/05 12:25	14	0	10		FE+2	Alk	NO2,NO3,SO4	NO2,NO3,SO4	PNA/PAH	LEAD	Dissolved Mn	CH4	
BMI05102803-06A	1413-MW09	AQ	10/27/05 09:45	14	0	10		FE+2	Alk	NO2,NO3,SO4	NO2,NO3,SO4	PNA/PAH	LEAD	Dissolved Mn	CH4	
BMI05102803-07A	1413-MW09DUP	AQ	10/27/05 09:45	14	0	10		FE+2	Alk	NO2,NO3,SO4	NO2,NO3,SO4	PNA/PAH	LEAD	Dissolved Mn	CH4	
BMI05102803-08A	1413-QCFB	AQ	10/27/05 12:00	3	0	10										
BMI05102803-09A	1413-QCEB	AQ	10/27/05 12:05	6	0	10										
BMI05102803-10A	1413-QCTB	AQ	10/27/05 00:00	1	0	10										Reno Trip Blank 9/22/05

Comments: No security seals, frozen ice. 4-Temp Blanks received w/out serial numbers. Samples not field filtered. Samples should be used as the control spike sample if possible (I.E.: MS/MSD) pH=2 onTOC's. Level IV QC required on sample 02. Report J-values for : Benzene down to 0.25 ug/L. If Jet Fuel is seen, report as Diesel and Footnote report. Amber received broken for sample 02 for PNA's analysis. Logged in as per w/o info for Voc's. Amended 10/31/05- see Work Order Info.

	Signature	Print Name	Company	Date/Time
Logged in by:	Patricia Edrosa	Patricia Edrosa	Alpha Analytical, Inc.	10/31/05 10:41

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Billing Information :
Battelle
505 King Avenue

Columbus, OH 43201

Client:
Battelle Memorial Institute
505 King Avenue

Columbus, OH 43201

Report Attention : Chris Zimmerman
CC Report :

CHAIN-OF-CUSTODY RECORD

AMENDED CA

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

Chris Zimmerman
TEL (614) 424-3779 x
FAX : (614) 424-3667
EMail : zimmerct@battelle.org

WorkOrder : BMI05102803

Report Due By : 5:00 PM On : 11-Nov-05

EDD Required : **Yes**

Sampled by : Scott Lowe

Job : TO102:14133
PO : 190907

Client's COC # : none

Cooler Temp : **4 °C**

Date Printed: **31-Oct-05**

QC Level : DS3 = DOD QC Required Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles ORG	SUB	TAT	PWS #	Requested Tests TDS	TOC_W	TPH/E_W	VOC_W					Sample Remarks
BMI05102803-01A	1413-MW04	AQ	10/27/05 10:40	14	0	10		TDS	TOC	TPH/E_C	8260/MTBE_C					
BMI05102803-02A	1413-MW05	AQ	10/27/05 11:40	15	0	10		TDS	TOC	TPH/E_C	8260/MTBE_C					MS/MSD
BMI05102803-03A	1413-MW06	AQ	10/27/05 09:10	14	0	10		TDS	TOC	TPH/E_C	8260/MTBE_C					
BMI05102803-04A	1413-MW07	AQ	10/27/05 13:15	14	0	10		TDS	TOC	TPH/E_C	8260/MTBE_C					
BMI05102803-05A	1413-MW08	AQ	10/27/05 12:25	14	0	10		TDS	TOC	TPH/E_C	8260/MTBE_C					
BMI05102803-06A	1413-MW09	AQ	10/27/05 09:45	14	0	10		TDS	TOC	TPH/E_C	8260/MTBE_C					
BMI05102803-07A	1413-MW09DUP	AQ	10/27/05 09:45	14	0	10		TDS	TOC	TPH/E_C	8260/MTBE_C					
BMI05102803-08A	1413-QCFB	AQ	10/27/05 12:00	3	0	10					8260/MTBE_C					
BMI05102803-09A	1413-QCEB	AQ	10/27/05 12:05	6	0	10				TPH/E_C	8260/MTBE_C					
BMI05102803-10A	1413-QCTB	AQ	10/27/05 00:00	1	0	10					8260/MTBE_C					Reno Trip Blank 9/22/05

Comments: No security seals, frozen ice. 4-Temp Blanks received w/out serial numbers. Samples not field filtered. Samples should be used as the control spike sample if possible (I.E.: MS/MSD) pH=2 onTOC's. Level IV QC required on sample 02. Report J-values for : Benzene down to 0.25 ug/L. If Jet Fuel is seen, report as Diesel and Footnote report. 1amber received broken for sample 02 for PNA's analysis. Logged in as per w/o info for Voc's. Amended 10/31/05- see Work Order Info.

	Signature	Print Name	Company	Date/Time
Logged in by:	Patricia Edrosa	Patricia Edrosa	Alpha Analytical, Inc.	10/31/05 10:4

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Work Order Information

BMI05102803

Monday, October 31, 2005 11:40 AM

AMENDED

* Amended 10/31/05: Corrected login error on -02 sample ID and added MS/MSD to -02 per Randy. LE

JANUARY 2006

Billing Information:
Name Gerald Tompkins
Address 505 King Avenue
City, State, Zip Columbus, OH 43201
Phone Number 614-424-4849 Fax 614-424-3667

LABORATORY
Name Alpha Analytical, Inc.
Address 255 Glendale Ave Ste. 21 Sparks, Nevada 89431
Phone 755-355-1044

Client Name **Battelle Memorial Institute**
Address **505 King Avenue**
City, State, Zip **Columbus, OH 43201**
P.O. # 190907 D.O. 70102
PWS # DWR #
Phone # 614 424 3779 Fax # 614 424 3667
Sampled by GH / SL
Report Attention Chris Zimmerman

Analyses Required

DATA REPORT
NEDTS FORMAT ☐
NIRIS ☒
EDF FORMAT ☒

Time Sampled	Date Sampled	Matrix* See Key Below	Office Use Only Lab ID Number	Field Point / Sample Description	Total and type of containers **See below	TPH/E	TPH/P	NO_2, NO_3, SO_4	Pb, Mn^{+2}, Fe^{+2}	TDS, AlK	TOC	VOC* see below	Other:	Other:	REMARKS
1310	1-17	AQ	BMI0601852-01	1413-MW04	5			X	X	X					
1344	1-17	AQ	-02	1413-MW05	5			X	X	X					
1344	1-17	AQ	-03	1413-MW05 DUP	5			X	X	X					
1218	1-17	AQ	-04	1413-MW06	5			X	X	X					
1425	1-17	AQ	-05	1413-MW07	5			X	X	X					
1522	1-17	AQ	-06	1413-MW08	5			X	X	X					
1135	1-17	AQ	-07	1413-MW09	5			X	X	X					

~~Alpha Analytical Sample Receipt~~

Security Seals? YES (NO)

Frozen Ice? (YES) NO

Temperature 4 °C temp Blank Recieved @ 4°

ADDITIONAL INSTRUCTIONS: **Specific VOC Requirements (please specify)** metals field filtered,

DATA Validation is required FOR 1413-MW05 Level IV, DATA to be forward to LDC, Report PDF format by email OR CD-Rom

	Signature	Print Name	Company	Date	Time
Relinquished by	Greg Headington	GREG HEADINGTON	BATTELLE	17JAN06	1559
Received by	Tana Dickinson	TANA DICKINSON	ALPHA	1/18/06	1030
Relinquished by					
Received by					
Relinquished by					
Received by					

*Key: AQ - Aqueous SO - Soil WA - Waste OT - Other **: L- Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Name Gerald Tompkins
Address 505 King Avenue
City, State, Zip Columbus, OH 43201
Phone Number 614-424-4849 Fax 614-424-3667

LABORATORY

Name Alpha Analytical, Inc.
Address 255 Glendale Ave, Suite 21
Sparks, Nevada 89431-5778
Phone (775) 355-1044

Client Name **Battelle Memorial Institute**	P.O. # 190907	D.O. T0102	
Address **505 King Avenue**	PWS #	DWR #	
City, State, Zip **Columbus, OH 43201**	Phone # 614 424 3779	Fax # 614 424 3667	
Sampled by SL/GH	Report Attention Chris Zimmerman		

Analyses Required

DATA REPORT: NEDTS FORMAT ☐ NIRIS ☒ EDF FORMAT ☒

Time Sampled	Date Sampled	Matrix* See Key Below	Office Use Only Lab ID Number	Field Point Name Sample Description	Total and type of containers **See below	TPH/E Diesel Motor Oil	TPH/P	NO_2, NO_3, SO_4	Pb, Mn^{+2}, Fe^{+2}	TDS, AlK	TOC	VOC* see below	Other: PNA's	Other: CHL	REMARKS
—	1-17	AQ	BM106011905- 01	1413 -QCTB	1V							X			
1110	1-17	AQ	02	1413 -QCFB	3V							X			
1525	1-17	AQ	03	1413-QCEB	3V	X						X			
1310	1-17	AQ	04	1413-MW04	10	X					X	X		X	
1344	1-17	AQ	05	1413-MW05	10	X					X	X		X	
1344	1-17	AQ	06	1413-MW05DUP	10	X					X	X		X	
1218	1-17	AQ	07	1413-MW06	10	X					X	X		X	
1435	1-17	AQ	08	1413-MW07	10	X					X	X		X	
1522	1-17	AQ	09	1413-MW08	10	X					X	X		X	
1135	1-17	AQ	10	1413-MW09	10	X					X	X		X	

ADDITIONAL INSTRUCTIONS: **Specific VOC Requirements (please specify)** * See attached sheet for VOC's

Data Validation Level IV Required for 1413-MW05, Data to be forwarded to LDC, Submit Report in pdf format either email or CD-Rom.

	Signature	Print Name	Company	Date	Time
Relinquished by	Greg Headington	GREG HEADINGTON	Battelle	18 JAN 06	0810
Received by	S. Siguentes	S. SIFUENTES	ALPHA	1-19-06	1:24
Relinquished by					
Received by					
Relinquished by					
Received by					

*Key: AQ - Aqueous SO - Soil WA - Waste OT - Other **: L- Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Name Gerald Tompkins
Address 505 King Avenue
City, State, Zip Columbus, OH 43201
Phone Number 614-424-4849 Fax 614-424-3667

LABORATORY
Name Alpha Analytical, Inc.
Address 255 Glendale Ave, Suite 21
Sparks, Nevada 89431
Phone (775) 355-1044

Client Name **Battelle Memorial Institute**
Address **505 King Avenue**
City, State, Zip **Columbus, OH 43201**
P.O. # 190907
D.O. T0102
PWS #
DWR #
Phone # 614 424 3779
Fax # 614 424 3667
Report Attention Chris Zimmerman
Sampled by SL/GH

Analyses Required

DATA REPORT
NEDTS FORMAT ☐
NIRIS ☒
EDF FORMAT ☒

Time Sampled	Date Sampled	Matrix* See Key Below	Office Use Only Lab ID Number	Field Point / Sample Description	Total and type of containers **See below	TPH/E	TPH/P	NO_2, NO_3, SO_4	Pb, Mn^{+2}, Fe^{+2}	TDS, AlK	TOC	VOC* see below	Other: PNA's	Other:	REMARKS
1310	1-17	AQ	BN1060119 05-04	1413-MW04	2								X		
1344	1-17	AQ	05	1413-MW05	2								X		
1344	1-17	AQ	06	1413-MW05 DUP	2								X		
1218	1-17	AQ	07	1413-MW06	2								X		
1425	1-17	AQ	08	1413-MW07	2								X		
1522	1-17	AQ	09	1413-MW08	2								X		
1135	1-17	AQ	10	1413-MW09	2								X		

ADDITIONAL INSTRUCTIONS: **Specific VOC Requirements (please specify)**

Data Validation Level ~~II~~ for 1413-MW05, PAHs to be forwarded to LDC, Submit Report in pdf format/email/CD.

	Signature	Print Name	Company	Date	Time
Relinquished by	[signature]	GREG HEADINGTON	Battelle	18 JAN 06	0810
Received by	[signature]	S. SIFUENTES	ALPHA	1-19-06	1:24
Relinquished by					
Received by					
Relinquished by					
Received by					

*Key: AQ - Aqueous SO - Soil WA - Waste OT - Other **: L- Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

CHAIN-OF-CUSTODY RECORD

CA

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : BMI06011905

Report Due By : 5:00 PM On : 02-Feb-06

Billing Information :
Battelle
505 King Avenue

Columbus, OH 43201

Client:
Battelle Memorial Institute
505 King Avenue

Columbus, OH 43201

Report Attention : Chris Zimmerman
CC Report :

Chris Zimmerman
TEL : (614) 424-3779
FAX : (614) 424-3667
EMail zimmerct@battelle.org

Job : TO102
PO : 190907

Client's COC # : none

EDD Required : Yes
Sampled by : SL/GH
Cooler Temp : 4 °C
Date Printed: 19-Jan-06

QC Level : DS3 = DOD QC Required : Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles ORG	SUB	TAT	PWS #	BNA_W	METHANE_W	TOC_W	TPH/E_W	VOC_W				Sample Remarks
BMI06011905-01A	1413-QCTB	AQ	01/17/06 00:00	1	0	10						8260/MTBE_C				
BMI06011905-02A	1413-QCFB	AQ	01/17/06 11:10	3	0	10						8260/MTBE_C				
BMI06011905-03A	1413-QCEB	AQ	01/17/06 15:25	3	0	10					TPH/E_C					Client provided 3 unpreserved VOA's only, unable to run VOC analysis w/o preserved VOA's for this sample
BMI06011905-04A	1413-MW04	AQ	01/17/06 13:10	12	0	10		PNA/PAH	CH4	TOC	TPH/E_C	8260/MTBE_C				
BMI06011905-05A	1413-MW05	AQ	01/17/06 13:44	12	0	10		PNA/PAH	CH4	TOC	TPH/E_C	8260/MTBE_C				
BMI06011905-06A	1413-MW05DUP	AQ	01/17/06 13:44	12	0	10		PNA/PAH	CH4	TOC	TPH/E_C	8260/MTBE_C				
BMI06011905-07A	1413-MW06	AQ	01/17/06 12:18	12	0	10		PNA/PAH	CH4	TOC	TPH/E_C	8260/MTBE_C				
BMI06011905-08A	1413-MW07	AQ	01/17/06 14:25	12	0	10		PNA/PAH	CH4	TOC	TPH/E_C	8260/MTBE_C				

Comments: No security seals, frozen ice. Temp Blank rec'd #7218 @4°c. Level IV QC Required/Sample 05 (1413-MW05), "Samples should be used as the control spike sample if possible (I.E.: MS/MSD)." Report J-values for Benzene down to 0.25 ug/L. : "If Jet Fuel is seen, report as Diesel and Footnote report. TOC/ph=2

	Signature	Print Name	Company	Date/Time
Logged in by:	S. Sifuentes	S. SIFUENTES	Alpha Analytical, Inc.	1/19/06 1:24

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.

Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

CHAIN-OF-CUSTODY RECORD

CA

Billing Information :
Battelle
505 King Avenue

Columbus, OH 43201

Client:
Battelle Memorial Institute
505 King Avenue

Columbus, OH 43201

Report Attention : Chris Zimmerman
CC Report :

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

Chris Zimmerman
TEL : (614) 424-3779
FAX : (614) 424-3667
EMail zimmerct@battelle.org

Job : TO102
PO : 190907

Client's COC # : none

WorkOrder : BMI06011905

Report Due By : 5:00 PM On : 02-Feb-06

EDD Required : **Yes**

Sampled by : SL/GH

Cooler Temp : **4 °C**

Date Printed: **19-Jan-06**

QC Level : DS3 = DOD QC Required : Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles ORG	SUB	TAT	PWS #	Requested Tests BNA_W	METHANE_W	TOC_W	TPH/E_W	VOC_W				Sample Remarks
BMI06011905-09A	1413-MW08	AQ	01/17/06 15:22	12	0	10		PNA/PAH	CH4	TOC	TPH/E_C	8260/MTBE_C				
BMI06011905-10A	1413-MW09	AQ	01/17/06 11:35	12	0	10		PNA/PAH	CH4	TOC	TPH/E_C	8260/MTBE_C				

Comments: No security seals, frozen ice. Temp Blank rec'd #7218 @4°c. Level IV QC Required/Sample 05 (1413-MW05), "Samples should be used as the control spike sample if possible (I.E.: MS/MSD)." Report J-values for Benzene down to 0.25 ug/L. : "If Jet Fuel is seen, report as Diesel and Footnote report. TOC/ph=2

	Signature	Print Name	Company	Date/Time
Logged in by:	[signature]	S. SIFUENTES	Alpha Analytical, Inc.	1/19/06 1:24

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.

Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Billing Information :
Battelle
505 King Avenue

Columbus, OH 43201

Client:
Battelle Memorial Institute
505 King Avenue

Columbus, OH 43201

Report Attention : Chris Zimmerman
CC Report :

CHAIN-OF-CUSTODY RECORD

Alpha Analytical, Inc.

255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

Chris Zimmerman
TEL : (614) 424-3779 x
FAX : (614) 424-3667
EMail : zimmerct@battelle.org

Job : TO102: 1413
PO : 190907
Client's COC # : none

CA

WorkOrder : BMI06011852

Report Due By : 5:00 PM On : 01-Feb-06

EDD Required : **Yes**

Sampled by : GH/SL

Cooler Temp : 4 °C

Date Printed: **18-Jan-06**

QC Level : DS3 = DOD QC Required : Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles ORG	SUB	TAT	PWS #	Requested Tests 3500FE_2OS_W	ALKALINITY	ANIONS(A)_W	ANIONS(B)_W	METALS_AQ	METALS_DS	TDS		Sample Remarks
BMI06011852-01A	1413-MW04	AQ	01/17/06 13:10	5	0	10		FE+2	Alk	NO2, NO3, SO4	NO2, NO3, SO4	Pb	Dissolved Mn	X		
BMI06011852-02A	1413-MW05	AQ	01/17/06 13:44	5	0	10		FE+2	Alk	NO2, NO3, SO4	NO2, NO3, SO4	Pb	Dissolved Mn	X		
BMI06011852-03A	1413-MW05DUP	AQ	01/17/06 13:44	5	0	10		FE+2	Alk	NO2, NO3, SO4	NO2, NO3, SO4	Pb	Dissolved Mn	X		
BMI06011852-04A	1413-MW06	AQ	01/17/06 12:18	5	0	10		FE+2	Alk	NO2, NO3, SO4	NO2, NO3, SO4	Pb	Dissolved Mn	X		
BMI06011852-05A	1413-MW07	AQ	01/17/06 14:25	5	0	10		FE+2	Alk	NO2, NO3, SO4	NO2, NO3, SO4	Pb	Dissolved Mn	X		
BMI06011852-06A	1413-MW08	AQ	01/17/06 15:22	5	0	10		FE+2	Alk	NO2, NO3, SO4	NO2, NO3, SO4	Pb	Dissolved Mn	X		
BMI06011852-07A	1413-MW09	AQ	01/17/06 11:35	5	0	10		FE+2	Alk	NO2, NO3, SO4	NO2, NO3, SO4	Pb	Dissolved Mn	X		

Comments: No security seals. Frozen ice. Temp Blank received @ 4°. Level IV required for Sample -02. Metals field filtered. :

	Signature	Print Name	Company	Date/Time
Logged in by:	Tara Dickinson	Tara Dickinson	Alpha Analytical, Inc.	1/18/06 1030

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

APPENDIX G

WASTE MANIFESTS

SEPTEMBER 2005

ADDITIONAL SITE ASSESSMENT WASTE MANIFEST FOR SOIL BORINGS

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.

Manifest Document No. 25668

2. Page 1 of 1

3. Generator's Name and Mailing Address USMC AC/S ENVIRO SECURITY
PO BOX 555008
CAMP PENDLETON, CA 92055

4. Generator's Phone (760 725-4321 ATTN: MARGO WILLIAMS

5. Transporter 1 Company Name EFR ENVIRONMENTAL SERVICES, INC.

6. US EPA ID Number CAR000011205

A. Transporter's Phone 619-722-6781

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address DOME ROCK INDUSTRIES, INC.
3125 W. DOME ROCK RD.
QUARTZSITE, AZ 85346

10. US EPA ID Number AZR000035915

C. Facility's Phone 928 927-7688

11. Waste Shipping Name and Description	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. NON-HAZARDOUS WASTE SOLID	021	DM	10500	P
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above 11A.ACCEPTANCE# (SOIL BORINGS)

SITE: 1523,1413

E. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
ALWAYS WEAR APPROPRIATE P.P.E. AND USE SAFE HANDLING METHODS.
24 HR. EMERGENCY NUMBER 1-800-424-9300 *CHEMTREC*

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name: NATHANIEL D. DELESTON

Signature: Nathaniel D. Deleston

Month Day Year: 10 13 05

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: Octavio Quintero

Signature: Octavio Quintero

Month Day Year: 10 13 05

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

Signature

Month Day Year

GENERATOR

TRANSPORTER

FACILITY

ORIGINAL - RETURN TO GENERATOR

OCTOBER 2005 AND JANUARY 2006

WASTE MANIFESTS FOR GROUNDWATER MONITORING ACTIVITIES

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.

Manifest Document No. 2588

2. Page 1 of 1

3. Generator's Name and Mailing Address
USMC AC/S ENVIRO. SECURITY
PO BOX 555008
CAMP PENDLETON, CA 92055

4. Generator's Phone (760) 725-4375 CONT: MARGO WILLIAMS

5. Transporter 1 Company Name
EFR ENVIRONMENTAL SERVICES, INC.

6. US EPA ID Number
CAR000011205

A. Transporter's Phone
619-722-6781

7. Transporter 2 Company Name

8. US EPA ID Number

8. Transporter's Phone

9. Designated Facility Name and Site Address
DOME ROCK INDUSTRIES, INC.
3125 W. DOME ROCK RD.
QUARTZSITE, AZ 85346

10. US EPA ID Number
AZR000035915

C. Facility's Phone
928 927-7688

11. Waste Shipping Name and Description	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. NON-HAZARDOUS WASTE LIQUID	001	T.T	00065	G
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above
11A. ACCEPTANCE#4321PW370(PURGE WATER)
SITE: 1413,1523,14151
MAIL: BATTELLE-3990 OLD TOWN AVE., STE. C205
SAN DIEGO, CA 92110 ATTN.: SCOTT LOWE

E. Handling Codes for Wastes Listed Above
11a. 01

15. Special Handling Instructions and Additional Information
ALWAYS WEAR APPROPRIATE P.P.E. AND USE SAFE HANDLING METHODS.
24 HOUR EMERGENCY NUMBER 1-800-424-9300 *CHEMTREC*
ER# AC/S ENVIRO. SEC. 760-725-4321

GENERATOR

16. **GENERATOR'S CERTIFICATION:** I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name: Kim Bergeron
Signature: [signature]
Month 12 Day 16 Year 05

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: Brian Denning
Signature: [signature]
Month 12 Day 16 Year 05

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name
Signature
Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name: JERRY R. JARRETT
Signature: [signature]
Month 12 Day 23 Year 05

ORIGINAL - RETURN TO GENERATOR

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. CA2170023533
Manifest Document No. 23884
2. Page 1 of 1

3. Generator's Name and Mailing Address USMC AC/S ENVIRO. SEC.
PO BOX 555008
CAMP PENDLETON, CA

4. Generator's Phone (760) 725-~~4321~~ 4375 CONTACT: MARGO WILLIAMS

5. Transporter 1 Company Name EPR ENVIRONMENTAL SERVICES, INC.
6. US EPA ID Number CAR000011205
A. Transporter's Phone 619-722-6781

7. Transporter 2 Company Name
8. US EPA ID Number
B. Transporter's Phone

9. Designated Facility Name and Site Address DOME ROCK INDUSTRIES, INC.
3125 W. DOME ROCK ROAD
QUARTZSITE, AZ 85346
10. US EPA ID Number AZR000035915
C. Facility's Phone 928-927-7688

11. Waste Shipping Name and Description	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. NON-HAZARDOUS WASTE LIQUID	001	TT	00050	G
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above
11A.4321PW370 (PORGE WATER) ~~PW~~ 4321PW370
SITE: 1413, 1523, 14151, 1491
MAIL: BATTELLE-3990 OLD TOWN AVE., STE. C205, SAN DIEGO, CA 92110
ATTN.: SCOTT LOWE

E. Handling Codes for Wastes Listed Above
11a.01

15. Special Handling Instructions and Additional Information
ALWAYS WEAR APPROPRIATE P.P.E. AND USE SAFE HANDLING METHODS.
24 HOUR EMERGENCY NUMBER 1-800-424-9300 *CHEMTREC*

EW# (760) 725-4321

16. **GENERATOR'S CERTIFICATION:** I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.
Printed/Typed Name GERALD C. TUCKER
Signature
Month 02 Day 17 Year 06

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name Brad Denning
Signature
Month 02 Day 17 Year 06

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name
Signature
Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.
Printed/Typed Name JARRETT
Signature
Month 02 Day 20 Year 06

GENERATOR | TRANSPORTER | FACILITY

ORIGINAL - RETURN TO GENERATOR

OCTOBER 2005 AND JANUARY 2006

WASTE MANIFESTS FOR FREE PRODUCT REMOVAL ACTIVITIES

State of California—Environmental Protection Agency
Form Approved OMB No. 2050-0039 (Expires 9-30-99)
Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

See Instructions on back of page 6.

Department of Toxic Substances Control
Sacramento, California

IN CASE OF EMERGENCY OR SPILL, CALL THE NATIONAL RESPONSE CENTER 1-800-424-8802; WITHIN CALIFORNIA, CALL 1-800-852-7550

GENERATOR

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. C A 2 1 7 0 0 2 3 5 3 3 — Manifest Document No. 7 0 4 9 8
2. Page 1 of 1
Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
USMC AC/S ENVIRO. SECURITY
PO Box 555008
CAMP PENDLETON, CA 92055

4. Generator's Phone (760) 725-4321 CONTACT: MARGO WILLIAMS

State Manifest Document Number: 24779438
State Generator's ID: HNA03360908
State Transporter's ID: D
Transporter Phone: (619) 722-5781
State Transporter's ID:
Transporter Phone:
State Facility's ID:
Facility Phone: 800-499-7145

5. Transporter 1 Company Name: EFR ENVIRONMENTAL SERVICES, INC.
6. US EPA ID Number: C A R 0 0 0 0 1 1 2 0 5

7. Transporter 2 Company Name:
8. US EPA ID Number:

9. Designated Facility Name and Site Address
PACIFIC RESOURCE RECOVERY
3150 EAST PICO ROAD
LOS ANGELES, CA 90023
10. US EPA ID Number: C A D 0 0 8 2 5 2 4 0 5

11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	Waste Number
a. UN1993, WASTE FLAMMABLE LIQUIDS, N.O.S. (GASOLINE) 3, PGII (D001)	001	DF	00002	G	State 213; EPA/Other D001
b.					State; EPA/Other
c.					State; EPA/Other
d.					State; EPA/Other

J. Additional Descriptions for Materials Listed Above
11A. ACCEPTANCE#626118
SITE: 2653, 2264, 1523 & 1413

K. Handling Codes for Wastes Listed Above
a.
b.
c.
d.

15. Special Handling Instructions and Additional Information
ALWAYS WEAR APPROPRIATE PPE AND USE SAFE HANDLING METHODS
24 HOUR EMERGENCY NUMBER (800) 424-9300 *CHEMTREC*
ER# AC/S ENVIRO SEC. 760-725-~~5617~~ 4321

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month	Day	Year
NATHANIEL D. DEFASTON	[signature]	10	13	05

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Octavio Quintero	[signature]	10	13	05

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year

DO NOT WRITE BELOW THIS LINE.

DTSC 8022A (1/99)
EPA 8700—22

White: TSDF SENDS THIS COPY TO DTSC WITHIN 30 DAYS.
To: P.O. Box 3000, Sacramento, CA 95812

State of California—Environmental Protection Agency
Form Approved OMB No. 2050-0039 (Expires 9-30-97)
Please Print or Type. Form Designed for Use on Elite (12-pitch) Typewriter.

See Instructions on back of page 6.

Department of Toxic Substances Control
Sacramento, California

IN CASE OF EMERGENCY OR SPILL, CALL THE NATIONAL RESPONSE CENTER (800) 424-8802, WITHIN CALIFORNIA (800) 852-7550

1. UNIFORM HAZARDOUS WASTE MANIFEST	2. Generator's US EPA ID No. [illegible]	Manifest Document No. [illegible]	2. Page 1 of 1
3. Generator's Name and Mailing Address [illegible]		A. State Manifest Document Number 24779993	Information in the shaded areas is not required by Federal law.
4. Generator's Phone ([illegible])		B. State Generator's ID [illegible]	
5. Transporter 1 Company Name [illegible]	6. US EPA ID Number [illegible]	C. State Transporter's ID	
7. Transporter 2 Company Name [illegible]	8. US EPA ID Number [illegible]	D. Transporter's Phone	
9. Designated Facility Name and Site Address [illegible]	10. US EPA ID Number [illegible]	E. State Facility's ID [illegible]	
		F. Facility's Phone	

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	13. Total Quantity	14. Unit Wt./Vol.	Waste No.
a. UNREG. HAZ. LIQUID, N.O.S. (GASOLINE), 9, UN9189	01	DF	0002	
b.				
c.				
d.				
e.				
f.				

G. Additional Descriptions for Materials Listed Above

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
WEAR APPROPRIATE PPE AND USE SAFE HANDLING METHODS
24 HOUR EMERGENCY NUMBER (800) 424-9300 "CHEMTREC"
FOR ACCIDENTS, INCIDENTS OR SPILLS (714) 524-4321

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month	Day	Year
Christopher A. Sotelo	[signature]	10	13	05

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Estevan Gonzalez	[signature]	10	13	05

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Francisco Hernandez	[signature]	10	14	05

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
Freddie Arredondo	[signature]	10	17	05

DO NOT WRITE BELOW THIS LINE.

DTSC 8022A (11/99)
EPA 8700—22

Green: TRANSPORTER RETAINS

State of California - Environmental Protection Agency
Form Approved OMB No. 2050-0039 (Expires 9-30-99)
Please print or type. Form designed for use on elite (12-pitch) typewriter

See Instructions on back of page 6.

Department of Toxic Substances Control
Sacramento, California

IN CASE OF EMERGENCY OR SPILL, CALL THE NATIONAL RESPONSE CENTER 1-800-424-8802; WITHIN CALIFORNIA, CALL 1-800-852-7550

GENERATOR

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No: CA217002353 — Manifest Document No.: 70762
2. Page 1 of 1

Information in the shaded areas is not required by Federal law

3. Generator's Name and Mailing Address:
USMC AC/S ENVIRO. SECURITY
PO BOX 555008
CAMP PENDLETON, CA 92055

A. State Manifest Document Number:

4. Generator's Phone: 760 725-4321 CONT: MARGO WILLIAMS

B. State Generator's ID: HYHA36020982

5. Transporter 1 Company Name: EFR ENVIRONMENTAL SERVICES, INC.
6. US EPA ID Number: CAR000011205

C. State Transporter's ID [Reserved.]

D. Transporter's Phone: (619) 722-6781

7. Transporter 2 Company Name:
8. US EPA ID Number:

E. State Transporter's ID [Reserved.]

F. Transporter's Phone:

9. Designated Facility Name and Site Address:
PACIFIC RESOURCE RECOVERY
3150 EAST PICO ROAD
LOS ANGELES, CA 90023

10. US EPA ID Number: OAD008252405

G. State Facility's ID:

H. Facility's Phone: 800-499-7145

11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste Number
a. UN1993, WASTE FLAMMABLE LIQUIDS, N.O.S. (GASOLINE) 3, PGII (D001)	001	DF	00002	G	State 213; EPA/Other D001
b.					State; EPA/Other
c.					State; EPA/Other
d.					State; EPA/Other

J. Additional Descriptions for Materials Listed Above:
11. ACCEPTANCE#626118
SITE: 2653, 2264, 1523, 1413
MAIL: BATTELLE-3990 OLD TOWN AVE., STE. C205
SAN DIEGO, CA 92110 ATTN.: SCOTT LOWE

K. Handling Codes for Wastes Listed Above
a. b. c. d.

15. Special Handling Instructions and Additional Information:
ALWAYS WEAR APPROPRIATE PPE AND USE SAFE HANDLING METHODS
24 HOUR EMERGENCY NUMBER (800) 424-9300 *CHEMTREC*
ER# AC/S ENVIRO. SEC. 760-725-4321

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment, OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: Nathaniel D. Deleston — Signature: [signature] — Month 12 Day 16 Year 05

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Octavio Quintero — Signature: Octavio Quintero — Month 12 Day 16 Year 05

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name: — Signature: — Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name: — Signature: — Month Day Year

DO NOT WRITE BELOW THIS LINE.

DTSC 8022A (1/99)
EPA 8700-22

State of California—Environmental Protection Agency
Form Approved OMB No. 2050-0039 (Expires 9-30-99)
Please print or Form designed for use on elite (12 pitch) typewriter

See Instructions on back of page 6.

Department of Toxic Substances Control
Sacramento, California

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No: CA217002353 | Manifest Document No: 71002 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law

3. Generator's Name and Mailing Address: USMC AC/S ENVIRO. SECURITY, PO BOX 555008, CAMP PENDLETON, CA 92055

4. Generator's Phone: (760) 725-~~4321~~ 4375 CONTACT: MARGO WILLIAMS

A. State Manifest Document Number:

B. State Generator's ID: HYHQ36020982

C. State Transporter's ID (Reserved.):

D. Transporter's Phone: (619) 722-6781

E. State Transporter's ID (Reserved.):

F. Transporter's Phone:

G. State Facility's ID:

H. Facility's Phone: 800-499-7145

5. Transporter 1 Company Name: EFR ENVIRONMENTAL SERVICES, INC

6. US EPA ID Number: CAR000011205

7. Transporter 2 Company Name:

8. US EPA ID Number:

9. Designated Facility Name and Site Address: PACIFIC RESOURCE RECOVERY, 3150 EAST PICO ROAD, LOS ANGELES, CA 90023

10. US EPA ID Number: CAD008252405

11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste Number
a. UN1993, WASTE FLAMMABLE LIQUIDS, N.O.S. (GASOLINE) 3, PGII, (D001)	001	DF	00005	G	State 213; EPA/Other D001
b.					State; EPA/Other
c.					State; EPA/Other
d.					State; EPA/Other

J. Additional Descriptions for Materials Listed Above: 11A. ACCEPTANCE#626118 SITE: 1523
MAIL: BATTELLE-3990 OLD TOWN AVE., STE. C205, SAN DIEGO, CA 92110 ATTN.: SCOTT LOWE

K. Handling Codes for Wastes Listed Above: a. b. c. d.

15. Special Handling Instructions and Additional Information:
ALWAYS WEAR APPROPRIATE PPE AND USE SAFE HANDLING METHODS
24 HOUR EMERGENCY NUMBER (800) 424-9300 *CHEMTREC* EK#(760) 725-4321

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: GERALD O. TUCKER | Signature: [signature] | Month 02 Day 17 Year 06

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Octavio Quintero | Signature: [signature] | Month 02 Day 17 Year 06

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name: | Signature: | Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19
Printed/Typed Name: | Signature: | Month Day Year

GENERATOR

TRANSPORTER

FACILITY

IN CASE OF EMERGENCY OR SPILL, CALL THE NATIONAL RESPONSE CENTER 1-800-424-8802; WITHIN CALIFORNIA, CALL 1-800-852-7550

DO NOT WRITE BELOW THIS LINE.

DTSC 8022A (11/99)
EPA 8700-22

ATTACHMENT 1

LETTER WORK PLAN FOR ADDITIONAL GROUNDWATER MONITORING WELL INSTALLATIONS AND ASSESSMENT AT FORMER UNDERGROUND STORAGE TANK SITE 1413, MARINE CORPS BASE CAMP PENDLETON

AND

ASSOCIATED REGULATORY CORRESPONDENCE

LETTER WORK PLAN FOR ADDITIONAL GROUNDWATER MONITORING WELL INSTALLATIONS AND ASSESSMENT AT FORMER UNDERGROUND STORAGE TANK SITE 1413
MARINE CORPS BASE CAMP PENDLETON

Contract No. N47408-01-D-8207
Task Order No. 0102

Prepared for:

Southwest Division Naval Facilities Engineering Command
1220 Pacific Highway
San Diego, California 92132-5190

Prepared by:

BATTELLE
505 King Avenue
Columbus, Ohio 43201

April 15, 2005

Approved: David Clexton
David Clexton
Battelle Project Registered Geologist

Approved: Chris Zimmerman
Chris Zimmerman
Battelle Program Manager

Letter Work Plan for Additional Groundwater Monitoring Well Installations and Assessment at Former Underground Storage Tank Site 1413 Marine Corps Base Camp Pendleton

This letter work plan for additional groundwater monitoring well installations and assessment at Site 1413, Marine Corps Base (MCB) Camp Pendleton, was prepared for the Southwest Division Naval Facilities Engineering Command (SWDIV) under Contract No. N47408-01-D-8207, Task Order No. 0102.

This plan was prepared in response to comments provided by the California Regional Water Quality Control Board, San Diego Region (RWQCB) at a meeting conducted on January 29, 2004, as well as comments received on December 3, 2004 in the reference document [SMC:50-3392.05:peurp]. Please note that different staff from RWQCB were involved during each of these respective commenting initiatives. The January 2004 meeting was attended by representatives from Battelle, RWQCB, SWDIV, and MCB Camp Pendleton AC/S ES (Battelle, 2004a).

In summary, the RWQCB has suggested that additional groundwater monitoring wells and soil borings be installed to further delineate the dissolved-phase plume and the soil contaminant plume, respectively, at Site 1413. Unless otherwise noted below, all procedures for soil boring advancements, well installations and well development can be found in the most current work plan for site assessment activities at MCB Camp Pendleton titled *Work Plan for Characterization of Underground Storage Tank Sites in Areas 12 and 13 at Marine Corps Base Camp Pendleton* (Battelle, 2004b).

Objectives

The objective of this effort is to install additional soil borings and groundwater monitoring wells to further delineate the extent of the soil contamination and dissolved phase plume at the site. The general intention is to place continuously cored soil borings to the northwest, southwest, and east of the former UST area and excavation, as well as additional groundwater monitoring wells to the northeast, east, south, and west of the former UST area and excavation. Figures 1 and 2 illustrate the current and proposed groundwater monitoring well and current and proposed soil boring locations, respectively. All site activities will be conducted in accordance with the current San Diego County Department of Environmental Health (DEH) *Site Assessment and Mitigation (SAM) Manual* (DEH, 2004).

Background

All information pertaining to the general site description and location, as well as regional geology and hydrogeology, can be found in the *Final Site Assessment Report for Former Underground Storage Tank Site 1413, Marine Corps Base Camp Pendleton, Oceanside, California* (Battelle, 1999). This information is also summarized below.

Site 1413. Site 1413 is located in Area 14 on the east side of Camp Pendleton in the foothills of the Peninsular Ranges. The site consists of Building 1413 and the area that formerly contained a UST and is specifically located on 16th Street, approximately 250 ft southwest of the E Street and 16th Street intersection. Prior to removal on October 18, 1996, Site 1413 contained one (1) 1,000-gallon reinforced concrete tank. The tank was used for storage and transfer of diesel fuel to the adjacent utility room in Building 1413. The information presented above was obtained from the Navy Public Works Center UST removal report (NPWC, 1997).

Based on data from previous environmental investigations, the site is generally underlain by fill, silty sands, sands with occasional gravels, and a silty sandstone to the depths which have been investigated (approximately 30 ft bgs). Groundwater at the site has been observed between approximately 12 to 18 ft bgs, and flow directions range from the northeast to southeast. The general gradient appears to exist in the easterly direction. During July 2000, approximately 91 yd^3 of contaminated soil was excavated and removed from the former UST location as part of an interim remedial action at Site 1413 (Battelle, 2001). The excavation was backfilled with gravel and capped with a concrete pad. Impacted soil remains beneath building 1413 at the site, and additional soil removal is not feasible.

Soil Boring and Groundwater Monitoring Well Installation and Development

All site activities including utility clearance, permitting, drilling, well construction, and waste disposal will be done in accordance with procedures described in the final *Work Plan for Characterization of Underground Storage Tank Sites in Areas 12 and 13 at Marine Corps Base Camp Pendleton* (Battelle, 2004b). A C-57 licensed drilling contractor will be contacted to install soil borings and groundwater monitoring wells at Site 1413. The contractor will have the appropriate certificates, experience, and training.

The placement of additional soil borings and groundwater monitoring wells at Site 1413 has been determined based on all available site information, including: (1) the location and results from existing soil borings and groundwater monitoring wells, (2) interpreted and calculated groundwater flow directions, and (3) logistical site constraints in the vicinity of the proposed work areas (i.e., existing buildings and landscaping, etc.).

Each groundwater monitoring well will be constructed similar to existing site wells and will be screened across the water table. Exact placement of the screened interval will be determined based upon the subsurface conditions observed during the advancement of the borehole, as well as conditions observed in nearby existing wells at the site. The *SAM Manual* and the California Department of Health Services (DHS) *Leaking Underground Fuel Tanks (LUFT) Manual* standards will be used as guides for the construction design, installation, and development of groundwater monitoring wells (DEH, 2004).

Additional soil samples will be collected at Site 1413 to further evaluate the presence of free product and define the soil contaminant plume (see Figure 2). Based on the typical range of groundwater depths observed at Site 1413 (i.e., 12 to 18 feet bgs), soil borings will be advanced using a hollow-stem auger rig through the vadose zone and into the saturated zone to a depth of approximately 20 ft bgs. Soil sampling will be conducted using a continuous core sampling device. Soil samples will be collected from the soil core at a minimum of 2.5-ft intervals or where visible staining or odors are observed. Soil samples will be screened in the field using a flame ionization detector (FID). Based on the field FID readings, soil samples with detectable hydrocarbons will be packaged and sent to a stationary laboratory for analysis of total petroleum hydrocarbons quantified as diesel (TPH-D). All soil sampling and analytical procedures outlined in the *Work Plan for Characterization of Underground Storage Tank Sites in Areas 12 and 13 at Marine Corps Base Camp Pendleton* (Battelle, 2004b) will be followed during these activities.

Soil cuttings generated during well installation will be collected and stored at a designated storage area located within Camp Pendleton for future disposal. All disposal of investigation-derived waste (IDW) will be conducted according to procedures outlined in the final *Work Plan for Characterization of Underground Storage Tank Sites in Areas 12 and 13 at Marine Corps Base Camp Pendleton* (Battelle, 2004b).

All newly installed monitoring wells will be developed a minimum of 48 hours after completing installation. The static water level and initial pH, temperature, specific conductivity, and turbidity will be

measured at the beginning of development. Well development will be accomplished by first bailing out accumulated sediment or mud from the well. The well screen then will slowly be surged. After bailing and surging, the well will be purged with a submersible pump. As development proceeds, the quantity of water removed from the well and the measurements of pH, temperature, specific conductivity, and turbidity will be recorded on the well development field log. Development will be considered complete when (1) three consecutive measurements of pH, temperature, and specific conductivity taken for every one-half borehole volume (after the first borehole volume was purged) vary less than 10%; and (2) turbidity is 5 NTU or less. If a limited amount of groundwater exists at the site, the well will be surged and purged to dryness. Following water recovery in the well, the well will be surged and purged to dryness for a second time. Following the second round of surging and purging, development will be considered complete. Water produced during well development will be collected and stored at the designated storage area for future disposal.

All work conducted as part of the additional soil boring and groundwater monitoring well installations at Site 1413 will be performed in accordance with the Health and Safety Plan and the Community Health and Safety Plan that are found as Attachments 2 and 3 in the final *Work Plan for Characterization for Underground Storage Tank Sites in Areas 12 and 13 at Marine Corps Base Camp Pendleton* (Battelle, 2004b).

References

Battelle. 1999. *Final Site Assessment Report for Former Underground Storage Tank Site 1413, Marine Corps Base Camp Pendleton, Oceanside, California.* Prepared for Naval Facilities Engineering Command, San Diego, CA. April.

Battelle. 2001. *Final Corrective Action Plan for Site 1413 (Includes: Documentation of Interim Remedial Activities), Marine Corps Base Camp Pendleton.* Prepared for Naval Facilities Engineering Command, San Diego, CA. June.

Battelle. 2004a. Meeting minutes from Quarterly Status Meeting with RWQCB, SWD, AC/S ES MCB Camp Pendleton, and Battelle. January 29.

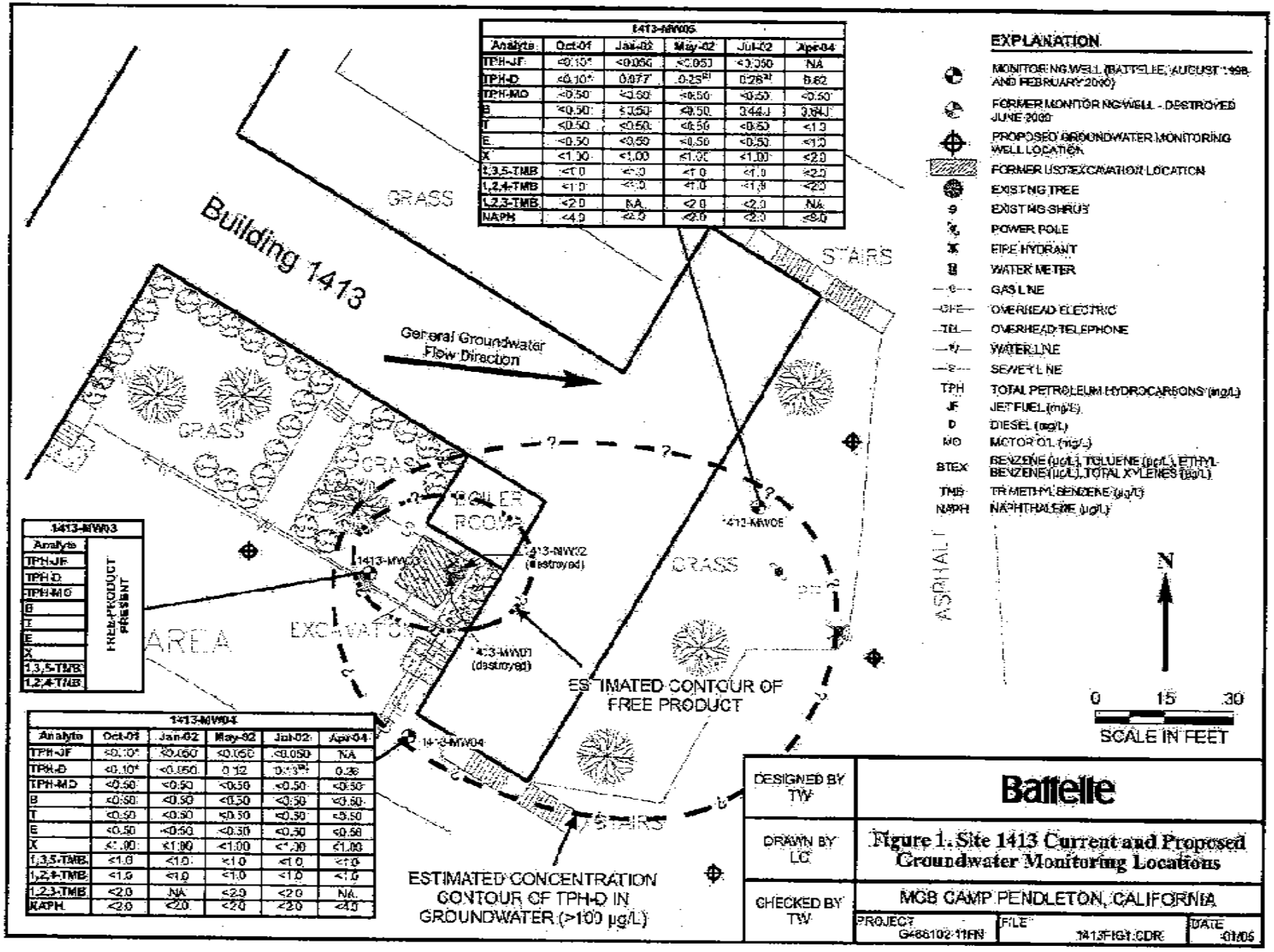
Battelle. 2004b. *Final Work Plan for Characterization of Underground Storage Tanks in Areas 12 and 13 at Marine Corps Base Camp Pendleton.* Prepared for Naval Facilities Engineering Service Center under Contract No. N68711-01-D-6016, Task Order No. 0003. September.

DEH, see San Diego County Department of Environmental Health.

Navy Public Works Center. 1997. *Underground Storage Tank Removal at Building 1413, Marine Corps Base Camp Pendleton, California.* Work Request # 94-220. Environmental Department, Underground Storage Tank Removal and Site Assessment and Remediation Division, San Diego, CA.

NPWC, see Navy Public Works Center.

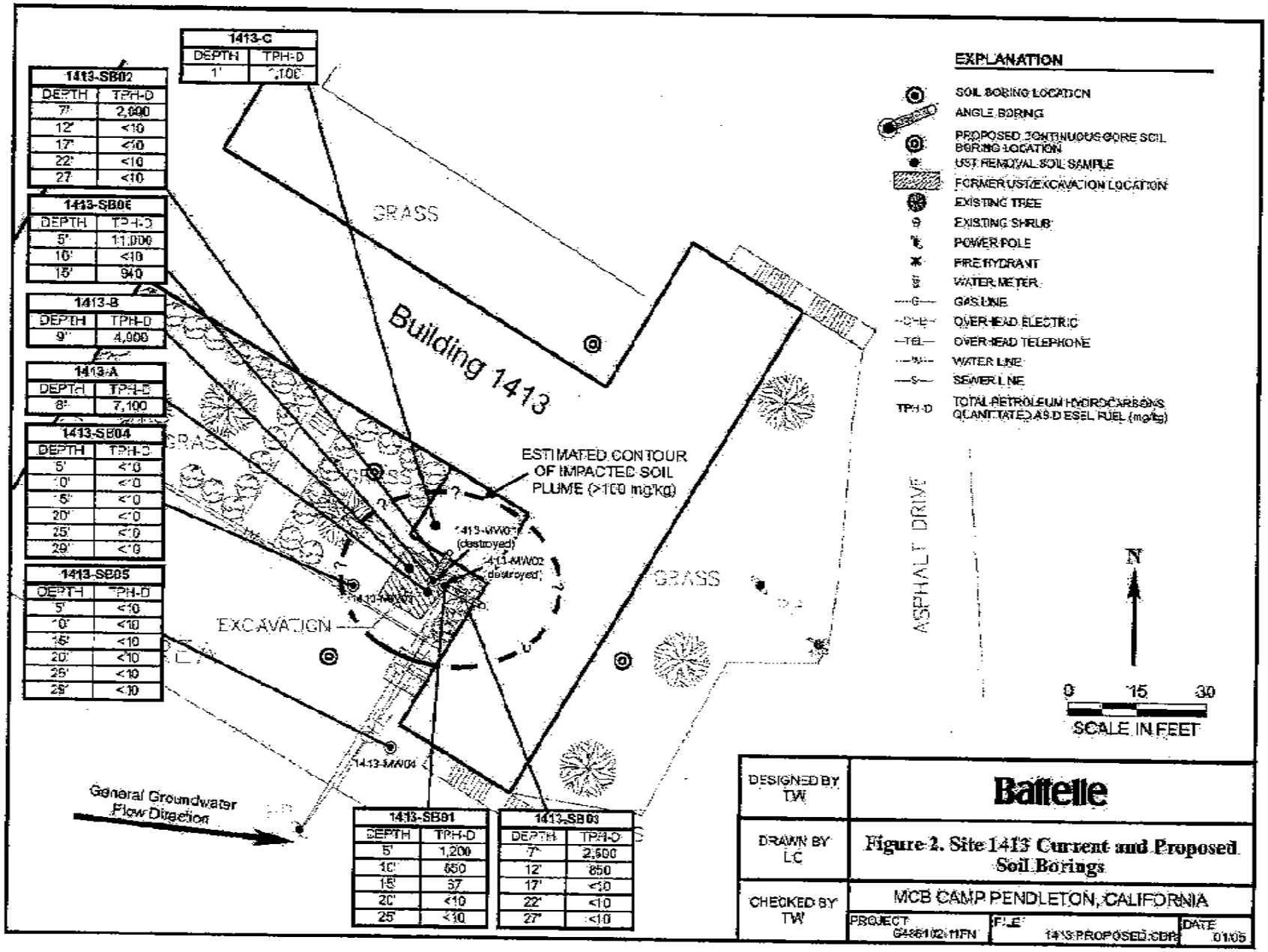
San Diego County Department of Environmental Health. 2004. *Site Assessment and Mitigation (SAM) Manual.* San Diego, CA.



1413-MW03	
Analyte	FREE PRODUCT PRESENT
TPH-JF	
TPH-D	
TPH-MO	
B	
T	
E	
X	
1,3,5-TMB	
1,2,4-TMB	

1413-MW04					
Analyte	Oct-01	Jan-02	May-02	Jul-02	Apr-04
TPH-JF	<0.10*	<0.050	<0.050	<0.050	NA
TPH-D	<0.10*	<0.050	0.12	0.13[R]	0.36
TPH-MO	<0.50	<0.50	<0.50	<0.50	<0.50
B	<0.50	<0.50	<0.50	<0.50	<0.50
T	<0.50	<0.50	<0.50	<0.50	<0.50
E	<0.50	<0.50	<0.50	<0.50	<0.50
X	<1.00	<1.00	<1.00	<1.00	<1.00
1,3,5-TMB	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-TMB	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,3-TMB	<2.0	NA	<2.0	<2.0	NA
NAPH	<2.0	<2.0	<2.0	<2.0	<4.0

1413-MW05					
Analyte	Oct-01	Jan-02	May-02	Jul-02	Apr-04
TPH-JF	<0.10*	<0.050	<0.050	<0.050	NA
TPH-D	<0.10*	0.077	0.25[R]	0.28[R]	0.62
TPH-MO	<0.50	<0.50	<0.50	<0.50	<0.50
B	<0.50	<0.50	<0.50	0.44J	0.84J
T	<0.50	<0.50	<0.50	<0.50	<1.0
E	<0.50	<0.50	<0.50	<0.50	<1.0
X	<1.00	<1.00	<1.00	<1.00	<2.0
1,3,5-TMB	<1.0	<1.0	<1.0	<1.0	<2.0
1,2,4-TMB	<1.0	<1.0	<1.0	<1.0	<2.0
1,2,3-TMB	<2.0	NA	<2.0	<2.0	NA
NAPH	<4.0	<2.0	<2.0	<2.0	<8.0


1413-C
DEPTH TPH-D
1' 7,100
1413-SB02
DEPTH TPH-D
7' 2,600
12' <10
17' <10
22' <10
27' <10
1413-SB06
DEPTH TPH-D
5' 11,000
10' <10
15' 940
1413-B
DEPTH TPH-D
9' 4,900
1413-A
DEPTH TPH-D
8' 7,100
1413-SB04
DEPTH TPH-D
5' <10
10' <10
15' <10
20' <10
25' <10
29' <10
1413-SB05
DEPTH TPH-D
5' <10
10' <10
15' <10
20' <10
25' <10
28' <10
1413-SB01
DEPTH TPH-D
5' 1,200
10' 650
15' 37
20' <10
25' <10
1413-SB03
DEPTH TPH-D
7' 2,500
12' 850
17' <10
22' <10
27' <10
GRASS
Building 1413
ESTIMATED CONTOUR OF IMPACTED SOIL PLUME (>100 mg/kg)
1413-MW01 (destroyed)
1413-MW02 (destroyed)
1413-MW03
1413-MW04
EXCAVATION
ASPHALT DRIVE
General Groundwater Flow Direction
EXPLANATION
SOIL BORING LOCATION
ANGLE BORING
PROPOSED CONTINUOUS CORE SOIL BORING LOCATION
UST REMOVAL SOIL SAMPLE
FORMER UST/EXCAVATION LOCATION
EXISTING TREE
EXISTING SHRUB
POWER POLE
FIRE HYDRANT
WATER METER
GAS LINE
OVER-HEAD ELECTRIC
OVER-HEAD TELEPHONE
WATER LINE
SEWER LINE
TPH-D TOTAL PETROLEUM HYDROCARBONS QUANTITATED AS DIESEL FUEL (mg/kg)
N
0 15 30
SCALE IN FEET
DESIGNED BY TW
DRAWN BY LC
CHECKED BY TW
Battelle
Figure 2. Site 1413 Current and Proposed Soil Borings
MCB CAMP PENDLETON, CALIFORNIA
PROJECT G486102-MFN
FILE 1413-PROPOSED.CDR
DATE 01/05

California Regional Water Quality Control Board

San Diego Region

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http:// www.waterboards.ca.gov/sandiego

August 11, 2005

In reply refer to:
SMC:50-3392.05:peurp

T.L. Sahagun
Acting RCRA Management Division Head
Assistant Chief of Staff
Environmental Security
United States Marine Corps
Camp Pendleton, CA 92055-5008

Dear Ms. Sahagun:

SUBJECT: Final Letter Work Plan for Additional Groundwater Monitoring Well Installations and Assessment at Former Underground Storage Tank Site 1413 (by Battelle, dated April 15, 2005) and Addendum (submitted on August 8, 2005, Project No. 5090.13c, RWQCB Case No. 9UT3392, Marine Corps Base, Camp Pendleton, California

The above-referenced work plan includes a proposal to install wells and to collect additional soil samples in order to complete delineation of soil and groundwater contamination at Site 1413. An addendum to the work plan was submitted on August 8, 2005. Modifications proposed in the addendum include installation of a well in what it is expected to be the most potentially contaminated zone (in the former tank excavation). The work plan and addendum are acceptable. Quarterly monitoring should be performed for a minimum of one year after wells have been installed.

The heading portion of this letter includes a Regional Board code number noted after "In reply refer to:" In order to assist us in the processing of your correspondence please include this code number in the heading or subject line portion of all correspondence and reports to the Regional Board pertaining to this matter.

If you have any questions please contact me at (858) 637-7137.

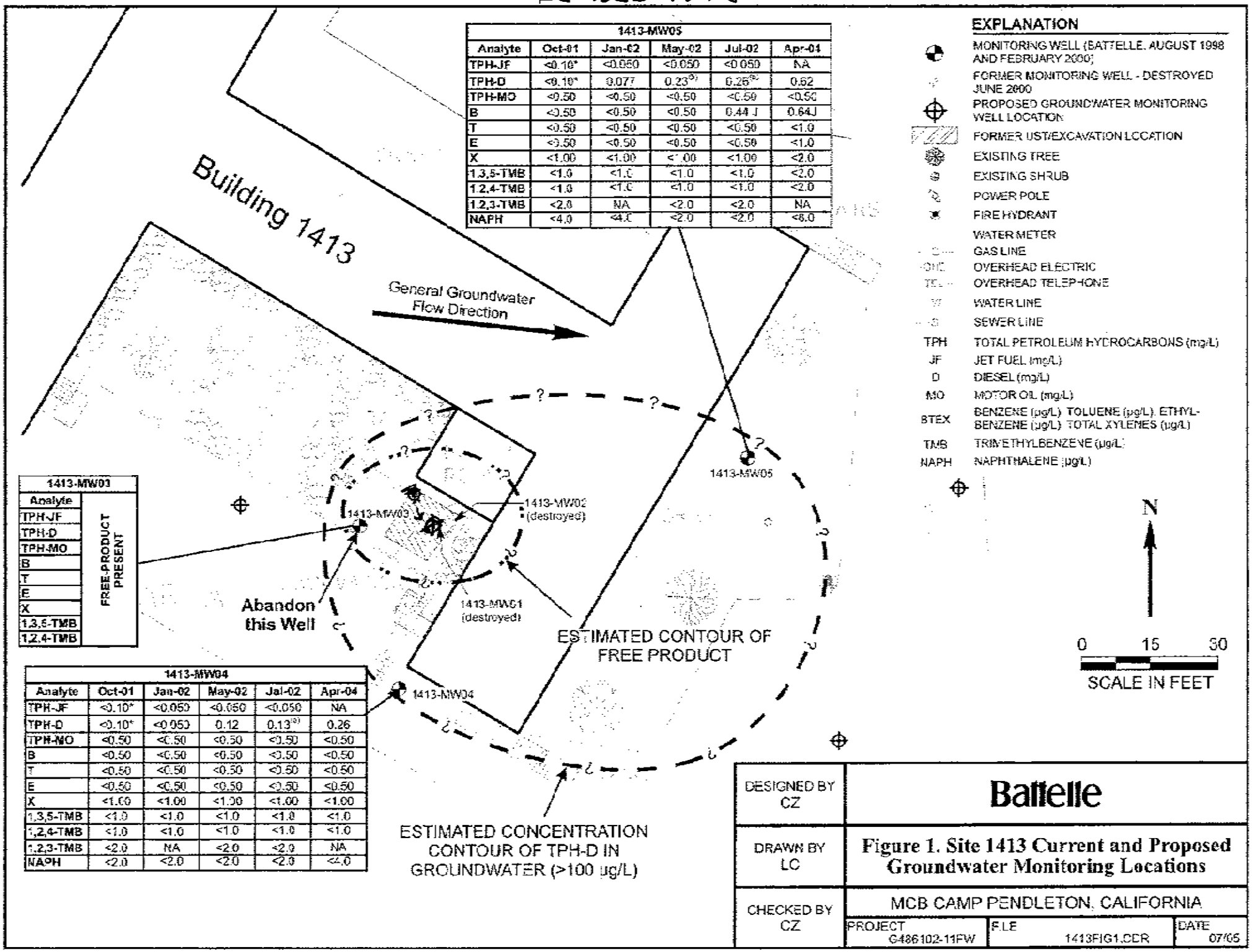
Sincerely,

Peter Peuron

Peter Peuron
Environmental Scientist

PMP:jpa:pmp

REVISED PLAN

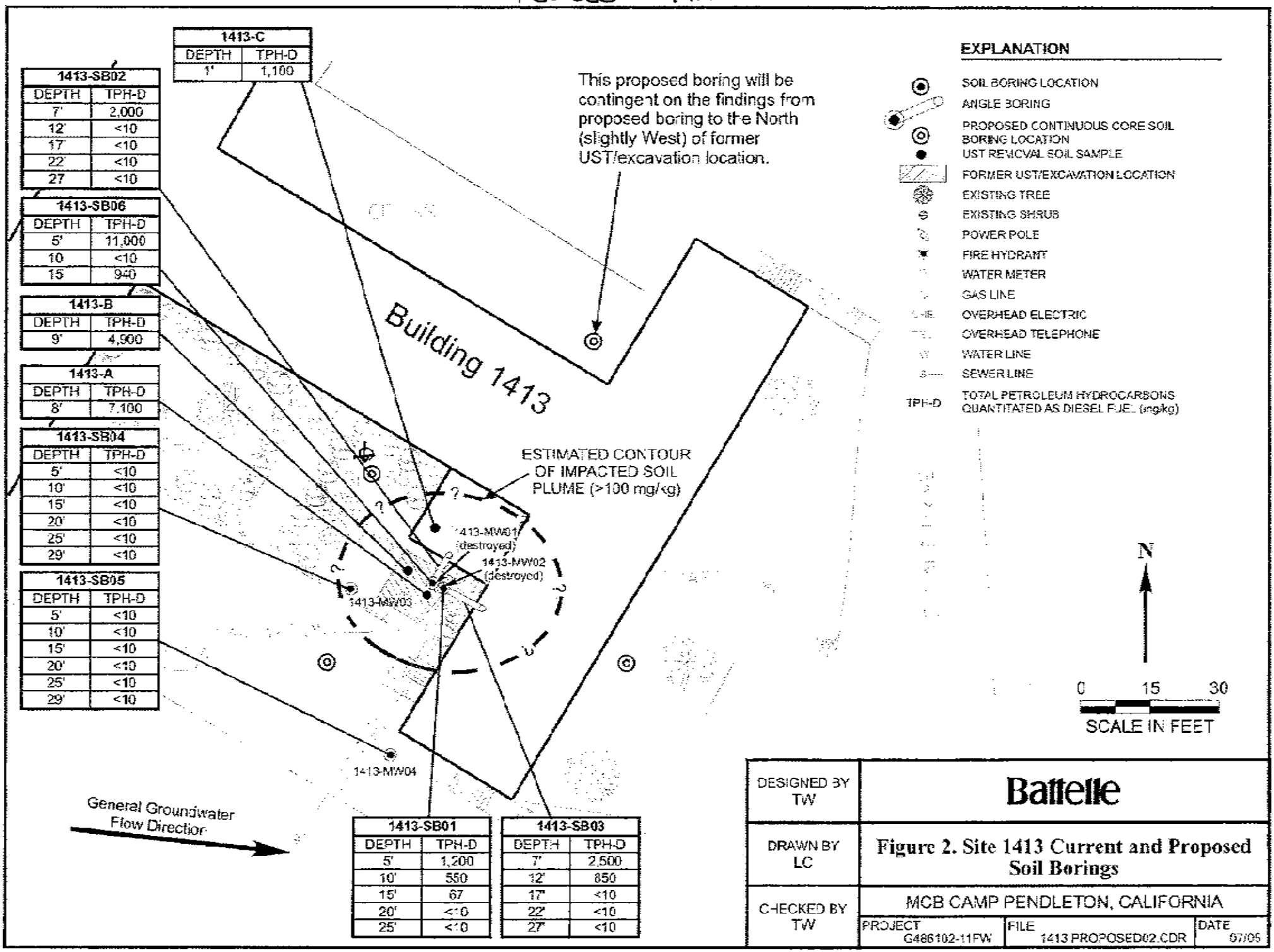


1413-MW01	
Analyte	FREE-PRODUCT PRESENT
TPH-JF	
TPH-D	
TPH-MO	
B	
T	
E	
X	
1,3,5-TMB	
1,2,4-TMB	

1413-MW05					
Analyte	Oct-01	Jan-02	May-02	Jul-02	Apr-04
TPH-JF	<0.10*	<0.050	<0.050	<0.050	NA
TPH-D	<0.10*	0.077	0.23(b)	0.26(b)	0.62
TPH-MO	<0.50	<0.50	<0.50	<0.50	<0.50
B	<0.50	<0.50	<0.50	0.44 J	0.64J
T	<0.50	<0.50	<0.50	<0.50	<1.0
E	<0.50	<0.50	<0.50	<0.50	<1.0
X	<1.00	<1.00	<1.00	<1.00	<2.0
1,3,5-TMB	<1.0	<1.0	<1.0	<1.0	<2.0
1,2,4-TMB	<1.0	<1.0	<1.0	<1.0	<2.0
1,2,3-TMB	<2.0	NA	<2.0	<2.0	NA
NAPH	<4.0	<4.0	<2.0	<2.0	<8.0

1413-MW04					
Analyte	Oct-01	Jan-02	May-02	Jul-02	Apr-04
TPH-JF	<0.10*	<0.050	<0.050	<0.050	NA
TPH-D	<0.10*	<0.050	0.12	0.13(b)	0.26
TPH-MO	<0.50	<0.50	<0.50	<0.50	<0.50
B	<0.50	<0.50	<0.50	<0.50	<0.50
T	<0.50	<0.50	<0.50	<0.50	<0.50
E	<0.50	<0.50	<0.50	<0.50	<0.50
X	<1.00	<1.00	<1.00	<1.00	<1.00
1,3,5-TMB	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-TMB	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,3-TMB	<2.0	NA	<2.0	<2.0	NA
NAPH	<2.0	<2.0	<2.0	<2.0	<4.0

REVISED PLAN



1413-C	
DEPTH	TPH-D
1'	1,100

1413-SB02	
DEPTH	TPH-D
7'	2,000
12'	<10
17'	<10
22'	<10
27	<10

1413-SB06	
DEPTH	TPH-D
5'	11,000
10	<10
15	940

1413-B	
DEPTH	TPH-D
9'	4,900

1413-A	
DEPTH	TPH-D
8'	7,100

1413-SB04	
DEPTH	TPH-D
5'	<10
10'	<10
15'	<10
20'	<10
25'	<10
29'	<10

1413-SB05	
DEPTH	TPH-D
5'	<10
10'	<10
15'	<10
20'	<10
25'	<10
29'	<10

1413-SB01	
DEPTH	TPH-D
5'	1,200
10'	550
15'	67
20'	<10
25'	<10

1413-SB03	
DEPTH	TPH-D
7'	2,500
12'	850
17'	<10
22'	<10
27'	<10

DESIGNED BY TW	Battelle
DRAWN BY LC	Figure 2. Site 1413 Current and Proposed Soil Borings
CHECKED BY TW	MCB CAMP PENDLETON, CALIFORNIA

PROJECT	FILE	DATE
G486102-11FW	1413 PROPOSED02.CDR	07/05

Zimmerman, Christian T

Subject: FW: Status for Site 1413

Approval to proceed...

-----Original Message-----
From: Peter Peuron [mailto:PPeuron@waterboards.ca.gov]
Sent: Tuesday, August 09, 2005 11:35
To: Storrs CIV Chet C
Subject: Re: Status for Site 1413

Chet,

This looks fine. I will send an approval letter out within the next day or two, but its o.k. to proceed.

Peter Peuron
(858) 637-7137

>>> "Storrs CIV Chet C" <chet.storrs@usmc.mil> 08/08/05 11:22 AM >>>
Peter,

Attached are the revised figures for additional site assessment at former UST Site 1413. Please note the following changes:
Groundwater Monitoring Wells
*
MW03 will be abandoned and a well will be reinstalled in the northwest corner of the excavation area. Down gradient wells were shifted slightly to the northeast. The up gradient well is still proposed in the same location.

Soil Borings

* All continuous core soil borings remain the same with the exception that the northernmost boring will only be advanced if petroleum constituents are observed during advancement of the boring to the north (slightly west) of the former UST/excavation area.

We are ready to proceed.

-----Original Message-----
From: Storrs CIV Chet C
Sent: Wednesday, July 20, 2005 16:03
To: 'Peter Peuron'
Cc: Bipin Patel (E-mail)
Subject: RE: Status for Site 1413

Sounds Good Peter, we can easily adjust. I will resubmit the figure to you for approval.

ccs

-----Original Message-----
From: Peter Peuron [mailto:PPeuron@waterboards.ca.gov]
Sent: Wednesday, July 20, 2005 14:54
To: Storrs CIV Chet C
Subject: Re: Status for Site 1413

Chet,

Sorry I didn't respond sooner. However, there is a problem. When we visited the site we agreed to abandon well MW03 and put a monitroing well in the excavation area. The well that is proposed to the west of the tank zone should be in the tank zone. I cannot issue a formal response until Friday at the earliest, but you may want to re do the figure with wells on it (to put one in the tank zone) and I could just approve that verbally (when I get it) and on paper sometime after that.

Peter

>>> "Storrs CIV Chet C" <chet.storrs@usmc.mil> 07/19/05 12:06PM >>>
Peter,

We are ready getting ready to proceed with field work at 1413. I was wondering if you had the opportunity to review the letter work plan. Based upon our meeting on 27 Apr, you were going to respond to the letter work plan with a RWQCB letter that adjusted the final boring numbers and locations. You can do this via email if you prefer, but I still need that final go-ahead from RWQCB. The meeting minutes are attached below. Thank you for your continued support of Camp Pendleton's Remediation Program.

VR
CCS

C. Christopher Storrs
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