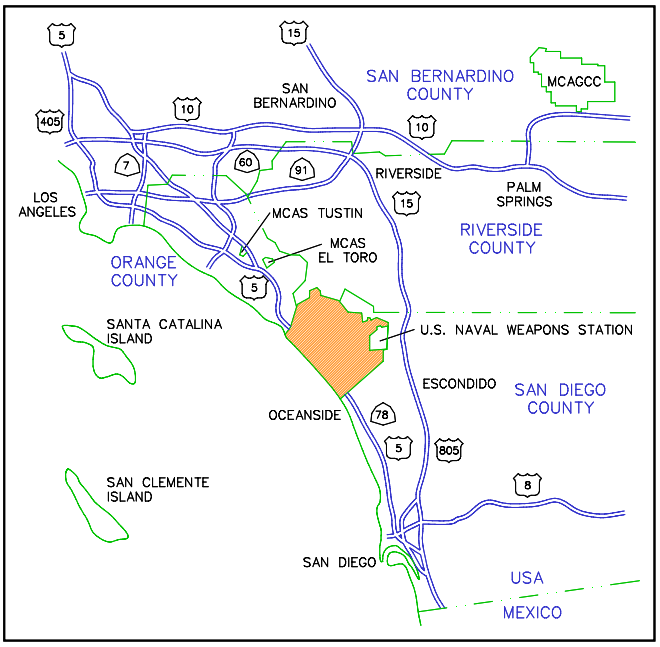
Semiannual Groundwater Monitoring Report (Includes: Documentation of Additional Site Assessment Activities) for UST Site 1523 Marine Corps Base Camp Pendleton



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CONTRACT NUMBER: N47408-01-D-8207
TASK ORDER: 0102
by

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April 2006

SEMIANNUAL GROUNDWATER MONITORING REPORT (INCLUDES: DOCUMENTATION OF ADDITIONAL SITE ASSESSMENT ACTIVITIES) for UST SITE 1523 MARINE CORPS BASE CAMP PENDLETON

Contract No. N47408-01-D-8207
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Semiannual
Groundwater Monitoring Report
(Includes: Documentation of
Additional Site Assessment Activities)
for UST Site 1523
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
$CaCO_3$	calcium carbonate
DEH	Department of Environmental Health
DHS	Department of Health Services
DIPE	di-isopropyl ether
DO	dissolved oxygen
EB	equipment blank
ETBE	ethyl-*tertiary*-butyl ether
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
NFESC	Naval Facilities Engineering Service Center
NTU	nephelometric turbidity units
NS	not sampled
ORP	oxidation-reduction potential
PNA	polynuclear aromatic hydrocarbons
QA	quality assurance
QC	quality control
RNA	remediation by natural attenuation
RW	recovery well
RWQCB	Regional Water Quality Control Board
SAM	site assessment and mitigation
TAME	*tertiary*-amyl methyl ether
TB	trip blank

TBA	*tertiary*-butyl alcohol
TDS	total dissolved solids
TMB	trimethylbenzene
TOC	total organic carbon
TOT	taste and odor threshold
TPH	total petroleum hydrocarbons
TPH-D	total petroleum hydrocarbons extractable as diesel
TPH-E	total petroleum hydrocarbons extractable
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 1523, 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 describes and presents results from the additional site assessment activities conducted at Site 1523 during September 2005. The groundwater is being monitored on a quarterly basis for petroleum hydrocarbon constituents and specific indicators associated with remediation by natural attenuation (RNA). This task was initiated under Task Order No. 0102 for the Naval Facilities Engineering Service Center (NFESC) Contract No. N47408-01-D-8207.

Site 1523 is located in Area 15 on the east side of Camp Pendleton, east of Vandegrift Boulevard (Figure 1) and just south of 11th Street. The site consists of Building 1523 and the area that formerly contained two underground storage tanks (USTs). Because of the close proximity of the two tanks, the site is simply referred to as Site 1523. In September 1996, one 1,000-gallon reinforced concrete UST and one 1,500-gallon reinforced concrete UST were removed from the site. Both USTs reportedly contained diesel fuel that was used to heat Building 1523. Several soil samples were taken from the excavation area, which indicated the presence of hydrocarbons related to diesel fuel.

Surface runoff from the site generally flows into a small, unnamed ephemeral stream that lies approximately 420 ft east of the site. The stream flows in an easterly direction and eventually discharges into the southerly flowing Pilgrim Creek, which is a tributary to the San Luis Rey River. According to the *Water Quality Control Plan for the San Diego Basin* (RWQCB, 1994), Site 1523 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 supply, agricultural supply, and industrial service supply. The nearest major surface water body is Lake O'Neil, located approximately 2 miles northwest of the site. The nearest downgradient water supply well is located approximately 5.75 miles southwest of the site, is adjacent to the San Luis Rey River, and serves the city of Oceanside, CA.

The geology at Site 1523 in the upper 7 to 8 ft below ground surface (bgs) is composed almost entirely of silty sands. The sands are fine to medium grained with a yellowish brown color and exist from approximately 7.5 ft bgs to the surface. Underlying the silty sands are Cretaceous-aged weathered and fractured bedrock which are olive gray to yellowish brown in color, decomposed, and slightly weathered. Groundwater elevations at the site range from approximately 323 to 345 ft above mean sea level (amsl) (approximately 30 to 49 below the top of the well casing). According to information presented in Ninyo and Moore (2000), Site 1523 appears to be located on a bedrock high, with groundwater flowing from the center in all directions at varying gradients. Based on groundwater contamination distribution, the major component of flow appears to be to the east and northeast.

Section 2.0: ADDITIONAL SITE ASSESSMENT ACTIVITIES

This section presents information regarding additional site assessment activities conducted at former UST Site 1523 during September 2005.

2.1 Regulatory Correspondence

At Site 1523, low-level detections of TPH-D in wells outside of the former tank cavity, as well as the presence of free product in monitoring wells located within close proximity to the former tank cavity, were historically observed and indicated that some migration of petroleum hydrocarbon constituents in groundwater may be occurring. On July 20, 2004, personnel from the San Diego Regional Water Quality Control Board (RWQCB), Southwest Division Naval Facilities Engineering Command, the Assistant Chief of Staff of Environmental Security for Camp Pendleton, and Battelle performed a site walk at Site 1523. This site walk was designed to evaluate the logistical challenges associated with the installation of additional groundwater monitoring wells in the adjacent canyon in order to further define the extent of the groundwater hydrocarbon plume. During the site walk, potential well locations were recommended and documented in a meeting minutes/summary package (Battelle, 2004).

In response to these recommendations, Battelle submitted the following document on April 15, 2005, to the Navy: *Letter Work Plan for Additional Groundwater Monitoring Well Installations and Assessment at Former Underground Storage Tank Site 1523, Marine Corps Base Camp Pendleton* (Battelle, 2005a) (Attachment 1). This document, which was approved by the RWQCB on June 30, 2005, (RWQCB, 2005) outlined the objectives and procedures for additional site characterization activities to be conducted at former UST Site 1523.

2.1.1 Groundwater Investigation. Following approval from the RWQCB, additional site assessment activities were conducted by Battelle at Site 1523 between September 9 and September 15, 2005. During this time, three additional groundwater monitoring wells (1523-MW06, 1523-MW07, and 1523-MW08) were installed. Monitoring wells 1523-MW06 and 1523-MW07 were installed in the canyon located to the northeast of the former USTs, which is the interpreted groundwater flow direction from the UST cavity. Well 1523-MW08 was installed to the southeast of the former UST cavity to further define potential contaminant migration in this direction. No soil samples were collected as part of this investigation, as the soil plume at former UST Site 1523 had been completely defined (Ninyo and Moore, 2000).

Groundwater monitoring wells 1523-MW06, 1523-MW07, and 1523-MW08 were developed on September 23, 2005. The development logs for these wells can be found in Appendix A. Soil boring logs and well completion diagrams for these wells are presented in Appendix B, along with site survey data. Figure 2 illustrates the locations of the additional groundwater monitoring wells installed at Site 1523 in relation to the existing groundwater monitoring well network. Groundwater monitoring well 1413-MW08 was designed and constructed based on historical site groundwater levels and groundwater gradients in conjunction with field observations made during the drilling of the well. The well extends to a depth of 40 ft bgs and is screened from 25 to 40 ft bgs. Although groundwater was detected at approximately 28-29 ft bgs in 1523-MW08, and a nearby existing groundwater monitoring well (1523-MW04) exhibited groundwater levels of 37 ft bgs during the time of installation, 1523-MW08 has been dry since its installation on September 15, 2005. This well will be monitored continually for groundwater, and will be sampled whenever possible.

Sampling of the upgraded well network at Site 1523 was initiated during the October 2005 and January 2006 quarterly groundwater monitoring events, and is discussed in detail in subsequent sections of this report. Laboratory analytical results from these sampling events are presented in Table 1.

2.1.2 Source Removal Activities. In addition to the expansion of the groundwater monitoring well network at Site 1523, it was recommended by RWQCB personnel that the excavation of contaminated soils be completed at Site 1523 to the extent practicable. During July 2005, approximately 512 yd^3 of contaminated soils were removed from the site. For a complete description of all excavation activities conducted at Site 1523, please refer to the *Summary Report of Remedial Action Activities at Site 1523, Marine Corps Base Camp Pendleton* (Battelle, 2005b).

Section 3.0: WATER-LEVEL MEASUREMENTS AND GROUNDWATER SAMPLING

Seven groundwater monitoring wells (1523-MW01 through 1523-MW07) at former UST Site 1523 were sampled during the October 2005 and January 2006 sampling events. Well 1523-MW08 was dry during October 2005 and January 2006 and was not able to be sampled. Also, the two recovery wells (1523-RW01 and 1523-RW02) at Site 1523 were not sampled during this time, as these wells are part of the free product recovery program which has been implemented at the site.

Groundwater samples were collected using the low-flow sampling technique during each sampling event. 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 any purging/sampling activities, the depth to groundwater was measured and recorded for each of these 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 the procedures followed in the field, as well as the various analyses performed on groundwater samples collected from Site 1523.

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, 1999). All data were recorded in field logbooks dedicated to Site 1523. Hard copies of the logbook sheets containing the field data collected are included in Appendix A 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.

Because groundwater flows radially away from the source area at Site 1523 at varying gradients, the average groundwater flow direction and hydraulic gradient at Site 1523 could not be determined. Instead, groundwater elevation contour maps were constructed on a site map showing measured groundwater elevations for October 2005 (Figure 3a) and January 2006 (Figure 3b). The groundwater elevations measured in October 2005 and January 2006 were relatively consistent with the historical groundwater elevations measured across Site 1523.

The major component of groundwater flow appears to be to the northeast based on the historic observed decrease of free product thickness in that direction. Water-level and free product measurements were taken from the top of casing, and the results are presented in Table 2.

3.1.2 Free Product Recovery Activities. Five monthly free product recovery events were conducted at Site 1523 during this reporting period, the first of which occurred on September 9, 2005. Two recovery wells (1523-RW01 and 1523-RW02) are used at the site for free product recovery. Results from these efforts, as well as from all historical free product removal activities, are presented in Table 3.

Free product has not been detected in 1523-RW01 since August 15, 2005, at which time 0.02 ft of product was measured in the well. Furthermore, free product has not been detected in 1523-RW02 since October 18, 2004, when 0.08 ft of product was measured. The decrease and absence of free product

in these wells can be attributed to the free product recovery program, which was permanently implemented at Site 1523 on October 18, 2004. This program is intended to remove free product in 1523-RW01 and 1523-RW02. The recovery program consists of installing 2-inch-wide, 36-inch-long selectively absorbent SoakEase™ socks in the two recovery wells as a passive collection system for free product, with each sock being capable of absorbing up to 3 quarts of product. The socks each have been placed in weighted, stainless-steel canisters to prevent hang-ups; the canisters also ensure that the absorbent media is immersed within the free product.

The free product recovery socks were installed in wells 1523-RW01 and 1523-RW02 on October 18, 2004; prior to sock installation, approximately 1.5 L and 1 L of product were removed from each well, respectively. The SoakEase™ socks were most recently replaced on January 20, 2006. Between September 2005 and January 2006, only trace amounts (sheen) of free product have been observed in and recovered from groundwater that was wrung and recovered from the absorbent socks.

Due to the limited amounts of free product being recovered from 1523-RW01 and 1523-RW02, the recovery events at Site 1523 were reduced in frequency from a bimonthly to a monthly basis. This change in frequency was initiated in April 2005.

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 well network sampled at Site 1523 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. The pumps are placed in the wells several hours prior to pumping in order to reduce turbidity. 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 1 provides the final field parameter readings collected immediately prior to sample collection, during all quarterly groundwater sampling events. Well 1523-MW06 was purged dry in January 2006 and water quality parameters were not able to be collected at this time. Copies of the original field data collection log sheets for the most recent quarterly sampling events are provided in Appendix A.

3.2 Analytical Results

Groundwater samples were collected at former UST Site 1523 during October 2005 and January 2006 in accordance with requirements in the *Site Assessment and Mitigation (SAM) Manual* (DEH, 2004). Table 4 provides a summary of groundwater sampling methods, analytes, requirements, and analytical methods for the current groundwater monitoring event. 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 following parameters:

- Total petroleum hydrocarbons (TPH) extractable as diesel (-D) and motor oil (-MO)
- Volatile organic compounds (VOCs)

- Benzene, toluene, ethylbenzene, and total xylenes/methyl-*tert*-butyl ether (BTEX/MTBE)
- Polynuclear aromatic hydrocarbons (PNAs)
- Monitored natural attenuation (MNA) parameters
  - Total organic carbon (TOC)
  - Methane
  - Nitrate/nitrite/sulfate
  - Manganese/lead/iron
  - Alkalinity/total dissolved solids (TDS).

Results for all analyses can be found in the laboratory analytical reports provided in Appendix C, as well as Table 1. Well 1523-MW08 was dry over the last two quarters and was not sampled. Well 1523-MW06 was purged dry in January 2006 and only VOC samples were collected. Additionally, no water quality parameters were collected for well 1523-MW06 in January 2006.

Groundwater samples collected at Site 1523 during the October 2005 sampling event indicated that TPH-D was present at low levels only in wells 1523-MW01 and 1523-MW03 at concentrations of 0.055 and 0.077 mg/L, respectively. Neither of these values exceed the Water Quality Criterion (i.e., taste and odor threshold concentration [TOT]) of 0.1 mg/L for TPH outlined in the amended *Water Quality Control Plan for the San Diego Basin (9)* (RWQCB, 1994). With the exception of an ethylbenzene detection in 1523-MW05 of 1.1 μg/L and a trichloroethylene detection in 1523-MW03 of 1.7 μg/L, no other VOCs were detected in Site 1523 groundwater during October 2005. Each of the VOC detections fell well below their respective maximum contaminant levels (MCLs). Furthermore, no PNA constituents were detected in the groundwater during this sampling event.

Groundwater samples collected during the January 2006 sampling event indicated that TPH-D was present at low levels in the following groundwater monitoring wells: 1523-MW01 (0.074 mg/L), 1523-MW02 (0.10 mg/L), 1523-MW03 (0.15 mg/L), and 1523-MW06 (0.15 mg/L). Based on these results, the TOT level of 0.1 mg/L for TPH was slightly exceeded in 1523-MW03 and 1523-MW06. Benzene and ethylbenzene also were detected in 1523-MW01 at concentrations of 0.46J and 2.4 μg/L, respectively; benzene was detected in 1523-MW03 at 0.29J μg/L; and naphthalene was detected in 1523-MW03 at 2.6 μg/L. Furthermore, trichloroethylene was detected in 1523-MW03 at a concentration of 2.0 μg/L and in 1523-MW05 at a concentration of 1.5 μg/L. Each of the VOC detections were below their respective MCLs, and no other VOC or PNA constituents were detected at Site 1523.

A complete list of selected analytical data from the quarterly sampling events and pertinent MCLs is presented in Table 1. Copies of the laboratory analytical reports for the October 2005 and January 2006 sampling events are provided in Appendix C. Figure 4 shows all hydrocarbon contaminant concentrations in groundwater observed during the April 2005, July 2005, October 2005, and January 2006 sampling events. Figure 5 presents historical TPH, BTEX, MTBE, naphthalene, and trimethylbenzene (TMB) concentrations for nine wells (1523-RW01, 1523-RW02, and 1523-MW01 through 1523-MW07) at Site 1523. Note that the contaminants that were reported at nondetectable levels during a particular sampling event were included on the historical plots as zero, although detection limits vary from sampling event to sampling event.

3.3 Evaluation of Biological Indicator Parameters

Specific chemical indicators of biodegradation were measured during the October 2005 and January 2006 sampling events 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 1523 are presented in Table 1.

Dissolved oxygen concentrations at Site 1523 ranged from 0.18 mg/L (1523-MW01) to 5.15 mg/L (1523-MW04) during October 2005, and from 0 mg/L (1523-MW01 and 1523-MW05) to 4.11 mg/L (1523-MW07) in January 2006. Historic and recent dissolved oxygen readings indicate that concentrations are generally much lower in wells which exhibit measurable amounts of petroleum constituents. These data indicate that aerobic biodegradation may be occurring in areas of hydrocarbon contamination at the site.

Nitrate levels ranged from 0.75 to 180J mg/L in wells 1523-MW01 through 1523-MW07 in October 2005. The nitrate levels were slightly lower in January 2006, with levels ranging from 0.47 to 150 mg/L. No correlation between lower nitrate levels and elevated petroleum concentrations was identified at Site 1523.

Sulfate concentrations in wells sampled at Site 1523 during October 2005 (1523-MW01 through 1523-MW07) ranged from 28 to 179 mg/L. Sulfate concentrations in wells during January 2006 (1523-MW01 through 1523-MW05, 1523-MW07) ranged from 31 to 280 mg/L. Generally, lower sulfate levels were observed in monitoring wells with petroleum hydrocarbon constituents present, which suggests the occurrence of biodegradation by processes associated with natural attenuation.

Reduced iron (Fe^{2+}) was detected during the October 2005 sampling event as total iron in wells 1523-MW01 (0.37 mg/L), 1523-MW02 (0.48 mg/L), 1523-MW03 (0.52 mg/L), 1523-MW04 (0.37 mg/L), 1523-MW06 (0.31 mg/L), and 1523-MW07 (0.62 mg/L). During the January 2006 sampling event, reduced iron was not detected (<0.050 mg/L) in any well at Site 1523.

Reduced manganese (Mn^{2+}) concentrations measured during the October 2005 sampling event were low, ranging from <0.0050 mg/L (1523-MW02, -MW04, -MW05) to 0.56 mg/L (1523-MW06). Similar trends were measured during the January 2006 sampling event. Generally, higher levels of reduced manganese were observed in wells with petroleum constituents, which provides some evidence that biodegradation is occurring at the site.

Methane concentrations were only detected in well 1523-MW03 at a concentration of 67 µg/L during the October 2005 sampling event. In January 2006, methane was detected in wells 1523-MW01, 1523-MW02, and 1523-MW03 at concentrations of 27 µg/L, 25 µg/L, and 59 µg/L, respectively. Generally, methane was observed in wells exhibiting the presence of hydrocarbon constituents, which would be expected.

Alkalinity concentrations during the October 2005 sampling event in monitoring wells 1523-MW01 through 1523-MW07 ranged from 160 to 440 mg/L as calcium carbonate ($CaCO_3$). Alkalinity concentrations recorded during January 2006 were relatively lower than the values recorded for the previous sampling event, with values ranging from 21 to 160 mg/L as $CaCO_3$.

Oxidation-reduction potential values taken during the October 2005 sampling event in monitoring wells 1523-MW01 through 1523-MW07 ranged from 9 to 248 millivolts (mV). The January 2006 ORP values in wells 1523-MW01 through 1523-MW07 showed slightly elevated conditions in relation to the October 2005 recorded values, with readings varying from 193.2 to 370 mV. Field-

measured ORP values may be used to identify *relative* differences of ORPs in different wells at a site. Because groundwater is seldom in a state of redox equilibrium and because platinum electrodes are subject to a variety of interferences (Chapelle et al., 1996), ORP values are not used to identify specific terminal electron acceptor processes.

In general, electron acceptors are depleted in wells with higher levels of petroleum constituents at former UST Site 1523. Conversely, metabolic byproducts of hydrocarbon mineralization are elevated 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 1523.

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, 1999), as summarized in Table 4. 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, Inc., 2004). Laboratory quality control (QC) summaries 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 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, in general, data quality objectives were met. Additionally, the analytical data, along with the associated laboratory QC information, were forwarded to an independent data validation service. 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. There were a few exceptions to the analytical criteria as noted in the laboratory data validation reports:

- The holding time requirement was exceeded for the VOCs analyses for samples collected from wells 1523-MW02 and 1523-MW04 during the October 2005 sampling event.
- The holding time requirement was exceeded (>2X) for the nitrate/nitrite analyses for samples collected from wells 1523-MW01 and 1523-MW04 during the October 2005 sampling event.

Exceptions to the analytical criteria generally 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 nitrate/nitrite non-detect results for samples that exceeded the holding time were assigned "R" flags. The "R" flag indicates that the non-detect result is unusable due to a gross exceedance (>2X) of holding time. Individual laboratory data validation sheets 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 1523. Field duplicate samples were collected at a rate of >10% of the total number of groundwater monitoring wells sampled at Site 1523. These samples were collected to ensure the consistency and integrity of sample collection methods. Duplicate samples were collected from Site 1523 during both the October 2005 and January 2006 sampling events.

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 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 the equipment rinsate blank at concentrations of 0.80 μg/L and 0.81 μg/L, respectively. However, toluene has never been detected in the groundwater at Site 1523. Therefore, it has been concluded that the toluene detections likely were the result of laboratory contamination.

Refer to Table 5 for the results of the October 2005 and 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 18 L of purged groundwater and water used to decontaminate the field equipment were generated at Site 1523 during the October 2005 sampling event, and approximately 30 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. Copies of the manifests for waste removal are provided in Appendix G.

The free product/groundwater waste derived from the selectively absorbent sock activity is being stored in a 55-gallon drum equipped with an over pack. This drum is located within the Battelle Site Office yard at MCB Camp Pendleton. The waste is on a 60-day holding cycle. Approximately 4.3 gallons of free product/groundwater were removed from the site during this reporting period. The manifests associated with this waste also can be found in Appendix G.

Section 6.0: CONCLUSIONS

This semiannual report contains groundwater monitoring data collected from Site 1523, 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 summarizes the additional site assessment activities conducted at Site 1523 in September 2005. The groundwater monitoring program that has been implemented at Site 1523 is designed to evaluate the occurrence of petroleum hydrocarbon constituents in the groundwater, as well as monitor the dissolved-phase plume for stability.

The groundwater monitoring well network at former UST Site 1523 was expanded during September 2005 to include two wells (1523-MW06 and 1523-MW07) in the canyon to the northeast and in the interpreted downgradient location from the former UST area. In addition, one sentry well (1523-MW08) was installed to the south of the former UST area to monitor for the presence of petroleum hydrocarbon constituents in groundwater. 1523-MW08 has been dry since its completion; however, this well will continue to be monitored for the presence of groundwater in order to evaluate site conditions in this vicinity. In all, the groundwater monitoring well network at Site 1523 has been expanded from five to eight wells. No soil samples were collected during the groundwater monitoring well installation activities, as the soil hydrocarbon plume had previously been well defined (Ninyo and Moore, 2000).

In addition to the expansion of the groundwater monitoring well network at Site 1523, approximately 512 yd^3 of contaminated soils were removed from the site in July 2005. For a complete description of all excavation activities conducted at Site 1523, please refer to the *Summary Report of Remedial Action Activities at Site 1523, Marine Corps Base Camp Pendleton* (Battelle, 2005b).

Following expansion of the groundwater monitoring well network at former UST Site 1523, quarterly monitoring activities took place during October 2005 and January 2006. Laboratory results from the October 2005 sampling event indicated that TPH-D was present in two wells only: 1523-MW01 (0.055 mg/L) and 1523-MW03 (0.077 mg/L). Both of these TPH-D detections were below their respective Water Quality Criteria for TPH (i.e., TOT of 0.1 mg/L) (RWQCB, 1994). During January 2006, TPH-D was detected in four site wells: 1523-MW01 (0.074 mg/L), 1523-MW02 (0.10 mg/L), 1523-MW03 (0.15 mg/L), and 1523-MW06 (0.15 mg/L). Based on the results from this sampling event, the TOT for TPH of 0.10 mg/L was exceeded slightly in wells 1523-MW03 and 1523-MW06. In addition, benzene was detected in 1523-MW01 and 1523-MW03 during January 2006 at concentrations of 0.46J and 0.29J μg/L, respectively. Ethylbenzene was detected in 1523-MW05 during October 2005 at a concentration of 1.1 μg/L, and in 1523-MW01 during January 2006 at a concentration of 2.4 μg/L. Naphthalene was detected in 1523-MW03 at 2.6 μg/L during January 2006. Furthermore, trichloroethylene was measured in 1523-MW03 during October 2005 and January 2006 at concentrations of 1.7 and 2.0 μg/L, respectively, and in 1523-MW05 during January 2006 at 1.5 μg/L. None of the VOC detections in the groundwater at Site 1523 were above MCLs for the respective analytes, and no other VOC or PNA constituents were detected in any of the other groundwater samples collected from the October 2005 and January 2006 sampling events.

Over the last two quarters of monthly monitoring, free product has not been detected at measurable amounts within the two recovery wells (1523-RW01 and 1523-RW02) at Site 1523. However, a product sheen was noted in both wells during October 2005 and January 2006. Due to the historic presence of free product at Site 1523, 2-inch-wide, 36-inch-long absorbent socks were installed in each of wells 1523-RW01 and 1523-RW02 on October 18, 2004. The absorbent socks currently are being

used as a passive recovery method and appear to be working well, as the product level in each well has been reduced to a sheen.

Quarterly groundwater monitoring is scheduled to continue at Site 1523 to further evaluate site conditions with the expanded groundwater monitoring well network. Additionally, the absorbent socks are being used for continued free product management at the site, and free product will continue to be monitored on a monthly basis. 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 1523 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, 2005b], and free product is no longer observed at the site).

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

- TPH levels in groundwater are only slightly above the respective TOT for TPH of 0.1 mg/L. The maximum TPH concentration detected at the site over the past year is 0.15 mg/L and is located in the former UST region. No VOC or PNA constituents exceed their respective MCLs.

- The dissolved-phase plume appears to be stable, and newly installed wells in the interpreted downgradient groundwater do not exhibit detectable levels of TPH (with the exception of one detection in 1523-MW06 that was slightly above the TOT).

- 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.

- Site 1523 is located further than 5 miles from the nearest downgradient drinking water well in the city of Oceanside.

Section 7.0: REFERENCES

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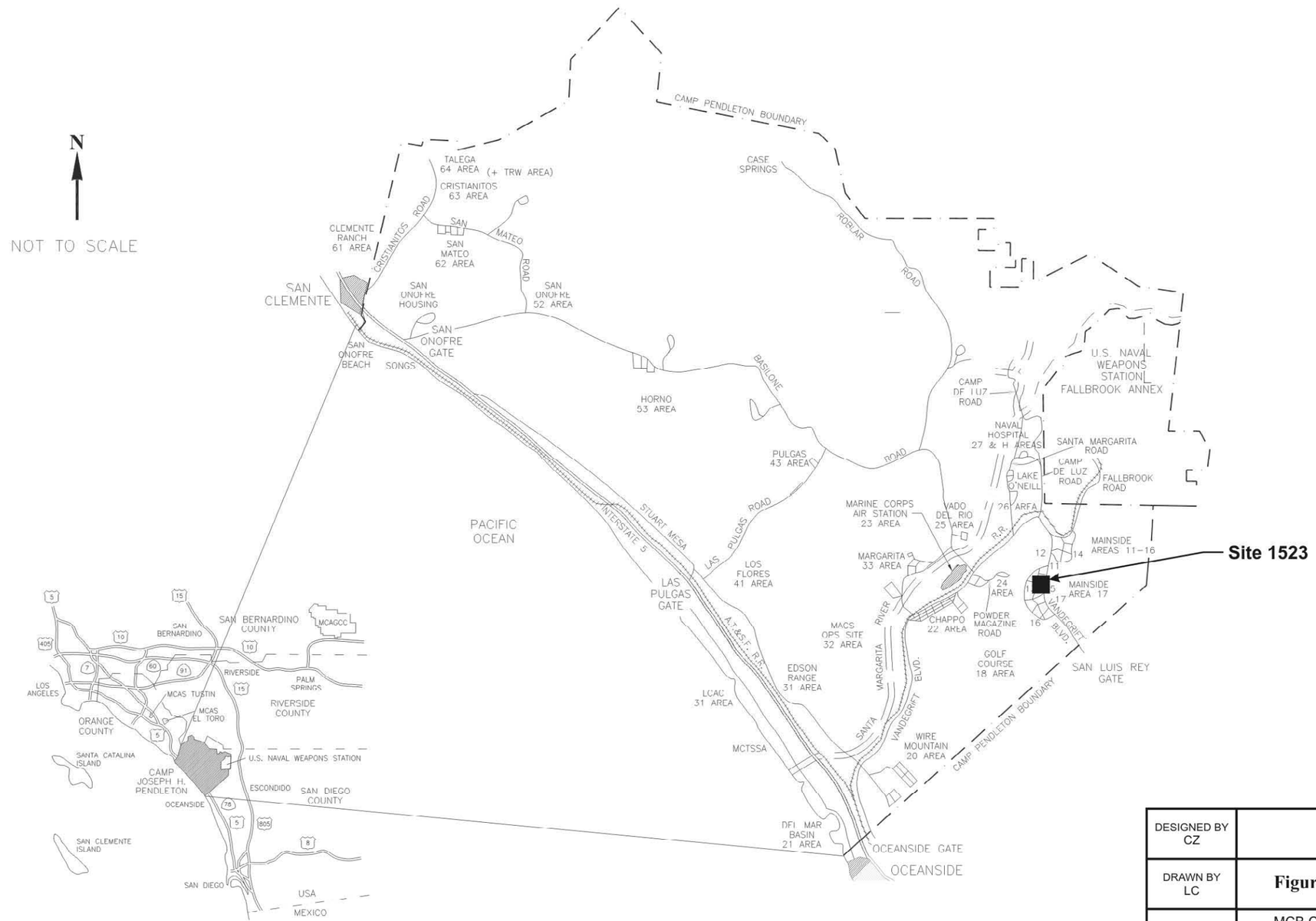
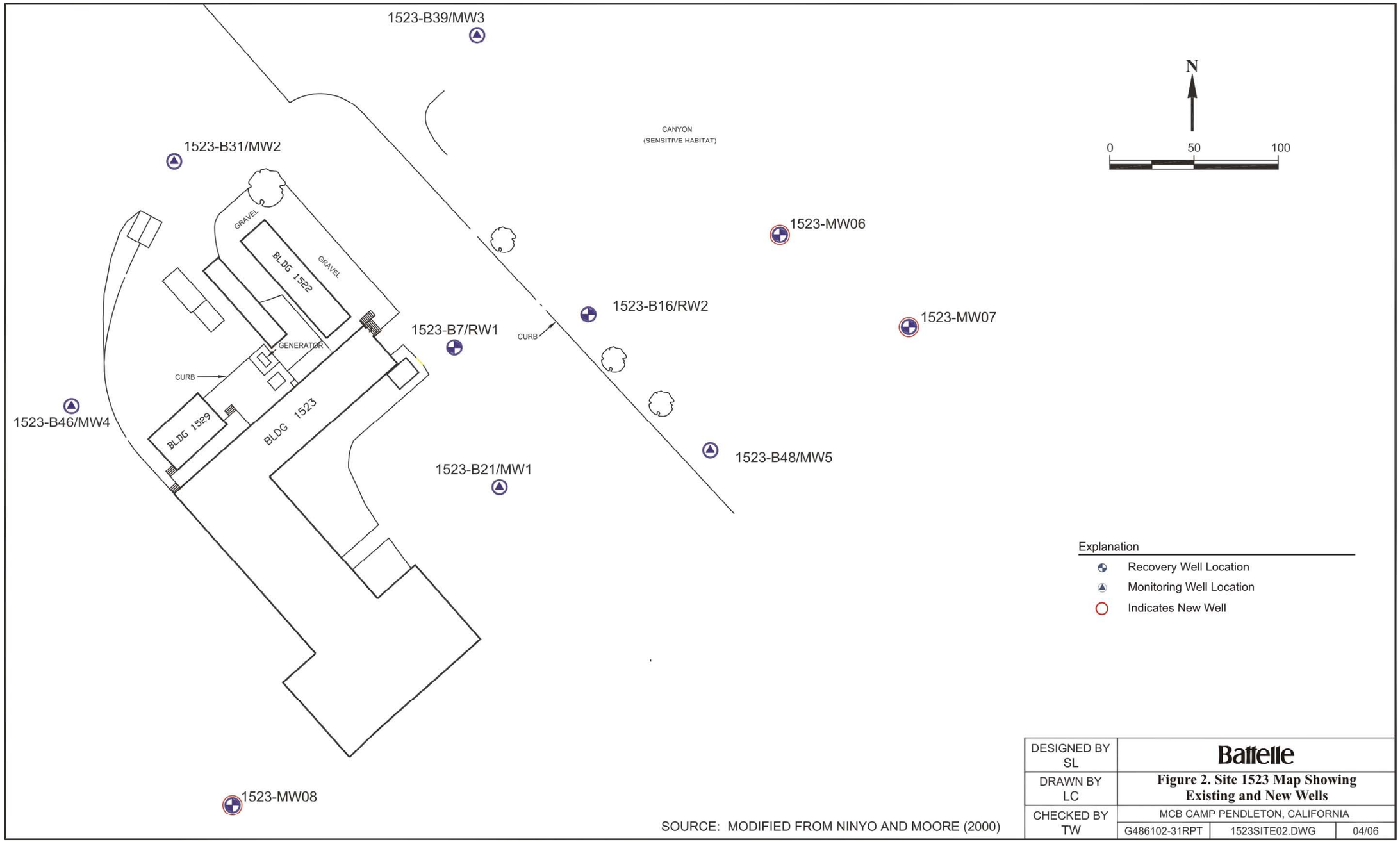
FIGURES

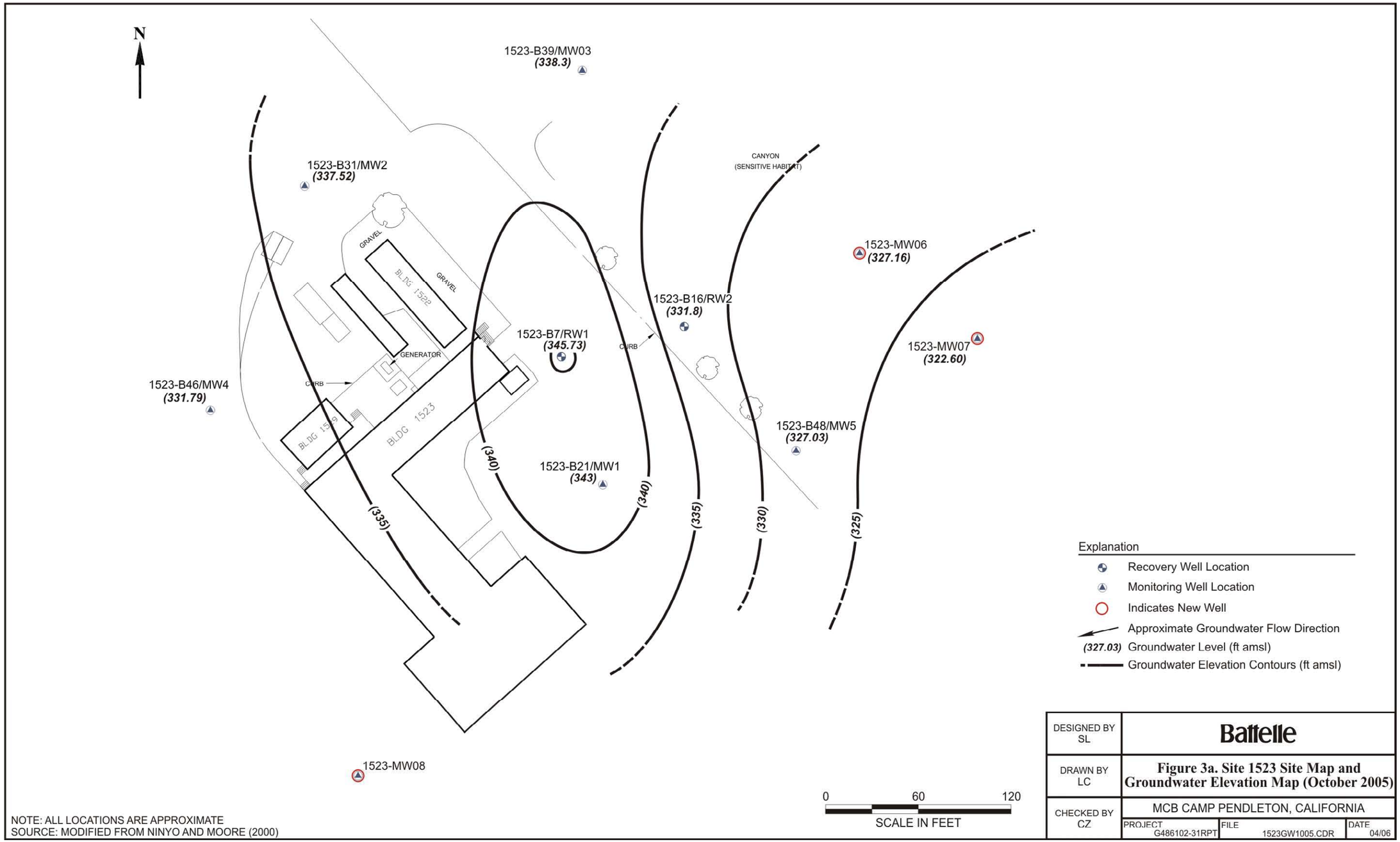


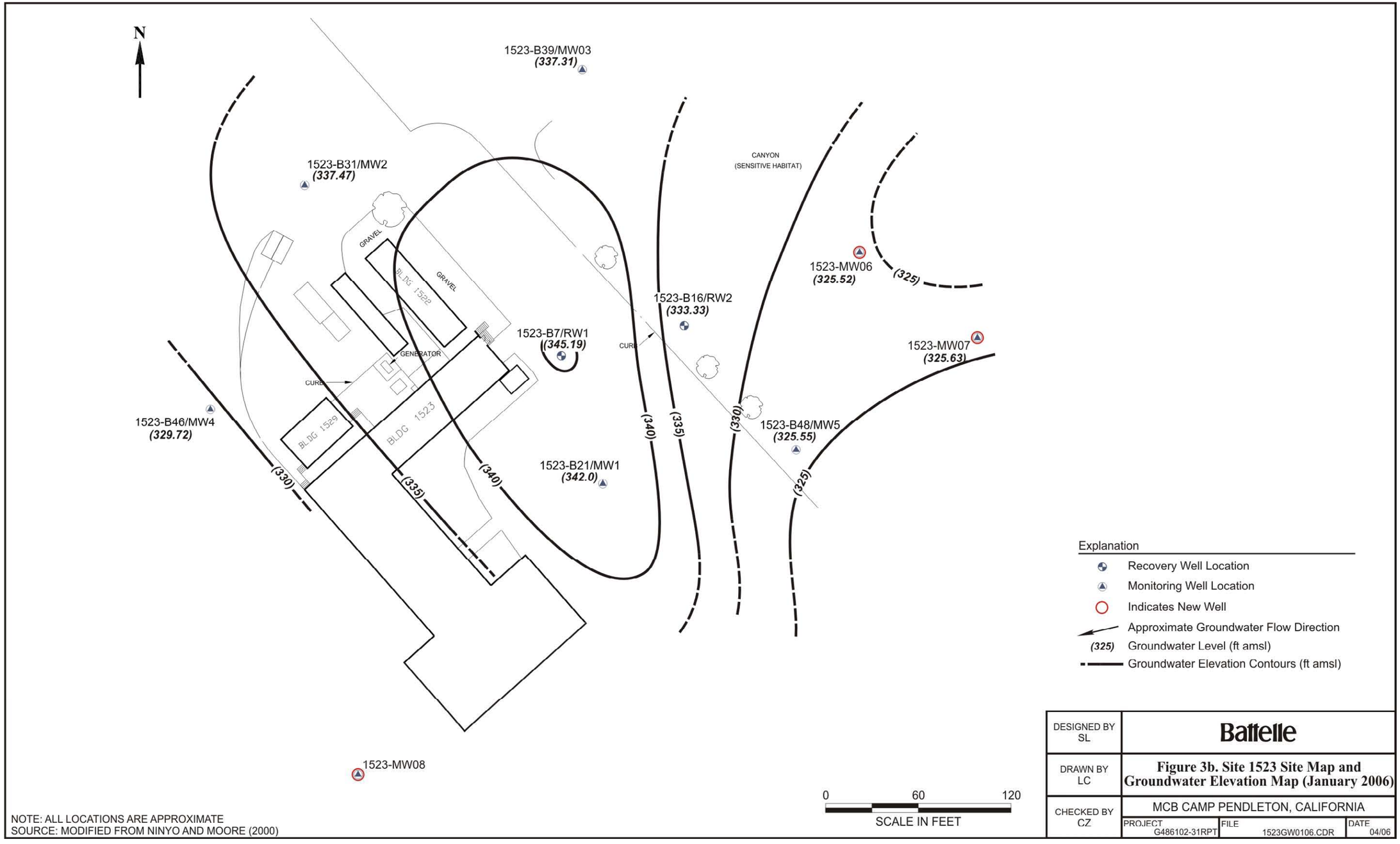
NOTE: MODIFIED FROM KLEINFELDER, REMOVAL OF UNDERGROUND STORAGE TANKS, CAMP JOSEPH H. PENDLETON, CAMP PENDLETON, CALIFORNIA NAVFAC DWG. NO. 8029558 AND 8029553

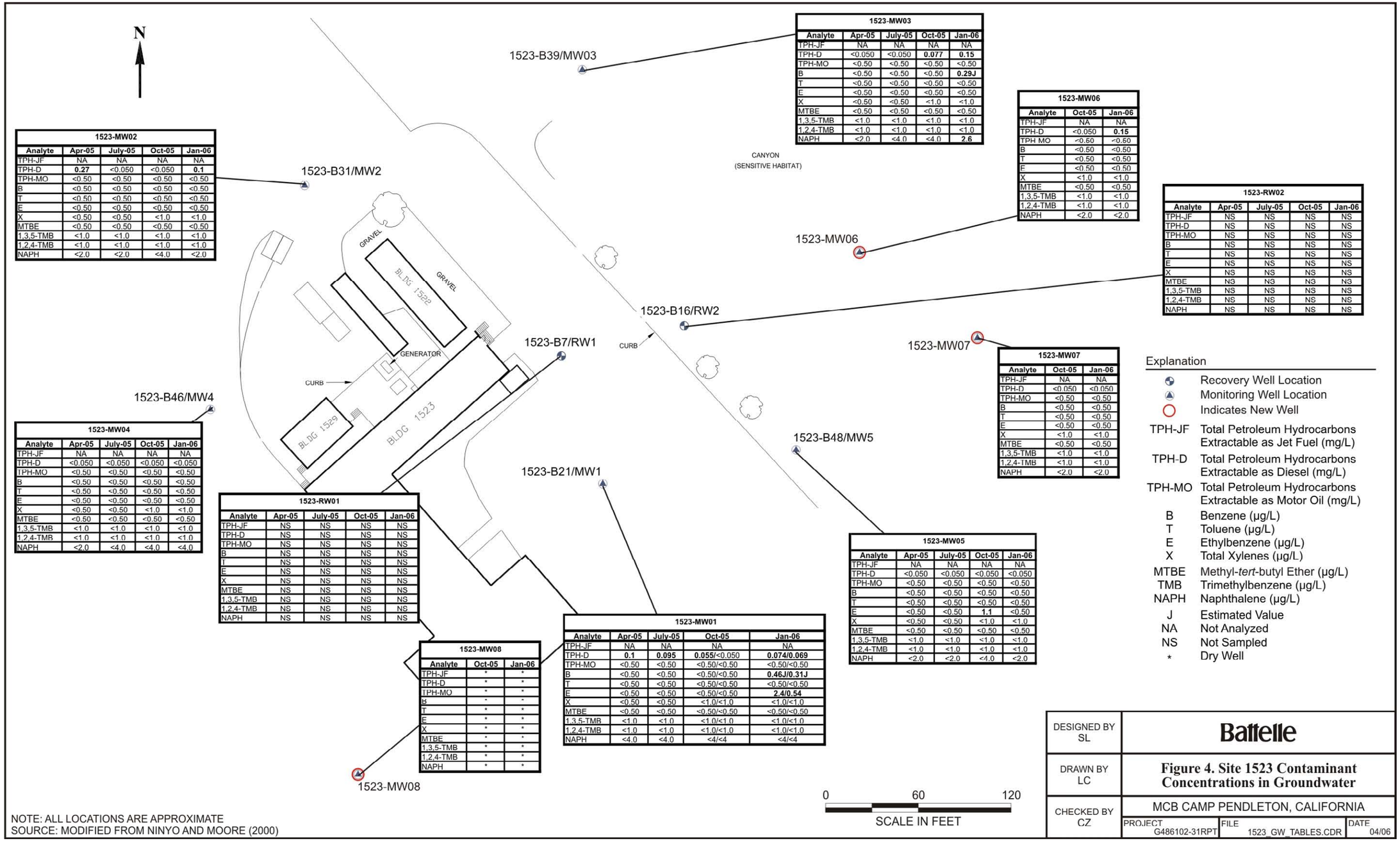
DESIGNED BY CZ	Battelle		
DRAWN BY LC	**Figure 1. Site 1523 Vicinity Map**		
CHECKED BY MG	MCB CAMP PENDLETON, CALIFORNIA		
	PROJECT G486102-31RPT	FILE 1523FIGURE1.CDR	DATE 04/06



DESIGNED BY SL	Battelle		
DRAWN BY LC	**Figure 2. Site 1523 Map Showing Existing and New Wells**		
CHECKED BY TW	MCB CAMP PENDLETON, CALIFORNIA		
	G486102-31RPT	1523SITE02.DWG	04/06


N
1523-B39/MW03
(338.3)
1523-B31/MW2
(337.52)
CANYON
(SENSITIVE HABITAT)
1523-MW06
(327.16)
GRAVEL
GRAVEL
BLDG 1522
1523-B16/RW2
(331.8)
1523-B7/RW1
(345.73)
CURB
1523-MW07
(322.60)
GENERATOR
CURB
1523-B46/MW4
(331.79)
BLDG 1523
1523-B48/MW5
(327.03)
(340)
1523-B21/MW1
(343)
(340)
(335)
(335)
(330)
(325)
Explanation
Recovery Well Location
Monitoring Well Location
Indicates New Well
Approximate Groundwater Flow Direction
(327.03) Groundwater Level (ft amsl)
Groundwater Elevation Contours (ft amsl)
1523-MW08
0
60
120
SCALE IN FEET
NOTE: ALL LOCATIONS ARE APPROXIMATE
SOURCE: MODIFIED FROM NINYO AND MOORE (2000)
DESIGNED BY SL
DRAWN BY LC
CHECKED BY CZ
Battelle
Figure 3a. Site 1523 Site Map and Groundwater Elevation Map (October 2005)
MCB CAMP PENDLETON, CALIFORNIA
PROJECT G486102-31RPT
FILE 1523GW1005.CDR
DATE 04/06


N
1523-B39/MW03
(337.31)
1523-B31/MW2
(337.47)
CANYON
(SENSITIVE HABITAT)
GRAVEL
GRAVEL
BLDG 1522
1523-MW06
(325.52)
(325)
1523-B16/RW2
(333.33)
1523-B7/RW1
(345.19)
CURB
GENERATOR
1523-MW07
(325.63)
CURB
BLDG 1529
BLDG 1523
1523-B46/MW4
(329.72)
(330)
(335)
(340)
(340)
(335)
(330)
1523-B48/MW5
(325.55)
(325)
1523-B21/MW1
(342.0)
1523-MW08
Explanation
Recovery Well Location
Monitoring Well Location
Indicates New Well
Approximate Groundwater Flow Direction
(325) Groundwater Level (ft amsl)
Groundwater Elevation Contours (ft amsl)
0
60
120
SCALE IN FEET
NOTE: ALL LOCATIONS ARE APPROXIMATE
SOURCE: MODIFIED FROM NINYO AND MOORE (2000)
DESIGNED BY SL
Battelle
DRAWN BY LC
Figure 3b. Site 1523 Site Map and Groundwater Elevation Map (January 2006)
CHECKED BY CZ
MCB CAMP PENDLETON, CALIFORNIA
PROJECT G486102-31RPT
FILE 1523GW0106.CDR
DATE 04/06



1523-MW03

Analyte	Apr-05	July-05	Oct-05	Jan-06
TPH-JF	NA	NA	NA	NA
TPH-D	<0.050	<0.050	**0.077**	**0.15**
TPH-MO	<0.50	<0.50	<0.50	<0.50
B	<0.50	<0.50	<0.50	**0.29J**
T	<0.50	<0.50	<0.50	<0.50
E	<0.50	<0.50	<0.50	<0.50
X	<0.50	<0.50	<1.0	<1.0
MTBE	<0.50	<0.50	<0.50	<0.50
1,3,5-TMB	<1.0	<1.0	<1.0	<1.0
1,2,4-TMB	<1.0	<1.0	<1.0	<1.0
NAPH	<2.0	<4.0	<4.0	**2.6**

1523-MW06

Analyte	Oct-05	Jan-06
TPH-JF	NA	NA
TPH-D	<0.050	**0.15**
TPH MO	<0.50	<0.50
B	<0.50	<0.50
T	<0.50	<0.50
E	<0.50	<0.50
X	<1.0	<1.0
MTBE	<0.50	<0.50
1,3,5-TMB	<1.0	<1.0
1,2,4-TMB	<1.0	<1.0
NAPH	<2.0	<2.0

1523-RW02

Analyte	Apr-05	July-05	Oct-05	Jan-06
TPH-JF	NS	NS	NS	NS
TPH-D	NS	NS	NS	NS
TPH-MO	NS	NS	NS	NS
B	NS	NS	NS	NS
T	NS	NS	NS	NS
E	NS	NS	NS	NS
X	NS	NS	NS	NS
MTBE	NS	NS	NS	NS
1,3,5-TMB	NS	NS	NS	NS
1,2,4-TMB	NS	NS	NS	NS
NAPH	NS	NS	NS	NS

1523-MW02

Analyte	Apr-05	July-05	Oct-05	Jan-06
TPH-JF	NA	NA	NA	NA
TPH-D	**0.27**	<0.050	<0.050	**0.1**
TPH-MO	<0.50	<0.50	<0.50	<0.50
B	<0.50	<0.50	<0.50	<0.50
T	<0.50	<0.50	<0.50	<0.50
E	<0.50	<0.50	<0.50	<0.50
X	<0.50	<0.50	<1.0	<1.0
MTBE	<0.50	<0.50	<0.50	<0.50
1,3,5-TMB	<1.0	<1.0	<1.0	<1.0
1,2,4-TMB	<1.0	<1.0	<1.0	<1.0
NAPH	<2.0	<2.0	<4.0	<2.0

1523-MW07

Analyte	Oct-05	Jan-06
TPH-JF	NA	NA
TPH-D	<0.050	<0.050
TPH-MO	<0.50	<0.50
B	<0.50	<0.50
T	<0.50	<0.50
E	<0.50	<0.50
X	<1.0	<1.0
MTBE	<0.50	<0.50
1,3,5-TMB	<1.0	<1.0
1,2,4-TMB	<1.0	<1.0
NAPH	<2.0	<2.0

1523-MW04

Analyte	Apr-05	July-05	Oct-05	Jan-06
TPH-JF	NA	NA	NA	NA
TPH-D	<0.050	<0.050	<0.050	<0.050
TPH-MO	<0.50	<0.50	<0.50	<0.50
B	<0.50	<0.50	<0.50	<0.50
T	<0.50	<0.50	<0.50	<0.50
E	<0.50	<0.50	<0.50	<0.50
X	<0.50	<0.50	<1.0	<1.0
MTBE	<0.50	<0.50	<0.50	<0.50
1,3,5-TMB	<1.0	<1.0	<1.0	<1.0
1,2,4-TMB	<1.0	<1.0	<1.0	<1.0
NAPH	<2.0	<4.0	<4.0	<4.0

1523-RW01

Analyte	Apr-05	July-05	Oct-05	Jan-06
TPH-JF	NS	NS	NS	NS
TPH-D	NS	NS	NS	NS
TPH-MO	NS	NS	NS	NS
B	NS	NS	NS	NS
T	NS	NS	NS	NS
E	NS	NS	NS	NS
X	NS	NS	NS	NS
MTBE	NS	NS	NS	NS
1,3,5-TMB	NS	NS	NS	NS
1,2,4-TMB	NS	NS	NS	NS
NAPH	NS	NS	NS	NS

1523-MW05

Analyte	Apr-05	July-05	Oct-05	Jan-06
TPH-JF	NA	NA	NA	NA
TPH-D	<0.050	<0.050	<0.050	<0.050
TPH-MO	<0.50	<0.50	<0.50	<0.50
B	<0.50	<0.50	<0.50	<0.50
T	<0.50	<0.50	<0.50	<0.50
E	<0.50	<0.50	**1.1**	<0.50
X	<0.50	<0.50	<1.0	<1.0
MTBE	<0.50	<0.50	<0.50	<0.50
1,3,5-TMB	<1.0	<1.0	<1.0	<1.0
1,2,4-TMB	<1.0	<1.0	<1.0	<1.0
NAPH	<2.0	<2.0	<4.0	<2.0

1523-MW08

Analyte	Oct-05	Jan-06
TPH-JF	*	*
TPH-D	*	*
TPH-MO	*	*
B	*	*
T	*	*
E	*	*
X	*	*
MTBE	*	*
1,3,5-TMB	*	*
1,2,4-TMB	*	*
NAPH	*	*

1523-MW01

Analyte	Apr-05	July-05	Oct-05	Jan-06
TPH-JF	NA	NA	NA	NA
TPH-D	**0.1**	**0.095**	**0.055**/<0.050	**0.074/0.069**
TPH-MO	<0.50	<0.50	<0.50/<0.50	<0.50/<0.50
B	<0.50	<0.50	<0.50/<0.50	**0.46J/0.31J**
T	<0.50	<0.50	<0.50/<0.50	<0.50/<0.50
E	<0.50	<0.50	<0.50/<0.50	**2.4/0.54**
X	<0.50	<0.50	<1.0/<1.0	<1.0/<1.0
MTBE	<0.50	<0.50	<0.50/<0.50	<0.50/<0.50
1,3,5-TMB	<1.0	<1.0	<1.0/<1.0	<1.0/<1.0
1,2,4-TMB	<1.0	<1.0	<1.0/<1.0	<1.0/<1.0
NAPH	<4.0	<4.0	<4/<4	<4/<4

Figure 5. Historical Trends of Contaminant Concentrations at Site 1523

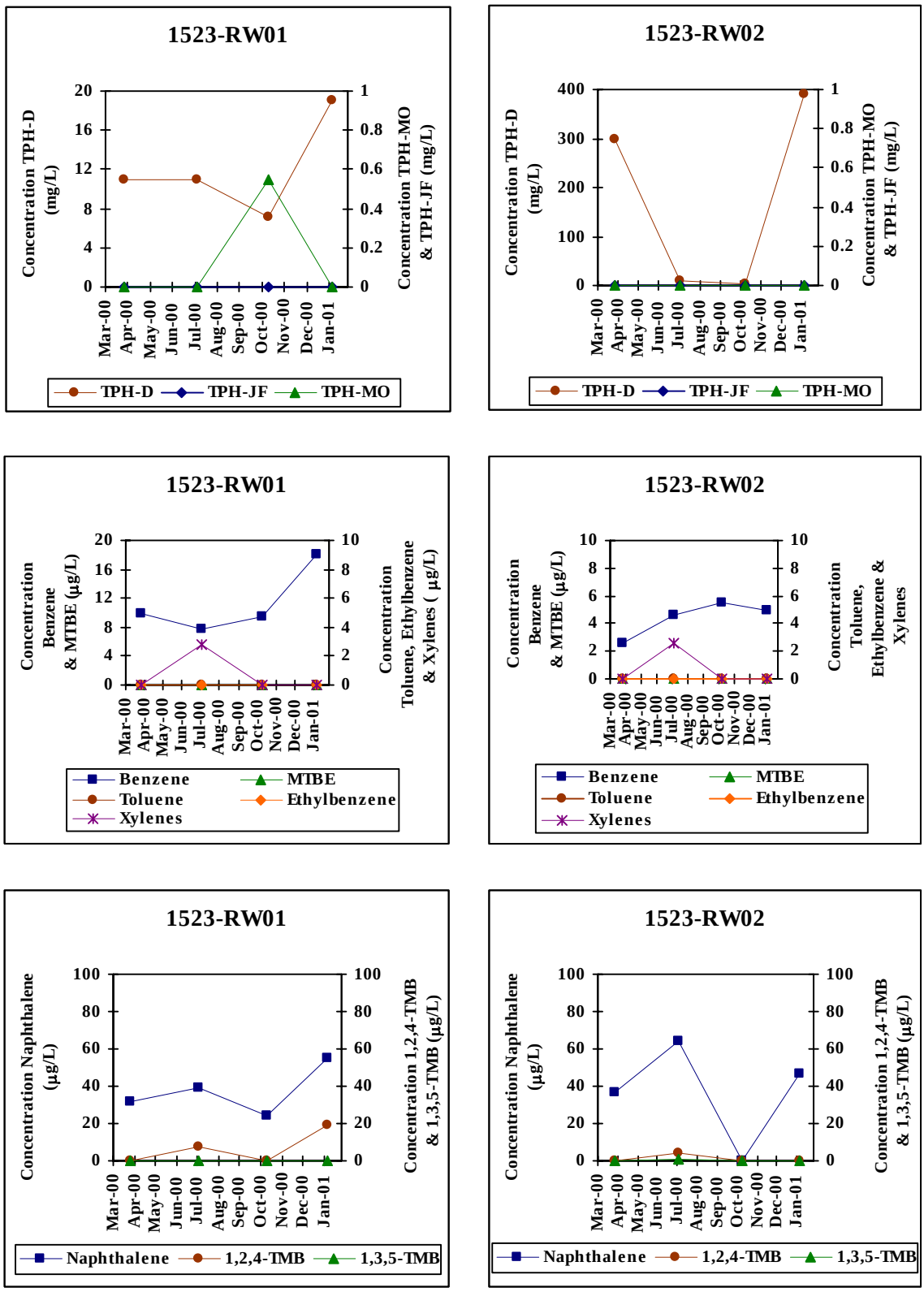


Figure 5. Historical Trends of Contaminant Concentrations at Site 1523 (Continued)

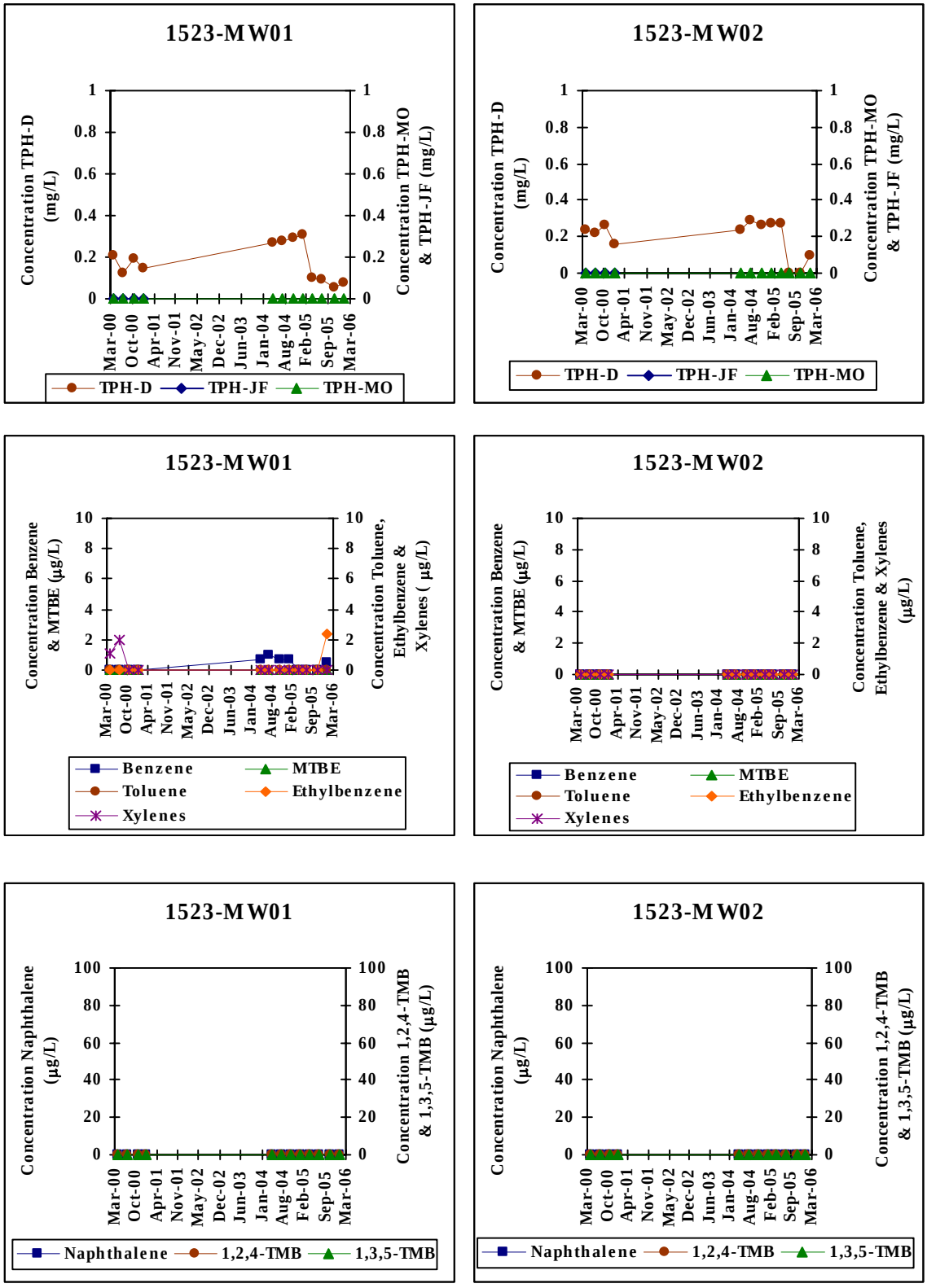


Figure 5. Historical Trends of Contaminant Concentrations at Site 1523 (Continued)

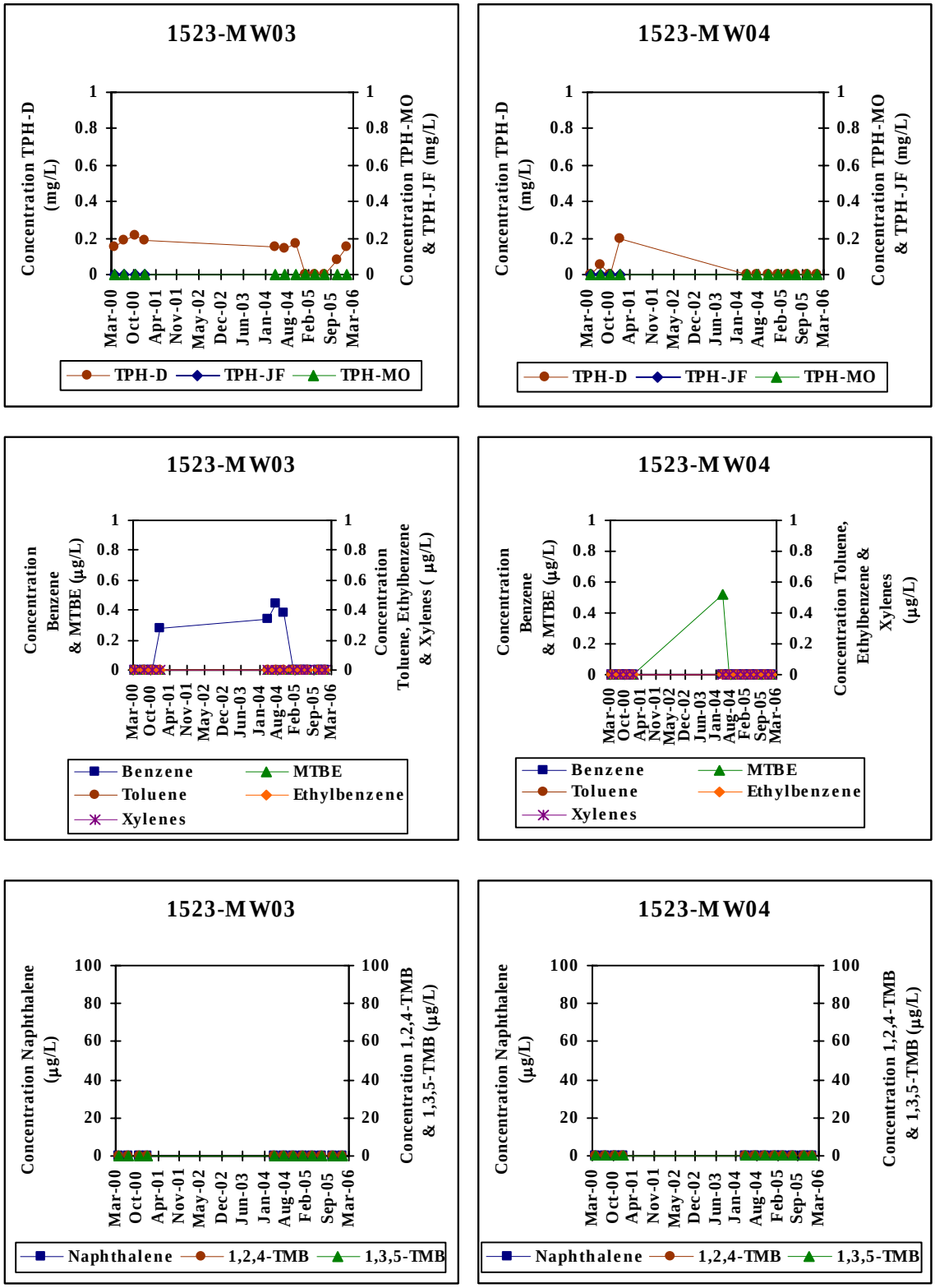


Figure 5. Historical Trends of Contaminant Concentrations at Site 1523 (Continued)

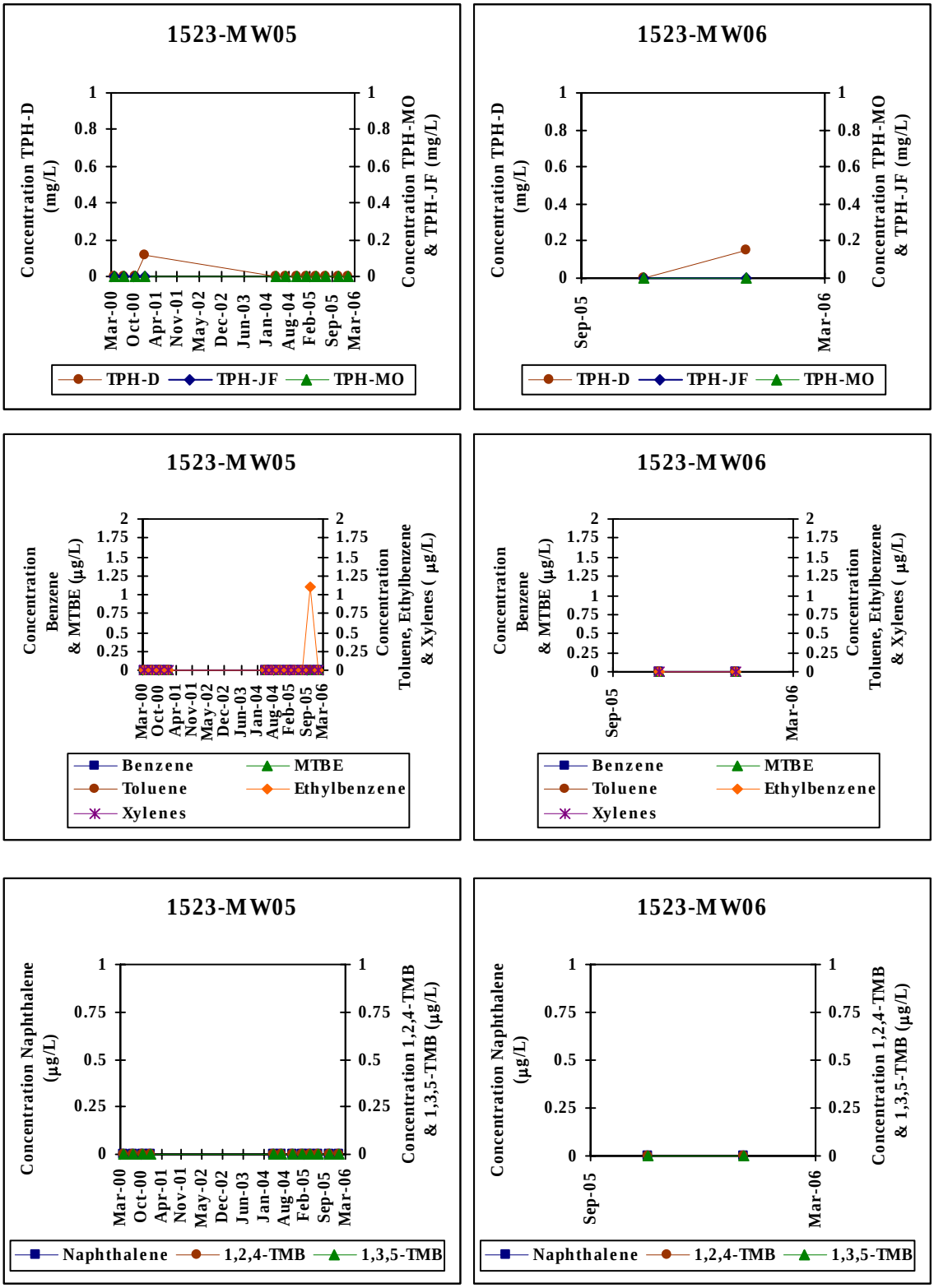
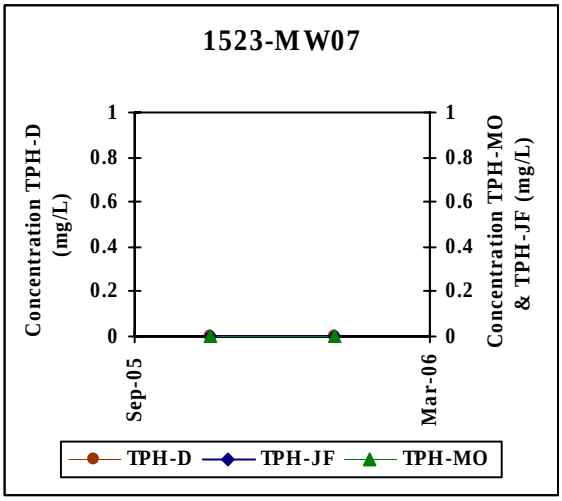
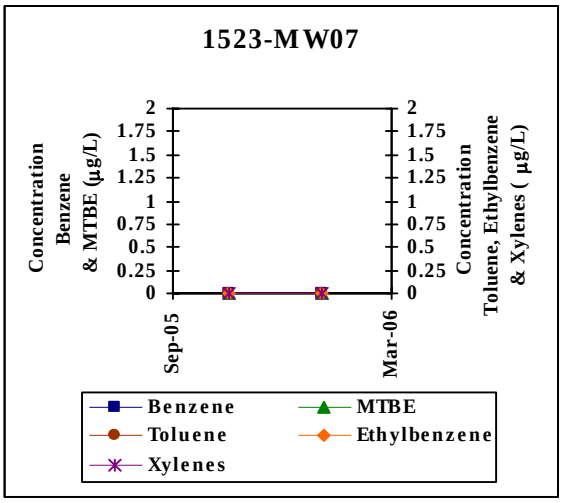
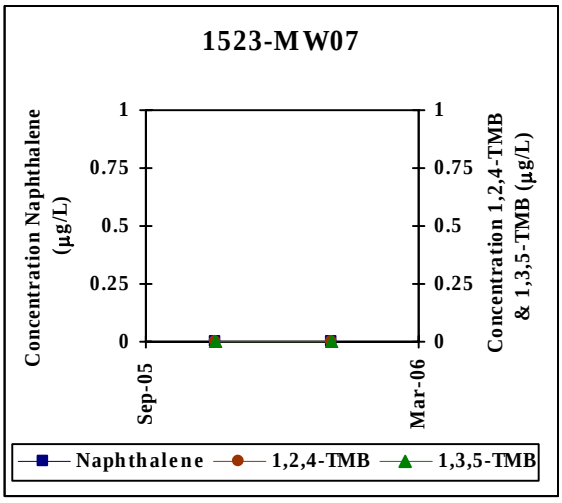


Figure 5. Historical Trends of Contaminant Concentrations at Site 1523 (Continued)







TABLES

Table 1. Analytical Results and Water Quality Parameters

Analyte	Units	1523-RW01 (not sampled since January 2001)					1523-RW02 (not sampled since January 2001)					
		4/09/00[a]	7/15/00	10/19/00[a]	1/14/01[a]	1/14/01[a][b]	4/12/00[a]	7/15/00	7/15/00[b]	10/19/00[a]	10/19/00[a][b]	1/31/01[a]
Organics							***Organics***					
TPH-JF	mg/L	<0.050	<0.050	<0.050	<0.50	<0.50	<0.050	<0.050	<0.050	<0.050	<0.050	<0.50
TPH-D	mg/L	11	11	7.1	19	19	300	11	6.3	1.9	8.1	390
TPH-MO	mg/L	<0.50	<0.50	0.55 G	<0.50	<0.50			<0.50	<0.50	0.94 G	<0.50
TPH-U[c]	mg/L	NA	NA	NA	NA	NA	NA	NA	1.2	NA	NA	NA
Benzene	µg/L	10	7.7	9.5	18	7.9	2.6	4.6	4	5.5	5.4	5.0 J
Toluene	µg/L	<5.0	<1.0	<2.5	<5.0	<5.0	<2.5	<0.50	<0.50	<2.5	<2.5	<5.0
Ethylbenzene	µg/L	<5.0	<1.0	<2.5	<5.0	<5.0	<2.5	<0.50	<0.50	<2.5	<2.5	<5.0
Total Xylenes	µg/L	<10.0	2.8	<5.0	<10.0	<10.0	<5.0	2.6	2.5	<5.0	<5.0	<10.0
MTBE	µg/L	<5.0	<1.0	<2.5	<5.0	<5.0	<2.5	<0.50	<0.50	<2.5	<2.5	<5.0
TBA	µg/L	NA	<50	<50	NA	NA	NA	<20	<20	<50	<50	NA
DIPE	µg/L	NA	6.1	7	NA	NA	NA	3.7	3.4	5.1	5.3	NA
ETBE	µg/L	NA	<2.5	<5.0	NA	NA	NA	<1.0	<1.0	<5.0	<5.0	NA
TAME	µg/L	NA	<2.5	<5.0	NA	NA	NA	<1.0	<1.0	<5.0	<5.0	NA
1,3,5-TMB	µg/L	<10	<2.5	<5.0	<10	<10	<5.0	1.1	1.5	<5.0	<5.0	<10
1,2,4-TMB	µg/L	<10	7.9	<5.0	19	<10	<5.0	4.3	5.6	<5.0	<5.0	<10
Naphthalene	µg/L	32	39	24	55	39	37	64	60	<10	<10	47
TOC	mg/L	97	140	NA	70	93	24	30	35	25	38	21
Methane	µg/L	1,600	400	210	1,300	1,200	1,400	1,600	1,400	220	240	1,800
Inorganics							***Inorganics***					
Nitrate	mg/L	<0.3	<0.3	NA	<0.3	<0.3	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7
Nitrite	mg/L	<0.5	<0.5	NA	<0.5	<0.5	<2.3	<2.3	<2.3	<2.3	<2.3	<2.3
Sulfate	mg/L	2	<1.5	NA	<1.5	<1.5	14	<7.5	<7.5	<7.5	<7.5	<7.5
Manganese	mg/L	1.9	0.87	NA	1.1	1.2	16	9.6	9.2	7.6	7.6	9.1
Iron	mg/L	1.7	<0.1	NA	1.3	1.2	12.5	4.5	4.2	<0.1	<0.1	20
Lead	mg/L	<0.002	<0.005	NA	<0.010	<0.010	<0.005	<0.005	<0.005	0.02	<0.005	<0.010
Groundwater Quality Parameters							***Groundwater Quality Parameters***					
Alkalinity	mg/L as $CaCO_3$	925	710	NA	920	930	255	220	210	200	200	270
TDS	mg/L	1,956	1,700	NA	1,800	1,700	7,273	7,200	7,000	5,800	6,200	8,100
pH	units	6.12	NA	NA	6.28[d]	6.28[d]	NA	NA	NA	NA	NA	6.33
Conductivity	mS/cm	2.99	NA	NA	2.74[d]	2.74[d]	NA	NA	NA	NA	NA	12.9
DO	mg/L	0.39	NA	NA	0.0[d]	0.0[d]	NA	NA	NA	NA	NA	0.01
Turbidity	NTU	57	NA	NA	14.0[d]	14.0[d]	NA	NA	NA	NA	NA	82
Temperature	°C	27.4	NA	NA	23.0[d]	23.0[d]	NA	NA	NA	NA	NA	21.3
Salinity	%	0.14	NA	NA	0.13[d]	0.13[d]	NA	NA	NA	NA	NA	0.74
ORP	mV	-266	NA	NA	-12[d]	-12[d]	NA	NA	NA	NA	NA	-48

Table 1. Analytical Results and Water Quality Parameters (Page 2 of 5)

Analyte	Units	1523-MW01											
		4/09/00[a]	7/15/00[a]	10/19/00[a]	1/13/01[a]	4/16/04**	7/11/04**	10/19/04**	1/20/05**	4/17/05**	7/8/05**	10/26/05**	1/19/06**
Organics													
TPH-JF	mg/L	<0.050	<0.050	<0.050	<0.050	NA	NA	NA	NA	NA	NA	NA	NA
TPH-D	mg/L	0.21	0.12	0.19	0.15	0.27	0.28	0.29	0.31	0.1	0.095	0.055/<0.050	0.074/0.069
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
TPH-U[c]	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	µg/L	<1.0	<0.50	<1.0	<1.3 J	0.65	1.0	0.7	0.72	<0.50	<0.50	<0.50/<0.50	0.46J/0.31J
Toluene	µg/L	<1.0	<0.50	<1.0	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50/<0.50	<0.50/<0.50
Ethylbenzene	µg/L	<1.0	<0.50	<1.0	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50/<0.50	2.4/0.54
Total Xylenes	µg/L	1.1	1.97	<2.0	<5.0	<1.00	<1.00	<0.50	<0.50	<0.50	<0.50	<1.0/<1.0	<1.0/<1.0
MTBE	µg/L	<1.0	<0.50	<1.0	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50/<0.50	<0.50/<0.50
TBA	µg/L	NA	<10	<20	NA	<20	NA	<10	NA	NA	NA	NA	NA
DIPE	µg/L	NA	<1.0	<2.0	NA	<1.0	NA	<1.0	NA	NA	NA	NA	NA
ETBE	µg/L	NA	<1.0	<2.0	NA	<1.0	NA	<1.0	NA	NA	NA	NA	NA
TAME	µg/L	NA	<1.0	<2.0	NA	<1.0	NA	<1.0	NA	NA	NA	NA	NA
1,3,5-TMB	µg/L	<2.0	<1.0	<2.0	<5.0	<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	<2.0	<1.0	<2.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0/<1.0	<1.0/<1.0
Naphthalene	µg/L	<4.0	<2.0	<4.0	<10	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0/<4.0	<4.0/<4.0
TOC	mg/L	15	14	25	4.6	4.7	4.8	4.9	5.6	3.9	4.6	3.8/3.7	2.9/2.6
Methane	µg/L	47	150	500	1,000	240	16	17	49	<10	<10	<10/<10	27/10
Inorganics													
Nitrate	mg/L	4.2	6.6	6	4.8	9.3	9.8	6.3	7	43	46	53J/53J	50/45
Nitrite	mg/L	<0.9	<2.3	<2.3	<0.9	<13(e)	<1.3 (e)	<1.0	<1.0	<0.50	<1.3	<0.50R/<0.25R	<2.5/<2.5
Sulfate	mg/L	35	42	38	29	19	20	16	19	24	27	29/28	31/35
Manganese	mg/L	0.14	0.12	0.11	0.07	0.13	0.058	0.078	0.096	<0.0050	<0.0050	0.015/0.022	0.014
Iron	mg/L	<0.1	<0.1	<0.1	<0.1	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.37/<0.30*	<0.050/<0.050
Lead	mg/L	<0.002	<0.005	<0.005	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.005	<0.0050/<0.0050	<0.0050
Groundwater Quality Parameters													
Alkalinity	mg/L as $CaCO_3$	245	250	240	240	260	270	1,600	300	290	340	330/330	21/27
TDS	mg/L	4,896	4,900	4,900	4,800	5,600	5,200	4,900	5,100	11,000	10,000	11000/11,000	12000/12,000
pH	units	6.55	6.66	5.29	6.68	6.77	6.80	6.92	6.69	6.77	6.71	7.36	6.53
Conductivity	mS/cm	8.07	9.1	8.27	9.5	11.3	11.8	3.61	9.7	19.1	19.2	19.3	19.3
DO	mg/L	0.54	0.38	0.37	0.22	0.00	0.51	0	0.45	0.85	0	0.18	0
Turbidity	NTU	22	0.0	5	16.0	0.0	0	0	0	0	0	269	0.3
Temperature	°C	25.4	25.1	24.8	22.9	22.6	22.7	21.8	21.8	22.5	23.6	22.7	22.6
Salinity	%	0.44	0.50	0.45	0.53	0.64	0.66	0.18	0.54	1.14	1.15	1.15	1.2
ORP	mV	23	89	-186	540	150	180.2	172.1	234	209	230	158.3	370

Analyte	Units	1523-MW02											
		4/10/00[a]	7/15/00[a]	10/19/00[a]	1/13/01[a]	4/16/04**	7/11/04**	10/20/04**	1/20/05**	4/15/05**	7/8/05**	10/26/05**	1/19/06**
Organics													
TPH-JF	mg/L	<0.050	<0.050	<0.050	<0.050	NA	NA	NA	NA	NA	NA	NA	NA
TPH-D	mg/L	0.24	0.22	0.26	0.16	0.24	0.29	0.26	0.27	0.27	<0.050	<0.050	0.1
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
TPH-U[c]	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	µg/L	<0.50	<0.50	<0.50	<0.50	<1.0	<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	<1.0	<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	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Total Xylenes	µg/L	<1.00	<1.00	<1.00	<1.00	<2.0	<1.00	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0
MTBE	µg/L	<0.50	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
TBA	µg/L	NA	<10	<10	NA	<40	NA	<10	NA	NA	NA	NA	NA
DIPE	µg/L	NA	<1.0	<1.0	NA	<2.0	NA	<1.0	NA	NA	NA	NA	NA
ETBE	µg/L	NA	<1.0	<1.0	NA	<2.0	NA	<1.0	NA	NA	NA	NA	NA
TAME	µg/L	NA	<1.0	<1.0	NA	<2.0	NA	<1.0	NA	NA	NA	NA	NA
1,3,5-TMB	µg/L	<1.0	<1.0	<1.0	<1.0	<2.0	<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	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene	µg/L	<2.0	<2.0	<2.0	<2.0	<8.0	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0	<2.0
TOC	mg/L	6.2	6.8	23	2.5	7.8	7.6	7.6	9.2	8.6	7.7	8.2	6
Methane	µg/L	<5.0	6.0	<5.0	7.4	<10	96	130	120	24	<10	<10	25
Inorganics													
Nitrate	mg/L	22	18	23	18	19	19	20	18	16	8.5	8.7	9.3
Nitrite	mg/L	<0.9	<0.9	<0.9	<0.9	<13(e)	<0.25	<1.0	<0.25	<0.25	<0.25	<0.25	<0.25
Sulfate	mg/L	20	22	23	23	28	28	29	30	31	100	79	55
Manganese	mg/L	0.19	0.15	0.1	0.05	0.064	0.032	0.029	0.034	0.03	<0.0050	<0.0050	0.0082
Iron	mg/L	<0.1	<0.1	<0.1	<0.1	<0.050	<0.050	<0.05	<0.050	<0.050	<0.050	0.48*	<0.050
Lead	mg/L	<0.002	<0.005	<0.005	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.0050	<0.0050
Groundwater Quality Parameters													
Alkalinity	mg/L as $CaCO_3$	295	290	300	300	380	410	2,100	430	440	370	420	160
TDS	mg/L	2,864	3,100	3,000	1,900	2,200	2,400	2,100	2,100	1,900	1,100	1,300	1,800
pH	units	6.80	6.60	5.15	6.57	6.73	6.75	6.78	6.57	7	7.36	7.06	6.59
Conductivity	mS/cm	4.17	4.48	4.88	4.73	4.40	4.21	3.88	4.03	3.63	2.1	2.42	2.83
DO	mg/L	1.24	0.97	0.26	0.59	0.00	0.00	0	0.09	0.05	1.95	0.99	0.06
Turbidity	NTU	22	144	0	21.0	6	0	0	2	0	0	447	6
Temperature	°C	23.1	25.2	23.1	23.3	22.7	23.1	21.9	22.5	22.2	23.3	22.5	21.6
Salinity	%	0.21	0.23	0.25	0.24	0.22	0.21	0.19	0.2	0.18	0.1	0.11	0.14
ORP	mV	83	114	127	296	135	195.1	188.6	183.5	189.3	195.7	158.9	198.1

Table 1. Analytical Results and Water Quality Parameters (Page 3 of 5)

Analyte	Units	1523-MW03											
		4/10/00[a]	7/15/00[a]	10/19/00[a]	1/13/01[a]	4/16/04**	7/11/04**	10/19/04**	1/20/05**	4/15/05**	7/8/05**	10/26/05**	1/19/06**
Organics													
TPH-JF	mg/L	<0.050	<0.050	<0.050	<0.050	NA	NA	NA	NA	NA	NA	NA	NA
TPH-D	mg/L	0.15	0.19	0.21	0.19	0.15	0.14	0.17	<0.050	<0.050	<0.050	0.077	0.15
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
TPH-U[c]	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	µg/L	<1.0	<0.50	<0.50	0.28 J	0.34J	0.44	0.38	<0.50	<0.50	<0.50	<0.50	0.29J
Toluene	µg/L	<1.0	<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	<1.0	<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	<2.0	<1.00	<1.00	<1.00	<1.00	<1.00	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0
MTBE	µg/L	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
TBA	µg/L	NA	<10	<10	NA	<10	NA	<10	NA	NA	NA	NA	NA
DIPE	µg/L	NA	<1.0	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	NA	NA
ETBE	µg/L	NA	<1.0	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	NA	NA
TAME	µg/L	NA	<1.0	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	NA	NA
1,3,5-TMB	µg/L	<2.0	<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	<2.0	<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	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<4.0	<2.0	<4.0	<4.0	2.6
TOC	mg/L	5.0	3.2	24	1.3	3.9	3.8	6.2	9	10	8	6.5	7.8
Methane	µg/L	690	490	210	260	<10	<10	11	<10	<10	52	67	59
Inorganics													
Nitrate	mg/L	6.9	7.3	7.6	7	9.4	9.0	8.6	0.98	0.38	0.5	4.2	7.1
Nitrite	mg/L	<0.9	<0.9	<0.9	<0.9	<13(e)	<0.25	<1.0	<0.25	<0.25	<0.25	<0.25	<0.25
Sulfate	mg/L	21	24	22	27	31	32	33	35	40	34	31	31
Manganese	mg/L	0.44	0.37	0.083	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	0.035	0.098	0.18	0.18
Iron	mg/L	0.1	<0.1	<0.1	<0.1	<0.050	<0.050	<0.05	0.12	0.055	<0.050	0.52*	<0.050
Lead	mg/L	<0.002	<0.005	<0.005	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.0050	<0.0050
Groundwater Quality Parameters													
Alkalinity	mg/L as $CaCO_3$	180	160	150	150	130	140	710	110	230	210	160	61
TDS	mg/L	3,877	4,200	4,300	3,900	3,100	3,500	3,100	240	380		2,000	3,400
pH	units	6.81	6.71	5.13	6.63	6.92	6.76	7	6.93	7.75	6.97	7.29	6.59
Conductivity	mS/cm	7.05	6.91	6.62	6.45	6.48	6.25	5.75	0.467	0.617	1.62	5.11	5.24
DO	mg/L	13.3	0.22	0.39	0.70	0.02	0.64	0	3.07	0.05	0	1.54	0.04
Turbidity	NTU	14	0.0	33	20.0	0.0	0.0	0	29	0	5	384	0
Temperature	°C	26.3	23.3	23.1	22.7	23.3	23.2	21.3	22.1	21.5	23.3	22.2	20.8
Salinity	%	0.38	0.37	0.35	0.34	0.34	0.33	0.13	0.01	0.02	0.07	0.14	0.27
ORP	mV	52	171	49	545	196	556	528	165.9	195.5	155.7	248	297

Analyte	Units	1523-MW04											
		4/10/00[a]	7/15/00[a]	10/19/00[a]	1/14/01[a]	4/16/04**	7/11/04**	10/20/04**	1/20/05**	4/15/05**	7/8/05**	10/26/05**	1/19/06**
Organics													
TPH-JF	mg/L	<0.050	<0.10	<0.050	<0.050	NA	NA	NA	NA	NA	NA	NA	NA
TPH-D	mg/L	<0.050	<0.10	0.052	0.20 D	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
TPH-MO	mg/L	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
TPH-U[c]	mg/L	10 G	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	µg/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
Toluene	µg/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
Ethylbenzene	µg/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
Total Xylenes	µg/L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0
MTBE	µg/L	<0.50	<0.50	<0.50	<0.50	0.52	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
TBA	µg/L	NA	<10	<10	NA	12	NA	<10	NA	NA	NA	NA	NA
DIPE	µg/L	NA	<1.0	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	NA	NA
ETBE	µg/L	NA	<1.0	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	NA	NA
TAME	µg/L	NA	<1.0	<1.0	NA	<1.0	NA	<1.0	NA	NA	NA	NA	NA
1,3,5-TMB	µg/L	<1.0	<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	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<4.0	<2.0	<4.0	<4.0	<4.0
TOC	mg/L	11	25	5.9	2.2	6.4	11	6.4	8.2	5.8	7.1	8.5	5
Methane	µg/L	270	220	270	110	<10	<10	<10	<10	<10	<10	<10	<10
Inorganics													
Nitrate	mg/L	88	84	90	52	150	130	170	170	200	250	180J	150
Nitrite	mg/L	<0.9	<0.9	<0.5	<0.9	<2.5[e][f]	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25R	<0.25
Sulfate	mg/L	38	NA	51	34	51	49	55	62	49	61	71	73
Manganese	mg/L	0.16	NA	0.085	0.02	<0.0050	<0.0050	<0.0050	0.014	<0.0050	<0.005	<0.0050	<0.0050
Iron	mg/L	0.1	NA	<0.1	<0.1	<0.050	<0.050	<0.05	<0.050	<0.050	<0.050	0.37*	<0.050
Lead	mg/L	<0.002	NA	<0.005	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.0050	<0.0050
Groundwater Quality Parameters													
Alkalinity	mg/L as $CaCO_3$	395	370	NA	450	330	390	380	380	400	380	440	140
TDS	mg/L	4,020	2,500	NA	1,800	2,500	2,300	2,300	2,800	2,700	4,100	2,800	2,400
pH	units	6.57	6.66	5.52	6.55(d)	6.92	6.73	NA	5.48	7.15	6.88	7.41	6.81
Conductivity	mS/cm	3.43	4.33	3.25	3.83(d)	4.34	3.83	NA	4.76	4.38	6.03	4.57	4.02
DO	mg/L	3.88	2.61	4.99	2.89(d)	6.34	4.41	NA	1.65	6	3.91	5.15	3.69
Turbidity	NTU	69	0.0	11	0.0(d)	0.0	0	NA	147	0	0	NA	0.9
Temperature	°C	23.9	24.3	21.0	21.6(d)	21.0	24.3	NA	21.8	21.4	24.2	21.7	20.2
Salinity	%	0.17	0.22	0.16	0.19(d)	0.22	0.23	NA	0.24	0.22	0.32	0.23	0.2
ORP	mV	151	225	33	268(d)	152	197.7	NA	263	239	229	175.3	361

Table 1. Analytical Results and Water Quality Parameters (Page 4 of 5)

Analyte	Units	1523-MW05												
		4/09/00[a]	4/09/00[a][b]	7/15/00[a]	10/19/00[a]	1/13/01[a]	4/16/04**	7/11/04**	10/19/04**	1/20/05**	4/17/05**	7/8/05**	10/26/05**	1/19/06**
Organics														
TPH-JF	mg/L	<0.050	<0.050	<0.050	<0.10	<0.050	NA	NA	NA	NA	NA/NA	NA	NA	NA
TPH-D	mg/L	<0.050	<0.050	<0.050	<0.10	0.12 D	<0.050	<0.050	<0.050	<0.050	<0.050/<0.050	<0.050	<0.050	<0.050
TPH-MO	mg/L	<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
TPH-U[c]	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA/NA	NA/NA	NA	NA
Benzene	µg/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
Toluene	µg/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
Ethylbenzene	µg/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	1.1	<0.50
Total Xylenes	µg/L	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<0.50	<0.50	<0.50/<0.50	<0.50/<0.50	<1.0	<1.0
MTBE	µg/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
TBA	µg/L	NA	NA	<10	<10	NA	<10	NA	<10	NA	NA/NA	NA/NA	NA	NA
DIPE	µg/L	NA	NA	<1.0	<1.0	NA	<1.0	NA	<1.0	NA	NA/NA	NA/NA	NA	NA
ETBE	µg/L	NA	NA	<1.0	<1.0	NA	<1.0	NA	<1.0	NA	NA/NA	NA/NA	NA	NA
TAME	µg/L	NA	NA	<1.0	<1.0	NA	<1.0	NA	<1.0	NA	NA/NA	NA/NA	NA	NA
1,3,5-TMB	µg/L	<1.0	<1.0	<1.0	<1.0	<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	<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	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0/<2.0	<2.0/<2.0	<4.0	<2.0
TOC	mg/L	2.5	2.2	2.9	13	1.9	2.8	6.4	3.2	3	3.0/2.7	2.9	2.8	2.2
Methane	µg/L	74	78	26	27	19	<10	<10	<10	<10	<10/<10	<10	<10	<10
Inorganics														
Nitrate	mg/L	19	19	19	19	19	20	20	21	21	19/19	22	22	21
Nitrite	mg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<2.5[e][f]	<0.25	<0.25	<0.25	<0.25/<0.25	<0.25	<0.25	<0.25
Sulfate	mg/L	79	79	83	83	83	61	58	59	74	95/95	79	58	51
Manganese	mg/L	0.035	0.037	0.029	0.029	0.029	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050/<0.0050	<0.005	<0.0050	0.020
Iron	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.050	<0.050	<0.050	<0.050	<0.050/<0.050	<0.050	<0.30*	<0.050
Lead	mg/L	<0.002	<0.002	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050/<0.0050	<0.005	<0.0050	<0.0050
Groundwater Quality Parameters														
Alkalinity	mg/L as $CaCO_3$	245	240	240	250	240	190	190	200	230	250/250	240	190	54
TDS	mg/L	1,070	986	1,200	1,300	1,100	2,200	2,700	2,100	1,700	990/980	1,700	2,700	4,100
pH	units	6.54	6.54	6.85	4.58	6.68	7.02	6.84	7.17	6.91	7.49	6.87	7.49	6.83
Conductivity	mS/cm	1.74	1.74	1.80	1.74	1.89	3.65	4.26	4.13	2.59	1.7	3.63	4.28	6.44
DO	mg/L	1.48	1.48	1.44	2.04	2.0	0.64	1.05	1.8	2.19	1.99	1.36	2.55	0
Turbidity	NTU	59	59	0.0	47	27	0.0	0.0	0	0	0	0	775	0.2
Temperature	°C	23.5	23.5	24.6	23.7	22.3	21.3	21.3	20.5	20.7	21.2	22.3	23.2	20.9
Salinity	%	0.08	0.08	0.08	0.08	0.09	0.18	0.21	0.21	20.7	0.08	0.12	0.22	0.3
ORP	mV	128	128	152	-67	352	147	228	226	226	114.2	182.7	141.7	238

Table 1. Analytical Results and Water Quality Parameters (Page 5 of 5)

Analyte	Units	1523-MW06		1523-MW07		1523-MW08	
		10/26/05**	1/19/06	10/26/05**	1/19/06**	10/26/05	1/19/06
Organics							
TPH-JF	mg/L	NA	NA	NA	NA	(g)	(g)
TPH-D	mg/L	<0.050	**0.15**	<0.050	<0.050	(g)	(g)
TPH-MO	mg/L	<0.50	<0.50	<0.50	<0.50	(g)	(g)
TPH-U[c]	mg/L	NA	NA	NA	NA	(g)	(g)
Benzene	µg/L	<0.50	<0.50	<0.50	<0.50	(g)	(g)
Toluene	µg/L	<0.50	<0.50	<0.50	<0.50	(g)	(g)
Ethylbenzene	µg/L	<0.50	<0.50	<0.50	<0.50	(g)	(g)
Total Xylenes	µg/L	<1.0	<1.0	<1.0	<1.0	(g)	(g)
MTBE	µg/L	<0.50	<0.50	<0.50	<0.50	(g)	(g)
TBA	µg/L	NA	NA	NA	NA	(g)	(g)
DIPE	µg/L	NA	NA	NA	NA	(g)	(g)
ETBE	µg/L	NA	NA	NA	NA	(g)	(g)
TAME	µg/L	NA	NA	NA	NA	(g)	(g)
1,3,5-TMB	µg/L	<1.0	<1.0	<1.0	<1.0	(g)	(g)
1,2,4-TMB	µg/L	<1.0	<1.0	<1.0	<1.0	(g)	(g)
Naphthalene	µg/L	<2.0	<2.0	<2.0	<2.0	(g)	(g)
TOC	mg/L	3.6	(h)	8.1	9.6	(g)	(g)
Methane	µg/L	<10	<10	<10	<10	(g)	(g)
Inorganics							
Nitrate	mg/L	0.75	(h)	0.96	0.47	(g)	(g)
Nitrite	mg/L	<0.25	(h)	<0.25	<0.25	(g)	(g)
Sulfate	mg/L	84	(h)	179	280	(g)	(g)
Manganese	mg/L	0.56	(h)	0.13	0.036	(g)	(g)
Iron	mg/L	0.31*	(h)	0.62*	<0.050	(g)	(g)
Lead	mg/L	<0.0050	(h)	<0.0050	<0.0050	(g)	(g)
Groundwater Quality Parameters							
Alkalinity	mg/L as $CaCO_3$	250	(h)	300	110	(g)	(g)
TDS	mg/L	3,000	(h)	2,700	1,600	(g)	(g)
pH	units	7.46	(h)	7.41	6.39	(g)	(g)
Conductivity	mS/cm	5.39	(h)	4.94	2.74	(g)	(g)
DO	mg/L	1.91	(h)	3.85	4.11	(g)	(g)
Turbidity	NTU	771	(h)	448	233	(g)	(g)
Temperature	°C	19.8	(h)	19.9	19.5	(g)	(g)
Salinity	%	0.28	(h)	0.25	0.13	(g)	(g)
ORP	mV	162	(h)	9	193.2	(g)	(g)

Note: Detection limits may be increased due to sample foaming.
*Iron (total) analysis
**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.

(a) Well purged dry.
(b) Duplicate sample.
(c) Unknown hydrocarbons eluted out between C12-C45+.
(d) Measurement on 01/13/01.
(e) Reporting limits increased due to high concentrations of non-target analytes.
(f) The unpreserved samples were not received by the lab within the 48-hour holding time, therefore a sulfuric acid subsample was analyzed. This value may not be accurate due to the preservation process.
(g) Well 1523-MW08 has been dry since well installation.
(h) Well 1523-MW06 was pumped dry on 1/19/06, therefore NOT ALL SAMPLE BOTTLES WERE FILLED.

D = Reported concentration includes additional compounds uncharacteristic of common fuels and lubricants.
G = Compounds outside the range of diesel have varying amounts of recovery.
J = Estimated value.
R = Non-detected samples were qualified as unusable (R) due to exceedance (>2X) of holding time.

DIPE = di-isopropyl ether.
ETBE = ethyl *tertiary*-butyl ether.
mS/cm = millisiemens per centimeter.
NS = Not sampled
NA = not analyzed.
NTU = nephelometric turbidity units
TAME = *tertiary*-amyl methyl ether.
TBA = *tertiary*-butyl ether.
TDS = total dissolved solids.
TPH-JF= TPH extractable as jet fuel.

MCL for benzene = 1 mg/L.
MCL for toluene = 150 mg/L.
MCL for ethylbenzene = 300 mg/L.
MCL for xylenes = 1,750 mg/L.
MCL for MTBE = 13 mg/L.

Table 2. 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)
1523-RW01	4/9/2000	374.66	49.66	31.62	343.04 (343.07)	31.59	343.07
	7/15/2000			30.53	344.13 (344.15)	30.51	344.15
	10/19/2000			30.61	344.05 (344.09)	30.56	344.1
	1/13/2001			31.03	343.63 (343.64)	31.02	343.64
	4/16/2004			31.65	343.01 (343.38)	31.21	343.45
	7/11/2004			31.6	343.06 (343.38)	31.22	343.44
	10/21/2004			32.1	342.56	32.15	342.51
					-342.6		
	4/21/2005			27.55	347.11	27.55	347.11
					-347.1		
	7/8/2005			28.07	346.59	28.055	346.605
					-346.6		
	10/14/2005			28.93	345.73	28.93	345.73
					(345.73)		
	1/20/2006			29.47	345.19	29.47	345.19
					(345.19)		
1523- RW02	4/12/2000	371.68	59.29	43.51	328.17 (328.18)	43.5	328.18
	7/15/2000			44.5	327.18	–	–
	10/19/2000			44.52	327.16 (327.17)	44.51	327.17
	1/13/2001			45.25	326.43 (326.46)	45.22	326.46
	4/16/2004			45.42	326.26 (326.34)	45.33	326.35
	7/11/2004			45.63	326.05 (326.15)	45.51	326.17
	10/21/2004			45.7	325.98	45.62	326.06
					-326.05		
	4/21/2005			36.55	335.13	36.55	335.13
					-335.1		

Table 2. Groundwater- and Product-Level Measurements (2 of 4)

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)
1523-RW02 (continued)	7/8/2005	371.68	59.29	40.66	331.02 (331.02)	40.66	331.02
	10/14/2005			39.88	331.8 (331.8)	39.88	331.8
	1/20/2006			38.35	333.33 (333.33)	38.35	333.33
1523-MW01	4/9/2000	376.1	60.08	34.99	341.11	–	–
	7/15/2000			33.51	342.59	–	–
	10/19/2000			44.72	331.38	–	–
	1/13/2001			35.32	340.78 (340.78)	35.315	340.785
	4/16/2004			36.15	339.95	–	–
	7/11/2004			35.91	340.19	–	–
	10/20/2004			35.64	340.46	–	–
	1/20/2005			30.97	345.13	–	–
	4/17/2005			25.4	350.7	–	–
	7/8/2005			28.9	347.2	–	–
	10/26/2005			32.55	343.55	–	–
	1/19/2006			34.1	342	–	–
1523-MW02	4/10/2000	375.42	57.45	41.24	334.18	–	–
	7/15/2000			41.345	334.075	–	–
	10/19/2000			41.56	333.86	–	–
	1/13/2001			40.83	334.59 (334.59)	40.825	334.595
	4/16/2004			41.39	334.03	–	–
	7/11/2004			41.62	333.8	–	–
	10/20/2004			41.11	334.31	–	–
	1/20/2005			39.75	335.67	–	–
	4/15/2005			34.3	341.12	–	–
	7/8/2005			34.88	340.54	–	–
	10/26/2005			37.9	337.52	–	–
	1/19/2006			37.95	337.47	–	–

Table 2. Groundwater- and Product-Level Measurements (3 of 4)

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)
1523-MW03	4/10/2000	374.72	59.12	42.12	332.6	–	–
	7/15/2000			42.415	332.305	–	–
	10/19/2000			42.61	332.11	–	–
	1/13/2001			42.84	331.88	–	–
	4/16/2004			42.51	332.21	–	–
	7/11/2004			42.71	332.01	–	–
	10/19/2004			42.9	331.82	–	–
	1/20/2005			42.1	332.62	–	–
	4/15/2005			37.64	337.08	–	–
	7/8/2005			35.63	339.09	–	–
	10/26/2005			36.42	338.3	–	–
	1/19/2006			37.41	337.31	–	–
1523-MW04	4/10/2000	369.49	47.58	42.33	327.16	–	–
	7/15/2000			42.31	327.18	–	–
	10/19/2000			41.6	327.89	–	–
	1/13/2001			42.95	326.54	–	–
	4/16/2004			43.39	326.1	–	–
	7/11/2004			43.43	326.06	–	–
	10/20/2004			42.75	326.74	–	–
	1/20/2005			39.08	330.41	–	–
	4/15/2005			30.28	339.21	–	–
	7/8/2005			34.15	335.34	–	–
	10/26/2005			37.7	331.79	–	–
	1/19/2006			39.77	329.72	–	–
1523-MW05	4/9/2000	372.03	60.12	44.69	327.34	–	–
	7/15/2000			47.19	324.84	–	–
	10/19/2000			46.75	325.28	–	–
	1/13/2001			48.32	323.71	–	–
	4/16/2004			48.8	323.23	–	–
	7/11/2004			49.06	322.97	–	–
	10/19/2004			46.79	325.24	–	–
	1/20/2005			40.31	331.72	–	–
	4/17/2005			37	335.03	–	–
	7/8/2005			41.67	330.36	–	–
	10/26/2005			45	327.03	–	–
	1/19/2006			46.48	325.55	–	–

Table 2. Groundwater- and Product-Level Measurements (4 of 4)

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)
1523-MW06	10/26/2005	352.88	29.25	25.72	327.16	–	–
	1/19/2006			27.36	325.52	–	–
1523-MW07	10/26/2005	343.8	25.3	21.2	322.6	–	–
	1/19/2006			18.17	325.63	–	–
1523-MW08	10/26/2005	370.48	40.3	DRY	DRY	–	–
	1/19/2006			DRY	DRY	–	–

(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) Well dry.

amsl = above mean sea level.

btoc = below top of casing.

ID = identification.

Table 3. Free Product Recovery Activity Results

Date	1523-RW1 *Recovery Sock*				
	Depth to Water (ft extension toc)	**Depth to Product (ft extension toc)**	**Product Thickness (ft)**	**Product Removed (gal)**	**Notes**
10/18/2004	32.15	31.1	1.05	NA	Sock Installed
1/1/2005	–	–	–	Sheen*	Sock Replaced
2/4/2005	28.79	NA	0	Sheen*	
2/25/2005	27.63	NA	0	Sheen*	
3/28/2005	26.16	NA	0	Sheen*	light sheen recovered; no hydrocarbon odor detected
4/21/2005	27.55	NA	0	Sheen*	light sheen recovered; no hydrocarbon odor detected
5/18/2005	26	NA	0	Sheen*	light sheen recovered; no hydrocarbon odor detected
6/17/2005	27.77	27.74	0.03	Sheen*	moderate sheen w/ moderate hydrocarbon odor recovered; replaced sock
7/8/2005	28.07	28.055	0.015	Sheen*	moderate sheen w/ moderate hydrocarbon odor recovered; sock in good condition
8/15/2005	29.91	29.89	0.02	Sheen*	moderate sheen w/ moderate hydrocarbon odor recovered; sock in good condition
9/6/2005	30.29	NA	0	Sheen*	light sheen recovered; no hydrocarbon odor detected
10/14/2005	28.93	NA	0	Sheen*	light sheen recovered; no hydrocarbon odor detected
11/28/2005	29.3	NA	0	Sheen*	light sheen recovered; no hydrocarbon odor detected
12/16/2005	29.14	NA	0	Sheen*	light sheen recovered; no hydrocarbon odor detected
1/20/2006	29.47	NA	0	Sheen*	light sheen recovered; slight hydrocarbon odor detected. Sock replaced.

Table 3. Free Product Recovery Activity Results (Continued)

Date	1523-RW2 *Recovery Sock*				
	Depth to Water (ft extension toc)	**Depth to Product (ft extension toc)**	**Product Thickness (ft)**	**Product Removed (gal)**	**Notes**
10/18/2004	45.7	45.62	0.08	NA	Sock Installed
1/1/2005	–	–	–	Sheen*	Sock replaced
2/4/2005	43.725	NA	0	Sheen*	
2/25/2005	42.695	NA	0	Sheen*	
3/28/2005	29.1	NA	0	Sheen*	light sheen recovered; no hydrocarbon odor detected
4/21/2005	36.55	NA	0	Sheen*	light sheen recovered; no hydrocarbon odor detected
5/18/2005	35.1	NA	0	Sheen*	light sheen recovered; no hydrocarbon odor detected
6/17/2005	39.1	NA	0	Sheen*	light sheen; no hydrocarbon odor detected. Sock replaced
7/8/2005	40.66	NA	0	Sheen*	light sheen; no hydrocarbon odor detected.
8/15/2005	42.19	NA	0	Sheen*	Light sheen; no hydrocarbon odor. Sock in good condition.
9/6/2005	43.86	NA	0	Sheen*	light sheen recovered; no hydrocarbon odor detected
10/14/2005	39.88	NA	0	Sheen*	light sheen recovered; no hydrocarbon odor detected
11/28/2005	39.21	NA	0	Sheen*	light sheen recovered; no hydrocarbon odor detected
12/16/2005	39.14	NA	0	Sheen*	light sheen recovered; no hydrocarbon odor detected
1/20/2006	38.35	NA	NA	Sheen*	light sheen recovered; slight hydrocarbon odor detected. Sock replaced.

* "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 Sampling Methods, Analytical Methods, and Standard Reporting Limits

Analyte	Volume/Storage Container	Preservation	Sample Holding Time	Analytical Method	Standard Reporting Limit[a]
Organic Analyses					
TPH-D	3×40 mL Glass	4°C	14 d	EPA SW 8015B	0.05 mg/L
TPH-MO	3×40 mL Glass	4°C	14 d	EPA SW 8015B	0.50 mg/L
BTEX	3×40 mL Glass	4°C; pH<2	14 d	EPA 624/SW8260B	0.50 µg/L
Naphthalene	3×40 mL Glass	4°C; pH<2	14 d	EPA 624/SW 8260B	2.0 µg/L
TMBs	3×40 mL Glass	4°C; pH<2	14 d	EPA 624/SW 8260B	1.0 µg/L
MTBE	3×40 mL Glass	4°C; pH<2	14 d	EPA 624/SW 8260B	0.50 µg/L
TBA	3×40 mL Glass	4°C; pH<2	14 d	EPA 624/SW 8260B	10 µg/L
DIPE	3×40 mL Glass	4°C; pH<2	14 d	EPA 624/SW 8260B	1 µg/L
ETBE	3×40 mL Glass	4°C; pH<2	14 d	EPA 624/SW 8260B	1 µg/L
TAME	3×40 mL Glass	4°C; pH<2	14 d	EPA 624/SW 8260B	1 µg/L
TOC	125 mL Glass	4°C; pH<2	28 d	EPA SW9060/415.1/SM-5310C	1.0 mg/L
Methane	3×40 mL Glass	4°C; pH<2	14 d	RSK-175	10 µg/L
PNA	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	0.3 mg/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	EPA SW 6020	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
Water 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/SM 2540C	7 mg/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, 2004).

(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 5. QA/QC Analytical Results

Analyte	Units	1523-QCEB 10/26/2005	1523-QCFB 10/26/2005	1523-QCTB 10/26/2005	1523-QCEB 1/19/2006	1523-QCFB 1/19/2006	1523-QCTB 1/19/2006
TPH-JF	mg/L	NA	NA	NA	NA	NA	NA
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	0.81	0.8	<0.50	NA	<0.50	<0.50
Ethylbenzene	µg/L	<0.50	<0.50	<0.50	NA	<0.50	<0.50
Total Xylenes	µg/L	<1.0	<1.0	<1.0	NA	<1.0	<1.0
MTBE	µg/L	<0.50	<0.50	<0.50	NA	<0.50	<0.50
1,3,5-TMB	µg/L	<1.0	<1.0	<1.0	NA	<1.0	<1.0
1,2,4-TMB	µg/L	<1.0	<1.0	<1.0	NA	<1.0	<1.0
Naphthalene	µg/L	<2.0	<2.0	<2.0	NA	<2.0	<2.0

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

APPENDIX A

FIELD DATA COLLECTION LOG SHEETS

SEPTEMBER 2005

WELL DEVELOPMENT LOGS

Battelle
The Business of Innovation

Marine Corps Base Camp Pendleton Site 1523
Well Development / Purge Log

Location: 1523	Well No.: MW-6	Date: 9-29-2005	Project No.: G486102-11FW	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. Lamel + Dale Emerson

EXPOSURE MONITORING
Background:_____PPM
Reading:_____PPM

WELL CONDITION
Good ☒ New
Fair ☐
Poor ☐

Total Well Depth: 29.50
Static Water Level: 25.16 Depth to Product:
Water Column: 4.34 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: HRS
Purge Stop Time: HRS
Total volume Purged: Gal.

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% µS	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
0815										Surge 15 mins
0830										Begin Bailing
0833			7.31	3999			20.4			
0838			6.80	1520			20.2			
0842			7.18	3999			20.3			
0847	29.00	~2.5								TD: 29.50
										80% Recharge Level:
										Sample Collected: HRS

Field Team Leader Signature _____

Battelle
The Business of Innovation

Marine Corps Base Camp Pendleton Site 1523
Well Development / Purge Log

Location: 1523	Well No.: MW-6	Date: 9-23-2005	Project No.: ~~G486102-11FW~~	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:	29.50		
Static Water Level:	25.16	Depth to Product:	
Water Column:	4.34	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: 08:30 HRS
Purge Stop Time: 08:42 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
08:15										Surge well (15 minutes).
08:30										Begin bailing well.
08:33			7.31	3999			20.4			
08:38			6.80	1520			20.2			
08:42			7.18	3999			20.3			End bailing well.
08:47	29.00	2.5								
										80% Recharge Level:
										Sample Collected: HRS

Field Team Leader Signature _____

Battelle
The Business of Innovation

Marine Corps Base Camp Pendleton Site 1523

Well Development / Purge Log

Location: 1523	Well No.: MW-7	Date: 9-23-2005	Project No.: G486102-11FW	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. Cornell + Dale Emerson

EXPOSURE MONITORING
Background:_____PPM
Reading:_____PPM

WELL CONDITION
Good ☒ New
Fair ☐
Poor ☐

Total Well Depth: 27.45
Static Water Level: 21.20 Depth to Product:
Water Column: 6.25 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: HRS
Purge Stop Time: HRS
Total volume Purged: Gal.

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% µS	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
0915										Surge 15 mins
0932			6.46	3999			21.5			Begin bailing
0936			7.15	3999			20.4			
0939			6.84	259			20.0			
0941	~~26.10~~ DRY									DRY
0944	26.10	~4.0								
										80% Recharge Level:
										Sample Collected: HRS

Field Team Leader Signature _____

Battelle
The Business of Innovation

Marine Corps Base Camp Pendleton Site 1523
Well Development / Purge Log

Location: 1523	Well No.: MW-7	Date: 9-23-2005	Project No.: G486102-11FW	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:	27.45		
Static Water Level:	21.20	Depth to Product:	
Water Column:	6.25	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: 09:32 HRS

Purge Stop Time: 09:41 HRS

Total volume Purged: 4.0 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
09:15										Surge well (15 minutes).
09:32			6.46	3999			21.5			Begin bailing well.
09:36			7.15	3999			20.4			
09:39			6.84	259			20.0			End bailing well.
09:41	DRY	4.0								
09:44	26.10									
										80% Recharge Level:
										Sample Collected: HRS

Field Team Leader Signature _____

Battelle
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Marine Corps Base Camp Pendleton Site 1523
Well Development / Purge Log

Location: 1523	Well No.: MW-8	Date: 9-23-2005	Project No.: G486102-11FW	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. Lomer + Dale Emerson

EXPOSURE MONITORING
Background:_____PPM
Reading:_____PPM

WELL CONDITION
Good ☒ New
Fair ☐
Poor ☐

Total Well Depth: 39.68

Static Water Level: DRY 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: HRS

Low Flow Method ☐

Purge Stop Time: HRS

Minimal Purge Sampling ☐

Total volume Purged: Gal.

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
										DRY WELL
										80% Recharge Level:
										Sample Collected: HRS

Field Team Leader Signature _____

Battelle
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Marine Corps Base Camp Pendleton Site 1523
Well Development / Purge Log

Location: 1523	Well No.: MW-8	Date: 9-23-2005	Project No.: G486102-11FW	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:	39.68		
Static Water Level:	DRY	Depth to Product:	
Water Column:		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: 09:32 HRS
Purge Stop Time: 09:41 HRS
Total volume Purged: 4.0 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
										DRY WELL.
										80% Recharge Level:
										Sample Collected: HRS

Field Team Leader Signature _____

OCTOBER 2005

GROUNDWATER MONITORING PURGE LOGS

Battelle
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Well Development / Purge Log

Location: SITE 1523 | Well No.: MW-01 | Date: 10-26-05 | Project No.: 94860102

Personnel: SCOTT LOWE

Equipment:

HORIBA U 10	☒	HORIBA U22	☐ OAKTON X 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):
Screened Interval (ft bgs):
Static Water Level: 32.55
Depth to Product: —
Water Column:
Product Layer: —
Well Casing Diameter: 4"
Borehole Diameter:
Multiplier:
Low Flow Method ☒
Minimal Purge Sampling ☐

Pump Type: Peristaltic ☐ Submersible ☐ Liquid Ring ☐ Bladder Pump ☒
Pump Rate:
Purge Start Time: 1345 HRS
Purge Stop Time: 1405 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
1350		0.30	7.72	15.7	271	8.81	22.8	0.99	155.6	- PUMP SET @0620, 10/26
1355		0.60	7.60	16.7	269	4.01	22.8	1.04	156.9	- DUP COLLECTED
1400		0.90	7.41	18.6	270	1.33	22.8	1.10	157.6	
1403		1.10	7.38	19.2	269	0.21	22.8	1.13	158.1	
1405		1.20	7.36	19.3	269	0.18	22.7	1.15	158.3	
										Sample Collected: 1410 HRS

Field Team Leader Signature: [signature]

Battelle
... Putting Technology To Work

Well Development / Purge Log

Location: SITE 1523 | Well No.: MW-02 | Date: 10-26-05 | Project No.: G486102 | 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): | Screened Interval (ft bgs):
Static Water Level: 37.90' | Depth to Product: ____
Water Column: | Product Layer: ____
Well Casing Diameter: 4"
Borehole Diameter: | Multiplier:
Low Flow Method ☒
Minimal Purge Sampling ☐

Pump Type: Peristaltic ☐ Submersible ☐ Liquid Ring ☐ Bladder Pump ☒
Pump Rate:
Purge Start Time: 1425 HRS
Purge Stop Time: 1445 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	Conductivity (mS/cm) +/- 5%	Turbidity (NTU) +/- 10%	Dissolved Oxygen (mg/l) +/- 0.2	Temp. (°C) +/- 3%	Salinity (%) -	ORP (mV) +/- 20	Comments
1430	38.11	0.30	6.60	2.66	190	1.56	22.6	0.12	138.8	-PUMP SET @ 0630, 10/26
1435	38.30	0.60	6.92	2.51	376	1.08	22.5	0.12	146.1	
1440	38.52	0.90	7.01	2.47	439	1.03	22.5	0.11	153.9	
1443	38.69	1.10	7.05	2.44	443	1.01	22.5	0.11	157.6	
1445	38.73	1.20	7.06	2.42	447	0.99	22.5	0.11	158.9	
										Sample Collected: 1450 HRS

Field Team Leader Signature _____

Battelle
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Well Development / Purge Log

Location: SITE 1523 | Well No.: MW-03 | Date: 10-26-05 | Project No.: G4486102 | 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): 42' | Screened Interval (ft bgs):
Static Water Level: 36.42' | Depth to Product: —
Water Column: | Product Layer: —
Well Casing Diameter: 4"
Borehole Diameter: | Multiplier:
Low Flow Method ☒
Minimal Purge Sampling ☐

Pump Type: Peristaltic ☐ Submersible ☐ Liquid Ring ☐ Bladder Pump ☒
Pump Rate:
Purge Start Time: 1105 HRS
Purge Stop Time: 1125 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
1110	36.80	0.30	7.35	4.13	520	1.76	21.9	0.20	310	PUMP SET @ 0610, 10/26/05
1115	37.02	0.60	7.31	4.92	419	1.55	21.9	0.19	296	
1120	37.14	0.90	7.31	5.11	387	1.53	22.1	0.14	252	
1123	37.29	1.10	7.29	5.11	384	1.54	22.2	0.14	248	
1125	37.35	1.20	7.29	5.11	384	1.54	22.2	0.14	248	

Sample Collected: 1130 HRS

Field Team Leader Signature _____

Battelle
... Putting Technology To Work

Well Development / Purge Log

Location: SITE 1523 | Well No.: MW-04 | Date: 10-26-05 | Project No.: G486102

Personnel: SCOTT LOWE

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

EXPOSURE MONITORING
- Background: _____ PPM
- Reading: _____ PPM

WELL CONDITION
- Good ☒
- Fair ☐
- Poor ☐

Total Well Depth (ft bgs): 47'
Screened Interval (ft bgs):
Static Water Level: 37.7'
Depth to Product: —
Water Column:
Product Layer: —
Well Casing Diameter: 4"
Borehole Diameter:
Multiplier:
Low Flow Method ☒
Minimal Purge Sampling ☐

Pump Type: Peristaltic ☐ Submersible ☐ Liquid Ring ☐ Bladder Pump ☒
Pump Rate:
Purge Start Time: 1300 HRS
Purge Stop Time: 1320 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
1305	13.90	0.30	7.41	4.48	—	10.43	22.2	0.23	173.0	· PNAs MS/MSD COLLECTED
1310	14.11	0.60	7.41	4.52	—	8.32	22.0	0.23	182.0	(PNAs ONLY)
1315	14.26	0.90	7.41	4.57	—	6.01	21.9	0.23	178.2	· PUMP SET @ 1215, 10/25/05
1318	14.40	1.10	7.41	4.57	—	5.20	21.9	0.23	179.8	
1320	14.59	1.20	7.41	4.57	—	5.15	21.7	0.23	175.3	
										Sample Collected: 1325 HRS

Field Team Leader Signature _____

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Well Development / Purge Log

Location: SITE 1523 | Well No.: MW-05 | Date: 10-26-05 | Project No.: 64860102 | 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): | Screened Interval (ft bgs):
Static Water Level: 45.0 | Depth to Product: —
Water Column: | Product Layer: —
Well Casing Diameter: 4"
Borehole Diameter: | Multiplier:
Low Flow Method ☒
Minimal Purge Sampling ☐

Pump Type: Peristaltic ☐ Submersible ☐ Liquid Ring ☐ Bladder Pump ☒
Pump Rate:
Purge Start Time: 1215 HRS
Purge Stop Time: 1235 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
1220	46.1	0.30	7.39	3.65	692	9.72	23.4	0.18	177.3	- PUMP SET @ 0645, 10/26
1225	46.21	0.60	7.43	3.91	709	6.01	23.3	0.20	151.4	
1230	46.33	0.90	7.47	4.15	766	3.46	23.3	0.20	143.9	
1233	46.37	1.10	7.49	4.26	774	2.68	23.2	0.20	141.8	
1235	46.40	1.20	7.49	4.28	775	2.55	23.2	0.22	141.7	
										Sample Collected: 1240 HRS

Field Team Leader Signature: [signature]

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Well Development / Purge Log

Location: SITE 1523	Well No.: MW-06	Date: 10-26-05	Project No.: G486102
			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):
Screened Interval (ft bgs):
Static Water Level: 25.72
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: 0850 HRS
Purge Stop Time: 0910 HRS
Total volume Purged: 1.0 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
0855		0.25	7.69	5.48	—	2.96	19.7	0.27	28	PUMP SET @ 1115, 10/25/05
0900		0.50	7.58	5.40	—	2.11	19.7	0.28	107	· H LOCK WELL CAP INSTALLED
0905		0.75	7.49	5.40	961	1.97	19.9	0.28	151	· NEW WELL, NO HYDROCARBON
0907		0.85	7.46	5.39	774	1.93	19.8	0.28	159	SHEEN/ODOR IN PURGED
0910		1.0	7.46	5.39	771	1.91	19.8	0.28	162	GROUNDWATER.
										Sample Collected: 0915 HRS

Field Team Leader Signature: [signature]

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Well Development / Purge Log

Location: SITE 1523 | Well No.: MW-07 | Date: 10-26-05 | Project No.: G4860102

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): | Screened Interval (ft bgs):
Static Water Level: 21.20' | 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: 0940 HRS
Purge Stop Time: 1000 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
0945	21.36	0.30	7.42	5.56	426	2.91	19.9	0.28	-14	PUMP SET @ 1125 ON 10/25/05
0950	21.51	0.60	7.41	5.24	435	3.61	19.9	6.27	-8	·NEW WELL, NO SHEEN/ODOR
0955	21.77	0.90	7.41	5.11	447	3.79	19.9	0.27	1	IN PURGED GROUND WATER
0957	21.90	1.05	7.41	4.95	448	3.83	19.9	0.25	8	·H LOCK WELL CAP INSTALLED
1000	21.96	1.20	7.41	4.94	448	3.85	19.9	0.25	9	
										Sample Collected: 1005 HRS

Field Team Leader Signature: [signature]

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Well Development / Purge Log

Location: SITE 1523 | Well No.: MW-08 | Date: 10-26-05 | Project No.: G486102 | 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): 40' | Screened Interval (ft bgs):
Static Water Level: DRY | Depth to Product: —
Water Column: | Product Layer: —
Well Casing Diameter: 4" | Pump Type: Peristaltic ☐ Submersible ☐ Liquid Ring ☐ Bladder Pump ☐
Borehole Diameter: | Multiplier: | Pump Rate: —
Purge Start Time: — HRS
Purge Stop Time: — HRS
Low Flow Method ☐
Total volume Purged: Gal.
Minimal Purge Sampling ☐
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
										WELL DRY
										NEW WELL
										Sample Collected: — HRS

Field Team Leader Signature: [signature]

JANUARY 2006

GROUNDWATER MONITORING PURGE LOGS

Battelle
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MCB Camp Pendleton
Well Development / Purge Log

Location: 1523	Well No.: MW-01	Date: 1-19-06	Project No.: T0102
			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: 60.08'

Static Water Level: 34.1 Depth to Product: —

Water Column: Product Layer: —

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

Well Casing Diameter: 4"

Pump Rate:

Borehole Diameter: Multiplier:

Purge Start Time: 1144 HRS

Low Flow Method ☒

Purge Stop Time: 1202 HRS

Minimal Purge Sampling ☐

Total volume Purged: 4.50 L ~~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
1147	34.27	0.75	6.48	19.5	0.0	1.04	22.6	1.2	268	• Pump Set @
1150	34.50	1.50	6.52	19.7	0.0	0.0	22.5	1.2	289	1-18-06
1153	34.86	2.25	6.53	19.6	0.6	0.0	22.6	1.2	331	
1156	34.94	3.0	6.53	19.5	0.2	0.0	22.6	1.2	357	• DUP Collected
1159	34.99	3.75	6.53	19.4	0.3	0.0	22.6	1.2	366	• MS/MSD Collected
1202	~~35.08~~	4.50	6.53	19.3	0.3	0.0	22.6	1.2	370	
										80% Recharge Level:
										Sample Collected: 1210 HRS

Field Team Leader Signature [signature]

DUP Collected

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Well Development / Purge Log

Location: 1523	Well No.: MW02	Date: 19 JAN 06	Project No.: 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: S Lowe, G. Headington

EXPOSURE MONITORING
Background: _____ PPM
Reading: _____ PPM

WELL CONITION
Good ☒
Fair ☐
Poor ☐

Total Well Depth

Static Water Level: 37.95 | Depth to Product:

Water Column: | Product Layer:

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

Well Casing Diameter:

Pump Rate: Low Flow Method

Borehole Diameter: | Multiplier:

Purge Start Time: 1334 HRS

One Well Volume: | 1 ½ Well Volume:

Purge Stop Time: 1420 HRS

Three Well Volumes:

Total volume Purged: 3 Liters plus / Gal Volume collected

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

Time	Water Depth (btoc)	Volume Recovered (gal)	PH (units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temp. (°C)	Salinity (%)	ORP (mV)	Comments
1342	38.40		6.18	2.82	7	0.57	21.7	0.13	202	Flow 130cc/min
1345	38.46		6.35	2.83	8	0.20	21.6	0.14	202	
1348	38.52		6.50	2.83	6	0.20	21.6	0.13	199.7	
1351	38.63		6.59	2.83	6	0.06	21.6	0.14	198.1	
										80% Recharge Level:
										Sample Collected: 1355 HRS

Field Team Leader Signature [signature]

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MCB Camp Pendleton
Well Development / Purge Log

Location: 1523	Well No.:MW-03	Date: 19JAN06	Project No.: TO 102	Page 1 of 1

Equipment:
- HORIBA U 10 ☒ — S/N: 101028
- HORIBA U22 ☐ — S/N:
- OAKton ORP ☒ #174908
- FID/PHOTO VAC ☐
- ORION 290A ☐
- INTERFACE PROBE ☒ 7
- 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: 59.12'

Static Water Level: 37.41' — Depth to Product:

Water Column: — Product Layer:

Well Casing Diameter: 4"

Borehole Diameter: — Multiplier:

Low Flow Method ☒

Minimal Purge Sampling ☒

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

Pump Rate:

Purge Start Time: 0913 HRS

Purge Stop Time: 1006 HRS

Total volume Purged: 3.2 liters 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
										Pump set 1710 HRS / 18JAN06
0922	37.82'		6.68	5.20	0.0	0.44	20.6	0.27	301	Flow 175 cc/min / Reduce Flow
0926	—		6.63	5.21	0.0	0.24	20.8	0.27	301	
0929	38.07'		6.62	5.23	0.0	0.10	20.8	0.27	299	Flow 80-90 cc/min
0932	38.18'		6.59	5.24	0.0	0.04	20.8	0.27	297	
										80% Recharge Level:
										Sample Collected: 0935 HRS

Field Team Leader Signature _____

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MCB Camp Pendleton
Well Development / Purge Log

Location: 1523	Well No.: MW-04	Date: 1-19-06	Project No.: 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, GH

EXPOSURE MONITORING
Background: _____ PPM
Reading: _____ PPM

WELL CONDITION
Good ☒
Fair ☐
Poor ☐

Total Well Depth: 47.58'

Static Water Level: 39.77 Depth to Product: —

Water Column: Product Layer: —

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

Well Casing Diameter: 4"

Pump Rate:

Borehole Diameter: Multiplier:

Purge Start Time: 0919 HRS

Low Flow Method ☒

Purge Stop Time: ~~0937~~ HRS 0940

Minimal Purge Sampling ☐

Total volume Purged: 3.0 L ~~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
0922	39.93	1.0	6.77	4.28	4.3	3.84	19.8	0.2	396	PUMP SET @
0925	39.94	1.3	6.78	4.22	2.7	3.21	19.2	0.2	392	1-18-06
0928	40.00	1.6	6.79	4.18	2.6	3.15	19.5	0.2	386	
0931	40.04	2.0	6.80	4.08	1.4	3.42	19.7	0.2	378	
0934	40.10	2.3	6.81	4.03	1.0	3.59	20.1	0.2	375	
0937	40.21	2.6	6.81	4.00	0.8	3.64	20.2	0.2	369	
0940	40.39	3.0	6.81	4.02	0.9	3.69	20.2	0.2	361	80% Recharge Level:
										Sample Collected: 0945 HRS

Field Team Leader Signature [signature]

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MCB Camp Pendleton

Well Development / Purge Log

Location: 1523	Well No.: MW-05	Date: 1-19-06	Project No.: TC 162
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: 60.12'

Static Water Level: 46.48 Depth to Product: —

Water Column: Product Layer: —

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

Well Casing Diameter: 4"

Pump Rate:

Borehole Diameter: Multiplier:

Purge Start Time: 1033 HRS

Low Flow Method ☒

Purge Stop Time: 1051 HRS

Minimal Purge Sampling ☐

Total volume Purged: 3.0 L ~~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
1036	46.68	0.5	6.42	6.17	0.5	2.40	20.8	0.3	277	Pump SET @
1039	46.75	1.0	6.65	6.30	1.9	0.32	20.9	0.3	258	1-18-06
1042	46.79	1.5	6.73	6.38	0.2	0.02	20.8	0.3	251	
1045	46.84	2.0	6.80	6.41	0.1	0.0	20.8	0.3	246	
1048	46.90	2.5	6.82	6.43	0.1	0.0	20.9	0.3	242	
1051	46.95	3.0	6.83	6.44	0.2	0.0	20.9	0.3	238	
										80% Recharge Level:
										Sample Collected: 1100 HRS

Field Team Leader Signature _____

Battelle
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MCB Camp Pendleton
Well Development / Purge Log

Location: 1523	Well No.:MW-06	Date: 19 JAN 06	Project No.: T0102	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: G. Headington, S. Lowe

EXPOSURE MONITORING
Background:_____PPM
Reading:_____PPM

WELL CONDITION
Good ☐
Fair ☐
Poor ☐

Total Well Depth: 29.25'

Static Water Level: 27.36' 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: 1046 HRS

Low Flow Method ☐

Purge Stop Time: HRS

Minimal Purge Sampling ☒

Total volume Purged: 1 Liter ~~Gal~~ 45 minutes

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
1109	27.71'									Collected ~ 300 ml - 500 ml
1113			Minimal	purge	sampling					
										Collected only 9 VOA in ~ 20 min.
										80% Recharge Level:
										Sample Collected: 1110 HRS

only collected VOA's

Field Team Leader Signature [signature]

* DRY well either equipment problem or well problem

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MCB Camp Pendleton
Well Development / Purge Log

Location: 1523	Well No.:MW-07	Date: 19JAN06	Project No.: T102	Page 1 of 1

Equipment:

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

Personnel: S. Lowe, G. Hardington

EXPOSURE MONITORING
Background:_____PPM
Reading:_____PPM

WELL CONDITION
Good ☐
Fair ☐
Poor ☐

Total Well Depth:

Static Water Level: 18.17' 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: 1150 HRS

Low Flow Method ☐

Purge Stop Time: 1229 HRS — DTW 20.19'

Minimal Purge Sampling ☒ —

Total volume Purged: 3 liters plus Gal. 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
1154	18.49'	—								Flow 100 ml/min
1158	18.80'	—	6.41	2.74	275	3.97	19.5	0.13	193.8	
1201	18.83'		6.39	2.74	233	4.11	19.5	0.13	193.2	
										80% Recharge Level:
										Sample Collected: 1204 HRS

Field Team Leader Signature [signature]

APPENDIX B

SEPTEMBER 2005 – ADDITIONAL SITE ASSESSMENT ACTIVITIES

(INCLUDES: SURVEY DATA, SOIL BORING DIAGRAMS, AND MONITORING WELL COMPLETION DIAGRAMS)

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 Construction Report for UST Site 1523 located at Camp Pendleton, California. Permit No. LMON102883, Assessor's Parcel No. 101-000-00, Establishment No. H053939-014.

Dear Marisue:

Enclosed please find three copies of a groundwater monitoring well construction report for Monitoring Well and Boring Construction Permit LMON102883. Three wells were completed under this permit for the purpose of delineating groundwater contamination at Site 1523, Marine Corps Base, Camp Pendleton, California.

Included in this report are copies of the permit cover page, site maps, and soil boring logs/well completion diagrams.

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 12/06
STATE OF CALIFORNIA

PERMIT #LMON102883
A.P.N. #101-520-15
EST #H05939-014

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

MONITORING WELL PERMIT EXTENSION

SITE NAME: SITE 1523

SITE ADDRESS: NEAR VANDERGRIFT & 11TH ST, MCB, CAMP PENDLETON, CA 92055

PERMIT FOR: **3 GROUNDWATER MONITORING WELLS**

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.

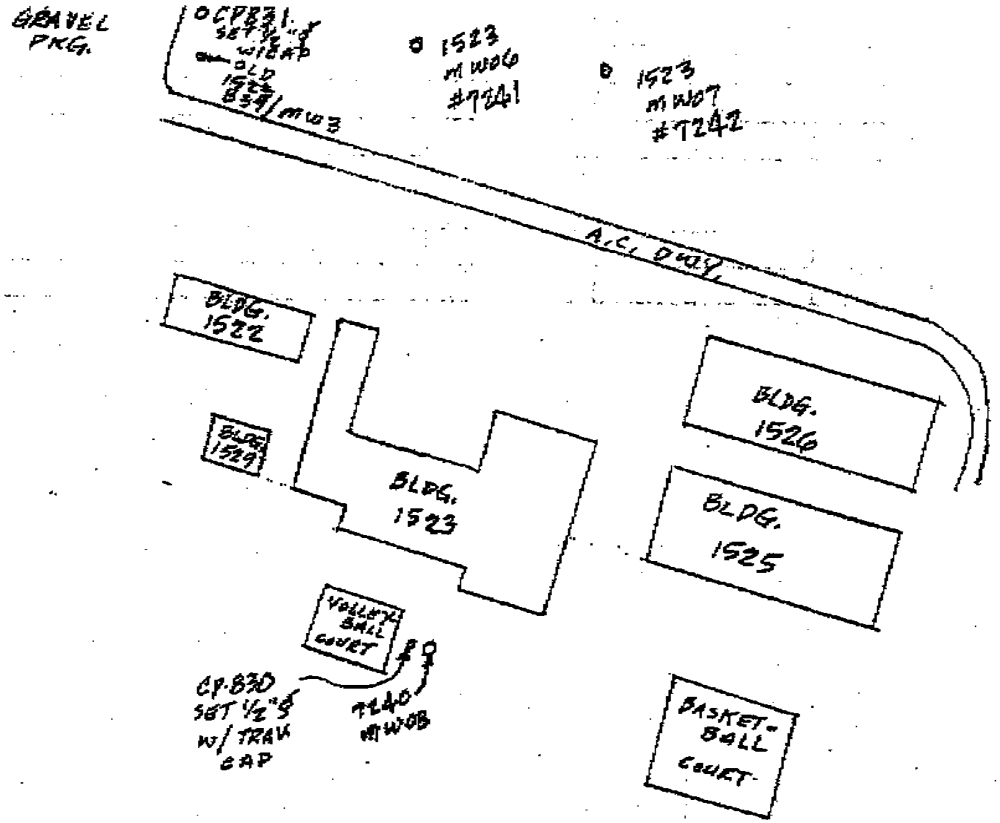
REQUEST RECEIVED: JUNE 9, 2005

NEW EXPIRATION DATE: OCTOBER 8, 2005

APPROVED BY: M Crystal DATE: 06/16/2005
MARISUE CRYSTAL

NOTIFIED: by mail

DEH:SAM PERMIT EXTENSION FIRST (Rev. 8/03)



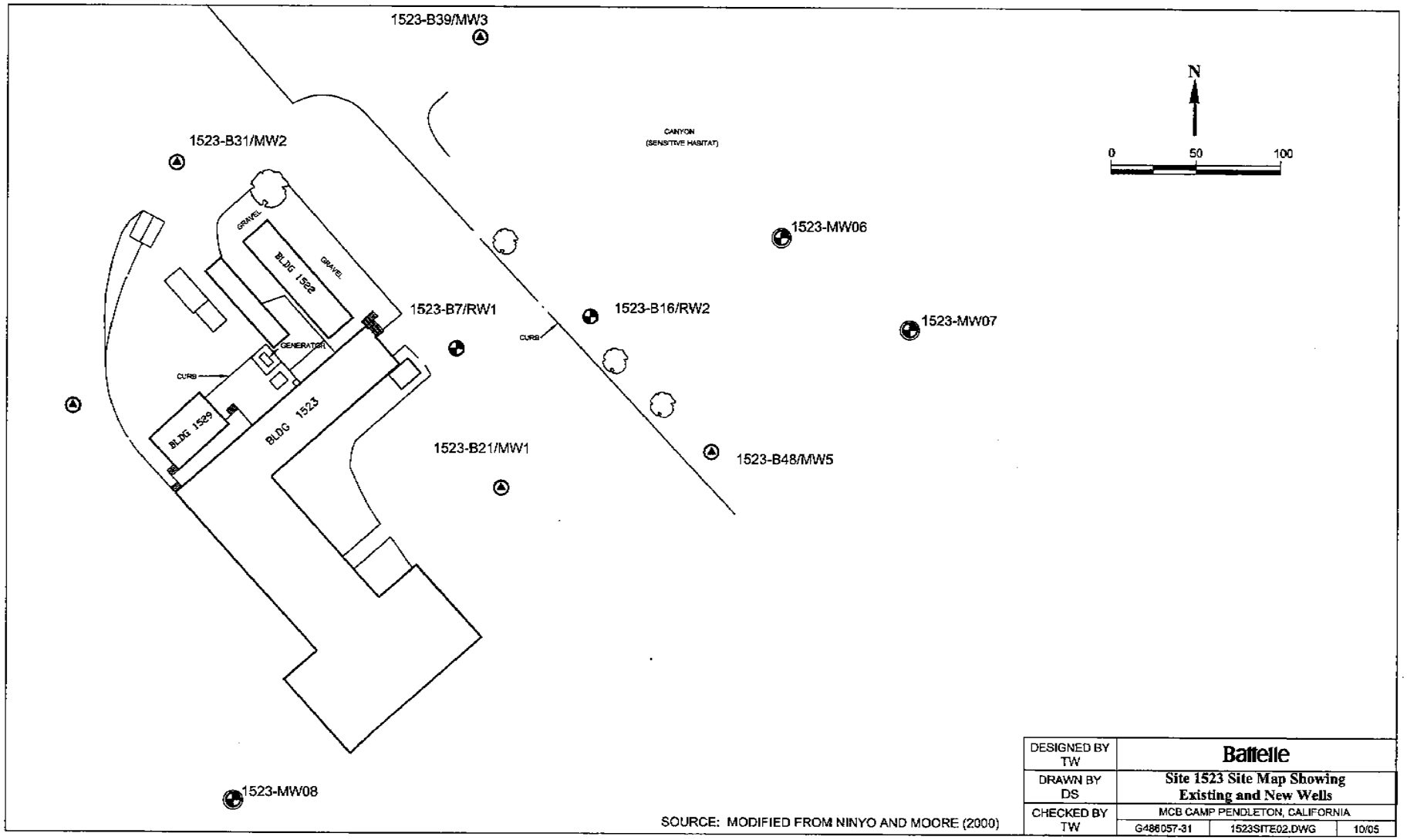
#7241 MW06 8" DIA. STL. PIPE RISER IN 3'X3' CONC. BASE
+2.78 F.S. CONC. TO RIM 8" STL.
-0.73 RIM 8" STL. TO RIM 2" PVC
+2.05 F.S. CONC. TO RIM 2" PVC

#7242 MW07 8" DIA. STL. PIPE RISER IN 3'X3' CONC. BASE
+2.65 F.S. CONC. TO RIM STL. RISER
-0.59 RIM STL. TO RIM 2" PVC
(+2.06 F.S. CONC. TO RIM 2" PVC)

BATTELLE
CAMP PENDLETON
SITE 1523

10-17-05
PG/PO

PT No.	Designation	Lid Elev.	Minus	Casing Elev.	Description	Northing	Easting	Latitude (Dec. Deg.)	Longitude (Dec. Deg.)
7240	1523MW08	370.78	+0.30	370.48	2" PVC	2053380.86	6237273.15	33.2971044	-117.3116588
7241	1523MW06	350.83FS	+2.05	352.88	2" PVC	2053719.29	6237598.16	33.2980435	-117.3106064
7242	1523MW07	341.74FS	+2.06	343.80	2" PVC	2053664.48	6237674.75	33.2978950	-117.3103540



SOURCE: MODIFIED FROM NINYO AND MOORE (2000)

DESIGNED BY TW	Battelle		
DRAWN BY DS	Site 1523 Site Map Showing Existing and New Wells		
CHECKED BY TW	MCB CAMP PENDLETON, CALIFORNIA		
	G486057-31	1523SITE02.DWG	10/05

Battelle
. . . Putting Technology To Work

SITE 1523, MCB Camp Pendleton
BORING LOG - 1523-SB66/MW06

Borehole Location: Building 1523 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: Air rotary Drill Rig: CME 75 Limited Access Hammer Type: 140 lb Date: 09/13/2005 Total Depth: 30' bgs	Northing (NAD 83): 2053719.29 Easting (NAD 83): 6237598.16 Surface Elevation (NAVD 88): 350.83 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	Boring Completion	Comments
0					Hand Augered to 5' 0'-3' Surface seal: Concrete (0.99 ft³)
5		SM	Silty SAND; light brown to pale yellow, dry, fine grain, trace gravel.		0'-15' Casing 3' - 13' Seal: bentonite chips (3.29 ft³)
10			As above, some cobbles. No dust in cuttings from 12'-13'.		
15		SM	As above, more cobbles. Cuttings damp from 18' to 19'.		
20			Lusardi Formation: Cobble conglomerate; granitic cobbles, white to light gray, very dense, dry cuttings.		13'-30' Filter Pack: #3 Sand (5.6ft³)
▽ 25					15'-30' Well Screen: 0.020-inch slot,
30			As above, slow drilling. TOTAL DEPTH = 30'		No soil samples collected. Boring logged from drill cuttings. No FID readings collected. This boring was advanced beyond the known soil plume specifically for the purpose of well installation.
35					
40					
45					Water Level Data: 9/14/05 24.0' bgs 9/23/05 25.16' bgs (pre-development) 10/26/05 25.72' bgs (post-development)
50					
55					
60					

1523-SB66/MW06.cdr

Battelle
. . . Putting Technology To Work

SITE 1523, MCB Camp Pendleton
BORING LOG - 1523-SB67/MW07

Borehole Location: Building 1523 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: Air rotary Drill Rig: CME 75 Limited Access Hammer Type: 140 lb Date: 09/15/2005 Total Depth: 25' bgs	Northing (NAD 83): 2053664.48 Easting (NAD 83): 6237674.75 Surface Elevation (NAVD 88): 341.74 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)	Blow Counts	Boring Completion	Comments
0							Hand Augered to 5'
							0'-3' Surface seal: Concrete (0.99 ft³)
5			Silty SAND; light brown to pale yellow, dry, fine grain, trace gravel.				0'-10' Casing
		SM					3' - 8.5' Seal: bentonite chips (1.81 ft³)
10			As above, some cobbles. No dust in cuttings from 12'-13'.				8.5'-25' Filter Pack: #3 Sand (5.43 ft³)
15			As above, more cobbles. Cuttings damp from 16' to 17'.				10'-25' Well Screen: 0.020-inch slot,
20			Lusardi Formation: Cobble conglomerate; granitic cobbles, white to light gray, very dense, dry cuttings. As above, slow drilling.				
25			TOTAL DEPTH = 25'				No soil samples collected. Boring logged from drill cuttings.
30							
35							No FID readings collected. This boring was advanced beyond the known soil plume specifically for the purpose of well installation.
40							Water Level Data: 9/15/05 18.9' bgs
45							9/23/05 21.20'bgs (pre-development) 10/26/05 21.20' bgs (post-development)
50							
55							
60							

1523-SB67/MW07.cdr

Battelle
. . . Putting Technology To Work

SITE 1523, MCB Camp Pendleton
BORING LOG - 1523-SB65/MW08

Borehole Location: Building 1523 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: Air rotary Drill Rig: CME 75 Limited Access Hammer Type: 140 lb Date: 09/09/2005-09/15/2005 Total Depth: 40' bgs	Northing (NAD 83): 2053380.86 Easting (NAD 83): 6237273.15 Surface Elevation (NAVD 88): 370.78 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					Hand Augered to 5'
					0' - 3' Surface seal: Concrete (0.99 ft³)
5		SM	Silty SAND; light brown to pale yellow, dry, fine grain, trace gravel.		
10			As above, some cobbles.		0' - 25' Casing
15		SM	As above, more cobbles.		
			Cuttings damp from 18' to 19'.		3' - 23' Seal: bentonite chips (6.58 ft³)
20			Lusardi Formation: Cobble conglomerate; granitic cobbles, white to light gray, very dense, dry cuttings.		
25			As above.		23' - 40' Filter Pack: #3 Sand (5.6 ft³)
			Cuttings damp from 28' to 29'.		
30			As above, slow drilling.		25' - 40' Well Screen: 0.020-inch slot,
35			As above, very slow drilling.		
40			TOTAL DEPTH = 40'		No soil samples collected. Boring logged from drill cuttings.
45					No FID readings collected. This boring was advanced beyond the known soil plume specifically for the purpose of well installation.
50					
55					No water observed in boring or well.
60					

1523-SB65/MW08.cdr

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: TO102/1523

Work Order: BMI05102720 **Cooler Temp:** 4 °C

Alpha's Sample ID	Client's Sample ID	Matrix
05102720-01A	1523-MW01	Aqueous
05102720-02A	1523-MW01 Dup	Aqueous
05102720-03A	1523-MW02	Aqueous
05102720-04A	1523-MW03	Aqueous
05102720-05A	1523-MW04	Aqueous
05102720-06A	1523-MW05	Aqueous
05102720-07A	1523-MW06	Aqueous
05102720-08A	1523-MW07	Aqueous
05102720-09A	1523-QCFB	Aqueous
05102720-10A	1523-QCEB	Aqueous
05102720-11A	1523-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 : 10/27/05

Job#: TO102/1523

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

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1523-MW01	TPH-E (Diesel)	0.055	0.050 mg/L	10/26/05	10/28/05
Lab ID :	BMI05102720-01A	TPH-E (Oil)	ND	0.50 mg/L	10/26/05	10/28/05
		Surr: Nonane	117	%REC	10/26/05	10/28/05
Client ID :	1523-MW01 Dup	TPH-E (Diesel)	ND	0.050 mg/L	10/26/05	10/28/05
Lab ID :	BMI05102720-02A	TPH-E (Oil)	ND	0.50 mg/L	10/26/05	10/28/05
		Surr: Nonane	114	%REC	10/26/05	10/28/05
Client ID :	1523-MW02	TPH-E (Diesel)	ND	0.050 mg/L	10/26/05	10/28/05
Lab ID :	BMI05102720-03A	TPH-E (Oil)	ND	0.50 mg/L	10/26/05	10/28/05
		Surr: Nonane	116	%REC	10/26/05	10/28/05
Client ID :	1523-MW03	TPH-E (Diesel)	0.077	0.050 mg/L	10/26/05	10/28/05
Lab ID :	BMI05102720-04A	TPH-E (Oil)	ND	0.50 mg/L	10/26/05	10/28/05
		Surr: Nonane	118	%REC	10/26/05	10/28/05
Client ID :	1523-MW04	TPH-E (Diesel)	ND	0.050 mg/L	10/26/05	10/28/05
Lab ID :	BMI05102720-05A	TPH-E (Oil)	ND	0.50 mg/L	10/26/05	10/28/05
		Surr: Nonane	124	%REC	10/26/05	10/28/05
Client ID :	1523-MW05	TPH-E (Diesel)	ND	0.050 mg/L	10/26/05	10/28/05
Lab ID :	BMI05102720-06A	TPH-E (Oil)	ND	0.50 mg/L	10/26/05	10/28/05
		Surr: Nonane	127	%REC	10/26/05	10/28/05
Client ID :	1523-MW06	TPH-E (Diesel)	ND	0.050 mg/L	10/26/05	10/28/05
Lab ID :	BMI05102720-07A	TPH-E (Oil)	ND	0.50 mg/L	10/26/05	10/28/05
		Surr: Nonane	121	%REC	10/26/05	10/28/05
Client ID :	1523-MW07	TPH-E (Diesel)	ND	0.050 mg/L	10/26/05	10/28/05
Lab ID :	BMI05102720-08A	TPH-E (Oil)	ND	0.50 mg/L	10/26/05	10/28/05
		Surr: Nonane	121	%REC	10/26/05	10/28/05
Client ID :	1523-QCEB	TPH-E (Diesel)	ND	0.050 mg/L	10/26/05	10/28/05
Lab ID :	BMI05102720-10A	TPH-E (Oil)	ND	0.50 mg/L	10/26/05	10/28/05
		Surr: Nonane	116	%REC	10/26/05	10/28/05

Alpha Analytical, Inc.

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

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

ND = Not Detected

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

11/9/05

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#: TO102/1523

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

Alpha Analytical Number: BMI05102720-01A
Client I.D. Number: 1523-MW01

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/03/05

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	113		%REC
62	Surr: Toluene-d8	94		%REC
63	Surr: 4-Bromofluorobenzene	101		%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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11/9/05
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102/1523

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

Alpha Analytical Number: BMI05102720-02A
Client I.D. Number: 1523-MW01 Dup

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/03/05

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	115		%REC
62	Surr: Toluene-d8	91		%REC
63	Surr: 4-Bromofluorobenzene	101		%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
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

11/9/05
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#: TO102/1523

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

Alpha Analytical Number: BMI05102720-03A
Client I.D. Number: 1523-MW02

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/03/05

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	111		%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
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11/9/05
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#: TO102/1523

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

Alpha Analytical Number: BMI05102720-04A
Client I.D. Number: 1523-MW03

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/03/05

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	1.7	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	113		%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	95		%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

11/9/05
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#: TO102/1523

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

Alpha Analytical Number: BMI05102720-05A
Client I.D. Number: 1523-MW04

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/03/05

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	113		%REC
62	Surr: Toluene-d8	95		%REC
63	Surr: 4-Bromofluorobenzene	99		%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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11/9/05
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102/1523

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

Alpha Analytical Number: BMI05102720-06A
Client I.D. Number: 1523-MW05

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/03/05

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	112		%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	99		%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	1.1	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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11/9/05
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#: TO102/1523

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

Alpha Analytical Number: BMI05102720-07A
Client I.D. Number: 1523-MW06

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/03/05

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	114		%REC
27	1,1,2-Trichloroethane	ND	1.0	µg/L	62	Surr: Toluene-d8	91		%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

11/9/05
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#: TO102/1523

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

Alpha Analytical Number: BMI05102720-08A
Client I.D. Number: 1523-MW07

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/04/05

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	117		%REC
27	1,1,2-Trichloroethane	ND	1.0	µg/L	62	Surr: Toluene-d8	93		%REC
28	Toluene	ND	0.50	µg/L	63	Surr: 4-Bromofluorobenzene	99		%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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11/9/05
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#: TO102/1523

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

Alpha Analytical Number: BMI05102720-09A
Client I.D. Number: 1523-QCFB

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/03/05

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	0.80	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	116		%REC
62	Surr: Toluene-d8	91		%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
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

11/9/05
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#: TO102/1523

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

Alpha Analytical Number: BMI05102720-10A
Client I.D. Number: 1523-QCEB

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/03/05

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	119		%REC
27	1,1,2-Trichloroethane	ND	1.0	µg/L	62	Surr: Toluene-d8	92		%REC
28	Toluene	0.81	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
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

11/9/05
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#: TO102/1523

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

Alpha Analytical Number: BMI05102720-11A
Client I.D. Number: 1523-QCTB

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/03/05

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	114		%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	106		%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

11/9/05
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

VOC Sample Preservation Report

Work Order: BMI05102720 **Project:** TO102/1523

Alpha's Sample ID	Client's Sample ID	Matrix	pH
05102720-01A	1523-MW01	Aqueous	2
05102720-02A	1523-MW01 Dup	Aqueous	2
05102720-03A	1523-MW02	Aqueous	4
05102720-04A	1523-MW03	Aqueous	2
05102720-05A	1523-MW04	Aqueous	4
05102720-06A	1523-MW05	Aqueous	2
05102720-07A	1523-MW06	Aqueous	2
05102720-08A	1523-MW07	Aqueous	2
05102720-09A	1523-QCFB	Aqueous	2
05102720-10A	1523-QCEB	Aqueous	2
05102720-11A	1523-QCTB	Aqueous	

11/9/05

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#: TO102/1523

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

Alpha Analytical Number: BMI05102720-01A
Client I.D. Number: 1523-MW01

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/04/05

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	100	%REC
18	Surr: 2-Fluorobiphenyl	75	%REC
19	Surr: 4-Terphenyl-d14	98	%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

11/9/05
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#: TO102/1523

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

Alpha Analytical Number: BMI05102720-02A
Client I.D. Number: 1523-MW01 Dup

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/04/05

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	74	%REC
19	Surr: 4-Terphenyl-d14	88	%REC

ND -- Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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11/9/05
Report Date

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102/1523

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

Alpha Analytical Number: BMI05102720-03A
Client I.D. Number: 1523-MW02

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/04/05

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	104	%REC
18	Surr: 2-Fluorobiphenyl	70	%REC
19	Surr: 4-Terphenyl-d14	93	%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#: TO102/1523

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

Alpha Analytical Number: BMI05102720-04A
Client I.D. Number: 1523-MW03

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/04/05

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	97	%REC
18	Surr: 2-Fluorobiphenyl	74	%REC
19	Surr: 4-Terphenyl-d14	87	%REC

Reporting Limits were increased due to sample matrix interferences.

ND - Not Detected

Roger Scholl Randy Gardner Walter Hutchinson

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

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102/1523

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

Alpha Analytical Number: BMI05102720-05A
Client I.D. Number: 1523-MW04

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/04/05

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	100	%REC
18	Surr: 2-Fluorobiphenyl	84	%REC
19	Surr: 4-Terphenyl-d14	98	%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#: TO102/1523

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

Alpha Analytical Number: BMI05102720-06A
Client I.D. Number: 1523-MW05

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/04/05

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	99	%REC
18	Surr: 2-Fluorobiphenyl	93	%REC
19	Surr: 4-Terphenyl-d14	93	%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#: TO102/1523

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

Alpha Analytical Number: BMI05102720-07A
Client I.D. Number: 1523-MW06

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/04/05

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	108	%REC
18	Surr: 2-Fluorobiphenyl	87	%REC
19	Surr: 4-Terphenyl-d14	100	%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#: TO102/1523

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

Alpha Analytical Number: BMI05102720-08A
Client I.D. Number: 1523-MW07

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/04/05

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	112	%REC
18	Surr: 2-Fluorobiphenyl	90	%REC
19	Surr: 4-Terphenyl-d14	103	%REC

ND = Not Detected

Roger Scholl Randy Gardner Walter Hutchman

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102/1523

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 :	**1523-MW01**						
Lab ID :	BMI05102720-01A	Nitrite (NO2) - N	ND	*	0.50 mg/L	10/26/05	11/10/05
		Nitrate (NO3) - N	53	*	0.50 mg/L	10/26/05	11/10/05
		Sulfate (SO4)	29		1.0 mg/L	10/26/05	10/27/05
Client ID :	**1523-MW01 Dup**						
Lab ID :	BMI05102720-02A	Nitrite (NO2) - N	ND	*	0.25 mg/L	10/26/05	11/10/05
		Nitrate (NO3) - N	53	*	0.50 mg/L	10/26/05	11/10/05
		Sulfate (SO4)	28		1.0 mg/L	10/26/05	10/27/05
Client ID :	**1523-MW02**						
Lab ID :	BMI05102720-03A	Nitrite (NO2) - N	ND		0.25 mg/L	10/26/05	10/27/05
		Nitrate (NO3) - N	8.7		0.25 mg/L	10/26/05	10/27/05
		Sulfate (SO4)	79		1.0 mg/L	10/26/05	10/27/05
Client ID :	**1523-MW03**						
Lab ID :	BMI05102720-04A	Nitrite (NO2) - N	ND		0.25 mg/L	10/26/05	10/27/05
		Nitrate (NO3) - N	4.2		0.25 mg/L	10/26/05	10/27/05
		Sulfate (SO4)	31		1.0 mg/L	10/26/05	10/27/05
Client ID :	**1523-MW04**						
Lab ID :	BMI05102720-05A	Nitrite (NO2) - N	ND	*	0.25 mg/L	10/26/05	11/10/05
		Nitrate (NO3) - N	180	*	2.5 mg/L	10/26/05	11/10/05
		Sulfate (SO4)	71		1.0 mg/L	10/26/05	10/27/05
Client ID :	**1523-MW05**						
Lab ID :	BMI05102720-06A	Nitrite (NO2) - N	ND		0.25 mg/L	10/26/05	10/27/05
		Nitrate (NO3) - N	22		0.25 mg/L	10/26/05	10/27/05
		Sulfate (SO4)	58		1.0 mg/L	10/26/05	10/27/05
Client ID :	**1523-MW06**						
Lab ID :	BMI05102720-07A	Nitrite (NO2) - N	ND		0.25 mg/L	10/26/05	10/27/05
		Nitrate (NO3) - N	0.75		0.25 mg/L	10/26/05	10/27/05
		Sulfate (SO4)	84		1.0 mg/L	10/26/05	10/27/05
Client ID :	**1523-MW07**						
Lab ID :	BMI05102720-08A	Nitrite (NO2) - N	ND		0.25 mg/L	10/26/05	10/27/05
		Nitrate (NO3) - N	0.96		0.25 mg/L	10/26/05	10/27/05
		Sulfate (SO4)	170		2.0 mg/L	10/26/05	11/10/05

*Note: Samples were originally run within hold time due to high concentrations of target analytes samples were re-run outside of hold time.
ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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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

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 10/27/05

Job#: TO102/1523

Iron by Spectrophotometer
SM3500-Fe D

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1523-MW01**					
Lab ID :	BMI05102720-01A	Iron, Total	0.37	0.30 mg/L	10/26/05	11/07/05
Client ID :	**1523-MW01 Dup**					
Lab ID :	BMI05102720-02A	Iron, Total	ND	0.30 mg/L	10/26/05	11/07/05
Client ID :	**1523-MW02**					
Lab ID :	BMI05102720-03A	Iron, Total	0.48	0.30 mg/L	10/26/05	11/07/05
Client ID :	**1523-MW03**					
Lab ID :	BMI05102720-04A	Iron, Total	0.52	0.30 mg/L	10/26/05	11/07/05
Client ID :	**1523-MW04**					
Lab ID :	BMI05102720-05A	Iron, Total	0.37	0.30 mg/L	10/26/05	11/07/05
Client ID :	**1523-MW05**					
Lab ID :	BMI05102720-06A	Iron, Total	ND	0.30 mg/L	10/26/05	11/07/05
Client ID :	**1523-MW06**					
Lab ID :	BMI05102720-07A	Iron, Total	0.31	0.30 mg/L	10/26/05	11/07/05
Client ID :	**1523-MW07**					
Lab ID :	BMI05102720-08A	Iron, Total	0.62	0.30 mg/L	10/26/05	11/07/05

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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11/9/05
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 : 10/27/05

Job#: TO102/1523

Dissolved Gases
Modified Method RSK-175 GC/FID

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1523-MW01**					
Lab ID :	BMI05102720-01A	Methane	ND	0.010 mg/L	10/26/05	10/27/05
Client ID :	**1523-MW01 Dup**					
Lab ID :	BMI05102720-02A	Methane	ND	0.010 mg/L	10/26/05	10/27/05
Client ID :	**1523-MW02**					
Lab ID :	BMI05102720-03A	Methane	ND	0.010 mg/L	10/26/05	10/27/05
Client ID :	**1523-MW03**					
Lab ID :	BMI05102720-04A	Methane	0.067	0.010 mg/L	10/26/05	10/27/05
Client ID :	**1523-MW04**					
Lab ID :	BMI05102720-05A	Methane	ND	0.010 mg/L	10/26/05	10/27/05
Client ID :	**1523-MW05**					
Lab ID :	BMI05102720-06A	Methane	ND	0.010 mg/L	10/26/05	10/27/05
Client ID :	**1523-MW06**					
Lab ID :	BMI05102720-07A	Methane	ND	0.010 mg/L	10/26/05	10/27/05
Client ID :	**1523-MW07**					
Lab ID :	BMI05102720-08A	Methane	ND	0.010 mg/L	10/26/05	10/27/05

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
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11/9/05
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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 : 10/27/05

Job#: TO102/1523

Dissolved Metals by ICPMS
EPA Method SW6020

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1523-MW01**					
Lab ID :	BMI05102720-01A	Manganese (Mn), Dissolved	0.015	0.0050 mg/L	10/26/05	11/04/05
Client ID :	**1523-MW01 Dup**					
Lab ID :	BMI05102720-02A	Manganese (Mn), Dissolved	0.022	0.0050 mg/L	10/26/05	11/04/05
Client ID :	**1523-MW02**					
Lab ID :	BMI05102720-03A	Manganese (Mn), Dissolved	ND	0.0050 mg/L	10/26/05	11/04/05
Client ID :	**1523-MW03**					
Lab ID :	BMI05102720-04A	Manganese (Mn), Dissolved	0.18	0.0050 mg/L	10/26/05	11/04/05
Client ID :	**1523-MW04**					
Lab ID :	BMI05102720-05A	Manganese (Mn), Dissolved	ND	0.0050 mg/L	10/26/05	11/04/05
Client ID :	**1523-MW05**					
Lab ID :	BMI05102720-06A	Manganese (Mn), Dissolved	ND	0.0050 mg/L	10/26/05	11/04/05
Client ID :	**1523-MW06**					
Lab ID :	BMI05102720-07A	Manganese (Mn), Dissolved	0.56	0.0050 mg/L	10/26/05	11/04/05
Client ID :	**1523-MW07**					
Lab ID :	BMI05102720-08A	Manganese (Mn), Dissolved	0.13	0.0050 mg/L	10/26/05	11/04/05

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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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 : 10/27/05

Job#: TO102/1523

Metals by ICPMS
EPA Method SW6020

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1523-MW01**					
Lab ID :	BMI05102720-01A	Lead (Pb)	ND	0.0050 mg/L	10/26/05	11/04/05
Client ID :	**1523-MW01 Dup**					
Lab ID :	BMI05102720-02A	Lead (Pb)	ND	0.0050 mg/L	10/26/05	11/04/05
Client ID :	**1523-MW02**					
Lab ID :	BMI05102720-03A	Lead (Pb)	ND	0.0050 mg/L	10/26/05	11/04/05
Client ID :	**1523-MW03**					
Lab ID :	BMI05102720-04A	Lead (Pb)	ND	0.0050 mg/L	10/26/05	11/04/05
Client ID :	**1523-MW04**					
Lab ID :	BMI05102720-05A	Lead (Pb)	ND	0.0050 mg/L	10/26/05	11/04/05
Client ID :	**1523-MW05**					
Lab ID :	BMI05102720-06A	Lead (Pb)	ND	0.0050 mg/L	10/26/05	11/04/05
Client ID :	**1523-MW06**					
Lab ID :	BMI05102720-07A	Lead (Pb)	ND	0.0050 mg/L	10/26/05	11/04/05
Client ID :	**1523-MW07**					
Lab ID :	BMI05102720-08A	Lead (Pb)	ND	0.0050 mg/L	10/26/05	11/04/05

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

11/9/05
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
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Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 10/27/05

Job#: TO102/1523

Alkalinity
EPA Method 310.1

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1523-MW01**					
Lab ID :	BMI05102720-01A	Alkalinity, Total (As CaCO3 at pH 4.5)	330	1.0 mg/L	10/26/05	11/09/05
Client ID :	**1523-MW01 Dup**					
Lab ID :	BMI05102720-02A	Alkalinity, Total (As CaCO3 at pH 4.5)	330	1.0 mg/L	10/26/05	11/09/05
Client ID :	**1523-MW02**					
Lab ID :	BMI05102720-03A	Alkalinity, Total (As CaCO3 at pH 4.5)	420	1.0 mg/L	10/26/05	11/09/05
Client ID :	**1523-MW03**					
Lab ID :	BMI05102720-04A	Alkalinity, Total (As CaCO3 at pH 4.5)	160	1.0 mg/L	10/26/05	11/09/05
Client ID :	**1523-MW04**					
Lab ID :	BMI05102720-05A	Alkalinity, Total (As CaCO3 at pH 4.5)	440	1.0 mg/L	10/26/05	11/09/05
Client ID :	**1523-MW05**					
Lab ID :	BMI05102720-06A	Alkalinity, Total (As CaCO3 at pH 4.5)	190	1.0 mg/L	10/26/05	11/09/05
Client ID :	**1523-MW06**					
Lab ID :	BMI05102720-07A	Alkalinity, Total (As CaCO3 at pH 4.5)	250	1.0 mg/L	10/26/05	11/09/05
Client ID :	**1523-MW07**					
Lab ID :	BMI05102720-08A	Alkalinity, Total (As CaCO3 at pH 4.5)	300	1.0 mg/L	10/26/05	11/09/05

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11/10/05
Report Date

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Attn: Chris Zimmerman
Phone: (614) 424-3779
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Date Received : 10/27/05

Job#: TO102/1523

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

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1523-MW01**					
Lab ID :	BMI05102720-01A	Solids, Total Dissolved (TDS)	11,000	50 mg/L	10/26/05	11/07/05
Client ID :	**1523-MW01 Dup**					
Lab ID :	BMI05102720-02A	Solids, Total Dissolved (TDS)	11,000	50 mg/L	10/26/05	11/07/05
Client ID :	**1523-MW02**					
Lab ID :	BMI05102720-03A	Solids, Total Dissolved (TDS)	1,300	10 mg/L	10/26/05	11/03/05
Client ID :	**1523-MW03**					
Lab ID :	BMI05102720-04A	Solids, Total Dissolved (TDS)	2,000	10 mg/L	10/26/05	11/04/05
Client ID :	**1523-MW04**					
Lab ID :	BMI05102720-05A	Solids, Total Dissolved (TDS)	2,800	25 mg/L	10/26/05	11/03/05
Client ID :	**1523-MW05**					
Lab ID :	BMI05102720-06A	Solids, Total Dissolved (TDS)	2,700	25 mg/L	10/26/05	11/07/05
Client ID :	**1523-MW06**					
Lab ID :	BMI05102720-07A	Solids, Total Dissolved (TDS)	3,000	25 mg/L	10/26/05	11/07/05
Client ID :	**1523-MW07**					
Lab ID :	BMI05102720-08A	Solids, Total Dissolved (TDS)	2,700	25 mg/L	10/26/05	11/07/05

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Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 10/27/05

Job#: TO102/1523

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

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1523-MW01**					
Lab ID :	BMI05102720-01A	Total Organic Carbon	3.8	1.0 mg/L	10/26/05	11/04/05
Client ID :	**1523-MW01 Dup**					
Lab ID :	BMI05102720-02A	Total Organic Carbon	3.7	1.0 mg/L	10/26/05	11/10/05
Client ID :	**1523-MW02**					
Lab ID :	BMI05102720-03A	Total Organic Carbon	8.2	1.0 mg/L	10/26/05	11/10/05
Client ID :	**1523-MW03**					
Lab ID :	BMI05102720-04A	Total Organic Carbon	6.5	1.0 mg/L	10/26/05	11/04/05
Client ID :	**1523-MW04**					
Lab ID :	BMI05102720-05A	Total Organic Carbon	8.5	1.0 mg/L	10/26/05	11/04/05
Client ID :	**1523-MW05**					
Lab ID :	BMI05102720-06A	Total Organic Carbon	2.8	1.0 mg/L	10/26/05	11/04/05
Client ID :	**1523-MW06**					
Lab ID :	BMI05102720-07A	Total Organic Carbon	3.6	1.0 mg/L	10/26/05	11/04/05
Client ID :	**1523-MW07**					
Lab ID :	BMI05102720-08A	Total Organic Carbon	8.1	1.0 mg/L	10/26/05	11/04/05

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11/10/05
Report Date

JANUARY 2006

Alpha Analytical, Inc.

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

Date: *03-Feb-06*

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

CASE NARRATIVE

Project: TO102-1523
Work Order: BMI06012350 **Cooler Temp:** 4 °C

Alpha's Sample ID	Client's Sample ID	Matrix
06012350-01A	1523-QCTB	Aqueous
06012350-02A	1523-QCFB	Aqueous
06012350-03A	1523-QCEB	Aqueous
06012350-04A	1523-MW01	Aqueous
06012350-05A	1523-MW01 Dup	Aqueous
06012350-06A	1523-MW02	Aqueous
06012350-07A	1523-MW03	Aqueous
06012350-08A	1523-MW04	Aqueous
06012350-09A	1523-MW05	Aqueous
06012350-10A	1523-MW06	Aqueous
06012350-11A	1523-MW07	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

Date: *18-Feb-06*

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

CASE NARRATIVE

Project: TO102-1523

Work Order: BMI06012003 **Cooler Temp:** 4 °C

Alpha's Sample ID	Client's Sample ID	Matrix
06012003-01A	1523-MW01	Aqueous
06012003-02A	1523-MW02	Aqueous
06012003-03A	1523-MW03	Aqueous
06012003-04A	1523-MW04	Aqueous
06012003-05A	1523-MW05	Aqueous
06012003-06A	1523-MW07	Aqueous
06012003-07A	1523-MW01Dup	Aqueous

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

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

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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 : 01/21/06

Job#: TO102-1523

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

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1523-QCEB	TPH-E (Diesel)	ND	0.050 mg/L	01/19/06	01/24/06
Lab ID :	BMI06012350-03A	TPH-E (Oil)	ND	0.50 mg/L	01/19/06	01/24/06
		Surr: Nonane	99	%REC	01/19/06	01/24/06
Client ID :	1523-MW01	TPH-E (Diesel)	0.074	0.050 mg/L	01/19/06	01/24/06
Lab ID :	BMI06012350-04A	TPH-E (Oil)	ND	0.50 mg/L	01/19/06	01/24/06
		Surr: Nonane	101	%REC	01/19/06	01/24/06
Client ID :	1523-MW01 Dup	TPH-E (Diesel)	0.069	0.050 mg/L	01/19/06	01/24/06
Lab ID :	BMI06012350-05A	TPH-E (Oil)	ND	0.50 mg/L	01/19/06	01/24/06
		Surr: Nonane	96	%REC	01/19/06	01/24/06
Client ID :	1523-MW02	TPH-E (Diesel)	0.10	0.050 mg/L	01/19/06	01/24/06
Lab ID :	BMI06012350-06A	TPH-E (Oil)	ND	0.50 mg/L	01/19/06	01/24/06
		Surr: Nonane	98	%REC	01/19/06	01/24/06
Client ID :	1523-MW03	TPH-E (Diesel)	0.15	0.050 mg/L	01/19/06	01/24/06
Lab ID :	BMI06012350-07A	TPH-E (Oil)	ND	0.50 mg/L	01/19/06	01/24/06
		Surr: Nonane	108	%REC	01/19/06	01/24/06
Client ID :	1523-MW04	TPH-E (Diesel)	ND	0.050 mg/L	01/19/06	01/24/06
Lab ID :	BMI06012350-08A	TPH-E (Oil)	ND	0.50 mg/L	01/19/06	01/24/06
		Surr: Nonane	98	%REC	01/19/06	01/24/06
Client ID :	1523-MW05	TPH-E (Diesel)	ND	0.050 mg/L	01/19/06	01/24/06
Lab ID :	BMI06012350-09A	TPH-E (Oil)	ND	0.50 mg/L	01/19/06	01/24/06
		Surr: Nonane	97	%REC	01/19/06	01/24/06
Client ID :	1523-MW06	TPH-E (Diesel)	0.15	0.050 mg/L	01/19/06	01/24/06
Lab ID :	BMI06012350-10A	TPH-E (Oil)	ND	0.50 mg/L	01/19/06	01/24/06
		Surr: Nonane	98	%REC	01/19/06	01/24/06
Client ID :	1523-MW07	TPH-E (Diesel)	ND	0.050 mg/L	01/19/06	01/24/06
Lab ID :	BMI06012350-11A	TPH-E (Oil)	ND	0.50 mg/L	01/19/06	01/24/06
		Surr: Nonane	97	%REC	01/19/06	01/24/06

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ND = Not Detected

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2/3/06
Report Date

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1523

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

Alpha Analytical Number: BMI06012350-04A
Client I.D. Number: 1523-MW01

Sampled: 01/19/06
Received: 01/21/06
Analyzed: 01/25/06

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	0.46	J	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	2.4		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	101			%REC
62	Surr: Toluene-d8	92			%REC
63	Surr: 4-Bromofluorobenzene	96			%REC

Some Reporting Limits were increased due to sample foaming.

J= Benzene concentrations and reporting limits between 0.25 and 0.50 µg/L are estimated.

ND = Not Detected

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Job#: TO102-1523

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

Alpha Analytical Number: BMI06012350-05A
Client I.D. Number: 1523-MW01 Dup

Sampled: 01/19/06
Received: 01/21/06
Analyzed: 01/25/06

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	0.31	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	102		%REC
27	1,1,2-Trichloroethane	ND		1.0	µg/L	62	Surr: Toluene-d8	93		%REC
28	Toluene	ND		0.50	µg/L	63	Surr: 4-Bromofluorobenzene	95		%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	0.54		0.50	µg/L					

Some Reporting Limits were increased due to sample foaming.

J= Benzene concentrations and reporting limits between 0.25 and 0.50 µg/L are estimated.

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

2/3/06
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#: TO102-1523

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

Alpha Analytical Number: BMI06012350-06A
Client I.D. Number: 1523-MW02

Sampled: 01/19/06
Received: 01/21/06
Analyzed: 01/25/06

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	92		%REC
28	Toluene	ND	0.50	µg/L	63	Surr: 4-Bromofluorobenzene	92		%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

2/3/06
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#: TQ102-1523

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

Alpha Analytical Number: BMI06012350-07A
Client I.D. Number: 1523-MW03

Sampled: 01/19/06
Received: 01/21/06
Analyzed: 01/25/06

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	0.29	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	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	2.0		1.0	µg/L	58	Naphthalene	2.6	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	93		%REC
28	Toluene	ND		0.50	µg/L	63	Surr: 4-Bromofluorobenzene	95		%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					

J= Benzene concentrations and reporting limits between 0.25 and 0.50 µg/L are estimated.

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

2/3/06
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#: TO102-1523

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

Alpha Analytical Number: BMI06012350-08A
Client I.D. Number: 1523-MW04

Sampled: 01/19/06
Received: 01/21/06
Analyzed: 01/25/06

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	104		%REC
27	1,1,2-Trichloroethane	ND	1.0	µg/L	62	Surr: Toluene-d8	93		%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

2/3/06
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1523

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

Alpha Analytical Number: BMI06012350-09A
Client I.D. Number: 1523-MW05

Sampled: 01/19/06
Received: 01/21/06
Analyzed: 01/25/06

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	1.5	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	96		%REC
28	Toluene	ND	0.50	µg/L	63	Surr: 4-Bromofluorobenzene	99		%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

2/3/06
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#: TO102-1523

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

Alpha Analytical Number: BMI06012350-10A
Client I.D. Number: 1523-MW06

Sampled: 01/19/06
Received: 01/21/06
Analyzed: 01/25/06

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	105		%REC
27	1,1,2-Trichloroethane	ND	1.0	µg/L	62	Surr: Toluene-d8	93		%REC
28	Toluene	ND	0.50	µg/L	63	Surr: 4-Bromofluorobenzene	95		%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

2/3/06
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#: TO102-1523

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

Alpha Analytical Number: BMI06012350-11A
Client I.D. Number: 1523-MW07

Sampled: 01/19/06
Received: 01/21/06
Analyzed: 01/25/06

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	106		%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	96		%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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2/3/06
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#: TO102-1523

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

Alpha Analytical Number: BMI06012350-01A
Client I.D. Number: 1523-QCTB

Sampled: 01/19/06
Received: 01/21/06
Analyzed: 01/25/06

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	95		%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	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

2/3/06
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#: TO102-1523

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

Alpha Analytical Number: BMI06012350-02A
Client I.D. Number: 1523-QCFB

Sampled: 01/19/06
Received: 01/21/06
Analyzed: 01/25/06

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	97		%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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2/3/06
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: BMI06012350 **Project:** TO102-1523

Alpha's Sample ID	Client's Sample ID	Matrix	pH
06012350-01A	1523-QCTB	Aqueous	
06012350-02A	1523-QCFB	Aqueous	2
06012350-04A	1523-MW01	Aqueous	2
06012350-05A	1523-MW01 Dup	Aqueous	2
06012350-06A	1523-MW02	Aqueous	2
06012350-07A	1523-MW03	Aqueous	2
06012350-08A	1523-MW04	Aqueous	2
06012350-09A	1523-MW05	Aqueous	2
06012350-10A	1523-MW06	Aqueous	2
06012350-11A	1523-MW07	Aqueous	2

2/3/06
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#: TO102-1523

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

Alpha Analytical Number: BMI06012350-04A
Client I.D. Number: 1523-MW01

Sampled: 01/19/06
Received: 01/21/06
Analyzed: 01/27/06

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	94	%REC
18	Surr: 2-Fluorobiphenyl	73	%REC
19	Surr: 4-Terphenyl-d14	99	%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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2/3/06
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#: TO102-1523

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

Alpha Analytical Number: BMI06012350-05A
Client I.D. Number: 1523-MW01 Dup

Sampled: 01/19/06
Received: 01/21/06
Analyzed: 01/27/06

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	91	%REC
18	Surr: 2-Fluorobiphenyl	68	%REC
19	Surr: 4-Terphenyl-d14	106	%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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2/3/06
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1523

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

Alpha Analytical Number: BMI06012350-06A
Client I.D. Number: 1523-MW02

Sampled: 01/19/06
Received: 01/21/06
Analyzed: 01/27/06

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	104	%REC
18	Surr: 2-Fluorobiphenyl	114 *	%REC
19	Surr: 4-Terphenyl-d14	101	%REC

Reporting Limits were increased due to sample matrix interferences.

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

2/3/06
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#: TO102-1523

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

Alpha Analytical Number: BMI06012350-07A
Client I.D. Number: 1523-MW03

Sampled: 01/19/06
Received: 01/21/06
Analyzed: 01/27/06

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	109		%REC
18	Surr: 2-Fluorobiphenyl	117	*	%REC
19	Surr: 4-Terphenyl-d14	103		%REC

Reporting Limits were increased due to sample matrix interferences.

*2-Fluorobiphenly surrogate recovery was 117%, with 54-113% criteria. The other surrogates met criteria.

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#: TO102-1523

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

Alpha Analytical Number: BMI06012350-08A
Client I.D. Number: 1523-MW04

Sampled: 01/19/06
Received: 01/21/06
Analyzed: 01/27/06

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	105	%REC
18	Surr: 2-Fluorobiphenyl	113	%REC
19	Surr: 4-Terphenyl-d14	104	%REC

ND = Not Detected

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1523

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

Alpha Analytical Number: BMI06012350-09A
Client I.D. Number: 1523-MW05

Sampled: 01/19/06
Received: 01/21/06
Analyzed: 01/27/06

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	102	%REC
18	Surr: 2-Fluorobiphenyl	109	%REC
19	Surr: 4-Terphenyl-d14	106	%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#: TO102-1523

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

Alpha Analytical Number: BMI06012350-11A
Client I.D. Number: 1523-MW07

Sampled: 01/19/06
Received: 01/21/06
Analyzed: 01/27/06

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	101	%REC
18	Surr: 2-Fluorobiphenyl	106	%REC
19	Surr: 4-Terphenyl-d14	105	%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 : 01/20/06

Job#: TO102-1523

Anions by IC
EPA Method 300.0 / 9056

	Parameter	Concentration		Reporting Limit	Date / Time Sampled	Date / Time Analyzed
Client ID :	Nitrite (NO2) - N	ND	D*	2.5 mg/L	01/19/06 12:10	01/24/06 18:48
1523-MW01	Nitrate (NO3) - N	50	*	2.5 mg/L	01/19/06 12:10	01/24/06 18:48
Lab ID :	Sulfate (SO4)	31		0.50 mg/L	01/19/06 12:10	01/20/06 19:17
BMI06012003-01A						
Client ID :	Nitrite (NO2) - N	ND		0.25 mg/L	01/19/06 13:55	01/20/06 19:36
1523-MW02	Nitrate (NO3) - N	9.3		0.25 mg/L	01/19/06 13:55	01/20/06 19:36
Lab ID :	Sulfate (SO4)	55		0.50 mg/L	01/19/06 13:55	01/20/06 19:36
BMI06012003-02A						
Client ID :	Nitrite (NO2) - N	ND		0.25 mg/L	01/19/06 09:35	01/20/06 19:54
1523-MW03	Nitrate (NO3) - N	7.1		0.25 mg/L	01/19/06 09:35	01/20/06 19:54
Lab ID :	Sulfate (SO4)	31		0.50 mg/L	01/19/06 09:35	01/20/06 19:54
BMI06012003-03A						
Client ID :	Nitrite (NO2) - N	ND		0.25 mg/L	01/19/06 09:45	01/20/06 20:13
1523-MW04	Nitrate (NO3) - N	150	**	6.3 mg/L	01/19/06 09:45	01/24/06 19:44
Lab ID :	Sulfate (SO4)	73		0.50 mg/L	01/19/06 09:45	01/20/06 20:13
BMI06012003-04A						
Client ID :	Nitrite (NO2) - N	ND		0.25 mg/L	01/19/06 11:00	01/20/06 20:31
1523-MW05	Nitrate (NO3) - N	21	**	1.3 mg/L	01/19/06 11:00	01/24/06 20:02
Lab ID :	Sulfate (SO4)	51		0.50 mg/L	01/19/06 11:00	01/20/06 20:31
BMI06012003-05A						
Client ID :	Nitrite (NO2) - N	ND		0.25 mg/L	01/19/06 12:04	01/20/06 20:50
1523-MW07	Nitrate (NO3) - N	0.47		0.25 mg/L	01/19/06 12:04	01/20/06 20:50
Lab ID :	Sulfate (SO4)	280		2.5 mg/L	01/19/06 12:04	01/23/06 22:36
BMI06012003-06A						
Client ID :	Nitrite (NO2) - N	ND	D*	2.5 mg/L	01/19/06 12:10	01/24/06 20:21
1523-MW01Dup	Nitrate (NO3) - N	45	*	2.5 mg/L	01/19/06 12:10	01/24/06 20:21
Lab ID :	Sulfate (SO4)	35		0.50 mg/L	01/19/06 12:10	01/20/06 21:08
BMI06012003-07A						

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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 : 01/20/06

Job#: TO102: 1523

Iron by Spectrophotometer
SM3500-Fe D

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1523-MW01**					
Lab ID :	BMI06012003-01A	Iron, Ferrous (+2)	ND	0.050 mg/L	01/19/06	01/20/06
Client ID :	**1523-MW02**					
Lab ID :	BMI06012003-02A	Iron, Ferrous (+2)	ND	0.050 mg/L	01/19/06	01/20/06
Client ID :	**1523-MW03**					
Lab ID :	BMI06012003-03A	Iron, Ferrous (+2)	ND	0.050 mg/L	01/19/06	01/20/06
Client ID :	**1523-MW04**					
Lab ID :	BMI06012003-04A	Iron, Ferrous (+2)	ND	0.050 mg/L	01/19/06	01/20/06
Client ID :	**1523-MW05**					
Lab ID :	BMI06012003-05A	Iron, Ferrous (+2)	ND	0.050 mg/L	01/19/06	01/20/06
Client ID :	**1523-MW07**					
Lab ID :	BMI06012003-06A	Iron, Ferrous (+2)	ND	0.050 mg/L	01/19/06	01/20/06
Client ID :	**1523-MW01Dup**					
Lab ID :	BMI06012003-07A	Iron, Ferrous (+2)	ND	0.050 mg/L	01/19/06	01/20/06

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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2/2/06
Report Date

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ANALYTICAL REPORT

Battelle Memorial Institute
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Columbus, OH 43201

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 01/21/06

Job#: TO102-1523

Dissolved Gases
Modified Method RSK-175 GC/FID

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1523-MW01**					
Lab ID :	BMI06012350-04A	Methane	0.027	0.010 mg/L	01/19/06	01/26/06
Client ID :	**1523-MW01 Dup**					
Lab ID :	BMI06012350-05A	Methane	0.010	0.010 mg/L	01/19/06	01/26/06
Client ID :	**1523-MW02**					
Lab ID :	BMI06012350-06A	Methane	0.025	0.010 mg/L	01/19/06	01/26/06
Client ID :	**1523-MW03**					
Lab ID :	BMI06012350-07A	Methane	0.059	0.010 mg/L	01/19/06	01/26/06
Client ID :	**1523-MW04**					
Lab ID :	BMI06012350-08A	Methane	ND	0.010 mg/L	01/19/06	01/26/06
Client ID :	**1523-MW05**					
Lab ID :	BMI06012350-09A	Methane	ND	0.010 mg/L	01/19/06	01/26/06
Client ID :	**1523-MW06**					
Lab ID :	BMI06012350-10A	Methane	ND	0.010 mg/L	01/19/06	01/26/06
Client ID :	**1523-MW07**					
Lab ID :	BMI06012350-11A	Methane	ND	0.010 mg/L	01/19/06	01/26/06

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 : 01/20/06

Job#: TO102-1523

Dissolved Metals by ICPMS
EPA Method SW6020

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1523-MW01**					
Lab ID :	BMI06012003-01A	Manganese (Mn), Dissolved	0.014	0.0050 mg/L	01/19/06	02/15/06
Client ID :	**1523-MW02**					
Lab ID :	BMI06012003-02A	Manganese (Mn), Dissolved	0.0082	0.0050 mg/L	01/19/06	02/15/06
Client ID :	**1523-MW03**					
Lab ID :	BMI06012003-03A	Manganese (Mn), Dissolved	0.18	0.010 mg/L	01/19/06	02/15/06
Client ID :	**1523-MW04**					
Lab ID :	BMI06012003-04A	Manganese (Mn), Dissolved	ND	0.0050 mg/L	01/19/06	02/15/06
Client ID :	**1523-MW05**					
Lab ID :	BMI06012003-05A	Manganese (Mn), Dissolved	0.020	0.0050 mg/L	01/19/06	02/15/06
Client ID :	**1523-MW07**					
Lab ID :	BMI06012003-06A	Manganese (Mn), Dissolved	0.036	0.0050 mg/L	01/19/06	02/15/06
Client ID :	**1523-MW01Dup**					
Lab ID :	BMI06012003-07A	Manganese (Mn), Dissolved	0.011	0.0050 mg/L	01/19/06	02/15/06

ND = Not Detected

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
Columbus, OH 43201

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 01/20/06

Job#: TO102-1523

Metals by ICPMS
EPA Method SW6020

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1523-MW01					
Lab ID :	BMI06012003-01A	Lead (Pb)	ND	0.0050 mg/L	01/19/06	02/15/06
Client ID :	1523-MW02					
Lab ID :	BMI06012003-02A	Lead (Pb)	ND	0.0050 mg/L	01/19/06	02/15/06
Client ID :	1523-MW03					
Lab ID :	BMI06012003-03A	Lead (Pb)	ND	0.0050 mg/L	01/19/06	02/15/06
Client ID :	1523-MW04					
Lab ID :	BMI06012003-04A	Lead (Pb)	ND	0.0050 mg/L	01/19/06	02/15/06
Client ID :	1523-MW05					
Lab ID :	BMI06012003-05A	Lead (Pb)	ND	0.0050 mg/L	01/19/06	02/15/06
Client ID :	1523-MW07					
Lab ID :	BMI06012003-06A	Lead (Pb)	ND	0.0050 mg/L	01/19/06	02/15/06
Client ID :	1523-MW01Dup					
Lab ID :	BMI06012003-07A	Lead (Pb)	ND	0.0050 mg/L	01/19/06	02/15/06

ND = Not Detected

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
Columbus, OH 43201

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 01/20/06

Job#: TO102-1523

Alkalinity
EPA Method 310.1

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1523-MW01**					
Lab ID :	BMI06012003-01A	Alkalinity, Total (As CaCO3 at pH 4.5)	21	1.0 mg/L	01/19/06	01/25/06
Client ID :	**1523-MW02**					
Lab ID :	BMI06012003-02A	Alkalinity, Total (As CaCO3 at pH 4.5)	160	1.0 mg/L	01/19/06	01/25/06
Client ID :	**1523-MW03**					
Lab ID :	BMI06012003-03A	Alkalinity, Total (As CaCO3 at pH 4.5)	61	1.0 mg/L	01/19/06	01/25/06
Client ID :	**1523-MW04**					
Lab ID :	BMI06012003-04A	Alkalinity, Total (As CaCO3 at pH 4.5)	140	1.0 mg/L	01/19/06	01/25/06
Client ID :	**1523-MW05**					
Lab ID :	BMI06012003-05A	Alkalinity, Total (As CaCO3 at pH 4.5)	54	1.0 mg/L	01/19/06	01/25/06
Client ID :	**1523-MW07**					
Lab ID :	BMI06012003-06A	Alkalinity, Total (As CaCO3 at pH 4.5)	110	1.0 mg/L	01/19/06	01/25/06
Client ID :	**1523-MW01Dup**					
Lab ID :	BMI06012003-07A	Alkalinity, Total (As CaCO3 at pH 4.5)	27	1.0 mg/L	01/19/06	01/25/06

Roger Scholl Randy Gardner Walter Hinchman

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**Nitrate was analyzed on a preserved sample. The accuracy of Nitrate may be biased high due to the possible oxidation of Nitrite to Nitrate.

*Nitrite and Nitrate are analyzed on a preserved sample. The accuracy of Nitrite may be biased low and the Nitrate biased high due to the possible oxidation of Nitrite to Nitrate.

D = Reporting Limits were increased due to high concentrations of non-target analytes.

ND = Not Detected

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

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 01/20/06

Job#: TO102-1523

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

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1523-MW01**					
Lab ID :	BMI06012003-01A	Solids, Total Dissolved (TDS)	12,000	50 mg/L	01/19/06	01/30/06
Client ID :	**1523-MW02**					
Lab ID :	BMI06012003-02A	Solids, Total Dissolved (TDS)	1,800	10 mg/L	01/19/06	01/27/06
Client ID :	**1523-MW03**					
Lab ID :	BMI06012003-03A	Solids, Total Dissolved (TDS)	3,400	25 mg/L	01/19/06	01/27/06
Client ID :	**1523-MW04**					
Lab ID :	BMI06012003-04A	Solids, Total Dissolved (TDS)	2,400	10 mg/L	01/19/06	01/27/06
Client ID :	**1523-MW05**					
Lab ID :	BMI06012003-05A	Solids, Total Dissolved (TDS)	4,100	25 mg/L	01/19/06	01/27/06
Client ID :	**1523-MW07**					
Lab ID :	BMI06012003-06A	Solids, Total Dissolved (TDS)	1,600	10 mg/L	01/19/06	01/26/06
Client ID :	**1523-MW01Dup**					
Lab ID :	BMI06012003-07A	Solids, Total Dissolved (TDS)	12,000	50 mg/L	01/19/06	01/27/06

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2/2/06
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

Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 01/21/06

Job#: TO102-1523

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

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1523-MW01**					
Lab ID :	BMI06012350-04A	Total Organic Carbon	2.9	1.0 mg/L	01/19/06	01/24/06
Client ID :	**1523-MW01 Dup**					
Lab ID :	BMI06012350-05A	Total Organic Carbon	2.6	1.0 mg/L	01/19/06	01/25/06
Client ID :	**1523-MW02**					
Lab ID :	BMI06012350-06A	Total Organic Carbon	6.0	1.0 mg/L	01/19/06	01/25/06
Client ID :	**1523-MW03**					
Lab ID :	BMI06012350-07A	Total Organic Carbon	7.8	4.0 mg/L	01/19/06	01/25/06
Client ID :	**1523-MW04**					
Lab ID :	BMI06012350-08A	Total Organic Carbon	5.0	1.0 mg/L	01/19/06	01/25/06
Client ID :	**1523-MW05**					
Lab ID :	BMI06012350-09A	Total Organic Carbon	2.2	1.0 mg/L	01/19/06	01/25/06
Client ID :	**1523-MW07**					
Lab ID :	BMI06012350-11A	Total Organic Carbon	9.6	1.0 mg/L	01/19/06	01/25/06

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2/3/06
Report Date

APPENDIX D

LABORATORY QA/QC ANALYTICAL RESULTS

OCTOBER 2005

Alpha Analytical, Inc.

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Date: *11-Nov-05*

QC Summary Report

Work Order: 05102720

Method Blank

Type: **MBLK** Test Code: **EPA Method SW8015**
File ID: Batch ID: **13417** Analysis Date: **10/28/2005 14:31**
Sample ID: **MBLK-13417** Units : **mg/L** Run ID: **FID_4_051028A** Prep Date: **10/28/2005**

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	126		100		126	47	141			

Laboratory Control Spike

Type: **LCS** Test Code: **EPA Method SW8015**
File ID: Batch ID: **13417** Analysis Date: **10/28/2005 15:05**
Sample ID: **LCS-13417** Units : **mg/L** Run ID: **FID_4_051028A** Prep Date: **10/28/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH-E (Diesel)	2.2	0.5	2.5		88	64	129			
Surr: Nonane	111		100		111	47	141			

Sample Matrix Spike

Type: **MS** Test Code: **EPA Method SW8015**
File ID: Batch ID: **13417** Analysis Date: **10/28/2005 16:14**
Sample ID: **05102720-01AMS** Units : **mg/L** Run ID: **FID_4_051028A** Prep Date: **10/28/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH-E (Diesel)	2.39	0.5	2.5	0.0513	93	56	147			
Surr: Nonane	115		100		115	47	141			

Sample Matrix Spike Duplicate

Type: **MSD** Test Code: **EPA Method SW8015**
File ID: Batch ID: **13417** Analysis Date: **10/28/2005 16:49**
Sample ID: **05102720-01AMSD** Units : **mg/L** Run ID: **FID_4_051028A** Prep Date: **10/28/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH-E (Diesel)	2.37	0.5	2.5	0.0513	93	56	147	2.387	0.7(25)	
Surr: Nonane	114		100		114	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: 05102720

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

File ID: **C:\HPCHEM\MS07\DATA\051103\05110331.D** Batch ID: **MS07W1103A** Analysis Date: **11/03/2005 18:50**

Sample ID: **MBLK MS07W1103A** Units : **µg/L** Run ID: **MSD_07_051103A** Prep Date: **11/03/2005**

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	11		10		110	76	127			
Surr: Toluene-d8	9.45		10		95	84	113			
Surr: 4-Bromofluorobenzene	10.3		10		103	79	119			

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Date: *11-Nov-05*

QC Summary Report

Work Order: 05102720

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

File ID: **C:\HPCHEM\MS07\DATA\051103\05110327.D** Batch ID: **MS07W1103A** Analysis Date: **11/03/2005 17:22**

Sample ID: **LCS MS07W1103A** Units : **µg/L** Run ID: **MSD_07_051103A** Prep Date: **11/03/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	8.12	1	10		81	32	129			
Chloromethane	8.78	2	10		88	44	121			
Vinyl chloride	9.68	1	10		97	80	120			
Chloroethane	13.5	1	10		135	52	142			
Bromomethane	9.33	2	10		93	5	151			
Trichlorofluoromethane	12.1	1	10		121	70	141			
1,1-Dichloroethene	11.5	1	10		115	80	120			
Dichloromethane	9.83	2	10		98	73	117			
trans-1,2-Dichloroethene	10.5	1	10		105	74	129			
1,1-Dichloroethane	10.2	1	10		102	78	125			
cis-1,2-Dichloroethene	9.51	1	10		95	79	126			
Bromochloromethane	9.43	1	10		94	76	126			
Chloroform	10.2	1	10		102	80	120			
2,2-Dichloropropane	12.1	1	10		121	71	156			
1,2-Dichloroethane	11.1	1	10		111	72	135			
1,1,1-Trichloroethane	10.7	1	10		107	74	132			
1,1-Dichloropropene	10.4	1	10		104	83	129			
Carbon tetrachloride	10.9	1	10		109	68	137			
Benzene	9.72	0.5	10		97	81	122			
Dibromomethane	9.67	1	10		97	75	127			
1,2-Dichloropropane	10.9	1	10		109	80	120			
Trichloroethene	9.88	1	10		99	74	125			
Bromodichloromethane	10.3	1	10		103	75	130			
cis-1,3-Dichloropropene	10.1	1	10		101	78	128			
trans-1,3-Dichloropropene	10.6	1	10		106	74	134			
1,1,2-Trichloroethane	9.96	1	10		99.6	75	129			
Toluene	9.46	0.5	10		95	80	120			
1,3-Dichloropropane	9.61	1	10		96	73	129			
Dibromochloromethane	10.2	1	10		102	71	130			
1,2-Dibromoethane (EDB)	19.9	2	20		99	75	132			
Tetrachloroethene	9.67	1	10		97	73	131			
1,1,1,2-Tetrachloroethane	10.4	1	10		104	78	125			
Chlorobenzene	9.66	1	10		97	79	124			
Ethylbenzene	9.62	0.5	10		96	80	120			
m,p-Xylene	9.9	0.5	10		99	80	129			
Bromoform	11.5	1	10		115	66	138			
Styrene	10.4	1	10		104	79	130			
o-Xylene	10.9	0.5	10		109	80	129			
1,1,2,2-Tetrachloroethane	9.93	1	10		99	63	142			
1,2,3-Trichloropropane	20.9	2	20		105	73	132			
Isopropylbenzene	10.1	1	10		101	78	133			
Bromobenzene	9.53	1	10		95	76	127			
n-Propylbenzene	9.44	1	10		94	78	130			
4-Chlorotoluene	9.85	1	10		99	80	129			
2-Chlorotoluene	10.6	1	10		106	79	129			
1,3,5-Trimethylbenzene	10.6	1	10		106	77	134			
tert-Butylbenzene	9.94	1	10		99	80	129			
1,2,4-Trimethylbenzene	10.1	1	10		101	77	133			
sec-Butylbenzene	9.79	1	10		98	79	129			
1,3-Dichlorobenzene	9.93	1	10		99	80	125			
1,4-Dichlorobenzene	10.1	1	10		101	79	125			
4-Isopropyltoluene	10.3	1	10		103	77	133			
1,2-Dichlorobenzene	9.81	1	10		98	79	119			
n-Butylbenzene	10.4	1	10		104	72	138			
1,2-Dibromo-3-chloropropane (DBCP)	49.8	3	50		99.6	61	138			
1,2,4-Trichlorobenzene	8.75	2	10		88	55	139			
Naphthalene	8.19	2	10		82	35	150			
Hexachlorobutadiene	20.5	2	20		102	65	135			
1,2,3-Trichlorobenzene	9.35	2	10		94	39	147			
Surr: 1,2-Dichloroethane-d4	12.2		10		122	76	127			
Surr: Toluene-d8	9.48		10		95	84	113			
Surr: 4-Bromofluorobenzene	9.6		10		96	79	119			

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Date: 11-Nov-05

QC Summary Report

Work Order: 05102720

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

File ID: **C:\HPCHEM\MS07\DATA\051103\05110337.D** Batch ID: **MS07W1103A** Analysis Date: **11/03/2005 21:02**

Sample ID: **05102720-05AMS** Units : **µg/L** Run ID: **MSD_07_051103A** Prep Date: **11/03/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	42.6	2.5	50	0	85	17	130			
Chloromethane	43.8	5	50	0	88	31	127			
Vinyl chloride	46.5	2.5	50	0	93	52	131			
Chloroethane	64.9	2.5	50	0	130	40	146			
Bromomethane	52.3	10	50	0	105	4	152			
Trichlorofluoromethane	59.8	2.5	50	0	120	57	143			
1,1-Dichloroethene	50.8	2.5	50	0	102	65	127			
Dichloromethane	44.1	10	50	0	88	68	119			
trans-1,2-Dichloroethene	47.5	2.5	50	0	95	67	131			
1,1-Dichloroethane	47.8	2.5	50	0	96	71	128			
cis-1,2-Dichloroethene	48.4	2.5	50	0	97	73	129			
Bromochloromethane	46.2	2.5	50	0	92	71	130			
Chloroform	49.3	2.5	50	0	99	71	124			
2,2-Dichloropropane	49	2.5	50	0	98	52	157			
1,2-Dichloroethane	54.9	2.5	50	0	110	68	139			
1,1,1-Trichloroethane	51.8	2.5	50	0	104	67	134			
1,1-Dichloropropene	48.3	2.5	50	0	97	75	130			
Carbon tetrachloride	52.3	2.5	50	0	105	62	137			
Benzene	45.8	1.3	50	0	92	74	125			
Dibromomethane	48.2	2.5	50	0	96	73	130			
1,2-Dichloropropane	52.3	2.5	50	0	105	72	130			
Trichloroethene	45.4	2.5	50	0	91	66	126			
Bromodichloromethane	51.5	2.5	50	0	103	70	133			
cis-1,3-Dichloropropene	44.7	2.5	50	0	89	61	130			
trans-1,3-Dichloropropene	48.3	2.5	50	0	97	67	134			
1,1,2-Trichloroethane	47	2.5	50	0	94	72	132			
Toluene	46.6	1.3	50	0	93	76	120			
1,3-Dichloropropane	49.3	2.5	50	0	99	73	129			
Dibromochloromethane	51.9	2.5	50	0	104	70	130			
1,2-Dibromoethane (EDB)	99.9	10	100	0	99.9	75	133			
Tetrachloroethene	43.8	2.5	50	0	88	66	131			
1,1,1,2-Tetrachloroethane	52.1	2.5	50	0	104	76	126			
Chlorobenzene	47.7	2.5	50	0	95	76	124			
Ethylbenzene	46.8	1.3	50	0	94	77	124			
m,p-Xylene	47.5	1.3	50	0	95	73	130			
Bromoform	57.6	2.5	50	0	115	66	140			
Styrene	49.7	2.5	50	0	99	73	131			
o-Xylene	49.5	1.3	50	0	99	74	131			
1,1,2,2-Tetrachloroethane	52.1	2.5	50	0	104	63	146			
1,2,3-Trichloropropane	102	10	100	0	102	73	136			
Isopropylbenzene	48.5	2.5	50	0	97	73	133			
Bromobenzene	47.5	2.5	50	0	95	75	127			
n-Propylbenzene	45.5	2.5	50	0	91	73	130			
4-Chlorotoluene	46.9	2.5	50	0	94	76	129			
2-Chlorotoluene	47.7	2.5	50	0	95	76	129			
1,3,5-Trimethylbenzene	48.2	2.5	50	0	96	70	135			
tert-Butylbenzene	49	2.5	50	0	98	74	129			
1,2,4-Trimethylbenzene	48.6	2.5	50	0	97	70	134			
sec-Butylbenzene	46.4	2.5	50	0	93	74	129			
1,3-Dichlorobenzene	47.8	2.5	50	0	96	77	125			
1,4-Dichlorobenzene	48.3	2.5	50	0	97	76	126			
4-Isopropyltoluene	48.8	2.5	50	0	98	71	133			
1,2-Dichlorobenzene	47.9	2.5	50	0	96	77	120			
n-Butylbenzene	48.3	2.5	50	0	97	63	138			
1,2-Dibromo-3-chloropropane (DBCP)	255	15	250	0	102	61	142			
1,2,4-Trichlorobenzene	41.5	10	50	0	83	54	143			
Naphthalene	36.9	10	50	0	74	35	159			
Hexachlorobutadiene	97.3	10	100	0	97	60	136			
1,2,3-Trichlorobenzene	44.2	10	50	0	88	38	154			
Surr: 1,2-Dichloroethane-d4	58.6		50		117	76	127			
Surr: Toluene-d8	47.2		50		94	84	113			
Surr: 4-Bromofluorobenzene	48		50		96	79	119			

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Date: *11-Nov-05*

OC Summary Report

Work Order: 05102720

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

File ID: **C:\HPCHEM\MS07\DATA\051103\05110338.D** Batch ID: **MS07W1103A** Analysis Date: **11/03/2005 21:24**

Sample ID: **05102720-05AMSD** Units : **µg/L** Run ID: **MSD_07_051103A** Prep Date: **11/03/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	46.2	2.5	50	0	92	17	130	42.61	8.0(16)	
Chloromethane	49.5	5	50	0	99	31	127	43.75	12.4(20)	
Vinyl chloride	51.9	2.5	50	0	104	52	131	46.47	11.1(16)	
Chloroethane	70.3	2.5	50	0	141	40	146	64.91	7.9(40)	
Bromomethane	62.9	10	50	0	126	4	152	52.26	18.4(32)	
Trichlorofluoromethane	62.7	2.5	50	0	125	57	143	59.79	4.7(22)	
1,1-Dichloroethene	55.2	2.5	50	0	110	65	127	50.78	8.4(17)	
Dichloromethane	47.3	10	50	0	95	68	119	44.07	7.2(15)	
trans-1,2-Dichloroethene	50.7	2.5	50	0	101	67	131	47.54	6.5(30)	
1,1-Dichloroethane	51.1	2.5	50	0	102	71	128	47.77	6.7(14)	
cis-1,2-Dichloroethene	51.1	2.5	50	0	102	73	129	48.43	5.3(23)	
Bromochloromethane	50.8	2.5	50	0	102	71	130	46.21	9.4(15)	
Chloroform	52.1	2.5	50	0	104	71	124	49.31	5.5(13)	
2,2-Dichloropropane	52	2.5	50	0	104	52	157	48.96	6.0(14)	
1,2-Dichloroethane	57.3	2.5	50	0	115	68	139	54.94	4.2(14)	
1,1,1-Trichloroethane	55.3	2.5	50	0	111	67	134	51.79	6.5(14)	
1,1-Dichloropropene	52.9	2.5	50	0	106	75	130	48.33	9.1(14)	
Carbon tetrachloride	55.9	2.5	50	0	112	62	137	52.28	6.8(15)	
Benzene	50	1.3	50	0	99.9	74	124	45.83	8.6(13)	
Dibromomethane	49.5	2.5	50	0	99	73	130	48.18	2.7(15)	
1,2-Dichloropropane	53.6	2.5	50	0	107	72	130	52.27	2.5(13)	
Trichloroethene	49	2.5	50	0	98	66	126	45.35	7.7(13)	
Bromodichloromethane	52.5	2.5	50	0	105	70	133	51.45	2.0(14)	
cis-1,3-Dichloropropene	46.5	2.5	50	0	93	61	130	44.67	4.0(15)	
trans-1,3-Dichloropropene	50	2.5	50	0	100	67	134	48.26	3.6(16)	
1,1,2-Trichloroethane	48.3	2.5	50	0	97	72	132	47	2.6(16)	
Toluene	47.9	1.3	50	0	96	76	119	46.59	2.8(13)	
1,3-Dichloropropane	49.7	2.5	50	0	99	73	129	49.26	0.9(15)	
Dibromochloromethane	52.5	2.5	50	0	105	70	130	51.93	1.1(15)	
1,2-Dibromoethane (EDB)	101	10	100	0	101	75	133	99.92	1.3(15)	
Tetrachloroethene	45.9	2.5	50	0	92	66	131	43.81	4.6(14)	
1,1,1,2-Tetrachloroethane	53.1	2.5	50	0	106	76	126	52.09	1.9(13)	
Chlorobenzene	49.2	2.5	50	0	98	76	120	47.72	3.0(12)	
Ethylbenzene	49.2	1.3	50	0	98	77	124	46.76	5.1(13)	
m,p-Xylene	49.1	1.3	50	0	98	73	130	47.47	3.4(14)	
Bromoform	58.2	2.5	50	0	116	66	140	57.62	0.9(16)	
Styrene	51.4	2.5	50	0	103	73	131	49.65	3.4(13)	
o-Xylene	50.9	1.3	50	0	102	74	131	49.48	2.8(13)	
1,1,2,2-Tetrachloroethane	52.2	2.5	50	0	104	63	146	52.14	0.2(17)	
1,2,3-Trichloropropane	102	10	100	0	102	73	136	101.9	0.4(19)	
Isopropylbenzene	51.7	2.5	50	0	103	73	133	48.52	6.4(15)	
Bromobenzene	50.2	2.5	50	0	100	75	127	47.54	5.5(18)	
n-Propylbenzene	48.2	2.5	50	0	96	73	130	45.51	5.7(14)	
4-Chlorotoluene	49.6	2.5	50	0	99	76	129	46.86	5.7(13)	
2-Chlorotoluene	50.5	2.5	50	0	101	76	129	47.69	5.8(13)	
1,3,5-Trimethylbenzene	50.6	2.5	50	0	101	70	135	48.17	4.8(14)	
tert-Butylbenzene	50.9	2.5	50	0	102	74	129	48.98	3.8(14)	
1,2,4-Trimethylbenzene	51.4	2.5	50	0	103	70	134	48.56	5.7(14)	
sec-Butylbenzene	50.5	2.5	50	0	101	74	129	46.42	8.5(14)	
1,3-Dichlorobenzene	50.8	2.5	50	0	102	77	125	47.84	6.0(12)	
1,4-Dichlorobenzene	51.2	2.5	50	0	102	76	126	48.3	5.8(12)	
4-Isopropyltoluene	51.8	2.5	50	0	104	71	133	48.82	5.9(15)	
1,2-Dichlorobenzene	50.7	2.5	50	0	101	77	120	47.88	5.7(12)	
n-Butylbenzene	51.4	2.5	50	0	103	63	138	48.29	6.2(15)	
1,2-Dibromo-3-chloropropane (DBCP)	266	15	250	0	106	61	142	255.1	4.0(17)	
1,2,4-Trichlorobenzene	44.8	10	50	0	90	54	143	41.48	7.8(21)	
Naphthalene	40.6	10	50	0	81	35	159	36.93	9.4(28)	
Hexachlorobutadiene	105	10	100	0	105	60	136	97.25	7.8(17)	
1,2,3-Trichlorobenzene	48.2	10	50	0	96	38	154	44.17	8.8(33)	
Surr: 1,2-Dichloroethane-d4	60.5		50		121	76	127			
Surr: Toluene-d8	46.5		50		93	84	113			
Surr: 4-Bromofluorobenzene	48.4		50		97	79	119			

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Date:
11-Nov-05

QC Summary Report

Work Order:
05102720

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: 05102720

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: 05102720

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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Date: *11-Nov-05*

QC Summary Report

Work Order: 05102720

Method Blank

Type: **MBLK** Test Code: **EPA Method SW6020**

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 SW6020**

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 SW6020**

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 SW6020**

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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QC Summary Report

Work Order: 05102720

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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QC Summary Report

Work Order: 05102720

Method Blank

Type: **MBLK** Test Code: **Modified Method RSK-175 GC/FID**

File ID: Batch ID: **13411** Analysis Date: **10/27/2005 16:29**

Sample ID: **MBLK-13411** Units : **mg/L** Run ID: **FID_6_051027A** Prep Date: **10/27/2005**

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: **13411** Analysis Date: **10/27/2005 16:48**

Sample ID: **LCS-13411** Units : **mg/L** Run ID: **FID_6_051027A** Prep Date: **10/27/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Methane	0.556	0.01	0.532		105	70	130			

Sample Matrix Spike

Type: **MS** Test Code: **Modified Method RSK-175 GC/FID**

File ID: Batch ID: **13411** Analysis Date: **10/31/2005 15:14**

Sample ID: **05102503-04AMS** Units : **mg/L** Run ID: **FID_6_051027A** Prep Date: **10/27/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Methane	7.35	0.01	2.66	5.031	87	70	130			

Sample Matrix Spike Duplicate

Type: **MSD** Test Code: **Modified Method RSK-175 GC/FID**

File ID: Batch ID: **13411** Analysis Date: **10/31/2005 15:33**

Sample ID: **05102503-04AMSD** Units : **mg/L** Run ID: **FID_6_051027A** Prep Date: **10/27/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Methane	6.32	0.01	2.66	5.031	49	70	130	7.353	15.0(20)	M2

Comments:

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M2 = Matrix spike recovery was low, the method control sample recovery was acceptable.

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Date: *11-Nov-05*

QC Summary Report

Work Order: 05102720

Method Blank

Type: **MBLK** Test Code: **EPA Method 160.1 / SM 2540 C**

File ID: Batch ID: **W051101TDS** Analysis Date: **11/01/2005 00:00**

Sample ID: **MBLK-W051101TDS** Units : **mg/L** Run ID: **WETLAB_051101D** Prep Date: **11/01/2005**

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: **W051101TDS** Analysis Date: **11/01/2005 00:00**

Sample ID: **LCS-W051101TDS** Units : **mg/L** Run ID: **WETLAB_051101D** Prep Date: **11/01/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Solids, Total Dissolved (TDS)	183	10	200		92	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: *11-Nov-05*

OC Summary Report

Work Order: 05102720

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:

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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QC Summary Report

Work Order: 05102720

Method Blank

Type: **MBLK** Test Code: **SM3500-Fe D**

File ID: Batch ID: **W051107FET** Analysis Date: **11/07/2005 00:00**

Sample ID: **MBLK-W051107FET** Units : **mg/L** Run ID: **WETLAB_051107B** Prep Date: **11/07/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Iron, Total	ND	0.3								

Laboratory Control Spike

Type: **LCS** Test Code: **SM3500-Fe D**

File ID: Batch ID: **W051107FET** Analysis Date: **11/07/2005 00:00**

Sample ID: **LCS-W051107FET** Units : **mg/L** Run ID: **WETLAB_051107B** Prep Date: **11/07/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Iron, Total	47	3	50		94	85	115			

Sample Matrix Spike

Type: **MS** Test Code: **SM3500-Fe D**

File ID: Batch ID: **W051107FET** Analysis Date: **11/07/2005 00:00**

Sample ID: **05102503-04AMS** Units : **mg/L** Run ID: **WETLAB_051107B** Prep Date: **11/07/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Iron, Total	68.7	3	50	27.27	83	70	130			

Sample Matrix Spike Duplicate

Type: **MSD** Test Code: **SM3500-Fe D**

File ID: Batch ID: **W051107FET** Analysis Date: **11/07/2005 00:00**

Sample ID: **05102503-04AMSD** Units : **mg/L** Run ID: **WETLAB_051107B** Prep Date: **11/07/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Iron, Total	69.1	3	50	27.27	84	70	130	68.72	0.6(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: *11-Nov-05*

QC Summary Report

Work Order: 05102720

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:

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: *11-Nov-05*

QC Summary Report

Work Order: 05102720

Method Blank

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

File ID: **02705\A12647_002.DXD** Batch ID: **13409A** Analysis Date: **10/27/2005 14:41**

Sample ID: **MB-13409** Units : **mg/L** Run ID: **IC_1_051027C** Prep Date: **10/27/2005**

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: **02705\A12648_003.DXD** Batch ID: **13409A** Analysis Date: **10/27/2005 14:58**

Sample ID: **LFB-13409** Units : **mg/L** Run ID: **IC_1_051027C** Prep Date: **10/27/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Nitrite (NO2) - N	2.03	0.25	2		102	90	110			
Nitrate (NO3) - N	2.16	0.25	2		108	90	110			

Sample Matrix Spike

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

File ID: **02705\A12653_008.DXD** Batch ID: **13409A** Analysis Date: **10/27/2005 16:25**

Sample ID: **05102623-03ALFM** Units : **mg/L** Run ID: **IC_1_051027C** Prep Date: **10/27/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Nitrite (NO2) - N	102	1.3	100	0	102	80	120			
Nitrate (NO3) - N	162	1.3	100	53.53	108	80	120			

Sample Matrix Spike Duplicate

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

File ID: **02705\A12654_009.DXD** Batch ID: **13409A** Analysis Date: **10/27/2005 16:43**

Sample ID: **05102623-03ALFMD** Units : **mg/L** Run ID: **IC_1_051027C** Prep Date: **10/27/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Nitrite (NO2) - N	101	1.3	100	0	101	80	120	101.6	0.8(2)	
Nitrate (NO3) - N	163	1.3	100	53.53	110	80	120	162	0.7(2)	

Comments:

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Date: *11-Nov-05*

QC Summary Report

Work Order: 05102720

Method Blank

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

File ID: **02705\A12647_002.DXD** Batch ID: **13409B** Analysis Date: **10/27/2005 14:41**

Sample ID: **MB-13409** Units : **mg/L** Run ID: **IC_1_051027C** Prep Date: **10/27/2005**

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: **02705\A12648_003.DXD** Batch ID: **13409B** Analysis Date: **10/27/2005 14:58**

Sample ID: **LFB-13409** Units : **mg/L** Run ID: **IC_1_051027C** Prep Date: **10/27/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Sulfate (SO4)	4.11	0.5	4		103	90	110			

Sample Matrix Spike

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

File ID: **02705\A12653_008.DXD** Batch ID: **13409B** Analysis Date: **10/27/2005 16:25**

Sample ID: **05102623-03ALFM** Units : **mg/L** Run ID: **IC_1_051027C** Prep Date: **10/27/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Sulfate (SO4)	275	5	200	69.91	102	80	120			

Sample Matrix Spike Duplicate

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

File ID: **02705\A12654_009.DXD** Batch ID: **13409B** Analysis Date: **10/27/2005 16:43**

Sample ID: **05102623-03ALFMD** Units : **mg/L** Run ID: **IC_1_051027C** Prep Date: **10/27/2005**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Sulfate (SO4)	276	5	200	69.91	103	80	120	274.8	0.3(2)	

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: *03-Feb-06*

QC Summary Report

Work Order: 06012350

Method Blank

Type: MBLK Test Code: EPA Method SW8015
File ID: Batch ID: 13961 Analysis Date: 01/24/2006 16:59
Sample ID: MBLK-13961 Units : mg/L Run ID: FID_2_060124A Prep Date: 01/24/2006

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	95.7		100		96	47	141			

Laboratory Control Spike

Type: LCS Test Code: EPA Method SW8015
File ID: Batch ID: 13961 Analysis Date: 01/24/2006 17:31
Sample ID: LCS-13961 Units : mg/L Run ID: FID_2_060124A Prep Date: 01/24/2006

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH-E (Diesel)	2.53	0.5	2.5		101	64	129			
Surr: Nonane	98.8		100		99	47	141			

Sample Matrix Spike

Type: MS Test Code: EPA Method SW8015
File ID: Batch ID: 13961 Analysis Date: 01/25/2006 00:52
Sample ID: 06012350-11AMS Units : mg/L Run ID: FID_2_060124A Prep Date: 01/24/2006

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH-E (Diesel)	2.61	0.5	2.5	0	105	56	147			
Surr: Nonane	121		100		121	47	141			

Sample Matrix Spike Duplicate

Type: MSD Test Code: EPA Method SW8015
File ID: Batch ID: 13961 Analysis Date: 01/25/2006 01:23
Sample ID: 06012350-11AMSD Units : mg/L Run ID: FID_2_060124A Prep Date: 01/24/2006

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
TPH-E (Diesel)	2.61	0.5	2.5	0	105	56	147	2.615	0.0(25)	
Surr: Nonane	142		100		142	47	141			S55

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.

S55 = Surrogate recovery was above laboratory acceptance limits.

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Date: 03-Feb-06

QC Summary Report

Work Order: 06012350

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

File ID: **C:\HPCHEM\MS10\DATA\060125\06012505.D** Batch ID: **MS10W0125A** Analysis Date: **01/25/2006 09:20**

Sample ID: **MBLK MS10W0125A** Units : µg/L Run ID: **MSD_10_060125A** Prep Date: **01/25/2006**

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	10.2		10		102	76	127			
Surr: Toluene-d8	9.65		10		97	84	113			
Surr: 4-Bromofluorobenzene	9.67		10		97	79	119			

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Date: 03-Feb-06

QC Summary Report

Work Order: 06012350

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

File ID: C:\HPCHEM\MS10\DATA\060125\06012504.D Batch ID: MS10W0125A Analysis Date: 01/25/2006 08:58

Sample ID: LCS MS10W0125A Units : µg/L Run ID: MSD_10_060125A Prep Date: 01/25/2006

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	8.37	1	10		84	32	129			
Chloromethane	10.8	2	10		108	44	121			
Vinyl chloride	10.3	1	10		103	80	120			
Chloroethane	11.2	1	10		112	52	142			
Bromomethane	9.39	2	10		94	5	151			
Trichlorofluoromethane	9	1	10		90	70	141			
1,1-Dichloroethene	9.8	1	10		98	80	120			
Dichloromethane	10.3	2	10		103	73	117			
trans-1,2-Dichloroethene	10.5	1	10		105	74	129			
1,1-Dichloroethane	10.3	1	10		103	78	125			
cis-1,2-Dichloroethene	11.1	1	10		111	79	126			
Bromochloromethane	10.5	1	10		105	76	126			
Chloroform	9.42	1	10		94	80	120			
2,2-Dichloropropane	10.3	1	10		103	71	156			
1,2-Dichloroethane	9.71	1	10		97	72	135			
1,1,1-Trichloroethane	8.8	1	10		88	74	132			
1,1-Dichloropropene	10.7	1	10		107	83	129			
Carbon tetrachloride	10.1	1	10		101	68	137			
Benzene	10.5	0.5	10		105	81	122			
Dibromomethane	10.6	1	10		106	75	127			
1,2-Dichloropropane	9.6	1	10		96	80	120			
Trichloroethene	9.66	1	10		97	74	125			
Bromodichloromethane	10.2	1	10		102	75	130			
cis-1,3-Dichloropropene	11.3	1	10		113	78	128			
trans-1,3-Dichloropropene	11.2	1	10		112	74	134			
1,1,2-Trichloroethane	11.3	1	10		113	75	129			
Toluene	9.68	0.5	10		97	80	120			
1,3-Dichloropropane	10.1	1	10		101	73	129			
Dibromochloromethane	9.12	1	10		91	71	130			
1,2-Dibromoethane (EDB)	20.3	2	20		101	75	132			
Tetrachloroethene	9.21	1	10		92	73	131			
1,1,1,2-Tetrachloroethane	9.42	1	10		94	78	125			
Chlorobenzene	10.4	1	10		104	79	124			
Ethylbenzene	9.88	0.5	10		99	80	120			
m,p-Xylene	10	0.5	10		100	80	129			
Bromoform	9.98	1	10		99.8	66	138			
Styrene	9.98	1	10		99.8	79	130			
o-Xylene	9.81	0.5	10		98	80	129			
1,1,2,2-Tetrachloroethane	11.1	1	10		111	63	142			
1,2,3-Trichloropropane	21.2	2	20		106	73	132			
Isopropylbenzene	10.2	1	10		102	78	133			
Bromobenzene	10.4	1	10		104	76	127			
n-Propylbenzene	10.7	1	10		107	78	130			
4-Chlorotoluene	10.7	1	10		107	80	129			
2-Chlorotoluene	10.6	1	10		106	79	129			
1,3,5-Trimethylbenzene	10.8	1	10		108	77	134			
tert-Butylbenzene	9.93	1	10		99	80	129			
1,2,4-Trimethylbenzene	10.8	1	10		108	77	133			
sec-Butylbenzene	10.3	1	10		103	79	129			
1,3-Dichlorobenzene	10.3	1	10		103	80	125			
1,4-Dichlorobenzene	10.4	1	10		104	79	125			
4-Isopropyltoluene	10.5	1	10		105	77	133			
1,2-Dichlorobenzene	10.3	1	10		103	79	119			
n-Butylbenzene	11.6	1	10		116	72	138			
1,2-Dibromo-3-chloropropane (DBCP)	52.3	3	50		105	61	138			
1,2,4-Trichlorobenzene	9.98	2	10		99.8	55	139			
Naphthalene	10.7	2	10		107	35	150			
Hexachlorobutadiene	17.1	2	20		85	65	135			
1,2,3-Trichlorobenzene	9.65	2	10		97	39	147			
Surr: 1,2-Dichloroethane-d4	10.5		10		105	76	127			
Surr: Toluene-d8	9.45		10		95	84	113			
Surr: 4-Bromofluorobenzene	9.63		10		96	79	119			

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Date: 03-Feb-06

QC Summary Report

Work Order: 06012350

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

File ID: C:\HPCHEM\MS10\DATA\060125\06012510.D Batch ID: MS10W0125A Analysis Date: 01/25/2006 11:08

Sample ID: 06012350-04AMS Units : µg/L Run ID: MSD_10_060125A Prep Date: 01/25/2006

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	39.6	2.5	50	0	79	17	130			
Chloromethane	49.3	5	50	0	99	31	127			
Vinyl chloride	45.2	2.5	50	0	90	52	131			
Chloroethane	51.8	2.5	50	0	104	40	146			
Bromomethane	45.4	10	50	0	91	4	152			
Trichlorofluoromethane	41.2	2.5	50	0	82	57	143			
1,1-Dichloroethene	42.8	2.5	50	0	86	65	127			
Dichloromethane	47.6	10	50	0	95	68	119			
trans-1,2-Dichloroethene	47	2.5	50	0	94	67	131			
1,1-Dichloroethane	48.8	2.5	50	0	98	71	128			
cis-1,2-Dichloroethene	51.1	2.5	50	0	102	73	129			
Bromochloromethane	49.3	2.5	50	0	99	71	130			
Chloroform	45.3	2.5	50	0	91	71	124			
2,2-Dichloropropane	45.4	2.5	50	0	91	52	157			
1,2-Dichloroethane	48.6	2.5	50	0	97	68	139			
1,1,1-Trichloroethane	40.2	2.5	50	0	80	67	134			
1,1-Dichloropropene	48.6	2.5	50	0	97	75	130			
Carbon tetrachloride	40.5	2.5	50	0	81	62	137			
Benzene	49	1.3	50	0	98	74	125			
Dibromomethane	51.6	2.5	50	0	103	73	130			
1,2-Dichloropropane	47.8	2.5	50	0	96	72	130			
Trichloroethene	44	2.5	50	0	88	66	126			
Bromodichloromethane	49.4	2.5	50	0	99	70	133			
cis-1,3-Dichloropropene	51.5	2.5	50	0	103	61	130			
trans-1,3-Dichloropropene	50.3	2.5	50	0	101	67	134			
1,1,2-Trichloroethane	55	2.5	50	0	110	72	132			
Toluene	43.8	1.3	50	0	88	76	120			
1,3-Dichloropropane	50.5	2.5	50	0	101	73	129			
Dibromochloromethane	45.5	2.5	50	0	91	70	130			
1,2-Dibromoethane (EDB)	99.1	10	100	0	99	75	133			
Tetrachloroethene	38.9	2.5	50	0	78	66	131			
1,1,1,2-Tetrachloroethane	45.2	2.5	50	0	90	76	126			
Chlorobenzene	48.2	2.5	50	0	96	76	124			
Ethylbenzene	47.3	1.3	50	2.4	90	77	124			
m,p-Xylene	44.8	1.3	50	0	90	73	130			
Bromoform	48.7	2.5	50	0	97	66	140			
Styrene	45.4	2.5	50	0	91	73	131			
o-Xylene	44.8	1.3	50	0	90	74	131			
1,1,2,2-Tetrachloroethane	54.6	2.5	50	0	109	63	146			
1,2,3-Trichloropropane	105	10	100	0	105	73	136			
Isopropylbenzene	47.6	2.5	50	0	95	73	133			
Bromobenzene	50.4	2.5	50	0	101	75	127			
n-Propylbenzene	49.5	2.5	50	0	99	73	130			
4-Chlorotoluene	51.4	2.5	50	0	103	76	129			
2-Chlorotoluene	50.5	2.5	50	0	101	76	129			
1,3,5-Trimethylbenzene	50	2.5	50	0	100	70	135			
tert-Butylbenzene	45.3	2.5	50	0	91	74	129			
1,2,4-Trimethylbenzene	51.3	2.5	50	0	103	70	134			
sec-Butylbenzene	46.8	2.5	50	0	94	74	129			
1,3-Dichlorobenzene	49.1	2.5	50	0	98	77	125			
1,4-Dichlorobenzene	49.8	2.5	50	0	99.6	76	126			
4-Isopropyltoluene	46.7	2.5	50	0	93	71	133			
1,2-Dichlorobenzene	51.1	2.5	50	0	102	77	120			
n-Butylbenzene	50.9	2.5	50	0	102	63	138			
1,2-Dibromo-3-chloropropane (DBCP)	270	15	250	0	108	61	142			
1,2,4-Trichlorobenzene	52.4	10	50	0	105	54	143			
Naphthalene	67.2	10	50	0	134	35	159			
Hexachlorobutadiene	73.6	10	100	0	74	60	136			
1,2,3-Trichlorobenzene	50.9	10	50	0	102	38	154			
Surr: 1,2-Dichloroethane-d4	52.8		50		106	76	127			
Surr: Toluene-d8	47.4		50		95	84	113			
Surr: 4-Bromofluorobenzene	49.1		50		98	79	119			

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Date: 03-Feb-06

QC Summary Report

Work Order: 06012350

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

File ID: C:\HPCHEM\MS10\DATA\060125\06012511.D Batch ID: MS10W0125A Analysis Date: 01/25/2006 11:30

Sample ID: 06012350-04AMSD Units : µg/L Run ID: MSD_10_060125A Prep Date: 01/25/2006

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Dichlorodifluoromethane	43.2	2.5	50	0	86	17	130	39.62	8.6(16)	
Chloromethane	54.3	5	50	0	109	31	127	49.25	9.7(20)	
Vinyl chloride	49.5	2.5	50	0	99	52	131	45.17	9.1(16)	
Chloroethane	55.4	2.5	50	0	111	40	146	51.75	6.8(40)	
Bromomethane	49.6	10	50	0	99	4	152	45.43	8.8(32)	
Trichlorofluoromethane	43.3	2.5	50	0	87	57	143	41.2	5.1(22)	
1,1-Dichloroethene	46	2.5	50	0	92	65	127	42.77	7.4(17)	
Dichloromethane	50.1	10	50	0	100	68	119	47.6	5.2(15)	
trans-1,2-Dichloroethene	49.4	2.5	50	0	99	67	131	46.95	5.0(30)	
1,1-Dichloroethane	50.9	2.5	50	0	102	71	128	48.75	4.3(14)	
cis-1,2-Dichloroethene	54.5	2.5	50	0	109	73	129	51.05	6.5(23)	
Bromochloromethane	50.5	2.5	50	0	101	71	130	49.33	2.4(15)	
Chloroform	47.3	2.5	50	0	95	71	124	45.25	4.4(13)	
2,2-Dichloropropane	47.3	2.5	50	0	95	52	157	45.36	4.1(14)	
1,2-Dichloroethane	49.8	2.5	50	0	99.6	68	139	48.55	2.6(14)	
1,1,1-Trichloroethane	42.9	2.5	50	0	86	67	134	40.18	6.6(14)	
1,1-Dichloropropene	51.8	2.5	50	0	104	75	130	48.6	6.4(14)	
Carbon tetrachloride	42.9	2.5	50	0	86	62	137	40.46	5.9(15)	
Benzene	51.8	1.3	50	0	104	74	125	49.01	5.6(13)	
Dibromomethane	53.1	2.5	50	0	106	73	130	51.55	2.9(15)	
1,2-Dichloropropane	50.2	2.5	50	0	100	72	130	47.76	5.0(13)	
Trichloroethene	47.1	2.5	50	0	94	66	126	44.02	6.7(13)	
Bromodichloromethane	51.7	2.5	50	0	103	70	133	49.42	4.5(14)	
cis-1,3-Dichloropropene	54.2	2.5	50	0	108	61	130	51.48	5.1(15)	
trans-1,3-Dichloropropene	52.8	2.5	50	0	106	67	134	50.28	4.9(16)	
1,1,2-Trichloroethane	57.7	2.5	50	0	115	72	132	54.97	4.8(16)	
Toluene	45.9	1.3	50	0	92	76	120	43.81	4.6(13)	
1,3-Dichloropropane	49.3	2.5	50	0	99	73	129	50.51	2.5(15)	
Dibromochloromethane	45.4	2.5	50	0	91	70	130	45.47	0.2(15)	
1,2-Dibromoethane (EDB)	98.9	10	100	0	99	75	133	99.09	0.2(15)	
Tetrachloroethene	40.7	2.5	50	0	81	66	131	38.85	4.8(14)	
1,1,1,2-Tetrachloroethane	46.8	2.5	50	0	94	76	126	45.15	3.6(13)	
Chlorobenzene	50.6	2.5	50	0	101	76	124	48.16	5.0(12)	
Ethylbenzene	49.7	1.3	50	2.4	95	77	124	47.28	5.1(13)	
m,p-Xylene	48	1.3	50	0	96	73	130	44.84	6.9(14)	
Bromoform	49.3	2.5	50	0	99	66	140	48.73	1.2(16)	
Styrene	48.6	2.5	50	0	97	73	131	45.44	6.6(13)	
o-Xylene	48	1.3	50	0	96	74	131	44.77	7.0(13)	
1,1,2,2-Tetrachloroethane	56.2	2.5	50	0	112	63	146	54.6	2.9(17)	
1,2,3-Trichloropropane	109	10	100	0	109	73	136	105.2	3.5(19)	
Isopropylbenzene	49.9	2.5	50	0	99.8	73	133	47.63	4.7(15)	
Bromobenzene	52.1	2.5	50	0	104	75	127	50.41	3.3(18)	
n-Propylbenzene	51.8	2.5	50	0	104	73	130	49.51	4.5(14)	
4-Chlorotoluene	53.3	2.5	50	0	107	76	129	51.4	3.7(13)	
2-Chlorotoluene	53.2	2.5	50	0	106	76	129	50.54	5.2(13)	
1,3,5-Trimethylbenzene	53	2.5	50	0	106	70	135	50.03	5.7(14)	
tert-Butylbenzene	48	2.5	50	0	96	74	129	45.29	5.8(14)	
1,2,4-Trimethylbenzene	54	2.5	50	0	108	70	134	51.32	5.1(14)	
sec-Butylbenzene	49.8	2.5	50	0	99.6	74	129	46.81	6.2(14)	
1,3-Dichlorobenzene	51.5	2.5	50	0	103	77	125	49.1	4.8(12)	
1,4-Dichlorobenzene	52.4	2.5	50	0	105	76	126	49.82	5.0(12)	
4-Isopropyltoluene	49.9	2.5	50	0	99.8	71	133	46.66	6.7(15)	
1,2-Dichlorobenzene	52.4	2.5	50	0	105	77	120	51.05	2.6(12)	
n-Butylbenzene	54.7	2.5	50	0	109	63	138	50.88	7.2(15)	
1,2-Dibromo-3-chloropropane (DBCP)	272	15	250	0	109	61	142	269.7	0.8(17)	
1,2,4-Trichlorobenzene	55.7	10	50	0	111	54	143	52.35	6.2(21)	
Naphthalene	61.3	10	50	0	123	35	159	67.16	9.1(28)	
Hexachlorobutadiene	79	10	100	0	79	60	136	73.56	7.1(17)	
1,2,3-Trichlorobenzene	52.8	10	50	0	106	38	154	50.93	3.6(33)	
Surr: 1,2-Dichloroethane-d4	53		50		106	76	127			
Surr: Toluene-d8	46.1		50		92	84	113			
Surr: 4-Bromofluorobenzene	48.8		50		98	79	119			

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Date: *03-Feb-06*

QC Summary Report

Work Order: 06012350

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: 03-Feb-06

QC Summary Report

Work Order: 06012350

Method Blank

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

File ID: **06012704.D** Batch ID: **13963** Analysis Date: **01/27/2006 10:28**

Sample ID: **MBLK 13963** Units : µg/L Run ID: **MSD_14_060124A** Prep Date: **01/24/2006**

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	91.2		100		91	62	124			
Surr: 2-Fluorobiphenyl	62.7		100		63	54	113			
Surr: 4-Terphenyl-d14	92.3		100		92	60	116			

Laboratory Control Spike

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

File ID: **06012705.D** Batch ID: **13963** Analysis Date: **01/27/2006 11:07**

Sample ID: **LCS 13963** Units : µg/L Run ID: **MSD_14_060124A** Prep Date: **01/24/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Naphthalene	65.2	10	100		65	62	104			
Acenaphthylene	74.4	10	100		74	71	120			
Acenaphthene	70	10	100		70	67	109			
Fluorene	75	10	100		75	67	114			
Phenanthrene	71	10	100		71	69	117			
Anthracene	73.1	10	100		73	70	117			
Fluoranthene	78	10	100		78	64	123			
Pyrene	77.9	10	100		78	70	119			
Benzo(a)anthracene	87	10	100		87	69	115			
Chrysene	87.4	10	100		87	63	129			
Benzo(b)fluoranthene	75.5	10	100		76	69	117			
Benzo(k)fluoranthene	80.1	10	100		80	70	122			
Benzo(a)pyrene	70.5	10	100		70	71	119			L50
Indeno(1,2,3-cd)pyrene	74.1	10	100		74	65	119			
Dibenz(a,h)anthracene	83.2	10	100		83	59	125			
Benzo(g,h,i)perylene	74.4	10	100		74	65	122			
Surr: Nitrobenzene-d5	100		100		100	62	124			
Surr: 2-Fluorobiphenyl	51.3		100		51	54	113			S54
Surr: 4-Terphenyl-d14	93.1		100		93	60	116			

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Date: 03-Feb-06

QC Summary Report

Work Order: 06012350

Sample Matrix Spike

Type: MS Test Code: EPA Method SW8270C

File ID: 06012715.D Batch ID: 13963 Analysis Date: 01/27/2006 17:07

Sample ID: 06012350-04AMS Units : µg/L Run ID: MSD_14_060124A Prep Date: 01/24/2006

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Naphthalene	63.1	10	100	0	63	30	116			
Acenaphthylene	55.5	10	100	0	56	57	120			M2
Acenaphthene	71	10	100	0	71	55	113			
Fluorene	76.8	10	100	0	77	57	116			
Phenanthrene	73.6	10	100	0	74	66	119			
Anthracene	74.9	10	100	0	75	61	120			
Fluoranthene	84.6	10	100	0	85	62	123			
Pyrene	81.9	10	100	0	82	63	120			
Benzo(a)anthracene	90.1	10	100	0	90	66	118			
Chrysene	93.2	10	100	0	93	58	130			
Benzo(b)fluoranthene	75.4	10	100	0	75	64	121			
Benzo(k)fluoranthene	82.6	10	100	0	83	65	122			
Benzo(a)pyrene	72.6	10	100	0	73	61	122			
Indeno(1,2,3-cd)pyrene	77.1	10	100	0	77	57	123			
Dibenz(a,h)anthracene	88.2	10	100	0	88	56	127			
Benzo(g,h,i)perylene	79.3	10	100	0	79	56	125			
Surr: Nitrobenzene-d5	92.6		100		93	62	124			
Surr: 2-Fluorobiphenyl	70.1		100		70	54	113			
Surr: 4-Terphenyl-d14	95.5		100		96	60	116			

Sample Matrix Spike Duplicate

Type: MSD Test Code: EPA Method SW8270C

File ID: 06012716.D Batch ID: 13963 Analysis Date: 01/27/2006 17:42

Sample ID: 06012350-04AMSD Units : µg/L Run ID: MSD_14_060124A Prep Date: 01/24/2006

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Naphthalene	70.3	10	100	0	70	30	116	63.13	10.8(35)	
Acenaphthylene	52.5	10	100	0	52	57	120	55.53	5.7(18)	M2
Acenaphthene	74.4	10	100	0	74	55	113	71.04	4.6(16)	
Fluorene	77.3	10	100	0	77	57	116	76.83	0.6(15)	
Phenanthrene	71.3	10	100	0	71	66	119	73.63	3.3(16)	
Anthracene	72.4	10	100	0	72	61	120	74.92	3.4(18)	
Fluoranthene	82.2	10	100	0	82	62	123	84.61	2.9(23)	
Pyrene	80.3	10	100	0	80	63	120	81.91	2.0(23)	
Benzo(a)anthracene	91.3	10	100	0	91	66	118	90.09	1.3(16)	
Chrysene	92.3	10	100	0	92	58	130	93.18	1.0(16)	
Benzo(b)fluoranthene	79.3	10	100	0	79	64	121	75.42	5.1(19)	
Benzo(k)fluoranthene	81.8	10	100	0	82	65	122	82.61	0.9(13)	
Benzo(a)pyrene	73.2	10	100	0	73	61	122	72.6	0.9(18)	
Indeno(1,2,3-cd)pyrene	77.9	10	100	0	78	57	123	77.09	1.1(22)	
Dibenz(a,h)anthracene	88.9	10	100	0	89	56	127	88.16	0.9(23)	
Benzo(g,h,i)perylene	80.3	10	100	0	80	56	125	79.25	1.3(25)	
Surr: Nitrobenzene-d5	98.2		100		98	62	124			
Surr: 2-Fluorobiphenyl	72.1		100		72	54	113			
Surr: 4-Terphenyl-d14	93.7		100		94	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.

L50 = Analyte recovery was below acceptance limits for the LCS, but was acceptable in the MS/MSD.

M2 = Matrix spike recovery was low, the method control sample recovery was acceptable.

S54 = Surrogate recovery was below laboratory acceptance limits.

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Date: 03-Feb-06

QC Summary Report

Work Order: 06012350

Method Blank

Type: MBLK Test Code: EPA Method SW9060/415.1/SM-5310C
File ID: 2 Batch ID: TOC012406 Analysis Date: 01/24/2006 17:12
Sample ID: MBLK-012406-TOC Units : mg/L Run ID: TOC_060124B Prep Date: 01/24/2006

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: TOC012406 Analysis Date: 01/24/2006 16:50
Sample ID: LCS-012406-TOC Units : mg/L Run ID: TOC_060124B Prep Date: 01/24/2006

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Total Organic Carbon	5.22	1	5		104	74	125			

Sample Matrix Spike

Type: MS Test Code: EPA Method SW9060/415.1/SM-5310C
File ID: 4 Batch ID: TOC012406 Analysis Date: 01/24/2006 23:20
Sample ID: 06012350-04A-MS Units : mg/L Run ID: TOC_060124B Prep Date: 01/24/2006

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Total Organic Carbon	5.41	1	5	2.884	50	56	137			M3

Sample Matrix Spike Duplicate

Type: MSD Test Code: EPA Method SW9060/415.1/SM-5310C
File ID: 6 Batch ID: TOC012406 Analysis Date: 01/24/2006 23:50
Sample ID: 06012350-04A-MSD Units : mg/L Run ID: TOC_060124B Prep Date: 01/24/2006

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Total Organic Carbon	5.58	1	5	2.884	54	56	137	5.408	3.1(15)	M3

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.

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Date: *03-Feb-06*

QC Summary Report

Work Order: 06012350

Method Blank

Type: **MBLK** Test Code: **Modified Method RSK-175 GC/FID**

File ID: Batch ID: **13975** Analysis Date: **01/26/2006 17:58**

Sample ID: **MBLK-13975** Units : **mg/L** Run ID: **FID_6_060126A** Prep Date: **01/26/2006**

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: **13975** Analysis Date: **01/26/2006 18:17**

Sample ID: **LCS-13975** Units : **mg/L** Run ID: **FID_6_060126A** Prep Date: **01/26/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Methane	0.575	0.01	0.532		108	70	130			

Sample Matrix Spike

Type: **MS** Test Code: **Modified Method RSK-175 GC/FID**

File ID: Batch ID: **13975** Analysis Date: **01/26/2006 19:49**

Sample ID: **06012350-04AMS** Units : **mg/L** Run ID: **FID_6_060126A** Prep Date: **01/26/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Methane	1.14	0.01	1.06	0.027	105	70	130			

Sample Matrix Spike Duplicate

Type: **MSD** Test Code: **Modified Method RSK-175 GC/FID**

File ID: Batch ID: **13975** Analysis Date: **01/26/2006 20:07**

Sample ID: **06012350-04AMSD** Units : **mg/L** Run ID: **FID_6_060126A** Prep Date: **01/26/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Methane	1.23	0.01	1.06	0.027	114	70	130	1.136	8.2(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: 06012003

Method Blank

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

File ID: **17** Batch ID: **13950A** 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
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: **13950A** 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
Nitrite (NO2) - N	0.496	0.25	0.5		99	90	110			
Nitrate (NO3) - N	0.525	0.25	0.5		105	90	110			

Sample Matrix Spike

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

File ID: **35** Batch ID: **13950A** 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
Nitrite (NO2) - N	245	6.3	250	0	98	80	120			
Nitrate (NO3) - N	263	6.3	250	0	105	80	120			

Sample Matrix Spike Duplicate

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

File ID: **36** Batch ID: **13950A** 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
Nitrite (NO2) - N	250	6.3	250	0	99.8	80	120	244.8	1.9(2)	
Nitrate (NO3) - N	268	6.3	250	0	107	80	120	263.4	1.8(2)	

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.

Alpha Analytical, Inc.

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Date: *01-Mar-06*

QC Summary Report

Work Order: 06012003

Method Blank

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

File ID: **17** Batch ID: **13964A** Analysis Date: **01/24/2006 16:57**

Sample ID: **MB-13964** Units : mg/L Run ID: **IC_2_060124A** Prep Date: **01/24/2006**

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: **13964A** Analysis Date: **01/24/2006 17:16**

Sample ID: **LFB-13964** Units : mg/L Run ID: **IC_2_060124A** Prep Date: **01/24/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Nitrite (NO2) - N	0.488	0.25	0.5		98	90	110			
Nitrate (NO3) - N	0.521	0.25	0.5		104	90	110			

Sample Matrix Spike

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

File ID: **24** Batch ID: **13964A** Analysis Date: **01/24/2006 19:07**

Sample ID: **06012003-01ALFM** Units : mg/L Run ID: **IC_2_060124B** Prep Date: **01/24/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Nitrite (NO2) - N	116	2.5	100	0	116	80	120			
Nitrate (NO3) - N	157	2.5	100	49.52	107	80	120			

Sample Matrix Spike Duplicate

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

File ID: **25** Batch ID: **13964A** Analysis Date: **01/24/2006 19:25**

Sample ID: **06012003-01ALFMD** Units : mg/L Run ID: **IC_2_060124B** Prep Date: **01/24/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Nitrite (NO2) - N	114	2.5	100	0	114	80	120	115.6	1.5(2)	
Nitrate (NO3) - N	158	2.5	100	49.52	109	80	120	156.7	0.9(2)	

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: 06012003

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: *18-Feb-06*

QC Summary Report

Work Order: 06012003

Method Blank

Type: **MBLK** Test Code: **EPA Method 160.1 / SM 2540 C**

File ID: Batch ID: **W060124TDS** Analysis Date: **01/24/2006 00:00**

Sample ID: **MBLK-W060124TDS** Units : **mg/L** Run ID: **WETLAB_060124D** Prep Date: **01/24/2006**

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: **W060124TDS** Analysis Date: **01/24/2006 00:00**

Sample ID: **LCS-W060124TDS** Units : **mg/L** Run ID: **WETLAB_060124D** Prep Date: **01/24/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Solids, Total Dissolved (TDS)	200	10	200		100	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: 06012003

Method Blank

Type: **MBLK** Test Code: **SM3500-Fe D**

File ID: Batch ID: **W060120FER** Analysis Date: **01/20/2006 00:00**

Sample ID: **MBLK-W060120FER** Units : **mg/L** Run ID: **WETLAB_060120D** Prep Date: **01/20/2006**

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: **W060120FER** Analysis Date: **01/20/2006 00:00**

Sample ID: **LCS-W060120FER** Units : **mg/L** Run ID: **WETLAB_060120D** Prep Date: **01/20/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Iron, Ferrous (+2)	1.52	0.05	1.5		101	85	115			

Sample Matrix Spike

Type: **MS** Test Code: **SM3500-Fe D**

File ID: Batch ID: **W060120FER** Analysis Date: **01/20/2006 00:00**

Sample ID: **06012003-01AMS** Units : **mg/L** Run ID: **WETLAB_060120D** Prep Date: **01/20/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Iron, Ferrous (+2)	1.28	0.05	1.5	0	85	70	130			

Sample Matrix Spike Duplicate

Type: **MSD** Test Code: **SM3500-Fe D**

File ID: Batch ID: **W060120FER** Analysis Date: **01/20/2006 00:00**

Sample ID: **06012003-01AMSD** Units : **mg/L** Run ID: **WETLAB_060120D** Prep Date: **01/20/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Iron, Ferrous (+2)	1.33	0.05	1.5	0	89	70	130	1.278	3.9(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: *18-Feb-06*

QC Summary Report

Work Order: 06012003

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

File ID: Batch ID: **W060125ALK** Analysis Date: **01/25/2006 00:00**

Sample ID: **LCS-W060125ALK** Units : **mg/L** Run ID: **WETLAB_060125C** Prep Date: **01/25/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Alkalinity, Total (As CaCO3 at pH 4.5)	5.09	1	5		102	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: 22-Feb-06

QC Summary Report

Work Order: 06012003

Method Blank

Type: MBLK Test Code: EPA Method SW6020
File ID: 021406.B\156_ICB.D\ Batch ID: 14071 Analysis Date: 02/15/2006 02:20
Sample ID: MB-14071 Units : mg/L Run ID: ICP/MS_060214C 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\157_LCS.D\ Batch ID: 14071 Analysis Date: 02/15/2006 02:25
Sample ID: LCS-14071 Units : mg/L Run ID: ICP/MS_060214C Prep Date: 02/13/2006

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Lead (Pb)	0.256	0.005	0.25		102	84	118			

Sample Matrix Spike

Type: MS Test Code: EPA Method SW6020
File ID: 021406.B\160MSL.D\ Batch ID: 14071 Analysis Date: 02/15/2006 02:39
Sample ID: 06020302-03AMS Units : mg/L Run ID: ICP/MS_060214C Prep Date: 02/13/2006

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Lead (Pb)	0.261	0.005	0.25	0	104	75	126			

Sample Matrix Spike Duplicate

Type: MSD Test Code: EPA Method SW6020
File ID: 021406.B\161MSDL.D\ Batch ID: 14071 Analysis Date: 02/15/2006 02:44
Sample ID: 06020302-03AMSD Units : mg/L Run ID: ICP/MS_060214C Prep Date: 02/13/2006

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Lead (Pb)	0.271	0.005	0.25	0	108	75	126	0.2611	3.7(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: *23-Feb-06*

QC Summary Report

Work Order: 06012003

Method Blank

Type **MBLK** Test Code: **EPA Method SW6020**
File ID: **021406.B\242_ICB.D** Batch ID: **14047** Analysis Date: **02/15/2006 09:21**
Sample ID: **MB-14047** Units : **mg/L** Run ID: **ICP/MS_060215C** 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 SW6020**
File ID: **021406.B\251_LCS.D** Batch ID: **14047** Analysis Date: **02/15/2006 10:05**
Sample ID: **LCS-14047** Units : **mg/L** Run ID: **ICP/MS_060215C** Prep Date: **02/08/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Manganese (Mn), Dissolved	0.0454	0.005	0.05		91	84	118			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW6020**
File ID: **021406.B\254MSL.D** Batch ID: **14047** Analysis Date: **02/15/2006 10:19**
Sample ID: **06012351-01AMS** Units : **mg/L** Run ID: **ICP/MS_060215C** Prep Date: **02/08/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Manganese (Mn), Dissolved	1.9	0.005	0.05	1.92	-44	75	126			M3

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW6020**
File ID: **021406.B\255MSD.D** Batch ID: **14047** Analysis Date: **02/15/2006 10:24**
Sample ID: **06012351-01AMSD** Units : **mg/L** Run ID: **ICP/MS_060215C** Prep Date: **02/08/2006**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LowLimit	HighLimit	RPDRefVal	%RPD(Limit)	Qual
Manganese (Mn), Dissolved	1.99	0.005	0.05	1.92	146	75	126	1.898	4.9(10)	M3

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.

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 26, 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): BMI05102720

Sample Identification

1523-MW01**
1523-MW01 Dup
1523-MW02
1523-MW03
1523-MW04
1523-MW05
1523-MW06
1523-MW07
1523-QCEB
1523-MW01MS
1523-MW01MSD

**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 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 1523-MW01** and 1523-MW01 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
	1523-MW01**	1523-MW01 Dup	
TPH as diesel	0.055	0.050U	200

X. Field Blanks

Sample 1523-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 BMI05102720

No Sample Data Qualified in this SDG

Camp Pendleton, CTO 102
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG BMI05102720

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 : 10/27/05

Job#: TO102/1523

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

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1523-MW01	TPH-E (Diesel)	0.055	0.050 mg/L	10/26/05	10/28/05
Lab ID :	BMI05102720-01A	TPH-E (Oil)	ND	0.50 mg/L	10/26/05	10/28/05
		Surr: Nonane	117	%REC	10/26/05	10/28/05
Client ID :	1523-MW01 Dup	TPH-E (Diesel)	ND	0.050 mg/L	10/26/05	10/28/05
Lab ID :	BMI05102720-02A	TPH-E (Oil)	ND	0.50 mg/L	10/26/05	10/28/05
		Surr: Nonane	114	%REC	10/26/05	10/28/05
Client ID :	1523-MW02	TPH-E (Diesel)	ND	0.050 mg/L	10/26/05	10/28/05
Lab ID :	BMI05102720-03A	TPH-E (Oil)	ND	0.50 mg/L	10/26/05	10/28/05
		Surr: Nonane	116	%REC	10/26/05	10/28/05
Client ID :	1523-MW03	TPH-E (Diesel)	0.077	0.050 mg/L	10/26/05	10/28/05
Lab ID :	BMI05102720-04A	TPH-E (Oil)	ND	0.50 mg/L	10/26/05	10/28/05
		Surr: Nonane	118	%REC	10/26/05	10/28/05
Client ID :	1523-MW04	TPH-E (Diesel)	ND	0.050 mg/L	10/26/05	10/28/05
Lab ID :	BMI05102720-05A	TPH-E (Oil)	ND	0.50 mg/L	10/26/05	10/28/05
		Surr: Nonane	124	%REC	10/26/05	10/28/05
Client ID :	1523-MW05	TPH-E (Diesel)	ND	0.050 mg/L	10/26/05	10/28/05
Lab ID :	BMI05102720-06A	TPH-E (Oil)	ND	0.50 mg/L	10/26/05	10/28/05
		Surr: Nonane	127	%REC	10/26/05	10/28/05
Client ID :	1523-MW06	TPH-E (Diesel)	ND	0.050 mg/L	10/26/05	10/28/05
Lab ID :	BMI05102720-07A	TPH-E (Oil)	ND	0.50 mg/L	10/26/05	10/28/05
		Surr: Nonane	121	%REC	10/26/05	10/28/05
Client ID :	1523-MW07	TPH-E (Diesel)	ND	0.050 mg/L	10/26/05	10/28/05
Lab ID :	BMI05102720-08A	TPH-E (Oil)	ND	0.50 mg/L	10/26/05	10/28/05
		Surr: Nonane	121	%REC	10/26/05	10/28/05
Client ID :	1524-QCEB	TPH-E (Diesel)	ND	0.050 mg/L	10/26/05	10/28/05
Lab ID :	BMI05102720-10A	TPH-E (Oil)	ND	0.50 mg/L	10/26/05	10/28/05
		Surr: Nonane	116	%REC	10/26/05	10/28/05

MH 12/19/05

LDC #: 14359A8

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 12/12/05

SDG #: BMI05102720

Page: 1 of 1

Laboratory: Alpha Analytical, Inc.

Reviewer: JTG

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: 10/26/05
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	% R = 85-115 2
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 = 1, 2
X.	Field blanks	ND	EB = 9

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	1523-MW01**	11	1523-MW01MSD	21		31	
2	1523-MW01 Dup	12	MBLK- 13417	22		32	
3	1523-MW02	13		23		33	
4	1523-MW03	14		24		34	
5	1523-MW04	15		25		35	
6	1523-MW05	16		26		36	
7	1523-MW06	17		27		37	
8	1523-MW07	18		28		38	
9	1523-QCEB	19		29		39	
10	1523-MW01MS	20		30		40	

Notes:

LDC #: 14259A8
SDG #: BMJ05/02720

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
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 #: 14359 A8
SDG #: BMI 05/03/20

VALIDATION FINDINGS CHECKLIST

Reviewer: JVZ
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 idetected in the field duplicates?	✓			
XV. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		

LDC #: 14359A8
SDG #: BM105102720

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: DVG
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
	1	2		
Diesel	0.055	0.050 U	200	

Compound	Concentration ( )		%RPD Limit _____	Qualification Parent only / All Samples

FLDUPNew.wpd

LDC #: 14359 A8
SDG #: BMI 05/02720

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: JVL
2nd Reviewer: CF

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	10/26/05	Diesel	1.3766e-4	1.3766e-4	1.3586e-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 #: 14359A6
SDG #: BHI 05102720

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: SVL
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	FA102801.D03	10/28/05	Diesel	25	24.3972	24.3373	~~93.14~~ 97.35	97.35
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 A8
SDG #: BMI 05102720

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: JVC
2nd reviewer: [signature]

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: # 1

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nonane	DB-1	100	116.7279	117	117	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

.DC #: 14359 A8
SDG #: BMI 05/02720

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: JVG
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 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: 10/11

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	0.0513	2.34	2.37	93	94	93	93	0.7	0.8
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 #: 14359A8

SDG #: BMI05/02720

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Page: 1 of 1

Reviewer: MC

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-13417

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	2.2	NA	88	88	—			
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 ±0.0% of the recalculated results.

LDC #: 14359A8
SDG #: BMI05102720

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: JVG
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. #1 Compound Name Diesel

Concentration = $\frac{(16\ 118)(1.35986e\text{-}4)(1\ ml)}{(40\ ml)}$ = 0.0548

≈ 0.055 mg/L

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

Comments:

SAMPCAL.xxx.xxxd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Camp Pendleton, CTO 102

Collection Date: October 26, 2005

LDC Report Date: December 19, 2005

Matrix: Water

Parameters: Volatiles

Validation Level: EPA Level III & IV

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): BMI05102720

Sample Identification

1523-MW01**
1523-MW01 Dup
1523-MW02
1523-MW03
1523-MW04
1523-MW05
1523-MW06
1523-MW07
1523-QCFB
1523-QCEB
1523-QCTB
1523-MW04MS
1523-MW04MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 13 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 with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Analysis	Required Holding Time (In Days) From Sample Collection Until Analysis	Flag	A or P
1523-MW02 1523-MW04	Benzene Toluene Chlorobenzene Ethylbenzene m,p-Xylenes o-Xylene 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene Isopropylbenzene Bromobenzene n-Propylbenzene 4-Chlorotoluene 2-Chlorotoluene 1,3,5-Trimethylbenzene tert-Butylbenzene 1,2,4-Trimethylbenzene sec-Butylbenzene p-Isopropyltoluene n-Butylbenzene 1,2,4-Trichlorobenzene	8	7	J (all detects) UJ (all non-detects)	P

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
11/3/05	Chloroethane	34.5	All samples in SDG BMI05102720	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 BMI05102720	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 1523-MW01** and 1523-MW01 Dup were identified as field duplicates. No volatiles were detected in any of the samples.

XVII. Field Blanks

Sample 1523-QCTB was identified as a trip blank. No volatile contaminants were found in this blank.

Sample 1523-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)
1523-QCEB	Toluene	0.81

Sample 1523-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)
1523-QCFB	Toluene	0.80

Camp Pendleton, CTO 102
Volatiles - Data Qualification Summary - SDG BMI05102720

SDG	Sample	Compound	Flag	A or P	Reason
BMI05102720	1523-MW02 1523-MW04	Benzene Toluene Chlorobenzene Ethylbenzene m,p-Xylenes o-Xylene 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene Isopropylbenzene Bromobenzene n-Propylbenzene 4-Chlorotoluene 2-Chlorotoluene 1,3,5-Trimethylbenzene tert-Butylbenzene 1,2,4-Trimethylbenzene sec-Butylbenzene p-Isopropyltoluene n-Butylbenzene 1,2,4-Trichlorobenzene	J (all detects) UJ (all non-detects)	P	Technical holding times
BMI05102720	1523-MW01** 1523-MW01 Dup 1523-MW02 1523-MW03 1523-MW04 1523-MW05 1523-MW06 1523-MW07 1523-QCFB 1523-QCEB 1523-QCTB	Chloroethane	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
BMI05102720	1523-MW01** 1523-MW01 Dup 1523-MW02 1523-MW03 1523-MW04 1523-MW05 1523-MW06 1523-MW07 1523-QCFB 1523-QCEB 1523-QCTB	All TCL compounds	None	P	Laboratory control samples

Camp Pendleton, CTO 102
Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI05102720

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#: TO102/1523

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

Alpha Analytical Number: BMI05102720-01A
Client I.D. Number: 1523-MW01

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/03/05

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	UJ	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	113		%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	101		%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) 251-4848 / info@alpha-analytical.com

11/9/05
Report Date

HH 11/9/05

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#: TO102/1523

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

Alpha Analytical Number: BMI05102720-02A
Client I.D. Number: 1523-MW01 Dup

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/03/05

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	UJ	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	115		%REC
27	1,1,2-Trichloroethane	ND		1.0	µg/L	62	Surr: Toluene-d8	91		%REC
28	Toluene	ND		0.50	µg/L	63	Surr: 4-Bromofluorobenzene	101		%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

11/9/05
Report Date

11/11/05

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#: TO102/1523

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

Alpha Analytical Number: BMI05102720-03A
Client I.D. Number: 1523-MW02

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/03/05

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	UJ	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	UJ	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	UJ	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	UJ	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	UJ	1.0	µg/L
39	o-Xylene	ND	UJ	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	UJ	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	UJ	2.0	µg/L
58	Naphthalene	ND		2.0	µg/L
59	Hexachlorobutadiene	ND		2.0	µg/L
60	1,2,3-Trichlorobenzene	ND	UJ	2.0	µg/L
61	Surr: 1,2-Dichloroethane-d4	111			%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 L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hinchman, Quality Assurance Officer
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11/9/05
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#: TO102/1523

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

Alpha Analytical Number: BMI05102720-04A
Client I.D. Number: 1523-MW03

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/03/05

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	U J	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	1.7		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	113		%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	95		%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 L. Schell, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hirschman, Quality Assurance Officer
Sacramento, CA • (916) 365-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

11/9/05
Report Date

11/12/1905

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102/1523

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

Alpha Analytical Number: BMI05102720-05A
Client I.D. Number: 1523-MW04

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/03/05

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	UJ	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	UJ	1.0	µg/L
4	Chloroethane	ND	UJ	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	UJ	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	UJ	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	UJ	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	UJ	4.0	µg/L
26	trans-1,3-Dichloropropene	ND		1.0	µg/L	61	Surr: 1,2-Dichloroethane-d4	113			%REC
27	1,1,2-Trichloroethane	ND		1.0	µg/L	62	Surr: Toluene-d8	95			%REC
28	Toluene	ND	UJ	0.50	µg/L	63	Surr: 4-Bromofluorobenzene	99			%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	UJ	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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11/9/05
Report Date

11/1/1905

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102/1523

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

Alpha Analytical Number: BMI05102720-06A
Client I.D. Number: 1523-MW05

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/03/05

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	UJ 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	112		%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	99		%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	1.1	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 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

11/9/05
Report Date

W4/21/05

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#: TO102/1523

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

Alpha Analytical Number: BMI05102720-07A
Client I.D. Number: 1523-MW06

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/03/05

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	UJ	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	114		%REC
27	1,1,2-Trichloroethane	ND		1.0	µg/L	62	Surr: Toluene-d8	91		%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) 211-4848 / info@alpha-analytical.com

11/9/05
Report Date

HH 11/9/05

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102/1523

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

Alpha Analytical Number: BMI05102720-08A
Client I.D. Number: 1523-MW07

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/04/05

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	117		%REC
27	1,1,2-Trichloroethane	ND	1.0	µg/L	62	Surr: Toluene-d8	93		%REC
28	Toluene	ND	0.50	µg/L	63	Surr: 4-Bromofluorobenzene	99		%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
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11/9/05
Report Date

11/4/2005

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102/1523

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

Alpha Analytical Number: BMI05102720-09A
Client I.D. Number: 1523-QCFB

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/03/05

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	UJ	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	0.80		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	116			%REC
62	Surr: Toluene-d8	91			%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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11/9/05
Report Date

HHI1905

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102/1523

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

Alpha Analytical Number: BMI05102720-10A
Client I.D. Number: 1523-QCEB

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/03/05

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	0.81	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	119		%REC
62	Surr: Toluene-d8	92		%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 Hutchman

Roger L. Scholl, Ph.D., Laboratory Director • Randy Gardner, Laboratory Manager • Walter Hutchman, Quality Assurance Officer
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11/9/05
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102/1523

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

Alpha Analytical Number: BMI05102720-11A
Client I.D. Number: 1523-QCTB

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/03/05

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	114		%REC
62	Surr: Toluene-d8	95		%REC
63	Surr: 4-Bromofluorobenzene	106		%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) 281-4849 / info@alpha-analytical.com

11/9/05
Report Date

LH 11/21/05

LDC #: 14359A1

SDG #: BMI05102720

Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 12/12/05

Page: 1 of 1

Reviewer: JTG

2nd Reviewer: CK

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: 10/26/05
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	ND	D = 1, 2
XVII.	Field blanks	SW	FB = 9 EB = 10 *TB = 11

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	1523-MW01**	11	1523-QCTB	21		31	
2	1523-MW01 Dup	12	1523-MW04MS	22		32	
3	1523-MW02	13	1523-MW04MSD	23		33	
4	1523-MW03	14	MBLK MS07W1105A	24		34	
5	1523-MW04	15		25		35	
6	1523-MW05	16		26		36	
7	1523-MW06	17		27		37	
8	1523-MW07	18		28		38	
9	1523-QCFB	19		29		39	
10	1523-QCEB	20		30		40	

LDC #: 14359A1
SDG #: BMI 05102720

VALIDATION FINDINGS CHECKLIST

Reviewer: JN
2nd Reviewer: Q

Method: Volatiles (EPA SW 846 Method 8260B)

Validation Area	Yes	No	NA	Findings/Comments
[illegible]				
All technical holding times were met.	✓	✓		
Cooler temperature criteria was met.	✓			
[illegible]				
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
[illegible]				
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?	✓			
[illegible]				
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?		✓		
[illegible]				
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.		✓		
[illegible]				
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?			✓	
[illegible]				
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?	✓			
[illegible]				
Was an LCS analyzed for this SDG?	✓			

LDC #: 14359A1
SDG #: BMI051027 20

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: JV
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?	✓			
[illegible]				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
[illegible]				
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?	✓			
[illegible]				
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?	✓			
[illegible]				
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?	✓			
[illegible]				
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)?		✓		
[illegible]				
System performance was found to be acceptable.	✓			
[illegible]				
Overall assessment of data was found to be acceptable.	✓			
[illegible]				
Field duplicate pairs were identified in this SDG.	✓			
Target compounds were detected in the field duplicates.		✓		
[illegible]				
Field blanks were identified in this SDG.	✓			
Target compounds were detected in the field blanks.	✓			

TARGET COMPOUND WORKSHEET

ETHOD: 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-Dichloroethane**	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. 2-Chloro toluene

* = System performance check compounds (SPCC) for RRF ; ** = Calibration check compounds (CCC) for %RSD.

LDC #: 14359A1
SDG #: BMI05102720

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: JVL
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
3, 5	W	N	10/26/05	—	11/03/05	8	J/UJ/R (aromatics only) (V, CC, DD, EE, RRR, SSS, FFF, HHH, JJJ, VV, WW, YY, BBB, LLL, AAA, CCC, DDD, EEE, GGG, III, KKK)
		(pH=4)					

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 #: 14759A1
SDG #: BMI 05102720

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
	11/03/05	05110327	D	34.5		All + Blk	J/UJ/A

LDC #: 14359A1
SDG #: BMI05/02720

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: JG
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
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 14359A1
SDG #: BMI05102720

VALIDATION FINDINGS WORKSHEET
Field Blanks

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

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: 9 Field Blank / Trip Blank / Rinsate / Other _____ (circle one)

Compound	Concentration Units (µg/L)
CC	0.80

Sample: 10 Field Blank / Trip Blank / Rinsate / Other EB (circle one)

Compound	Concentration Units (µg/L)
CC	0.81

Sample: _____ Field Blank / Trip Blank / Rinsate / Other _____ (circle one)

Compound	Concentration Units ( )

LDC #: 14354A1
SDG #: BMI05102720

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: VM
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 (1.0 std)	Recalculated RRF (1.0 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL	10/27/05	Methylene chloride (1st internal standard)	3.518e-1	0.3518	0.3197	0.3192	9.9	9.9
			~~Trichlorethene~~ CC (2nd internal standard)	3.199	3.199	3.259	3.259	3.1	3.1
			~~Toluene~~ AAA (3rd internal standard)	3.926	3.926	3.74	3.73	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 #: 14359A1
SDG #: BM105102720

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	DS110327	11/03/05	Methylene chloride (1st internal standard)	0.319r	0.314	0.314	1.6	1.7
			~~Trichlorethene~~ CC (2nd internal standard)	3.259	3.08r	3.08r	5.4	5.4
			~~Toluene~~ AAA (3rd internal standard)	3.740	3.97r	3.97r	6.2	6.2
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 #: 14359A1
SDG #: BMI05102720

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: JVZ
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: #1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8	20	18.76	94	94	0
Bromofluorobenzene	↓	20.24	101	101	↓
1,2-Dichloroethane-d4	↓	22.61	113	113	↓
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 A1
SDG #: BMI05 / 02720

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: JZ
2nd Reviewer: ✓

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: 12/13

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	50.8	55.2	102	102	110	110	8.4	8.3
Trichloroethene	↓	↓	↓	45.4	49	91	91	98	98	7.7	7.6
Benzene	↓	↓	↓	45.8	50	92	92	99.9	100	8.6	8.8
Toluene	↓	↓	↓	46.6	47.9	93	93	96	96	2.8	2.8
Chlorobenzene	↓	↓	↓	47.7	49.2	95	95	98	98	3.0	3.1

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 #: 14359A1
SDG #: DMI05/02720

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 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 MS07W1107A

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	11.5	NA	115	115				
Trichloroethene			9.88		99	99				
Benzene			9.72		97	97				
Toluene			9.46		95	95				
Chlorobenzene			9.66		97	97				

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 #: 14759A1
SDG #: BMI05/102720

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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

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).

DI = Dilution factor.

%S = Percent solids, applicable to solis and solid matrices only.

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 26, 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):	BMI05102720

Sample Identification

1523-MW01**
1523-MW01 Dup
1523-MW02
1523-MW03
1523-MW04
1523-MW05
1523-MW06
1523-MW07
1523-MW04MS
1523-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 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 1523-MW01** and 1523-MW01 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 BMI05102720

No Sample Data Qualified in this SDG

Camp Pendleton, CTO 102
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG BMI05102720

No Sample Data Qualified in this SDG

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ANALYTICAL REPORT

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Job#: TO102/1523

Attn: Chris Zimmerman
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Alpha Analytical Number: BMI05102720-01A
Client I.D. Number: 1523-MW01

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/04/05

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	100	%REC
18	Surr: 2-Fluorobiphenyl	75	%REC
19	Surr: 4-Terphenyl-d14	98	%REC

ND Not Detected

Roger Scholl Randy Gardner Walter Hutchison

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11/9/05
Report Date

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MH 12/9/05

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Alpha Analytical Number: BMI05102720-02A
Client I.D. Number: 1523-MW01 Dup

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/04/05

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	74	%REC
19	Surr: 4-Terphenyl-d14	88	%REC

ND - Not Detected

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Alpha Analytical Number: BMI05102720-03A
Client I.D. Number: 1523-MW02

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/04/05

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	104	%REC
18	Surr: 2-Fluorobiphenyl	70	%REC
19	Surr: 4-Terphenyl-d14	93	%REC

ND = Not Detected

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Alpha Analytical Number: BMI05102720-04A
Client I.D. Number: 1523-MW03

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/04/05

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	97	%REC
18	Surr: 2-Fluorobiphenyl	74	%REC
19	Surr: 4-Terphenyl-d14	87	%REC

Reporting Limits were increased due to sample matrix interferences.

ND = Not Detected

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Alpha Analytical Number: BMI05102720-05A
Client I.D. Number: 1523-MW04

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/04/05

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	100	%REC
18	Surr: 2-Fluorobiphenyl	84	%REC
19	Surr: 4-Terphenyl-d14	98	%REC

ND = Not Detected

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Alpha Analytical Number: BMI05102720-06A
Client I.D. Number: 1523-MW05

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/04/05

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	99	%REC
18	Surr: 2-Fluorobiphenyl	93	%REC
19	Surr: 4-Terphenyl-d14	93	%REC

ND = Not Detected

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Report Date

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Alpha Analytical Number: BMI05102720-07A
Client I.D. Number: 1523-MW06

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/04/05

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	108	%REC
18	Surr: 2-Fluorobiphenyl	87	%REC
19	Surr: 4-Terphenyl-d14	100	%REC

ND = Not Detected

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Alpha Analytical Number: BMI05102720-08A
Client I.D. Number: 1523-MW07

Sampled: 10/26/05
Received: 10/27/05
Analyzed: 11/04/05

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	112	%REC
18	Surr: 2-Fluorobiphenyl	90	%REC
19	Surr: 4-Terphenyl-d14	103	%REC

ND = Not Detected

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11/9/05
Report Date

LDC #: 14359A2

SDG #: BMI05102720

Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 12/12/05

Page: 1 of 1

Reviewer: DVG

2nd Reviewer: Q

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: 10/26/05
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Continuing calibration	A	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
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 = 1, 2
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	1523-MW01**	11	MBLK 13437	21		31	
2	1523-MW01 Dup	12		22		32	
3	1523-MW02	13		23		33	
4	1523-MW03	14		24		34	
5	1523-MW04	15		25		35	
6	1523-MW05	16		26		36	
7	1523-MW06	17		27		37	
8	1523-MW07	18		28		38	
9	1523-MW04MS	19		29		39	
10	1523-MW04MSD	20		30		40	

LDC #: 14759A2
SDG #: BMI05/02720

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: JW
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. Blank				
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 Spike				
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 #: 14359A2
SDG #: BM105/102720

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: JV
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. Performance Evaluation 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 & RLs				
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				
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 #: 14359A2
SDG #: BMI05/02720

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: JVC
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, 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 (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)	0.974	0.974	1.024	1.024	16.8	6.8
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)	1.321	1.321	1.379	1.379	4.0	4.0
			Pentachlorophenol (4th internal standard)	1.099	1.099	1.129	1.129	5.9	5.9
			Bis(2-ethylhexyl)phthalate (5th internal standard)	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 #: 14359A2
SDG #: BMI05 102700

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

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

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	D5110403	11/04/05	Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)	1.024	0.977	0.977	4.7	4.6
			Fluorene (3rd internal standard)	1.379	1.332	1.332	3.4	3.4
			Pentachlorophenol (4th internal standard)	1.129	1.103	1.103	2.3	2.3
			Bis(2-ethylhexyl)phthalate (5th internal standard)	1.236	1.182	1.182	4.3	4.3
			Benzo(a)pyrene (6th internal standard)	1.277	1.229	1.229	3.8	3.8
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.

LDC #: 14359A2
SDG #: BMI05102720

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: JK
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: #1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5	100	99.97	100	100	0
2-Fluorobiphenyl	↓	74.66	75	75	↓
Terphenyl-d14	↓	98.20	98	98	↓
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 #: 14359A2
SDG #: BMI05102700

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: JM
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: 9/10

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	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.

LDC #: 14359A2
SDG #: BMI0C/02720

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: JVL
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 13437

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 #: 14359A2
SDG #: BMI05/02770

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: JVG
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?

$$\text{Concentration} = \frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$$

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_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 26, 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): BMI05102720

Sample Identification

1523-MW01**
1523-MW01 Dup
1523-MW02
1523-MW03
1523-MW04
1523-MW05
1523-MW06
1523-MW07
1523-MW01F**
1523-MW01 DupF
1523-MW02F
1523-MW03F
1523-MW04F
1523-MW05F
1523-MW06F
1523-MW07F
1523-MW04FMS
1523-MW04FMSD

Sample IDs ending in "F" were analyzed for dissolved manganese.
**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 18 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 1523-MW01** and 1523-MW01 Dup and samples 1523-MW01F** and 1523-MW01 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
	1523-MW01F**	1523-MW01 DupF	
Manganese	0.015	0.022	38

XIV. Field Blanks

No field blanks were identified in this SDG.

Camp Pendleton, CTO 102
Lead & Dissolved Manganese - Data Qualification Summary - SDG BMI05102720

No Sample Data Qualified in this SDG

Camp Pendleton, CTO 102
Lead & Dissolved Manganese - Laboratory Blank Data Qualification Summary - SDG BMI05102720

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 : 10/27/05

Job#: TO102/1523

Metals by ICPMS
EPA Method SW6020

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1523-MW01**					
Lab ID :	BMI05102720-01A	Lead (Pb)	ND	0.0050 mg/L	10/26/05	11/04/05
Client ID :	**1523-MW01 Dup**					
Lab ID :	BMI05102720-02A	Lead (Pb)	ND	0.0050 mg/L	10/26/05	11/04/05
Client ID :	**1523-MW02**					
Lab ID :	BMI05102720-03A	Lead (Pb)	ND	0.0050 mg/L	10/26/05	11/04/05
Client ID :	**1523-MW03**					
Lab ID :	BMI05102720-04A	Lead (Pb)	ND	0.0050 mg/L	10/26/05	11/04/05
Client ID :	**1523-MW04**					
Lab ID :	BMI05102720-05A	Lead (Pb)	ND	0.0050 mg/L	10/26/05	11/04/05
Client ID :	**1523-MW05**					
Lab ID :	BMI05102720-06A	Lead (Pb)	ND	0.0050 mg/L	10/26/05	11/04/05
Client ID :	**1523-MW06**					
Lab ID :	BMI05102720-07A	Lead (Pb)	ND	0.0050 mg/L	10/26/05	11/04/05
Client ID :	**1523-MW07**					
Lab ID :	BMI05102720-08A	Lead (Pb)	ND	0.0050 mg/L	10/26/05	11/04/05

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

11/9/05
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 : 10/27/05

Job#: TO102/1523

Dissolved Metals by ICPMS
EPA Method SW6020

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1523-MW01					
Lab ID :	BMI05102720-01A	Manganese (Mn), Dissolved	0.015	0.0050 mg/L	10/26/05	11/04/05
Client ID :	1523-MW01 Dup					
Lab ID :	BMI05102720-02A	Manganese (Mn), Dissolved	0.022	0.0050 mg/L	10/26/05	11/04/05
Client ID :	1523-MW02					
Lab ID :	BMI05102720-03A	Manganese (Mn), Dissolved	ND	0.0050 mg/L	10/26/05	11/04/05
Client ID :	1523-MW03					
Lab ID :	BMI05102720-04A	Manganese (Mn), Dissolved	0.18	0.0050 mg/L	10/26/05	11/04/05
Client ID :	1523-MW04					
Lab ID :	BMI05102720-05A	Manganese (Mn), Dissolved	ND	0.0050 mg/L	10/26/05	11/04/05
Client ID :	1523-MW05					
Lab ID :	BMI05102720-06A	Manganese (Mn), Dissolved	ND	0.0050 mg/L	10/26/05	11/04/05
Client ID :	1523-MW06					
Lab ID :	BMI05102720-07A	Manganese (Mn), Dissolved	0.56	0.0050 mg/L	10/26/05	11/04/05
Client ID :	1523-MW07					
Lab ID :	BMI05102720-08A	Manganese (Mn), Dissolved	0.13	0.0050 mg/L	10/26/05	11/04/05

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

11/9/05
Report Date

LDC #: 14359A4

VALIDATION COMPLETENESS WORKSHEET

Date: 12-18-05

SDG #: BMI05102720

Level III/IV

Page: 1 of 1

Laboratory: Alpha Analytical, Inc.

Reviewer: MG

2nd Reviewer: MM

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: 10-26-05
II.	Calibration	A	
III.	Blanks	A	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	A	MS/MSD (SDG: BMI05102503)
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=1*+2*, D=9+10
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 1	1523-MW01**	11	1523-MW02F	21		31	
2 1	1523-MW01 Dup	12	1523-MW03F	22		32	
3 1	1523-MW02	13	1523-MW04F	23		33	
4 1	1523-MW03	14	1523-MW05F	24		34	
5 1	1523-MW04	15	1523-MW06F	25		35	
6 1	1523-MW05	16	1523-MW07F	26		36	
7 1	1523-MW06	17	1523-MW04FMS	27		37	
8 1	1523-MW07	18	1523-MW04FMSD	28		38	
9	1523-MW01F**	19 1	PBW1	29		39	
10	1523-MW01 DupF	20 2	PBW2	30		40	

Notes: Samples appended with "F" were analyzed for Dissolved Manganese

LDC #: 14359A4
SDG #: BMI05102720

VALIDATION FINDINGS CHECKLIST

Reviewer: MG
2nd Reviewer: LM

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. 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 #: 14359A4
SDG #: BMI05102720

VALIDATION FINDINGS CHECKLIST

Reviewer: MG
2nd Reviewer: MM

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 #: 14359A4
SDG #: BMI05102780

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer: [illegible]

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1 → 8	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⁻, ___ ___
9 → 16	↓	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 17, 18	↓	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 #: 14359A4
SDG #: BMI05102720

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: MG
2nd reviewer: [illegible]

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
	9	10			
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Cadmium					
Calcium					
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Magnesium					
Manganese	0.015	0.022	38		
Mercury					
Nickel					
Potassium					
Selenium					
Silver					
Sodium					
Thallium					
Vanadium					
Zinc					
Cyanide					
Boron					
Molybdenum					
Strontium					
Silicon					

Notes:

LDC #: 14359A4
SDG #: BMI051027D0

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Reviewer: MG
2nd Reviewer: [illegible]

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	51.08	50.00	102	not reported	Y
0423 CCV7	ICP/MS (Continuing calibation)	Mn	86.34	80.00	108	108	↓

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 #: 14359A4
SDG #: BMI05102720

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: MG
2nd Reviewer: MH

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)
0043 ICSAB	ICP interference check	Mn	204.30 (µg/L)	200.00 (µg/L)	102	not reported	
0004 LCS	Laboratory control sample	Pb	0.26230 (mg/L)	0.25 (mg/L)	105	105	
0453 17	Matrix spike	Mn	(SSR-SR) 0.05165 (mg/L)	0.05 (mg/L)	103	103	
0453/0457 17/18	Duplicate	Mn	0.05165 (mg/L)	0.05135 (mg/L)	0.6	Mb	
—	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 #: 14359A4
SDG #: BMI05102720

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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 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)(DII) / (In. Vol.)(%S)

RD = Raw data concentration
FV = Final volume (ml)
In. Vol. = Initial volume (ml) or weight (G)
DII = Dilution factor
%S = Decimal percent solids

Recalculation:
A dilution factor of 5 already applied by software.
From raw data: Mn = 0.014675 mg/L

Sample ID	Analyte	Reported Concentration (mg/L)	Calculated Concentration (mg/L)	Acceptable (Y/N)
9	Mn	0.015	0.015	Y

RECALC.4S2

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Camp Pendleton, CTO 102

Collection Date: October 26, 2005

LDC Report Date: December 13, 2005

Matrix: Water

Parameters: Methane

Validation Level: EPA Level III & IV

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): BMI05102720

Sample Identification

1523-MW01**
1523-MW01 Dup
1523-MW02
1523-MW03
1523-MW04
1523-MW05
1523-MW06
1523-MW07

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 8 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 not within QC limits. Since there were no associated samples, no data were qualified.

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 1523-MW01** and 1523-MW01 Dup were identified as field duplicates. No methane contaminants were detected in any of the samples.

X. Field Blanks

No field blanks were identified in this SDG.

Camp Pendleton, CTO 102
Methane - Data Qualification Summary - SDG BMI05102720

No Sample Data Qualified in this SDG

Camp Pendleton, CTO 102
Methane - Laboratory Blank Data Qualification Summary - SDG BMI05102720

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 : 10/27/05

Job#: TO102/1523

Dissolved Gases
Modified Method RSK-175 GC/FID

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1523-MW01**					
Lab ID :	BMI05102720-01A	Methane	ND	0.010 mg/L	10/26/05	10/27/05
Client ID :	**1523-MW01 Dup**					
Lab ID :	BMI05102720-02A	Methane	ND	0.010 mg/L	10/26/05	10/27/05
Client ID :	**1523-MW02**					
Lab ID :	BMI05102720-03A	Methane	ND	0.010 mg/L	10/26/05	10/27/05
Client ID :	**1523-MW03**					
Lab ID :	BMI05102720-04A	Methane	0.067	0.010 mg/L	10/26/05	10/27/05
Client ID :	**1523-MW04**					
Lab ID :	BMI05102720-05A	Methane	ND	0.010 mg/L	10/26/05	10/27/05
Client ID :	**1523-MW05**					
Lab ID :	BMI05102720-06A	Methane	ND	0.010 mg/L	10/26/05	10/27/05
Client ID :	**1523-MW06**					
Lab ID :	BMI05102720-07A	Methane	ND	0.010 mg/L	10/26/05	10/27/05
Client ID :	**1523-MW07**					
Lab ID :	BMI05102720-08A	Methane	ND	0.010 mg/L	10/26/05	10/27/05

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
Sacramento, CA • (916) 365-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

11/9/05
Report Date

WH12/9/05

LDC #: 14359A51

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 12/12/05

SDG #: BMI05102720

Page: 1 of 1

Laboratory: Alpha Analytical, Inc.

Reviewer: [illegible]

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: 10/26/05
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	~~%R = 85-115~~ 2
III.	Blanks	A	
IVa.	Surrogate recovery	N	Not req'd.
IVb	Matrix spike/Matrix spike duplicates	SW	4151-MW07 from BMI 05102503
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	ND	D = 1, 2
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	1523-MW01**	11		21		31	
2	1523-MW01 Dup	12		22		32	
3	1523-MW02	13		23		33	
4	1523-MW03	14		24		34	
5	1523-MW04	15		25		35	
6	1523-MW05	16		26		36	
7	1523-MW06	17		27		37	
8	1523-MW07	18		28		38	
9	MBLK-1341	19		29		39	
10		20		30		40	

Notes:

LDC #: 14259 A51
SDG #: BMI 05102720

VALIDATION FINDINGS CHECKLIST

Reviewer: MG
2nd Reviewer: [illegible]

Method: ✓ GC ___ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. General 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 #: 14359 A51
SDG #: BMI 051027 20

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 #: 14359A51
SDG #: BMT05/02726

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: MC
2nd Reviewer: 9

METHOD: ✓ GC ___ HPLC

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?
Y N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y (N) N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	H19-MW07 MS/MSD	Methane	( )	49 (70-130)	( )	None	No qual
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 14359 A51
SDG #: BMT 05102720

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: JR
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	9/20/05	Methane	3.7182e+6	3.7182e+6	3.291e+6	3.291e+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 #: 14359A51
SDG #: BMI 05102720

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: JK
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	GA10270503		Methane	2.66	3.01	3.01	113.12	113.12
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 A51

SDG #: BMI 05/02720

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 - 13411

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	0.556	NA	105	105				
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 A51
SDG #: BMI05102720

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: JVC
2nd Reviewer: [signature]

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: _____

SAMPCAL [illegible]

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Camp Pendleton, CTO 102

Collection Date: October 26, 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): BMI05102720

Sample Identification

1523-MW01**
1523-MW01 Dup
1523-MW02
1523-MW03
1523-MW04
1523-MW05
1523-MW06
1523-MW07
1523-MW04MS
1523-MW04MSD
1523-MW04DUP

**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 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 with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
1523-MW01** 1523-MW01 Dup	Nitrite as N	15 days	48 hours	J (all detects) R (all non-detects)	A
1523-MW04 1523-MW04MS 1523-MW04MSD	Nitrate as N	15 days	48 hours	J (all detects) R (all non-detects)	

Non-detected sample concentrations were qualified as unusable (R) due to a gross exceedance (>2X) of holding time.

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 (1523-MW07)	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 BMI05102720	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 BMI05102720	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 1523-MW01** and 1523-MW01 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
	1523-MW01**	1523-MW01 Dup	
Total alkalinity	330	330	0

Analyte	Concentration (mg/L)		RPD
	1523-MW01**	1523-MW01 Dup	
Nitrate as N	53	53	0
Sulfate	29	28	4
Total dissolved solids	11000	11000	0
Total Iron	0.37	0.30U	200
Total organic carbon	3.8	3.7	3

X. Field Blanks

No field blanks were identified in this SDG.

Camp Pendleton, CTO 102
Wet Chemistry - Data Qualification Summary - SDG BMI05102720

SDG	Sample	Analyte	Flag	A or P	Reason
BMI05102720	1523-MW01** 1523-MW01 Dup 1523-MW04	Nitrite as N Nitrate as N	J (all detects) R (all non-detects) J (all detects) R (all non-detects)	A	Technical holding times
BMI05102720	1523-MW07	Sulfate	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (RPD)
BMI05102720	1523-MW01** 1523-MW01 Dup 1523-MW02 1523-MW03 1523-MW04 1523-MW05 1523-MW06 1523-MW07	Alkalinity	None	P	Laboratory control samples
BMI05102720	1523-MW01** 1523-MW01 Dup 1523-MW02 1523-MW03 1523-MW04 1523-MW05 1523-MW06 1523-MW07	Total organic carbon	None	P	Sample result verification

Camp Pendleton, CTO 102
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG BMI05102720

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 : 10/27/05

Job#: TO102/1523

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

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1523-MW01					
Lab ID :	BMI05102720-01A	Total Organic Carbon	3.8	1.0 mg/L	10/26/05	11/04/05
Client ID :	1523-MW01 Dup					
Lab ID :	BMI05102720-02A	Total Organic Carbon	3.7	1.0 mg/L	10/26/05	11/10/05
Client ID :	1523-MW02					
Lab ID :	BMI05102720-03A	Total Organic Carbon	8.2	1.0 mg/L	10/26/05	11/10/05
Client ID :	1523-MW03					
Lab ID :	BMI05102720-04A	Total Organic Carbon	6.5	1.0 mg/L	10/26/05	11/04/05
Client ID :	1523-MW04					
Lab ID :	BMI05102720-05A	Total Organic Carbon	8.5	1.0 mg/L	10/26/05	11/04/05
Client ID :	1523-MW05					
Lab ID :	BMI05102720-06A	Total Organic Carbon	2.8	1.0 mg/L	10/26/05	11/04/05
Client ID :	1523-MW06					
Lab ID :	BMI05102720-07A	Total Organic Carbon	3.6	1.0 mg/L	10/26/05	11/04/05
Client ID :	1523-MW07					
Lab ID :	BMI05102720-08A	Total Organic Carbon	8.1	1.0 mg/L	10/26/05	11/04/05

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11/10/05
Report Date

MH121905

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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 : 10/27/05

Job#: TO102/1523

Iron by Spectrophotometer
SM3500-Fe D

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1523-MW01					
Lab ID :	BMI05102720-01A	Iron, Total	0.37	0.30 mg/L	10/26/05	11/07/05
Client ID :	1523-MW01 Dup					
Lab ID :	BMI05102720-02A	Iron, Total	ND	0.30 mg/L	10/26/05	11/07/05
Client ID :	1523-MW02					
Lab ID :	BMI05102720-03A	Iron, Total	0.48	0.30 mg/L	10/26/05	11/07/05
Client ID :	1523-MW03					
Lab ID :	BMI05102720-04A	Iron, Total	0.52	0.30 mg/L	10/26/05	11/07/05
Client ID :	1523-MW04					
Lab ID :	BMI05102720-05A	Iron, Total	0.37	0.30 mg/L	10/26/05	11/07/05
Client ID :	1523-MW05					
Lab ID :	BMI05102720-06A	Iron, Total	ND	0.30 mg/L	10/26/05	11/07/05
Client ID :	1523-MW06					
Lab ID :	BMI05102720-07A	Iron, Total	0.31	0.30 mg/L	10/26/05	11/07/05
Client ID :	1523-MW07					
Lab ID :	BMI05102720-08A	Iron, Total	0.62	0.30 mg/L	10/26/05	11/07/05

ND = Not Detected

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MH 12/19/05

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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 : 10/27/05

Job#: TO102/1523

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

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1523-MW01					
Lab ID :	BMI05102720-01A	Solids, Total Dissolved (TDS)	11,000	50 mg/L	10/26/05	11/07/05
Client ID :	1523-MW01 Dup					
Lab ID :	BMI05102720-02A	Solids, Total Dissolved (TDS)	11,000	50 mg/L	10/26/05	11/07/05
Client ID :	1523-MW02					
Lab ID :	BMI05102720-03A	Solids, Total Dissolved (TDS)	1,300	10 mg/L	10/26/05	11/03/05
Client ID :	1523-MW03					
Lab ID :	BMI05102720-04A	Solids, Total Dissolved (TDS)	2,000	10 mg/L	10/26/05	11/04/05
Client ID :	1523-MW04					
Lab ID :	BMI05102720-05A	Solids, Total Dissolved (TDS)	2,800	25 mg/L	10/26/05	11/03/05
Client ID :	1523-MW05					
Lab ID :	BMI05102720-06A	Solids, Total Dissolved (TDS)	2,700	25 mg/L	10/26/05	11/07/05
Client ID :	1523-MW06					
Lab ID :	BMI05102720-07A	Solids, Total Dissolved (TDS)	3,000	25 mg/L	10/26/05	11/07/05
Client ID :	1523-MW07					
Lab ID :	BMI05102720-08A	Solids, Total Dissolved (TDS)	2,700	25 mg/L	10/26/05	11/07/05

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11/9/05
Report Date

TO102/1523

HH12/9/05

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102/1523

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 :	1523-MW01						
Lab ID :	BMI05102720-01A	Nitrite (NO2) - N	ND	*R	0.50 mg/L	10/26/05	11/10/05
		Nitrate (NO3) - N	53	*J	0.50 mg/L	10/26/05	11/10/05
		Sulfate (SO4)	29		1.0 mg/L	10/26/05	10/27/05
Client ID :	1523-MW01 Dup						
Lab ID :	BMI05102720-02A	Nitrite (NO2) - N	ND	*R	0.25 mg/L	10/26/05	11/10/05
		Nitrate (NO3) - N	53	*J	0.50 mg/L	10/26/05	11/10/05
		Sulfate (SO4)	28		1.0 mg/L	10/26/05	10/27/05
Client ID :	1523-MW02						
Lab ID :	BMI05102720-03A	Nitrite (NO2) - N	ND		0.25 mg/L	10/26/05	10/27/05
		Nitrate (NO3) - N	8.7		0.25 mg/L	10/26/05	10/27/05
		Sulfate (SO4)	79		1.0 mg/L	10/26/05	10/27/05
Client ID :	1523-MW03						
Lab ID :	BMI05102720-04A	Nitrite (NO2) - N	ND		0.25 mg/L	10/26/05	10/27/05
		Nitrate (NO3) - N	4.2		0.25 mg/L	10/26/05	10/27/05
		Sulfate (SO4)	31		1.0 mg/L	10/26/05	10/27/05
Client ID :	1523-MW04						
Lab ID :	BMI05102720-05A	Nitrite (NO2) - N	ND	*R	0.25 mg/L	10/26/05	11/10/05
		Nitrate (NO3) - N	180	*J	2.5 mg/L	10/26/05	11/10/05
		Sulfate (SO4)	71		1.0 mg/L	10/26/05	10/27/05
Client ID :	1523-MW05						
Lab ID :	BMI05102720-06A	Nitrite (NO2) - N	ND		0.25 mg/L	10/26/05	10/27/05
		Nitrate (NO3) - N	22		0.25 mg/L	10/26/05	10/27/05
		Sulfate (SO4)	58		1.0 mg/L	10/26/05	10/27/05
Client ID :	1523-MW06						
Lab ID :	BMI05102720-07A	Nitrite (NO2) - N	ND		0.25 mg/L	10/26/05	10/27/05
		Nitrate (NO3) - N	0.75		0.25 mg/L	10/26/05	10/27/05
		Sulfate (SO4)	84		1.0 mg/L	10/26/05	10/27/05
Client ID :	1523-MW07						
Lab ID :	BMI05102720-08A	Nitrite (NO2) - N	ND		0.25 mg/L	10/26/05	10/27/05
		Nitrate (NO3) - N	0.96		0.25 mg/L	10/26/05	10/27/05
		Sulfate (SO4)	170	J	2.0 mg/L	10/26/05	11/10/05

*Note: Samples were originally run within hold time due to high concentrations of target analytes samples were re-run outside of hold time.
ND = Not Detected

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11/10/05
Report Date

TO102/1523

11/11/1905

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ANALYTICAL REPORT

Battelle Memorial Institute
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Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 10/27/05

Job#: TO102/1523

Alkalinity
EPA Method 310.1

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1523-MW01					
Lab ID :	BMI05102720-01A	Alkalinity, Total (As CaCO3 at pH 4.5)	330	1.0 mg/L	10/26/05	11/09/05
Client ID :	1523-MW01 Dup					
Lab ID :	BMI05102720-02A	Alkalinity, Total (As CaCO3 at pH 4.5)	330	1.0 mg/L	10/26/05	11/09/05
Client ID :	1523-MW02					
Lab ID :	BMI05102720-03A	Alkalinity, Total (As CaCO3 at pH 4.5)	420	1.0 mg/L	10/26/05	11/09/05
Client ID :	1523-MW03					
Lab ID :	BMI05102720-04A	Alkalinity, Total (As CaCO3 at pH 4.5)	160	1.0 mg/L	10/26/05	11/09/05
Client ID :	1523-MW04					
Lab ID :	BMI05102720-05A	Alkalinity, Total (As CaCO3 at pH 4.5)	440	1.0 mg/L	10/26/05	11/09/05
Client ID :	1523-MW05					
Lab ID :	BMI05102720-06A	Alkalinity, Total (As CaCO3 at pH 4.5)	190	1.0 mg/L	10/26/05	11/09/05
Client ID :	1523-MW06					
Lab ID :	BMI05102720-07A	Alkalinity, Total (As CaCO3 at pH 4.5)	250	1.0 mg/L	10/26/05	11/09/05
Client ID :	1523-MW07					
Lab ID :	BMI05102720-08A	Alkalinity, Total (As CaCO3 at pH 4.5)	300	1.0 mg/L	10/26/05	11/09/05

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11/10/05
Report Date

MH 12/9/05

LDC #: 14359A6

SDG #: BMI05102720

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) Total Iron

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: 10-26-05
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	SW	MS/MSD (SDG: BMI05102803, BMI05102503)
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 = 1+2
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	1523-MW01**	11	1523-MW04DUP	21		31	
2	1523-MW01 Dup	12	PBW1	22		32	
3	1523-MW02	13	~~PBW2~~ gnd	23		33	
4	1523-MW03	14		24		34	
5	1523-MW04	15		25		35	
6	1523-MW05	16		26		36	
7	1523-MW06	17		27		37	
8	1523-MW07	18		28		38	
9	1523-MW04MS	19		29		39	
10	1523-MW04MSD	20		30		40	

Notes:

LDC #: 14359A6
SDG #: BMI05102720

VALIDATION FINDINGS CHECKLIST

Reviewer: MG
2nd Reviewer: MY

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 #: 14359A6
SDG #: BMI05102720

VALIDATION FINDINGS CHECKLIST

Reviewer: MG
2nd Reviewer: [illegible]

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 #: 14359A6
SDG #: BM105102730

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer: My

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1 → 8	W	pH (TDS) Cl F (NO3) (NO2) (SO4) PO4 (ALK) CN- NH3 TKN (TOC) CR6+ ClO4 Br (Tot Iron)
QC 9, 10	↓	pH TDS Cl F (NO3) (NO2) SO4 PO4 ALK CN- NH3 TKN (TOC) CR6+ ClO4 Br
↓ 11	↓	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 #: 14359A6
SDG #: BMI05102720

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: MG
2nd reviewer: MM

All circled dates have exceeded the technical holding time.
Y N N/A Were all samples preserved as applicable to each method ?
Y N N/A Were all cooler temperatures within validation criteria?

Method:		300.0	300.0				
Parameters:		NO_2-N	NO_3-N				
Technical holding time:		48 hr.	48 hr				
Sample ID	Sampling date	Analysis date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier
1	10-26-05	11-10-05	11-10-05	(15 days)			J/R/A*
2	↓	↓	↓	(↓)			↓
5	↓	↓	↓	(↓)			↓
9	↓	↓	↓	(↓)			↓
10	↓	↓	↓	(↓)			↓

HT.8

*re-analysis

LDC #: 14359A6
SDG #: BMI05102720

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	1413-MW05 MS/MSD	water	SO_4			6.7 (≤ 2)	all 8	J/UJ/A

Comments:

MSD.6

LDC #: 14359A6
SDG #: BMI05102720

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
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 #: 14359A6
SDG #: BMI05102720

VALIDATION FINDINGS WORKSHEET
Sample Result Verification

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.

ABVCROL6

LDC #: 14359A6
SDG #: BMI05102720

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
	1	2			
tot. Alk.	330	330	0		
NO_3-N	53	53	0		
SO_4	29	28	4		
TDS	11000	11000	0		
tot. Iron	0.37	0.30 U	200		

Analyte	Concentration (mg/L)		RPD (Limit)	Difference (Limit)	Qualifier
	1	2			
TOC	3.8	3.7	3		

Analyte	Concentration ( )		RPD (Limit)	Difference (Limit)	Qualifier

Analyte	Concentration ( )		RPD (Limit)	Difference (Limit)	Qualifier

LDC #: 14359A6
SDG #: BMI05102720

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 TOC was recalculated. Calibration date: 9-29-04

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		µg C (units)	Area (units)	Recalculated r or %R	Reported r or %R	Acceptable (Y/N)
Initial calibration	TOC	Blank	0.0 (µg C)	1290398	r^2=0.999	r^2=0.999	Y
Calibration verification		Standard 1	4.0 (	)	2347018		
		Standard 2	8.0 (	)	3329396		
		Standard 3	20. (	)	7521596		
		Standard 4	40. (	)	14662217		
		Standard 5	80. (	)	28524834		
		Standard 6	–		–		
		Standard 7	–		–		
Calibration verification	NO_3-N	1154 CCV3	4.144 (mg/L)	4.0 (mg/L)	104	104	
Calibration verification	~~1423~~ SO_4	1423 CCV1	1.974 (mg/L)	2.00 (mg/L)	99	99	
Calibration verification	Tot. Iron	ICV	1.5007 (mg/L)	1.5 (mg/L)	100	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.

CALCLC.6

LDC #: 14359A6
SDG #: BMI05102720

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	Total Fe	47.0196 (mg/L)	50 (mg/L)	94	94	Y
1304 9	Matrix spike sample	NO_3-N	(SSR-SR) 199.216 (mg/L)	200 (mg/L)	99.6	99.6	↓
11	Duplicate sample	TDS	2747.5 (mg/L)	2672.5 (mg/L)	3	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 #: 14359A6
SDG #: BMI05102720

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 #1, TOC reported with a positive detect were recalculated and verified using the following equation:

Concentration = $y = mx + b$

where $m = 344286.9$
$x = \mu g\ C$
NOT USED → $b = 890641.1$
$y = \overline{Area} = 5291066$

Recalculation:

$5291066 = 344286.9(x)$
$15.368188\ \mu g\ C = x$

then $\frac{15.368188\ \mu g}{4.0\ ml} = 3.842\ \mu g/ml$ (or mg/L)

#	Sample ID	Analyte	Reported Concentration (mg/L)	Calculated Concentration (mg/L)	Acceptable (Y/N)
1	1	tot. Alk.	330	330	Y
		NO_3-N	53	53	↓
		SO_4	29	29	↓
		TDS	11000	11000	↓
		tot. Iron	0.37	0.37	↓
		TOC	3.8	3.8	↓

Note:

RECALC.6

JANUARY 2006

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Camp Pendleton, CTO 102

Collection Date: January 19, 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): BMI06012350

Sample Identification

1523-QCEB
1523-MW01**
1523-MW01Dup
1523-MW02
1523-MW03
1523-MW04
1523-MW05
1523-MW06
1523-MW07
1523-MW07MS
1523-MW07MSD

**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 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 with the following exceptions:

Date	Compound	%D	Affected Compound	Associated Samples	Flag	A or P
1/24/06	TPH as motor oil	16.6	TPH as motor oil	1523-QCEB 1523-MW01** 1523-MW01Dup 1523-MW02 1523-MW03 1523-MW04 1523-MW05 1523-MW06 1523-MW07 MBLK-13961	J (all detects) UJ (all non-detects)	A

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 1523-MW01** and 1523-MW01Dup 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
	1523-MW01**	1523-MW01Dup	
TPH as diesel	0.074	0.069	7

X. Field Blanks

Sample 1523-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 BMI06012350

SDG	Sample	Compound	Flag	A or P	Reason
BMI06012350	1523-QCEB 1523-MW01** 1523-MW01Dup 1523-MW02 1523-MW03 1523-MW04 1523-MW05 1523-MW06 1523-MW07	TPH as motor oil	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)

Camp Pendleton, CTO 102
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG BMI06012350

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 : 01/21/06

Job#: TO102-1523

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

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1523-QCEB	TPH-E (Diesel)	ND U	0.050 mg/L	01/19/06	01/24/06
Lab ID :	BMI06012350-03A	TPH-E (Oil)	ND UJ	0.50 mg/L	01/19/06	01/24/06
		Surr: Nonane	99	%REC	01/19/06	01/24/06
Client ID :	1523-MW01	TPH-E (Diesel)	0.074	0.050 mg/L	01/19/06	01/24/06
Lab ID :	BMI06012350-04A	TPH-E (Oil)	ND UJ	0.50 mg/L	01/19/06	01/24/06
		Surr: Nonane	101	%REC	01/19/06	01/24/06
Client ID :	1523-MW01 Dup	TPH-E (Diesel)	0.069	0.050 mg/L	01/19/06	01/24/06
Lab ID :	BMI06012350-05A	TPH-E (Oil)	ND UJ	0.50 mg/L	01/19/06	01/24/06
		Surr: Nonane	96	%REC	01/19/06	01/24/06
Client ID :	1523-MW02	TPH-E (Diesel)	0.10	0.050 mg/L	01/19/06	01/24/06
Lab ID :	BMI06012350-06A	TPH-E (Oil)	ND UJ	0.50 mg/L	01/19/06	01/24/06
		Surr: Nonane	98	%REC	01/19/06	01/24/06
Client ID :	1523-MW03	TPH-E (Diesel)	0.15	0.050 mg/L	01/19/06	01/24/06
Lab ID :	BMI06012350-07A	TPH-E (Oil)	ND UJ	0.50 mg/L	01/19/06	01/24/06
		Surr: Nonane	108	%REC	01/19/06	01/24/06
Client ID :	1523-MW04	TPH-E (Diesel)	ND U	0.050 mg/L	01/19/06	01/24/06
Lab ID :	BMI06012350-08A	TPH-E (Oil)	ND UJ	0.50 mg/L	01/19/06	01/24/06
		Surr: Nonane	98	%REC	01/19/06	01/24/06
Client ID :	1523-MW05	TPH-E (Diesel)	ND U	0.050 mg/L	01/19/06	01/24/06
Lab ID :	BMI06012350-09A	TPH-E (Oil)	ND UJ	0.50 mg/L	01/19/06	01/24/06
		Surr: Nonane	97	%REC	01/19/06	01/24/06
Client ID :	1523-MW06	TPH-E (Diesel)	0.15	0.050 mg/L	01/19/06	01/24/06
Lab ID :	BMI06012350-10A	TPH-E (Oil)	ND UJ	0.50 mg/L	01/19/06	01/24/06
		Surr: Nonane	98	%REC	01/19/06	01/24/06
Client ID :	1523-MW07	TPH-E (Diesel)	ND U	0.050 mg/L	01/19/06	01/24/06
Lab ID :	BMI06012350-11A	TPH-E (Oil)	ND UJ	0.50 mg/L	01/19/06	01/24/06
		Surr: Nonane	97	%REC	01/19/06	01/24/06

WHO 3/13/06

LDC #: 14702F8

SDG #: BMI06012350

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: 01/19/06
IIa.	Initial calibration	A	
IIb.	Calibration verification	SW	ICV ≤ 15
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 = 2 & 3
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	1523-QCEB	11	1523-MW07MSD	21	MBLK-13961	31	
2	1523-MW01**	12		22		32	
3	1523-MW01Dup	13		23		33	
4	1523-MW02	14		24		34	
5	1523-MW03	15		25		35	
6	1523-MW04	16		26		36	
7	1523-MW05	17		27		37	
8	1523-MW06	18		28		38	
9	1523-MW07	19		29		39	
10	1523-MW07MS	20		30		40	

Notes:

LDC #: 14702 F8
SDG #: BM10601235D

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
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%?	✓			
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 spike				
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 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?	✓			
Was an LCS analyzed per extraction batch?	✓			

LDC #: 14702 P8
SDG #: BM10601235D

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: B
2nd Reviewer: G

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 blank				
Were field blanks identified in this SDG?	✓	NO	✓	
Were target compounds detected in the field blanks?		✓		

LDC #: 14702F8
SDG #: BM1060123SD

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

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

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
What type of continuing calibration calculation was performed? ___%D or ___RPD
Y N N/A Were continuing calibration standards analyzed at the required frequencies?
Y N N/A Did the continuing calibration standards meet the %D / RPD validation criteria of ≤15.0%?
Level IV Only
Y N N/A Were the retention times for all calibrated compounds within their respective acceptance windows?

#	Date	Standard ID	Detector/ Column	Compound	%D / RPD (Limit ≤ 15.0)	RT (limit)	Associated Samples	Qualifications
	1/24/06	012301.D50	DB1	Motor Oil	16.6	( )	MBLK - 13961,	J/UJ/A
						( )	1 → 9	
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		

LDC #: 14702P8
SDG #: BM1060235D

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
	2	3		
Diesel	0.044	0.069	7	

Compound	Concentration ( )		%RPD Limit _____	Qualification Parent only / All Samples

LDC #: 14702B8
SDG #: BM1060123SD

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: B
2nd Reviewer: A

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 10.0% of the recalculated results.

LDC #: 14702P8
SDG #: BM106012350

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: [illegible]
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	2A012301		Diesel	250	286.97	286.97	114.79	114.79
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 #: 14702F8
SDG #: BM106012350

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer:
2nd reviewer:

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	Percent Recovery	Percent Difference
				Reported	Recalculated	
Nonane	DB.1	100	101.0336	101	101	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 #: 14702F8
SDG #: BM1060123SD

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer:
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 concentration; SA = Spike added; MS = Matrix spike percent recovery; SC = Sample concentration; MSD = Matrix spike duplicate percent recovery

MS/MSD samples: Water

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	2.61	2.61	105	105	105	105	0	0
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 #: 14702F8

SDG #: BM1060123SD

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Page: 1 of 1

Reviewer: B

2nd Reviewer:

_____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-13961

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	2.53	NA	101	101	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 #: 14702 F8
SDG #: BM106012350

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 6 of 7
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= $\frac{(A)(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$

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 TPH-E

Concentration = $\frac{33708 \times 8.7678 \times 10^{-5} \times 1}{40}$

= 0.074 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 19, 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): BMI06012350

Sample Identification

1523-QCTB
1523-QCFB
1523-MW01**
1523-MW01Dup
1523-MW02
1523-MW03
1523-MW04
1523-MW05
1523-MW06
1523-MW07
1523-MW01MS
1523-MW01MSD

**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

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.

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 BMI06012350	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 1523-MW01** and 1523-MW01Dup were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD
	1523-MW01**	1523-MW01Dup	
Benzene	0.46	0.31	39
Ethylbenzene	2.4	0.54	127

XVII. Field Blanks

Sample 1523-QCTB was identified as a trip blank. No volatile contaminants were found in this blank.

Sample 1523-QCFB was identified as a field blank. No volatile contaminants were found in this blank.

Camp Pendleton, CTO 102
Volatiles - Data Qualification Summary - SDG BMI06012350

SDG	Sample	Compound	Flag	A or P	Reason
BMI06012350	1523-QCTB 1523-QCFB 1523-MW01** 1523-MW01Dup 1523-MW02 1523-MW03 1523-MW04 1523-MW05 1523-MW06 1523-MW07	All TCL compounds	None	P	Laboratory control samples

Camp Pendleton, CTO 102
Volatiles - Laboratory Blank Data Qualification Summary - SDG BMI06012350

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#: TO102-1523

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

Alpha Analytical Number: BMI06012350-01A
Client I.D. Number: 1523-QCTB

Sampled: 01/19/06
Received: 01/21/06
Analyzed: 01/25/06

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	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	95		%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	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

2/3/06
Report Date

3/10/06

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1523

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

Alpha Analytical Number: BMI06012350-02A
Client I.D. Number: 1523-QCFB

Sampled: 01/19/06
Received: 01/21/06
Analyzed: 01/25/06

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	97		%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
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 281-4848 / info@alpha-analytical.com

2/3/06
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
Job#: TQ102-1523

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

Alpha Analytical Number: BMI06012350-04A
Client I.D. Number: 1523-MW01

Sampled: 01/19/06
Received: 01/21/06
Analyzed: 01/25/06

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	0.46 J	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	2.4	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	8.0	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	101		%REC
62	Surr: Toluene-d8	92		%REC
63	Surr: 4-Bromofluorobenzene	96		%REC

Some Reporting Limits were increased due to sample foaming.

J= Benzene concentrations and reporting limits between 0.25 and 0.50 µg/L are estimated.

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#: TO102-1523

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

Alpha Analytical Number: BMI06012350-05A
Client I.D. Number: 1523-MW01 Dup

Sampled: 01/19/06
Received: 01/21/06
Analyzed: 01/25/06

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration		Reporting Limit	
1	Dichlorodifluoromethane	ND	U	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	0.31	J J	0.50	µg/L
21	Dibromomethane	ND	U	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	0.54		0.50	µg/L

	Compound	Concentration		Reporting Limit	
36	m,p-Xylene	ND	U	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	102			%REC
62	Surr: Toluene-d8	93			%REC
63	Surr: 4-Bromofluorobenzene	95			%REC

Some Reporting Limits were increased due to sample foaming.

J - Benzene concentrations and reporting limits between 0.25 and 0.50 µg/L are estimated.

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#: TO102-1523

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

Alpha Analytical Number: BMI06012350-06A
Client I.D. Number: 1523-MW02

Sampled: 01/19/06
Received: 01/21/06
Analyzed: 01/25/06

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		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	92			%REC
28	Toluene	ND		0.50	µg/L	63	Surr: 4-Bromofluorobenzene	92			%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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2/10/06

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1523

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

Alpha Analytical Number: BM106012350-07A
Client I.D. Number: 1523-MW03

Sampled: 01/19/06
Received: 01/21/06
Analyzed: 01/25/06

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	0.29	J	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		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	2.0		1.0	µg/L	58	Naphthalene	2.6		2.0	µg/L
24	Bromodichloromethane	ND	U	1.0	µg/L	59	Hexachlorobutadiene	ND	U	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	93			%REC
28	Toluene	ND		0.50	µg/L	63	Surr: 4-Bromofluorobenzene	95			%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						

J= Benzene concentrations and reporting limits between 0.25 and 0.50 µg/L are estimated.

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#: TO102-1523

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

Alpha Analytical Number: BMI06012350-08A
Client I.D. Number: 1523-MW04

Sampled: 01/19/06
Received: 01/21/06
Analyzed: 01/25/06

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	104		%REC
27	1,1,2-Trichloroethane	ND	1.0	µg/L	62	Surr: Toluene-d8	93		%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 Hüchtman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hüchtman, Quality Assurance Officer
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2/3/06
Report Date

2/10/06

Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1523

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

Alpha Analytical Number: BMI06012350-09A
Client I.D. Number: 1523-MW05

Sampled: 01/19/06
Received: 01/21/06
Analyzed: 01/25/06

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	1.5	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	96		%REC
28	Toluene	ND	0.50	µg/L	63	Surr: 4-Bromofluorobenzene	99		%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

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Alpha Analytical, Inc.

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1523

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

Alpha Analytical Number: BMI06012350-10A
Client I.D. Number: 1523-MW06

Sampled: 01/19/06
Received: 01/21/06
Analyzed: 01/25/06

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	105		%REC
27	1,1,2-Trichloroethane	ND	1.0	µg/L	62	Surr: Toluene-d8	93		%REC
28	Toluene	ND	0.50	µg/L	63	Surr: 4-Bromofluorobenzene	95		%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

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ANALYTICAL REPORT

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201
Job#: TO102-1523

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

Alpha Analytical Number: BMI06012350-11A
Client I.D. Number: 1523-MW07

Sampled: 01/19/06
Received: 01/21/06
Analyzed: 01/25/06

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	NO	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	NO		1.0	µg/L
9	trans-1,2-Dichloroethene	NO		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	NO		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	NO		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	NO		1.0	µg/L	59	Hexachlorobutadiene	ND		2.0	µg/L
25	cis-1,3-Dichloropropene	NO		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	106			%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	96			%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 Hutchison

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

2/3/06
Report Date

3/10/06

LDC #: 14702F1

SDG #: BMI06012350

Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 3/08/06

Page: 1 of 1

Reviewer: JVL

2nd Reviewer: CK

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: 1/19/06
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	% RSD ≤ 15
IV.	Continuing calibration	A	
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 = 3, 4
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	1523-QCTB	11	1523-MW01MS	21		31	
2	1523-QCFB	12	1523-MW01MSD	22		32	
3	1523-MW01**	13	MB2K MS10 W01KA	23		33	
4	1523-MW01Dup	14		24		34	
5	1523-MW02	15		25		35	
6	1523-MW03	16		26		36	
7	1523-MW04	17		27		37	
8	1523-MW05	18		28		38	
9	1523-MW06	19		29		39	
10	1523-MW07	20		30		40	

LDC #: 14702F1
SDG #: BMI060123350

VALIDATION FINDINGS CHECKLIST

Reviewer: JVB
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 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 #: 14702E4
SDG #: BMI06012003

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 2 of 2
Reviewer: MG
2nd reviewer: [illegible]

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-, ____
		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 #: 14702E4
SDG #: BMI06012003

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: MG
2nd reviewer: MY

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
	1	7			
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Cadmium					
Calcium					
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Magnesium					
Manganese	0.014	0.011	24		
Mercury					
Nickel					
Potassium					
Selenium					
Silver					
Sodium					
Thallium					
Vanadium					
Zinc					
Cyanide					
Boron					
Molybdenum					
Strontium					
Silicon					

Notes:

FLDUP.4S2

LDC #: 14702E4
SDG #: BMI06012003

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Reviewer: MG
2nd Reviewer: [illegible]

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)						
ICV	ICP/MS (Initial calibration)	Pb	47.97	50.00	96	not reported ~~96~~ mA	Y
1117 CCV	ICP/MS (Continuing calibation)	Mn	85.30	80.00	107	107	↓

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 #: 14702E4
SDG #: BMI06012003

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: MG
2nd Reviewer: Hy

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 ICSAB	ICP interference check	Mn	221.50 (µg/L)	200.00 (µg/L)	111	not reported	Y
0225 LCS	Laboratory control sample	Pb	0.2553 (mg/L)	0.25 (mg/L)	102	102	↓
1019 1491-MW05 MS	Matrix spike	Mn	(SSR-SR) -0.021 (mg/L)	0.05 (mg/L)	-42	-44	↓
1019/1024 1491-MW05 MS/MSD	Duplicate	Mn	1.8985 (mg/L)	1.9925 (mg/L)	4.8	4.9	↓
—	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 #: 14702E4
SDG #: BMI06012003

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 #1, Mn were recalculated and verified using the following equation:

Concentration = (RD)(FV)(Dil) / (In. Vol.)(%S)

Recalculation: (Software applied a 5x dilution factor)

from raw data: Mn = (13.585 ug/L)(1 mg/1000 ug)

Mn = 0.013585 mg/L

RD = Raw data concentration
FV = Final volume (ml)
In. Vol. = Initial volume (ml) or weight (G)
Dil = Dilution factor
%S = Decimal percent solids

Sample ID	Analyte	Reported Concentration (mg/L)	Calculated Concentration (mg/L)	Acceptable (Y/N)
1	Mn	0.014	0.014	Y

RECALC.4S2

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Camp Pendleton, CTO 102

Collection Date: January 19, 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): BMI06012350

Sample Identification

1523-MW01**
1523-MW01Dup
1523-MW02
1523-MW03
1523-MW04
1523-MW05
1523-MW06
1523-MW07
1523-MW01MS
1523-MW01MSD

**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 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 1523-MW01** and 1523-MW01Dup were identified as field duplicates. No methane was detected in any of the samples with the following exceptions:

Compound	Concentration (mg/L)		RPD
	1523-MW01**	1523-MW01Dup	
Methane	0.027	0.010	92

X. Field Blanks

No field blanks were identified in this SDG.

Camp Pendleton, CTO 102
Methane - Data Qualification Summary - SDG BMI06012350

No Sample Data Qualified in this SDG

Camp Pendleton, CTO 102
Methane - Laboratory Blank Data Qualification Summary - SDG BMI06012350

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 : 01/21/06

Job#: TO102-1523

Dissolved Gases
Modified Method RSK-175 GC/FID

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	1523-MW01					
Lab ID :	BMI06012350-04A	Methane	0.027	0.010 mg/L	01/19/06	01/26/06
Client ID :	1523-MW01 Dup					
Lab ID :	BMI06012350-05A	Methane	0.010	0.010 mg/L	01/19/06	01/26/06
Client ID :	1523-MW02					
Lab ID :	BMI06012350-06A	Methane	0.025	0.010 mg/L	01/19/06	01/26/06
Client ID :	1523-MW03					
Lab ID :	BMI06012350-07A	Methane	0.059	0.010 mg/L	01/19/06	01/26/06
Client ID :	1523-MW04					
Lab ID :	BMI06012350-08A	Methane	ND	0.010 mg/L	01/19/06	01/26/06
Client ID :	1523-MW05					
Lab ID :	BMI06012350-09A	Methane	ND	0.010 mg/L	01/19/06	01/26/06
Client ID :	1523-MW06					
Lab ID :	BMI06012350-10A	Methane	ND	0.010 mg/L	01/19/06	01/26/06
Client ID :	1523-MW07					
Lab ID :	BMI06012350-11A	Methane	ND	0.010 mg/L	01/19/06	01/26/06

ND = Not Detected

Roger Scholl Randy Gardner Walter Hutchinson

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

2/3/06
Report Date

3/10/06

LDC #: 14702F51

SDG #: BMI06012350

Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 3/7/06

Page: 1 of 1

Reviewer:

2nd Reviewer:

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: 1/9/06
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 = 1 + 2
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	1523-MW01**	11	MBLK-13975	21		31	
2	1523-MW01Dup	12		22		32	
3	1523-MW02	13		23		33	
4	1523-MW03	14		24		34	
5	1523-MW04	15		25		35	
6	1523-MW05	16		26		36	
7	1523-MW06	17		27		37	
8	1523-MW07	18		28		38	
9	1523-MW01MS	19		29		39	
10	1523-MW01MSD	20		30		40	

Notes:

LDC #: 14702 FS
SDG #: BM1060123 SD

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer:
2nd Reviewer:

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 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?	✓			
Was an LCS analyzed per extraction batch?	✓			

LDC #: 14702F51
SDG #: BM1060123 SO

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: [illegible]
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 #: 14702F51
SDG #: BM06012350

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
	1	2		
methane	0.027	0.010	92	

Compound	Concentration ( )		%RPD Limit _____	Qualification Parent only / All Samples

LDC #: 14702 F5 /
SDG #: BM1060 12350

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 ug/L CF (0.5%std)	Recalculated ug/L CF (0.5%std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL GC10	7/20/05	methane	3.7182×10^6	3.7182×10^6	3.291×10^6	3.291×10^6	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.

INIC[illegible] SB

LDC #: 14702 F5 1
SDG #: BM1060012350

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 %D	Recalculated %D
1	6A012606 19		methane	2.64	2.84	2.84	106.88	106.88
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 #: 14702 F51
SDG #: BM106012350

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer:
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 concentration; SA = Spike added; MS = Matrix spike percent recovery; SC = Sample concentration; MSD = Matrix spike duplicate percent recovery

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)											
Benzene (8021B)											
Methane (RSK-175)	1.06	1.06	0.027	1.14	1.23	105	105	114	114	8.2	7.6
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.

LDC #: 14702 F51
SDG #: BM106012 350

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Page: 1 of 1
Reviewer:
2nd Reviewer:

____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 - 13975

Compound	Spike Added (mg/L)		Sample Conc. (mg/L)	Spike Sample Concentration ( )		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	0.575	NA	108	108	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 #: 14702F51
SDG #: BM106012350

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. # 1 Compound Name Methane

Concentration = 87259 / 3.291 x 10^6

= 0.027 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 19, 2006

LDC Report Date: March 8, 2006

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level III & IV

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): BMI06012003

Sample Identification

1523-MW01**
1523-MW02
1523-MW03
1523-MW04
1523-MW05
1523-MW07
1523-MW01Dup
1523-MW01MS
1523-MW01MSD
1523-MW07DUP

**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, 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.

Samples were received in good condition, per the chain-of-custody with the following exceptions:

Sample	Analyte	Finding	Criteria	Flag	A or P
1523-MW01** 1523-MW01Dup	Nitrite as N Nitrate as N	Analysis was performed on acid preserved samples.	Analysis must be performed on an unpreserved aliquot.	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P

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-MW06MS/MSD (1523-MW01** 1523-MW02 1523-MW03 1523-MW04 1523-MW05 1523-MW01Dup)	Sulfate	-	-	5.1 (≤2)	J (all detects) UJ (all non-detects)	A
14151-MW01MS/MSD (1523-MW07)	Sulfate	-	-	3.4 (<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 BMI06012003	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 1523-MW01** and 1523-MW01Dup were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/L)		RPD
	1523-MW01**	1523-MW01Dup	
Alkalinity	21	27	25
Total dissolved solids	12000	12000	0
Nitrate as N	50	45	11
Sulfate	31	35	12

X. Field Blanks

No field blanks were identified in this SDG.

Camp Pendleton, CTO 102
Wet Chemistry - Data Qualification Summary - SDG BMI06012003

SDG	Sample	Analyte	Flag	A or P	Reason
BMI06012003	1523-MW01** 1523-MW01Dup	Nitrite as N Nitrate as N	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Sample condition
BMI06012003	1523-MW01** 1523-MW02 1523-MW03 1523-MW04 1523-MW05 1523-MW01Dup 1523-MW07	Sulfate	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (RPD)
BMI06012003	1523-MW01** 1523-MW02 1523-MW03 1523-MW04 1523-MW05 1523-MW07 1523-MW01Dup	Alkalinity	None	P	Laboratory control samples

Camp Pendleton, CTO 102
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG BMI06012003

No Sample Data Qualified in this SDG

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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 : 01/20/06

Job#: TO102-1523

Alkalinity
EPA Method 310.1

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1523-MW01**					
Lab ID :	BMI06012003-01A	Alkalinity, Total (As CaCO3 at pH 4.5)	21	1.0 mg/L	01/19/06	01/25/06
Client ID :	**1523-MW02**					
Lab ID :	BMI06012003-02A	Alkalinity, Total (As CaCO3 at pH 4.5)	160	1.0 mg/L	01/19/06	01/25/06
Client ID :	**1523-MW03**					
Lab ID :	BMI06012003-03A	Alkalinity, Total (As CaCO3 at pH 4.5)	61	1.0 mg/L	01/19/06	01/25/06
Client ID :	**1523-MW04**					
Lab ID :	BMI06012003-04A	Alkalinity, Total (As CaCO3 at pH 4.5)	140	1.0 mg/L	01/19/06	01/25/06
Client ID :	**1523-MW05**					
Lab ID :	BMI06012003-05A	Alkalinity, Total (As CaCO3 at pH 4.5)	54	1.0 mg/L	01/19/06	01/25/06
Client ID :	**1523-MW07**					
Lab ID :	BMI06012003-06A	Alkalinity, Total (As CaCO3 at pH 4.5)	110	1.0 mg/L	01/19/06	01/25/06
Client ID :	**1523-MW01Dup**					
Lab ID :	BMI06012003-07A	Alkalinity, Total (As CaCO3 at pH 4.5)	27	1.0 mg/L	01/19/06	01/25/06

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2/2/06
Report Date

3/10/06

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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 : 01/20/06

Job#: TO102-1523

Anions by IC
EPA Method 300.0 / 9056

	Parameter	Concentration	Reporting Limit	Date / Time Sampled	Date / Time Analyzed
Client ID :	Nitrite (NO2) - N	ND UJ D*	2.5 mg/L	01/19/06 12:10	01/24/06 18:48
1523-MW01	Nitrate (NO3) - N	50 J *	2.5 mg/L	01/19/06 12:10	01/24/06 18:48
Lab ID :	Sulfate (SO4)	31 J	0.50 mg/L	01/19/06 12:10	01/20/06 19:17
BMI06012003-01A					
Client ID :	Nitrite (NO2) - N	ND U	0.25 mg/L	01/19/06 13:55	01/20/06 19:36
1523-MW02	Nitrate (NO3) - N	9.3	0.25 mg/L	01/19/06 13:55	01/20/06 19:36
Lab ID :	Sulfate (SO4)	55 J	0.50 mg/L	01/19/06 13:55	01/20/06 19:36
BMI06012003-02A					
Client ID :	Nitrite (NO2) - N	ND U	0.25 mg/L	01/19/06 09:35	01/20/06 19:54
1523-MW03	Nitrate (NO3) - N	7.1	0.25 mg/L	01/19/06 09:35	01/20/06 19:54
Lab ID :	Sulfate (SO4)	31 J	0.50 mg/L	01/19/06 09:35	01/20/06 19:54
BMI06012003-03A					
Client ID :	Nitrite (NO2) - N	ND U	0.25 mg/L	01/19/06 09:45	01/20/06 20:13
1523-MW04	Nitrate (NO3) - N	150 **	6.3 mg/L	01/19/06 09:45	01/24/06 19:44
Lab ID :	Sulfate (SO4)	73 J	0.50 mg/L	01/19/06 09:45	01/20/06 20:13
BMI06012003-04A					
Client ID :	Nitrite (NO2) - N	ND U	0.25 mg/L	01/19/06 11:00	01/20/06 20:31
1523-MW05	Nitrate (NO3) - N	21 **	1.3 mg/L	01/19/06 11:00	01/24/06 20:02
Lab ID :	Sulfate (SO4)	51 J	0.50 mg/L	01/19/06 11:00	01/20/06 20:31
BMI06012003-05A					
Client ID :	Nitrite (NO2) - N	ND U	0.25 mg/L	01/19/06 12:04	01/20/06 20:50
1523-MW07	Nitrate (NO3) - N	0.47	0.25 mg/L	01/19/06 12:04	01/20/06 20:50
Lab ID :	Sulfate (SO4)	280 J	2.5 mg/L	01/19/06 12:04	01/23/06 22:36
BMI06012003-06A					
Client ID :	Nitrite (NO2) - N	ND UJ D*	2.5 mg/L	01/19/06 12:10	01/24/06 20:21
1523-MW01Dup	Nitrate (NO3) - N	45 J *	2.5 mg/L	01/19/06 12:10	01/24/06 20:21
Lab ID :	Sulfate (SO4)	35 J	0.50 mg/L	01/19/06 12:10	01/20/06 21:08
BMI06012003-07A					

2/10/06

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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 : 01/20/06

Job#: TO102-1523

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

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1523-MW01**					
Lab ID :	BMI06012003-01A	Solids, Total Dissolved (TDS)	12,000	50 mg/L	01/19/06	01/30/06
Client ID :	**1523-MW02**					
Lab ID :	BMI06012003-02A	Solids, Total Dissolved (TDS)	1,800	10 mg/L	01/19/06	01/27/06
Client ID :	**1523-MW03**					
Lab ID :	BMI06012003-03A	Solids, Total Dissolved (TDS)	3,400	25 mg/L	01/19/06	01/27/06
Client ID :	**1523-MW04**					
Lab ID :	BMI06012003-04A	Solids, Total Dissolved (TDS)	2,400	10 mg/L	01/19/06	01/27/06
Client ID :	**1523-MW05**					
Lab ID :	BMI06012003-05A	Solids, Total Dissolved (TDS)	4,100	25 mg/L	01/19/06	01/27/06
Client ID :	**1523-MW07**					
Lab ID :	BMI06012003-06A	Solids, Total Dissolved (TDS)	1,600	10 mg/L	01/19/06	01/26/06
Client ID :	**1523-MW01Dup**					
Lab ID :	BMI06012003-07A	Solids, Total Dissolved (TDS)	12,000	50 mg/L	01/19/06	01/27/06

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2/2/06
Report Date

3/10/06

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ANALYTICAL REPORT

Battelle Memorial Institute
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Attn: Chris Zimmerman
Phone: (614) 424-3779
Fax: (614) 424-3667
Date Received : 01/20/06

Job#: TO102: 1523

Iron by Spectrophotometer
SM3500-Fe D

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1523-MW01**					
Lab ID :	BMI06012003-01A	Iron, Ferrous (+2)	ND	0.050 mg/L	01/19/06	01/20/06
Client ID :	**1523-MW02**					
Lab ID :	BMI06012003-02A	Iron, Ferrous (+2)	ND	0.050 mg/L	01/19/06	01/20/06
Client ID :	**1523-MW03**					
Lab ID :	BMI06012003-03A	Iron, Ferrous (+2)	ND	0.050 mg/L	01/19/06	01/20/06
Client ID :	**1523-MW04**					
Lab ID :	BMI06012003-04A	Iron, Ferrous (+2)	ND	0.050 mg/L	01/19/06	01/20/06
Client ID :	**1523-MW05**					
Lab ID :	BMI06012003-05A	Iron, Ferrous (+2)	ND	0.050 mg/L	01/19/06	01/20/06
Client ID :	**1523-MW07**					
Lab ID :	BMI06012003-06A	Iron, Ferrous (+2)	ND	0.050 mg/L	01/19/06	01/20/06
Client ID :	**1523-MW01Dup**					
Lab ID :	BMI06012003-07A	Iron, Ferrous (+2)	ND	0.050 mg/L	01/19/06	01/20/06

ND = Not Detected

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2/2/06
Report Date

2/10/06

LDC #: 14702E6

SDG #: BMI06012003

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	SW	Sampling dates: 1-19-06
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	SW	MS/MSD (SDG: BMI06011852 & BMI06011952)
V	Duplicates	A	DUP (SDG: BMI06011653)
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 = 1+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	1523-MW01**	11	PBW	21		31	
2	1523-MW02	12		22		32	
3	1523-MW03	13		23		33	
4	1523-MW04	14		24		34	
5	1523-MW05	15		25		35	
6	1523-MW07	16		26		36	
7	1523-MW01Dup	17		27		37	
8	1523-MW01MS	18		28		38	
9	1523-MW01MSD	19		29		39	
10	1523-MW07DUP	20		30		40	

Notes:

LDC #: 14702E6
SDG #: BMI06012003

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 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 #: 14702E6
SDG #: BMI06012003

VALIDATION FINDINGS CHECKLIST

Reviewer: MG
2nd Reviewer: MY

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 #: 14702E6
SDG #: BMI06012003

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
		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 #: 14702E6
SDG #: BMI06012003

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: MG
2nd reviewer: [illegible]

All circled dates have exceeded the technical holding time.
Y (N) N/A Were all samples preserved as applicable to each method ?
(Y) N N/A Were all cooler temperatures within validation criteria?

Method:							
Parameters:							
Technical holding time:							
Sample ID	**Sampling date**	**Analysis date**	**Analysis date**	**Analysis date**	**Analysis date**	**Analysis date**	**Qualifier**
1, 7	(* Method 300.0 analysis for NO_2-N and NO_3-N was performed on acid preserved samples.)						J/UJ/P NO_2-N NO_3-N
4, 5	(* Method 300.0 analysis for NO_3-N was performed on acid preserved samples.)						~~J/UJ/P~~ No qual [illegible] ~~NO_3-N~~
	(NO_2-N was analyzed within holding time and ND).						

HT.6

* Criteria: Anion analysis by 300.0 should be performed on unpreserved samples per the method.

LDC #: 14702E6
SDG #: BMI06012003

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	1413-MW06 MS/MSD	water	SO_4			5.1 (≤2)	all 1-5,7	J/UJ/A
2	14151-MW01 MS/MSD	water	SO_4			3.4 (≤2)	6	↓

Comments:

MSD.6

LDC #: 14709E6
SDG #: BMI06012003

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
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 #: 14702E6
SDG #: BMI06012003

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: MG
2nd reviewer: MM

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
	1	7			
Alk	21.	27.	25		
TDS	12000.	12000.	0		
NO_3-N	50.	45.	11		
SO_4	31.	35.	12		

Analyte	Concentration ( )		RPD (Limit)	Difference (Limit)	Qualifier

Analyte	Concentration ( )		RPD (Limit)	Difference (Limit)	Qualifier

Analyte	Concentration ( )		RPD (Limit)	Difference (Limit)	Qualifier

LDC #: 14702E6
SDG #: BMI06012003

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 SO4 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	SO_4	Blank Std 0	0.10 (mg/L)	0.039	r=0.999731	r=0.999901	Y
Calibration verification		Standard 1	0.20 ( )	0.079			
		Standard 2	0.50 ( )	0.188			
		Standard 3	1.0 ( )	0.389			
		Standard 4	2.0 ( )	0.817			
		Standard 5	4.0 ( )	1.610			
		Standard 6	8.0 ( )	3.310			
		Standard 7	12.0 ( )	5.137			
Calibration verification	Ferrous Iron	ICV	1.46785 (mg/L)	1.5 (mg/L)	98	not reported	
Calibration verification	NO_3-N	1639 CCV	0.1294 (mg/L)	0.125 (mg/L)	104	104	
Calibration verification	NO_2-N	1639 CCV	0.1271 (mg/L)	0.125 (mg/L)	102	102	

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 #: 14702E6
SDG #: BMI06012003

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: MG
2nd Reviewer: MG

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 = Found / True x 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 = |S-D| / (S+D)/2 x 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	SO_4	0.9631 (mg/L)	1 (mg/L)	96	96	Y
8	Matrix spike sample	Ferrous Iron	(SSR-SR) 1.27806 (mg/L)	1.5 (mg/L)	85	85	↓
10	Duplicate sample	TDS	1567.0 (mg/L)	1597.0 (mg/L)	2	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 #: 14702E6
SDG #: BMI06012003

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 #1, Alk reported with a positive detect were recalculated and verified using the following equation:

Concentration = Recalculation:

$$\frac{(0.4468\ ml)(0.0954\ N)(50\,000)}{100\ ml} = 21.31\ mg/L$$

#	Sample ID	Analyte	Reported Concentration (mg/L)	Calculated Concentration (mg/L)	Acceptable (Y/N)
1	1	Alk	21.	21.	Y
		TDS	12000.	12000.	↓
		NO_3-N	50.	50.	↓
		SO_4	31.	31.	↓

Note:

RECALC.6

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Camp Pendleton, CTO 102

Collection Date: January 19, 2006

LDC Report Date: March 8, 2006

Matrix: Water

Parameters: Total Organic Carbon

Validation Level: EPA Level III & IV

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): BMI06012350

Sample Identification

1523-MW01**
1523-MW01Dup
1523-MW02
1523-MW03
1523-MW04
1523-MW05
1523-MW07
1523-MW01MS
1523-MW01MSD

**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 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
1523-MW01MS/MSD (All samples in SDG BMI06012350)	Total organic carbon	50 (56-137)	54 (56-137)	-	J (all detects) UJ (all non-detects)	A

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 BMI06012350	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 1523-MW01** and 1523-MW01Dup were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/L)		RPD
	1523-MW01**	1523-MW01Dup	
Total organic carbon	2.9	2.6	11

X. Field Blanks

No field blanks were identified in this SDG.

Camp Pendleton, CTO 102
Total Organic Carbon - Data Qualification Summary - SDG BMI06012350

SDG	Sample	Analyte	Flag	A or P	Reason
BMI06012350	1523-MW01** 1523-MW01Dup 1523-MW02 1523-MW03 1523-MW04 1523-MW05 1523-MW07	Total organic carbon	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
BMI06012350	1523-MW01** 1523-MW01Dup 1523-MW02 1523-MW03 1523-MW04 1523-MW05 1523-MW07	Total organic carbon	None	P	Sample result verification

Camp Pendleton, CTO 102
Total Organic Carbon - Laboratory Blank Data Qualification Summary - SDG BMI06012350

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 : 01/21/06

Job#: TO102-1523

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

		Parameter	Concentration		Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**1523-MW01**						
Lab ID :	BMI06012350-04A	Total Organic Carbon	2.9	J	1.0 mg/L	01/19/06	01/24/06
Client ID :	**1523-MW01 Dup**						
Lab ID :	BMI06012350-05A	Total Organic Carbon	2.6		1.0 mg/L	01/19/06	01/25/06
Client ID :	**1523-MW02**						
Lab ID :	BMI06012350-06A	Total Organic Carbon	6.0		1.0 mg/L	01/19/06	01/25/06
Client ID :	**1523-MW03**						
Lab ID :	BMI06012350-07A	Total Organic Carbon	7.8		4.0 mg/L	01/19/06	01/25/06
Client ID :	**1523-MW04**						
Lab ID :	BMI06012350-08A	Total Organic Carbon	5.0		1.0 mg/L	01/19/06	01/25/06
Client ID :	**1523-MW05**						
Lab ID :	BMI06012350-09A	Total Organic Carbon	2.2		1.0 mg/L	01/19/06	01/25/06
Client ID :	**1523-MW07**						
Lab ID :	BMI06012350-11A	Total Organic Carbon	9.6		1.0 mg/L	01/19/06	01/25/06

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

2/3/06
Report Date

3/10/06

LDC #: 14702F6

SDG #: BMI06012350

Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 3-7-06

Page: 1 of 1

Reviewer: MG

2nd Reviewer: LM

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: 1-19-06
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	SW	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 = 1+2
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	1523-MW01**	11		21		31	
2	1523-MW01Dup	12		22		32	
3	1523-MW02	13		23		33	
4	1523-MW03	14		24		34	
5	1523-MW04	15		25		35	
6	1523-MW05	16		26		36	
7	1523-MW07	17		27		37	
8	1523-MW01MS	18		28		38	
9	1523-MW01MSD	19		29		39	
10	PBW	20		30		40	

Notes:

LDC #: 14702F6
SDG #: BMI06012350

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 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 #: 14702F6
SDG #: BMI06012350

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 #: 14702F6
SDG #: BMI06012350

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: MG
2nd Reviewer: MY

METHOD: Inorganics, EPA Method 415.1

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	TOC	-	45 (56-137)	15.8 (≤15)	all	J/UJ/A
1	8/9	water	TOC	50 (56-137)	54 (56-137)		all	J/UJ/A

Comments:

MSD.6

LOC #: 14702F6
SDG #: BMI06012350

VALIDATION FINDINGS WORKSHEET
Sample Result Verification

Reviewer: MG
2nd Reviewer: MM

METHOD: Inorganics, Method ~~see cover~~ 415.1 mg

#	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.			
2	~~1~~	~~TOC~~	~~(recalculated~~	~~conc > 10%D)~~		~~J dets / * P~~ mg
			~~reported : 2.9~~	~~(mg/L)~~		
			~~recalculated : 2.2~~	(↓)		

Comments: * The y intercept was used to calculate the CCV std's. but the intercept was not used to calculate sample concentrations.

ABVCRDL6

LDC #: 14702F6
SDG #: BMI06012350

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
	1	2			
TOC	2.9	2.6	11		

Analyte	Concentration ( )		RPD (Limit)	Difference (Limit)	Qualifier

Analyte	Concentration ( )		RPD (Limit)	Difference (Limit)	Qualifier

Analyte	Concentration ( )		RPD (Limit)	Difference (Limit)	Qualifier

LDC #: 14702F6
SDG #: BMI06012350

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: MG
2nd Reviewer: MM

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	CCV2	10.1787 (mg/L)	10 (mg/L)	101.8	101.8	
Calibration verification	TOC	CCV3	4.9892 (mg/L)	5 (mg/L)	99.8	99.8	
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 #: 14702F6
SDG #: BMI06012350

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

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

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	5.2220 (mg/L)	5 (mg/L)	104	104	Y
8	Matrix spike sample	TOC	(SSR-SR) 2.5242 ~~3.1073~~ (mg/L)	5 (mg/L)	50 ~~62~~	50	↓
8/9	Duplicate sample	TOC	9x4 5.4084 ~~5.9915~~ (mg/L)	5.5801 ~~5.1141~~ (mg/L)	9x4 3.1 ~~15.8~~	3.1	↓

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 #: 14702F6
SDG #: BMI06012350

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 #1, 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:
$3971953 = 3.443e+05 + 890640$
$8.9495\ \mu g\ C = x$
then $\frac{8.9495\ \mu g\ C}{4.0\ ml} = 2.24\ \mu g/ml$ or mg/L

#	Sample ID	Analyte	Reported Concentration (mg/L)	Calculated Concentration (mg/L)	Acceptable (Y/N)
1	1	TOC	2.9	2.2	N

Note:

APPENDIX F

CHAIN-OF-CUSTODY DOCUMENTATION

OCTOBER 2005

Billing Information:
Name GERALD TOMPKINS
Address 505 KING AVE
City, State, Zip COLUMBUS, OH 43201
Phone Number 6144244849 Fax 6144243667

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

Page # 1 of 1

Client Name: Battelle Memorial Institute	P.O. # 190907	D.O. TO102	
Address: 505 King Avenue	PWS #	DWR #	
City, State, Zip: Columbus, OH 43201	Phone # 614 4028227	Fax # 6144243667	
Sampled by: SCOTT LOWE	Report Attention: CHRIS ZIMMERMAN		

Analyses Required: EDFX NIRSX

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	TRVP	PNAs	NO_2, NO_3, SO_4	Pb, Mn^{+2}, Fe^{+2}	TDS, ALK	TOC	VOC *see below	Other METHANE	REMARKS
1410	10/26	AQ	0510272001	1523-MW01*	12	X	X	X	X	X	X	X	X		• TEMP BLANK
1410			2	1523-MW01DUP	12	X	X	X	X	X	X	X	X		ENCLOSED
1450			3	1523-MW02	12	X	X	X	X	X	X	X	X		• ALL SMPLS.
1130			4	1523-MW03	12	X	X	X	X	X	X	X	X		NOT FIELD filtered
1325			5	1523-MW04	12	X	X	X	X	X	X	X	X		• REPORTS TO BE
1325				1523-MW04 MS	1		X								SUBMITTED • PDF
1325				1523-MW04 MSD	1		X								FORMAT either
1240			6	1523-MW05	12	X	X	X	X	X	X	X	X		BY E-MAIL
0915			7	1523-MW06	12	X	X	X	X	X	X	X	X		OR BY CD-Rom
1005			8	1523-MW07	12	X	X	X	X	X	X	X	X		
1400			9	1523-QCFB	3V							X			* EDF, NIRS
1420			10	1523-QCEB	6V	X						X			NEEDED
—			11	1523-QCTB	1V							X			

ADDITIONAL INSTRUCTIONS: **Specific VOC Requirements (please specify):** STANDARD LIST of 36 COMPOUNDS + BTEX + MTBE
DATA TO BE FORWARDED TO CDC FOR DATA VALIDATION, USE *1523-MW01 FOR LVL. IV DATA VALIDATION

Signature	Print Name	Company	Date	Time
Relinquished by: [signature]	SCOTT LOWE	BATTELLE	10/26/05	1635
Received by: [signature]	G Navarrete	Alpha	10/27/05	12:15
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 :
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 : TO102/1523
PO : 190907

Client's COC # : none

CA

WorkOrder : BMI05102720

Report Due By : 5:00 PM On : 10-Nov-05

EDD Required : **Yes**

Sampled by : Scott Lowe

Cooler Temp : **4 °C**

Date Printed: **27-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_TOT_W	ALKALINITY	ANIONS(A)_W	ANIONS(B)_W	BNA_W	METALS_AQ	METALS_DS	METHANE_W	Sample Remarks
BMI05102720-01A	1523-MW01	AQ	10/26/05 14:10	14	0	10		FE,Total	Alk	NO2,NO3, SO4	NO2,NO3, SO4	PNA's	Pb	Mn+2	CH4	Level IV QC required on this sample.
BMI05102720-02A	1523-MW01 Dup	AQ	10/26/05 14:10	14	0	10		FE,Total	Alk	NO2,NO3, SO4	NO2,NO3, SO4	PNA's	Pb	Mn+2	CH4	
BMI05102720-03A	1523-MW02	AQ	10/26/05 14:50	14	0	10		FE,Total	Alk	NO2,NO3, SO4	NO2,NO3, SO4	PNA's	Pb	Mn+2	CH4	
BMI05102720-04A	1523-MW03	AQ	10/26/05 11:30	14	0	10		FE,Total	Alk	NO2,NO3, SO4	NO2,NO3, SO4	PNA's	Pb	Mn+2	CH4	
BMI05102720-05A	1523-MW04	AQ	10/26/05 13:25	15	0	10		FE,Total	Alk	NO2,NO3, SO4	NO2,NO3, SO4	PNA's	Pb	Mn+2	CH4	MS/MSD on PNA's for this sample.
BMI05102720-06A	1523-MW05	AQ	10/26/05 12:40	14	0	10		FE,Total	Alk	NO2,NO3, SO4	NO2,NO3, SO4	PNA's	Pb	Mn+2	CH4	
BMI05102720-07A	1523-MW06	AQ	10/26/05 09:15	14	0	10		FE,Total	Alk	NO2,NO3, SO4	NO2,NO3, SO4	PNA's	Pb	Mn+2	CH4	
BMI05102720-08A	1523-MW07	AQ	10/26/05 10:05	14	0	10		FE,Total	Alk	NO2,NO3, SO4	NO2,NO3, SO4	PNA's	Pb	Mn+2	CH4	
BMI05102720-09A	1523-QCFB	AQ	10/26/05 14:00	3	0	10										
BMI05102720-10A	1523-QCEB	AQ	10/26/05 14:20	6	0	10										

Comments: No security seals, ice frozen.5-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 #01. Report J-values for : Benzene down to 0.25 ug/L. Per Latricia logged samples in for Total Fe (by 3500) not Fe+2, same as yesterday. If Jet Fuel is seen, report as Diesel and Footnote report. 1-500ml amber received broken for sample #05. Logged in as per w/o info for Voc's.

	Signature	Print Name	Company	Date/Time
Logged in by:	Graciela Navarrete	G. Navarrete	Alpha Analytical, Inc.	10/27/05 12:45

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

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

CA

WorkOrder : BMI05102720

Report Due By : 5:00 PM On : 10-Nov-05

EDD Required : **Yes**

Sampled by : Scott Lowe

Report Attention : Chris Zimmerman
CC Report :

Job : TO102/1523
PO : 190907

Client's COC # : none

Cooler Temp : 4 °C

Date Printed: **27-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
BMI05102720-01A	1523-MW01	AQ	10/26/05 14:10	14	0	10		TDS	TOC	TPH/E_C	8260/ Mtbe_C					Level IV QC required on this sample.
BMI05102720-02A	1523-MW01 Dup	AQ	10/26/05 14:10	14	0	10		TDS	TOC	TPH/E_C	8260/ Mtbe_C					
BMI05102720-03A	1523-MW02	AQ	10/26/05 14:50	14	0	10		TDS	TOC	TPH/E_C	8260/ Mtbe_C					
BMI05102720-04A	1523-MW03	AQ	10/26/05 11:30	14	0	10		TDS	TOC	TPH/E_C	8260/ Mtbe_C					
BMI05102720-05A	1523-MW04	AQ	10/26/05 13:25	15	0	10		TDS	TOC	TPH/E_C	8260/ Mtbe_C					MS/MSD on PNA's for this sample.
BMI05102720-06A	1523-MW05	AQ	10/26/05 12:40	14	0	10		TDS	TOC	TPH/E_C	8260/ Mtbe_C					
BMI05102720-07A	1523-MW06	AQ	10/26/05 09:15	14	0	10		TDS	TOC	TPH/E_C	8260/ Mtbe_C					
BMI05102720-08A	1523-MW07	AQ	10/26/05 10:05	14	0	10		TDS	TOC	TPH/E_C	8260/ Mtbe_C					
BMI05102720-09A	1523-QCFB	AQ	10/26/05 14:00	3	0	10					8260/ Mtbe_C					
BMI05102720-10A	1523-QCEB	AQ	10/26/05 14:20	6	0	10				TPH/E_C	8260/ Mtbe_C					

Comments: No security seals, ice frozen.5-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 #01. Report J-values for : Benzene down to 0.25 ug/L. Per Latricia logged samples in for Total Fe (by 3500) not Fe+2, same as yesterday. If Jet Fuel is seen, report as Diesel and Footnote report. 1-500ml amber received broken for sample #05. Logged in as per w/o info for Voc's.

	Signature	Print Name	Company	Date/Time
Logged in by:	Isaacela Navarrete	G. Navarrete	Alpha Analytical, Inc.	10/27/05 12:40

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

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

WorkOrder : BMI05102720

Report Due By : 5:00 PM On : 10-Nov-05

Client:
Battelle Memorial Institute
505 King Avenue

Columbus, OH 43201

Chris Zimmerman
TEL : (614) 424-3779 x
FAX : (614) 424-3667
EMail : zimmerct@battelle.org

EDD Required : **Yes**

Sampled by : Scott Lowe

Report Attention : Chris Zimmerman
CC Report :

Job : TO102/1523
PO : 190907

Client's COC # : none

Cooler Temp : 4 °C

Date Printed: **27-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
BMI05102720-11A	1523-QCTB	AQ	10/26/05 00:00	1	0	10					8260/ Mtbe_C				TB lab provided with date of 9/22/05.

Comments: No security seals, ice frozen.5-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 #01. Report J-values for : Benzene down to 0.25 ug/L. Per Latricia logged samples in for Total Fe (by 3500) not Fe+2, same as yesterday. If Jet Fuel is seen, report as Diesel and Footnote report. 1-500ml amber received broken for sample #05. Logged in as per w/o info for Voc's.

	Signature	Print Name	Company	Date/Time
Logged in by:	Graciela Navarrete	G. Navarrete	Alpha Analytical, Inc.	10/27/05 12:40

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

AMENDED

CHAIN-OF-CUSTODY RECORD

CA

Billing Information :
Battelle
505 King Avenue

Columbus, OH 43201

Alpha Analytical, Inc.

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

WorkOrder : BMI05102720

Report Due By : 5:00 PM On : 10-Nov-05

Client:
Battelle Memorial Institute
505 King Avenue

Columbus, OH 43201

Chris Zimmerman
TEL : (614) 424-3779 x
FAX : (614) 424-3667
EMail : zimmerct@battelle.org

EDD Required : **Yes**

Sampled by : Scott Lowe

Report Attention : Chris Zimmerman
CC Report :

Job : TO102/1523
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 #	3500FE_TOT_W	ALKALINITY	ANIONS(A)_W	ANIONS(B)_W	BNA_W	METALS_AQ	METALS_DS	METHANE_W	Sample Remarks
								Requested Tests								
BMI05102720-01A	1523-MW01	AQ	10/26/05 14:10	14	0	10		FE,Total	Alk	NO2,NO3, SO4	NO2,NO3, SO4	PNA's	Pb	Mn+2	CH4	Level IV QC required on this sample.
BMI05102720-02A	1523-MW01 Dup	AQ	10/26/05 14:10	14	0	10		FE,Total	Alk	NO2,NO3, SO4	NO2,NO3, SO4	PNA's	Pb	Mn+2	CH4	
BMI05102720-03A	1523-MW02	AQ	10/26/05 14:50	14	0	10		FE,Total	Alk	NO2,NO3, SO4	NO2,NO3, SO4	PNA's	Pb	Mn+2	CH4	
BMI05102720-04A	1523-MW03	AQ	10/26/05 11:30	14	0	10		FE,Total	Alk	NO2,NO3, SO4	NO2,NO3, SO4	PNA's	Pb	Mn+2	CH4	
BMI05102720-05A	1523-MW04	AQ	10/26/05 13:25	15	0	10		FE,Total	Alk	NO2,NO3, SO4	NO2,NO3, SO4	PNA's	Pb	Mn+2	CH4	MS/MSD on all analysis not just PNA's for this sample, per Randy.
BMI05102720-06A	1523-MW05	AQ	10/26/05 12:40	14	0	10		FE,Total	Alk	NO2,NO3, SO4	NO2,NO3, SO4	PNA's	Pb	Mn+2	CH4	
BMI05102720-07A	1523-MW06	AQ	10/26/05 09:15	14	0	10		FE,Total	Alk	NO2,NO3, SO4	NO2,NO3, SO4	PNA's	Pb	Mn+2	CH4	
BMI05102720-08A	1523-MW07	AQ	10/26/05 10:05	14	0	10		FE,Total	Alk	NO2,NO3, SO4	NO2,NO3, SO4	PNA's	Pb	Mn+2	CH4	
BMI05102720-09A	1523-QCFB	AQ	10/26/05 14:00	3	0	10										

Comments: No security seals, ice frozen.5-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 #01. Report J-values for : Benzene down to 0.25 ug/L. Per Latricia logged samples in for Total Fe (by 3500) not Fe+2, same as yesterday. If Jet Fuel is seen, report as Diesel and Footnote report. 1-500ml amber received broken for sample #05. Logged in as per w/o info for Voc's.

	Signature	Print Name	Company	Date/Time
Logged in by:	Gracielo Navarrete	G Navarrete	Alpha Analytical, Inc.	10/31/05 10:10

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

Job : TO102/1523
PO : 190907

Client's COC # : none

WorkOrder : BMI05102720

Report Due By : 5:00 PM On : 10-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 TDS	TOC_W	TPH/E_W	VOC_W				Sample Remarks
BMI05102720-01A	1523-MW01	AQ	10/26/05 14:10	14	0	10		TDS	TOC	TPH/E_C	8260 Mtbe_C				Level IV QC required on this sample.
BMI05102720-02A	1523-MW01 Dup	AQ	10/26/05 14.10	14	0	10		TDS	TOC	TPH/E_C	8260 Mtbe_C				
BMI05102720-03A	1523-MW02	AQ	10/26/05 14:50	14	0	10		TDS	TOC	TPH/E_C	8260 Mtbe_C				
BMI05102720-04A	1523-MW03	AQ	10/26/05 11:30	14	0	10		TDS	TOC	TPH/E_C	8260 Mtbe_C				
BMI05102720-05A	1523-MW04	AQ	10/26/05 13:25	15	0	10		TDS	TOC	TPH/E_C	8260 Mtbe_C				MS/MSD on all analysis not just PNA's for this sample, per Randy.
BMI05102720-06A	1523-MW05	AQ	10/26/05 12:40	14	0	10		TDS	TOC	TPH/E_C	8260 Mtbe_C				
BMI05102720-07A	1523-MW06	AQ	10/26/05 09:15	14	0	10		TDS	TOC	TPH/E_C	8260 Mtbe_C				
BMI05102720-08A	1523-MW07	AQ	10/26/05 10:05	14	0	10		TDS	TOC	TPH/E_C	8260 Mtbe_C				
BMI05102720-09A	1523-QCFB	AQ	10/26/05 14:00	3	0	10					8260 Mtbe_C				

Comments: No security seals, ice frozen.5-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 #01. Report J-values for : Benzene down to 0.25 ug/L. Per Latricia logged samples in for Total Fe (by 3500) not Fe+2, same as yesterday. If Jet Fuel is seen, report as Diesel and Footnote report. 1-500ml amber received broken for sample #05. Logged in as per w/o info for Voc's.

	Signature	Print Name	Company	Date/Time
Logged in by:	Gracela Navarrete	G Navarrete	Alpha Analytical, Inc.	10/31/05 18:10

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

AMENDED

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 x
FAX : (614) 424-3667
EMail zimmerct@battelle.org

Job TO102/1523
PO : 190907

Client's COC # none

WorkOrder : BMI05102720

Report Due By : 5:00 PM On : 10-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 #	TDS	TOC_W	TPH/E_W	VOC_W				Sample Remarks
BMI05102720-10A	1523-QCEB	AQ	10/26/05 14:20	6	0	10				TPH/E_C	8260/ Mtbe_C				
BMI05102720-11A	1523-QCTB	AQ	10/26/05 00:00	1	0	10					8260/ Mtbe_C				TB lab provided with date of 9/22/05.

Comments: No security seals, ice frozen.5-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 lV QC required on sample #01. Report J-values for : Benzene down to 0.25 ug/L. Per Latricia logged samples in for Total Fe (by 3500) not Fe+2, same as yesterday. If Jet Fuel is seen, report as Diesel and Footnote report. 1-500ml amber received broken for sample #05. Logged in as per w/o info for Voc's.

	Signature	Print Name	Company	Date/Time
Logged in by:	Gisela Navarrete	G Navarrete	Alpha Analytical, Inc.	10/31/05 10:10

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

COC. 11/10/05

Work Order Information

BMI05102720

Monday, October 31, 2005 11:09 AM

Amended coc 10/31/05 per Randy to have MS/MSD run on all analysis not just PNA's on sample #05. GN

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 Suite 21
Sparks, Nevada 89431
Phone (775) 355-1044

Client Name	Battelle Memorial Institute	P.O. # 190907	D.O. TO 102
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	

DATA REPORT
NEDTS FORMAT ☐
NIRIS ☒
EDF FORMAT ☒

Analyses Required

Time Sampled	Date Sampled	Matrix* See Key Below	Office Use Only / Lab ID Number	Field Points / 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, AIK	TOC	VOC* see below	Other:	Other:	REMARKS
1210	1-19	AQ	BM106012003-01	1523-MW01	5			X	X	X					
1355	1-19	AQ	02	1523-MW02	5			X	X	X					
0935	1-19	AQ	03	1523-MW03	5			X	X	X					
0945	1-19	AQ	04	1523-MW04	5			X	X	X					
1100	1-19	AQ	05	1523-MW05	5			X	X	X					
~~—~~	~~1-19~~	~~AQ~~		~~1523-MW06 ALH~~	~~5~~			~~X~~	~~X~~	~~X~~					NO SAMPLE COLLECTED
1204	1-19	AQ	06	1523-MW07	5			X	X	X					
~~—~~	~~1-19~~	~~AQ~~		~~1523-MW08 ALH~~	~~5~~			~~X~~	~~X~~	~~X~~					NO SAMPLE Collected
1210	1-19	AQ	07	1523-MW01 DUP	5			X	X	X					

ADDITIONAL INSTRUCTIONS: **Specific VOC Requirements (please specify)** Metals field filtered.

Data Validation is required for 1523-MW01, Data to be forwarded to LDC, Submit report on pdf format, email, CD-ROM.

	Signature	Print Name	Company	Date	Time
Relinquished by	[signature]	Greg Headington	Battelle	19 JAN 06	1448
Received by	[signature]	S. SIFUENTES	ALPHA	1-20-06	11:05
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

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 Suite 21 Sparks, Nevada 89431
Phone (775) 355-1044

Client Name **Battelle Memorial Institute**	P.O. # 190907	D.O. TO102	
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

Time Sampled	Date Sampled	Matrix* See Key Below	Office Use Only Lab ID Number	Field Points / 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: CH_4	Other:	REMARKS
—	1-19	AQ	BMI060235 0-01	1523-QCTB	1V							X			4°C
1240	1-19	AQ	-02	1523-QCFB	3V							X			
1230	1-19	AQ	-03	1523-QCEB	3V	X						~~X~~ GH			TPH/E ONLY
1210	1-19	AQ	-04	1523-MW01	9V	X						X	X		
1210	1-19	AQ	-05	1523-MW01 DUP	9V	X						X	X		temp blank
1355	1-19	AQ	-06	1523-MW02	9V	X						X	X		#4840 @
0935	1-19	AQ	-07	1523-MW03	9V	X						X	X		4°
0945	1-19	AQ	-08	1523-MW04	9V	X						X	X		
1100	1-19	AQ	-09	1523-MW05	9V	X						X	X		
1110	1-19	AQ	-10	1523-MW06	9V	X						X	X		
1204	1-19	AQ	-11	1523-MW07	9V	X						X	X		

DATA REPORT
NEDTS FORMAT ☐
NIRIS ☒
EDF FORMAT ☒

ADDITIONAL INSTRUCTIONS: Specific VOC Requirements (please specify) *VOC's see attached sheet.

Data Validation is required for ~~TPH~~ GH 1523-MW01. Data to be forwarded to LDC. Submit report pdf. format by email OR CD-Rom

	Signature	Print Name	Company	Date	Time
Relinquished by	Greg Heedington	Greg Heedington	Battelle	20 JAN 06	0812
Received by	Laura Dickinson	Laura Dickinson	Alpha	1/23/06	1350
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

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, Suite 21
Sparks, Nevada 89431
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		

DATA REPORT: NEDTS FORMAT ☐ NIRIS ☒ EDF FORMAT ☒

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	TPH/P	NO_2, NO_3, SO_4	Pb, Mn^{+2}, Fe^{+2}	TDS, AIK	TOC	VOC* see below	Other: PNA's	Other:	REMARKS
1210	1-19	AQ	BMI06012350-~~01~~ CD	1523-MW01 -04	3						X		X		4°C @
1210	1-19	AQ	CD ~~-02~~	1523-MW01 DUP -05	3						X		X		
1355	1-19	AQ	CD ~~-03~~	1523-MW02 -06	3						X		X		
0935	1-19	AQ	CD ~~-04~~	1523-MW03 -07	3						X		X		
				~~-15~~ GLH											

ADDITIONAL INSTRUCTIONS: **Specific VOC Requirements (please specify)** Submit report in pdf format by email or CD-Rom

Data Validation is required for 1523-MW01, Data to be forwarded to LDC.

Signature	Print Name	Company	Date	Time
Relinquished by Greg Headington	Greg Headington	Battelle	20 JAN 06	0815
Received by Tara Dickinson	Tara Dickinson	Alpha	1/23/06	900
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

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, Suite 21
Sparks, NV 89431
Phone (775) 355-1044

Client Name **Battelle Memorial Institute**	P.O. # 190907	D.O. TO 102	
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 Zimerman		

DATA REPORT: NEDTS FORMAT ☐ NIRIS ☒ EDF FORMAT ☒

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	TPH/P	NO_2, NO_3, SO_4	Pb, Mn^{+2}, Fe^{+2}	TDS, AIK	TOC	VOC* see below	Other: PNA's	Other:	REMARKS
0945	1-19	AQ	BMI060123500 ~~05~~	1523-MW04 -08	3						X		X		4°C
1100	1-19	AQ	~~06~~	1523-MW05 -09	3						X		X		
1204	1-19	AQ	~~07~~	1523-MW07 -11	3						X		X		
1210	1-19	AQ	~~04~~	1523-MW01 MS -04	2								X		
1210	1-19	AQ	~~04~~	1523-MW01 MSD -04	2								X		

ADDITIONAL INSTRUCTIONS: **Specific VOC Requirements (please specify)** Submit report in pdf format by email or CD-Rom.

DATA Validation is required for 1523-MW01, DATA to be forwarded to LDC.

	Signature	Print Name	Company	Date	Time
Relinquished by	Greg Headington	Greg Headington	Battelle	20 JAN 06	0815
Received by	Tara Dickinson	Tara Dickinson	Alpha	1/23/06	1300
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 : BMI06012350

Report Due By : 5:00 PM On : 06-Feb-06

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 x
FAX : (614) 424-3667
EMail : zimmerct@battelle.org

EDD Required : **Yes**

Sampled by : SL/GH

Report Attention : Chris Zimmerman
CC Report :

Job : TO102: 1523
PO : 190907
Client's COC # : none

Cooler Temp : 4 °C

Date Printed: **23-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
BMI06012350-01A	1523-QCTB	AQ	01/19/06 00:00	1	0	10						8260_C				Reno Trip Blank 12/13/05
BMI06012350-02A	1523-QCFB	AQ	01/19/06 12:40	3	0	10						8260_C				
BMI06012350-03A	1523-QCEB	AQ	01/19/06 12:30	3	0	10					TPH/E_C					
BMI06012350-04A	1523-MW01	AQ	01/19/06 12:10	16	0	10		PNA/PAH	CH4	TOC	TPH/E_C	8260_C				pH for TOC = 2 (MS/MSD on this sample)
BMI06012350-05A	1523-MW01 Dup	AQ	01/19/06 12:10	12	0	10		PNA/PAH	CH4	TOC	TPH/E_C	8260_C				pH for TOC = 2
BMI06012350-06A	1523-MW02	AQ	01/19/06 13:55	12	0	10		PNA/PAH	CH4	TOC	TPH/E_C	8260_C				pH for TOC = 2
BMI06012350-07A	1523-MW03	AQ	01/19/06 09:35	12	0	10		PNA/PAH	CH4	TOC	TPH/E_C	8260_C				pH for TOC = 2
BMI06012350-08A	1523-MW04	AQ	01/19/06 09:45	12	0	10		PNA/PAH	CH4	TOC	TPH/E_C	8260_C				pH for TOC = 2
BMI06012350-09A	1523-MW05	AQ	01/19/06 11:00	12	0	10		PNA/PAH	CH4	TOC	TPH/E_C	8260_C				pH for TOC = 2
BMI06012350-10A	1523-MW06	AQ	01/19/06 11:10	9	0	10			CH4		TPH/E_C	8260_C				

Comments: No security seals. Frozen ice. Level IV QC required. Samples should be used as the control spike sample if possible (I.E.: MS/MSD). Saturday delivery. Samples kept cold and secure @ 4° until log-in. Data validation is required for 1523-MW01. : Report J-values for Benzene down to 0.25 ug/L. If Jet Fuel is seen, report as Diesel and Footnote report. Temp Blank serial # 4840 received @ 4°.

	Signature	Print Name	Company	Date/Time
Logged in by:	Tara Dickinson	Tara Dickinson	Alpha Analytical, Inc.	1/23/06 1350

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 : BMI06012350

Report Due By : 5:00 PM On : 06-Feb-06

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 x
FAX : (614) 424-3667
EMail : zimmerct@battelle.org

EDD Required : **Yes**

Sampled by : SL/GH

Report Attention : Chris Zimmerman
CC Report :

Job : TO102: 1523
PO : 190907

Client's COC # : none

Cooler Temp : 4 °C

Date Printed: **23-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
BMI06012350-11A	1523-MW07	AQ	01/19/06 12:04	12	0	10		PNA/PAH	CH4	TOC	TPH/E_C	8260_C				pH for TOC = 2

Comments: No security seals. Frozen ice. Level IV QC required. Samples should be used as the control spike sample if possible (I.E.: MS/MSD). Saturday delivery. Samples kept cold and secure @ 4° until log-in. Data validation is required for 1523-MW01. : Report J-values for Benzene down to 0.25 ug/L. If Jet Fuel is seen, report as Diesel and Footnote report. Temp Blank serial # 4840 received @ 4°.

	Signature	Print Name	Company	Date/Time
Logged in by:	Tara Dickinson	Tara Dickinson	Alpha Analytical, Inc.	1/23/06 1350

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

WorkOrder : BMI06012003

Report Due By : 5:00 PM On : 03-Feb-06

EDD Required : **Yes**

Sampled by : SL/GH

Job : TO102: 1523
PO : 190907

Client's COC # : none

Cooler Temp : 4 °C

Date Printed: **20-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	TDS			Sample Remarks
BMI06012003-01A	1523-MW01	AQ	01/19/06 12:10	5	0	10		FE+2	Alk	NO2,NO3,SO4	NO2,NO3,SO4	Pb,Mn	TDS			
BMI06012003-02A	1523-MW02	AQ	01/19/06 13:55	5	0	10		FE+2	Alk	NO2,NO3,SO4	NO2,NO3,SO4	Pb,Mn	TDS			
BMI06012003-03A	1523-MW03	AQ	01/19/06 09:35	5	0	10		FE+2	Alk	NO2,NO3,SO4	NO2,NO3,SO4	Pb,Mn	TDS			
BMI06012003-04A	1523-MW04	AQ	01/19/06 09:45	5	0	10		FE+2	Alk	NO2,NO3,SO4	NO2,NO3,SO4	Pb,Mn	TDS			
BMI06012003-05A	1523-MW05	AQ	01/19/06 11:00	5	0	10		FE+2	Alk	NO2,NO3,SO4	NO2,NO3,SO4	Pb,Mn	TDS			
BMI06012003-06A	1523-MW07	AQ	01/19/06 12:04	5	0	10		FE+2	Alk	NO2,NO3,SO4	NO2,NO3,SO4	Pb,Mn	TDS			
BMI06012003-07A	1523-MW01Dup	AQ	01/19/06 12:10	5	0	10		FE+2	Alk	NO2,NO3,SO4	NO2,NO3,SO4	Pb,Mn	TDS			

Comments: No security seals, frozen ice. Samples should be used as the control spike sample if possible (I.E.: MS/MSD). Metals field filtered. Use sample -01 for data validation. No Temp Blank rec'd :

	Signature	Print Name	Company	Date/Time
Logged in by:	[signature]	S. SIFUENTES	Alpha Analytical, Inc.	1/20/06 11:05

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

AMENDED

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 : BMI06012003

Report Due By : 5:00 PM On : 03-Feb-06

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 : SL/GH

Report Attention : Chris Zimmerman
CC Report :

Job : TO102-1523
PO : 190907

Client's COC # : none

Cooler Temp	Samples Received	Date Printed
4 °C	20-Jan-06	08-Feb-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 #	3500FE_2OS_W	ALKALINITY	ANIONS(A)_W	ANIONS(B)_W	METALS_AQ	METALS_DS	TDS		Sample Remarks
								Requested Tests								
BMI06012003-01A	1523-MW01	AQ	01/19/06 12:10	5	0	10		FE+2	Alk	NO2,NO3,SO4	NO2,NO3,SO4	Pb	Dissolved Mn	TDS		
BMI06012003-02A	1523-MW02	AQ	01/19/06 13:55	5	0	10		FE+2	Alk	NO2,NO3,SO4	NO2,NO3,SO4	Pb	Dissolved Mn	TDS		
BMI06012003-03A	1523-MW03	AQ	01/19/06 09:35	5	0	10		FE+2	Alk	NO2,NO3,SO4	NO2,NO3,SO4	Pb	Dissolved Mn	TDS		
BMI06012003-04A	1523-MW04	AQ	01/19/06 09:45	5	0	10		FE+2	Alk	NO2,NO3,SO4	NO2,NO3,SO4	Pb	Dissolved Mn	TDS		
BMI06012003-05A	1523-MW05	AQ	01/19/06 11:00	5	0	10		FE+2	Alk	NO2,NO3,SO4	NO2,NO3,SO4	Pb	Dissolved Mn	TDS		
BMI06012003-06A	1523-MW07	AQ	01/19/06 12:04	5	0	10		FE+2	Alk	NO2,NO3,SO4	NO2,NO3,SO4	Pb	Dissolved Mn	TDS		
BMI06012003-07A	1523-MW01Dup	AQ	01/19/06 12:10	5	0	10		FE+2	Alk	NO2,NO3,SO4	NO2,NO3,SO4	Pb	Dissolved Mn	TDS		

Comments: No security seals, frozen ice. Level IV QC Required, samples should be used as the control spike sample if possible (I.E.: MS/MSD). Metals field filtered. Use sample -01 for data validation. No Temp Blank rec'd. : Amended 2-8-06 @ 2:20pm per Jeff to correct test grp for metals, MN to dissolved grp, due to log in error. SS

	Signature	Print Name	Company	Date/Time
Logged in by:	[signature]	S. SIFUENTES	Alpha Analytical, Inc.	2/8/06 2:20pm

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. 2566 8

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: 1 01 3 05

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: Octavio Quintero
Signature: Octavio Quintero
Month Day Year: 1 01 3 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

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 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: K Berger
Month 12 Day 14 Year 05

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: Brian Denning
Signature: Brian Denning
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: Jerry R Jarrett
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. 2588.4 | 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	T.T	00650	G
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above
11A.4321PW370 (PURGE 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*

EK# (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 O. TUCKER | Signature | Month 02 Day 17 Year 06

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Brian 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: JERRY R. JARRETT | Signature | Month 02 Day 20 Year 06

GENERATOR
TRANSPORTER
FACILITY

ORIGINAL - RETURN TO GENERATOR

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. CA2170023533 — Manifest Document No. 70498
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 Generator's Tracking Number: 247 70498

5. Transporter 1 Company Name: EFR ENVIRONMENTAL SERVICES, INC.
6. US EPA ID Number: CAR000011205

State Transporter's ID: HAZ-316-02-0184
Transporter's Phone: (619) 722-5781

7. Transporter 2 Company Name
8. US EPA ID Number

State Transporter's ID:
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: CAD008252405

State Facility's ID:
Facility's Phone: 800-499-7746

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	State Waste Number / EPA/Other 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#326118
STATE: 2653, 2284, 1523 & 1413

K. Handling Codes for Wastes Listed Above

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: Nathaniel D. Defaxton — Signature: [signature] — Month 10 Day 13 Year 05

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Octavio Quintero — Signature: [signature] — Month 10 Day 13 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

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. 2060-0039 (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

1. UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator's US EPA ID No. [illegible]	Manifest Document No. [illegible]	2. Page 1 of 1
3. Generator's Name and Mailing Address [illegible]			
4. Generator's Phone [illegible]			
5. Transporter 1 Company Name [illegible]	6. US EPA ID Number [illegible]		
7. Transporter 2 Company Name [illegible]	8. US EPA ID Number [illegible]		
9. Designated Facility Name and Site Address PACIFIC RESOURCE RECOVERY [illegible]	10. US EPA ID Number [illegible]		

11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt./Vol.	Waste Number
[illegible]	001	DF	00002		

15. Special Handling Instructions and Additional Information
ALWAYS WEAR APPROPRIATE PPE AND USE SAFE HANDLING METHODS
24 HOUR EMERGENCY NUMBER [illegible]
[illegible] 4521

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.

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Printed/Typed Name	Signature	Month	Day	Year
[illegible]	[illegible]	10	13	05

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
[illegible]	[illegible]	10	13	05

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
[illegible]	[illegible]	10	[illegible]	05

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	Freddie Arredondo	10	19	05

DO NOT WRITE BELOW THIS LINE.

DTSC 8022A (1/99)
EPA 8700-22

Green: TRANSPORTER RETAINS

State of California – Environmental Protection Agency
Form Approved OMB No. 2050-0039 (Expires 9-30-99)
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Department of Toxic Substances Control
Sacramento, California

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. CA2117010123513 Manifest Document No. 7017 6 2
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 CONT: MARGO WILLIAMS

A. State Manifest Document Number

B. State Generator's ID HAX 440 13 6 10 2 10 9 8 2

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: CAD008252405

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	12. Containers 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	00001 2	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.

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GENERATOR

Printed/Typed Name: J. Nathaniel D. Deleston
Signature:
Month 12 Day 16 Year 05

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Octavio Quintero
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 hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name
Signature
Month Day Year

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DTSC 8022A (1/99)
EPA 8700—22

State of California Environmental Protection Agency
Form Approved OMB No 2050-0039 (Expires 9-30-99)
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Department of Toxic Substances Control
Sacramento, California

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. CA2170012315313 Manifest Document No 7 1 0 0 2
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

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: CAD008215240 5

A. State Manifest Document Number
B. State Generator's ID: HYHQ36012098 Z
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

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.

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Printed/Typed Name: GERALD O. TUCKER Signature: [signature] Month 01 Day 21 Year 16

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Octavio Quintero Signature: [signature] Month 01 Day 21 Year 16

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 (1/99)
EPA 8700-22

ATTACHMENT 1

LETTER WORK PLAN FOR ADDITIONAL GROUNDWATER MONITORING WELL INSTALLATIONS AND ASSESSMENT AT FORMER UNDERGROUND STORAGE TANK SITE 1523, MARINE CORPS BASE CAMP PENDLETON

AND REGULATORY CORRESPONDENCE

LETTER WORK PLAN FOR ADDITIONAL GROUNDWATER MONITORING WELL INSTALLATIONS AND ASSESSMENT AT FORMER UNDERGROUND STORAGE TANK SITE 1523
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
Battelle Project Registered Geologist

Approved: _____
Chris Zimmerman
Battelle Program Manager

Letter Work Plan for Additional Groundwater Monitoring Well Installations and Assessment at Former Underground Storage Tank Site 1523 Marine Corps Base Camp Pendleton

This letter work plan for additional groundwater monitoring well installations and assessment at Site 1523, 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 meetings conducted January 29, 2004 and July 20, 2004. Both meetings were attended by representatives from Battelle, RWQCB, SWDIV, and MCB Camp Pendleton AC/S ES (Battelle 2004a, 2004b).

In summary, the RWQCB agrees that free product recovery and excavation should be implemented at Site 1523. In addition, RWQCB requests that additional groundwater monitoring wells be installed in the canyon to the northeast of former UST 1523, as well as behind Building 1523 to the southeast. 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, 2004c).

Objectives

The objective of this effort is to install additional groundwater monitoring wells in the canyon located to the northeast, which is the interpreted groundwater flow direction from the UST cavity. In addition, a well will also be installed to the southwest of the former UST to further define potential contaminant migration in this direction. Figures 1 and 2 illustrate the current and proposed monitoring well 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 *Environmental Site Assessment Report for UST Site 1523, Marine Corps Base Camp Pendleton, San Diego County, California* (Ninyo and Moore, 2000). This information is also summarized below.

Site 1523. Site 1523 is located in Area 15 which is also on the east side of Camp Pendleton in the foothills of the Peninsular Ranges. The site consists of Building 1523 and the area that formerly contained two USTs. The site is specifically located east of Vandegrift Boulevard, just south of 11th Street. In September 1996, one (1) 1,000-gallon reinforced concrete UST and one (1) 1,500-gallon reinforced concrete UST were removed from the site. Both USTs reportedly contained diesel fuel that was used to heat Building 1523. Quarterly groundwater monitoring and free product removal are currently being undertaken at the site.

Based on data from previous environmental investigations, the site is generally underlain by fill, silty sands, and a conglomerate which has been identified as the Lusardi Formation. Groundwater at the site

has been observed at depths ranging from approximately 30 to 50 ft bgs. Free product has been detected in two of the wells located in the interpreted groundwater flow direction to the east of the former tank cavity. However, based on the site geology (i.e., bedrock high) and groundwater flow calculations using various combinations of site wells, groundwater may flow in various directions at the site. Quarterly groundwater monitoring and free product removal are currently being undertaken at the site.

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, 2004c). A C-57 licensed drilling contractor will be contacted to install groundwater monitoring wells at Site 1523. The contractor will have the appropriate certificates, experience, and training.

The placement of additional groundwater monitoring wells at Site 1523 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., sensitive habitat in the canyon to the northeast of former UST 1523, site utilities, 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).

Soil samples will not be collected during the investigation at Site 1523, as soil contamination has previously been adequately characterized at this site (Ninyo and Moore, 2000). 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, 2004c).

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 groundwater monitoring well installations at Site 1523 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, 2004c).

References

Battelle. 2004a. Meeting minutes from Quarterly Status Meeting with RWQCB, SWD, AC/S ES MCB Camp Pendleton, and Battelle. January 29.

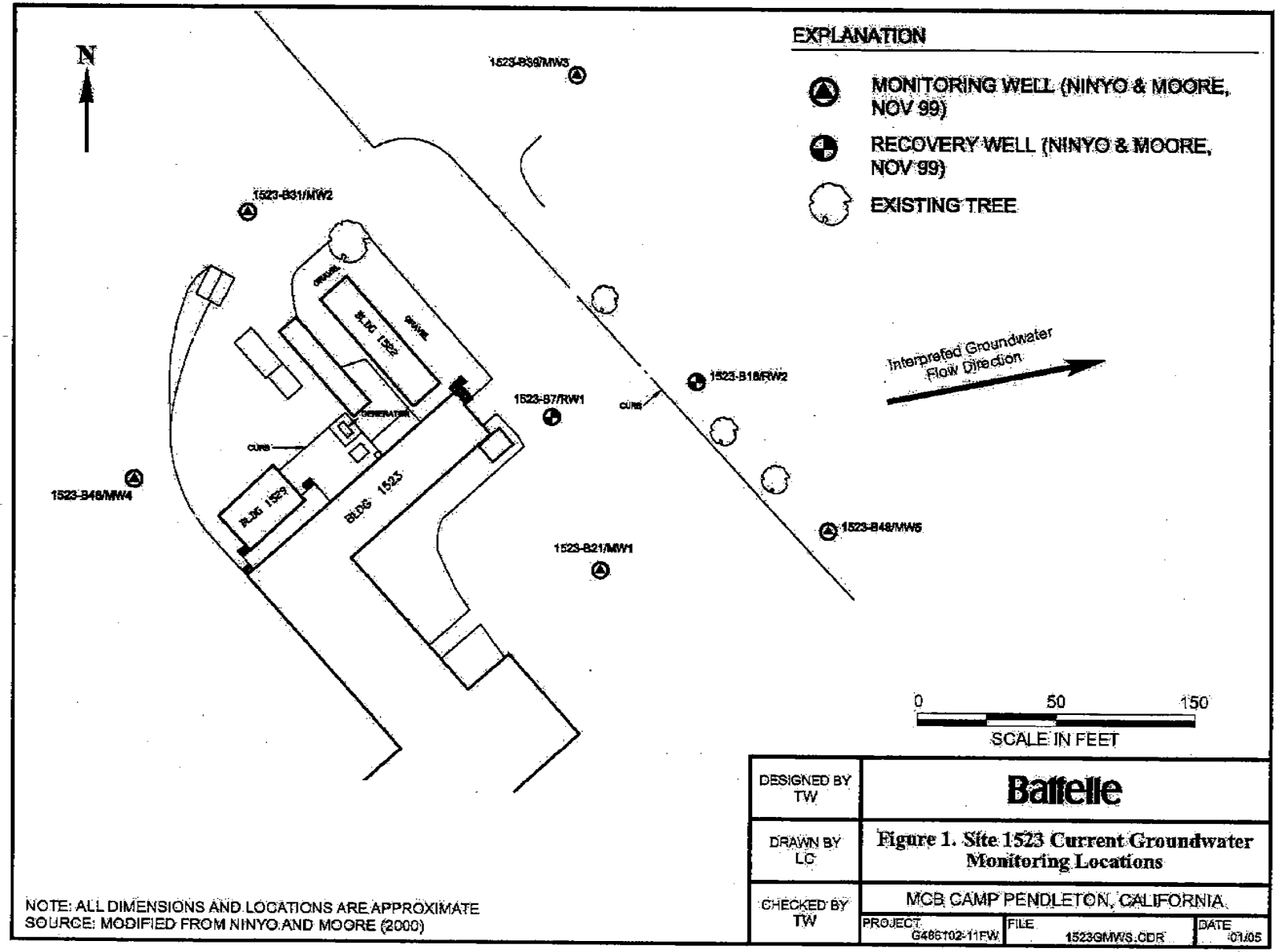
Battelle. 2004b. Meeting minutes from status meeting and site walk at former UST Sites 1523 and 1536 with RWQCB, SWD, AC/S ES MCB Camp Pendleton, and Battelle. July 20.

Battelle. 2004c. *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.

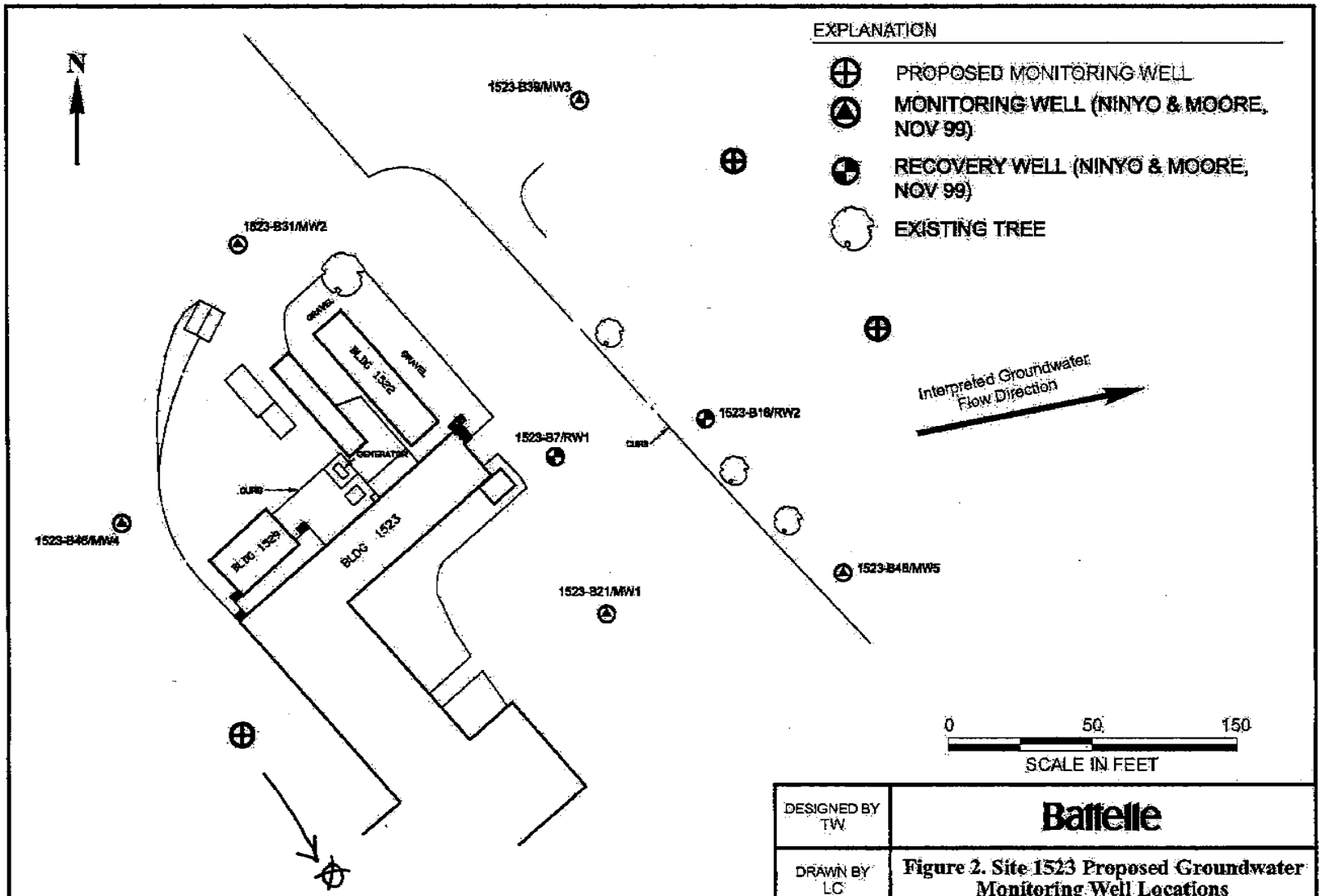
Ninyo and Moore. 2000. *Environmental Site Assessment Report For UST Site 1523, Marine Corps Base Camp Pendleton, San Diego County, California.* San Diego, CA.

San Diego County Department of Environmental Health. 2004. *Site Assessment and Mitigation (SAM) Manual.* San Diego, CA.



NOTE: ALL DIMENSIONS AND LOCATIONS ARE APPROXIMATE
SOURCE: MODIFIED FROM NINYO AND MOORE (2000)

DESIGNED BY TW	Battelle		
DRAWN BY LC	Figure 1. Site 1523 Current Groundwater Monitoring Locations		
CHECKED BY TW	MCB CAMP PENDLETON, CALIFORNIA		
	PROJECT G466102-11FW	FILE 1523GMWS.CDR	DATE 01/05



NOTE: ALL DIMENSIONS AND LOCATIONS ARE APPROXIMATE
SOURCE: MODIFIED FROM NINYO AND MOORE (2000)

DESIGNED BY TW	Battelle		
DRAWN BY LC	Figure 2. Site 1523 Proposed Groundwater Monitoring Well Locations		
CHECKED BY TW	MCB CAMP PENDLETON, CALIFORNIA		
	PROJECT G486102-11FW	FILE 1523PROPOSED02.CDR	DATE 01/05

California Regional Water Quality Control Board

San Diego Region

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(858) 467-2952 • Fax (858) 571-6972
http:// www.waterboards.ca.gov/sandiego

June 27, 2005

Assistant Chief of Staff
Environmental Security
Attn: Ms. Tracy Sahagun, RCRA Division Head
Box 555008, Bldg. 22165
Marine Corps Base Camp Pendleton, CA 92055-5008

In Reply refer to:
SMC: 50-0634.05:grifb

Dear Ms. Sahagun:

SUBJECT: FINAL INTERIM REMEDIAL ACTION PLAN AND LETTER WORK PLAN FOR UNDERGROUND STORAGE TANK SITE 1523, MARINE CORPS BASE CAMP PENDLETON, CALIFORNIA (Document Reference Number 5090.13c ENVSEC/414)

The California Regional Water Quality Control Board, San Diego Region (Regional Board) has reviewed the "Final Interim Remedial Action Plan for Site 1523, Marine Corps Base Camp Pendleton, California" prepared by Battelle and dated May 10, 2005 (IRAP), and the "Letter Work Plan for Additional Groundwater Monitoring Well Installations and Assessment at Former Underground Storage Tank Site 1523, Marine Corps Base Camp Pendleton, California" prepared by Battelle and dated April 15, 2005 (Work Plan). Underground storage tank (UST) site 1523 consists of soil and ground water contaminated by the unauthorized release of diesel heating fuel from two former concrete USTs located immediately southeast of the northern extension of Building 1523. The IRAP presents an overview of historical environmental investigation findings, proposed remedial activities to address soil contamination in the vicinity of the former UST excavation, proposed soil remedial action cleanup goals, and a proposed confirmation soil sampling and analytical plan. The Work Plan presents proposed locations for three ground water monitoring wells to assess the extent of ground water contamination.

The purpose of this letter is to provide Marine Corps Base Camp Pendleton (Base) with comments and issues of concern regarding the proposed activities presented in the IRAP and Work Plan.

IRAP SPECIFIC COMMENTS

Subsection 5.3.6

The proposed activities involve the possibility of constructing a temporary decontamination pad near UST Site 1523 or at Battelle's contractor's yard. Whereas the location of the Battelle's contractor's yard is not specifically identified in the IRAP, it is assumed to not be located in the vicinity of UST Site 1523 and the Regional Board does not support the use of an offsite

decontamination station. Such an approach may have numerous adverse consequences including but not limited to the spread of site related contamination into uncontaminated areas and/or potentially impact receptors.

Subsection 5.3.10
The proposed stockpile construction requires revision to include the installation of berms, which are required to prevent liquids within the stockpile soils from exiting the stockpile and to prevent surface waters from entering the stockpile soils.

Appendix A, Subsection 2.0
The proposed confirmation sampling plan, collection of 6 to 8 soil samples, does not seem adequate based on the size of the excavation. The number proposed in Subsection 2.2.1 seems more appropriate.

Appendix A, Subsection 2.3.3
Consider securing the sample label on each container with clear adhesive tape.

Appendix A, Subsection 2.4.1
The consultant proposes the use of an analytical laboratory located in Sparks, Nevada. The use of an out of state laboratory may be logistically very difficult for this particular investigation due to the limited sample holding time of 48 hours, which is a requirement of the proposed analytical method, 8260B using an En Core sampler. The use of such a lab will require that field staff carefully plan field activities to ensure sample holding times are not exceeded and place a sufficient quantity of ice in each sample cooler to ensure proper sample preservation during transport.

Appendix A, Table 1-2
According to Step 5, if the confirmation soil analytical data indicates constituents are below the action levels, the site will be recommended for closure. The proposed activities solely address only soil contamination; the unauthorized release also has resulted in significant ground water contamination that must be addressed prior to site closure.

Appendix A, Table 2-2
The proposed analytical plan involves the analysis of the following VOCs: benzene, toluene, ethylbenzene, and xylene. Based on the presence of other VOCs detected in ground water samples, the analysis of the complete suite of VOCs is required during this investigation. In an email dated June 10, 2005, the consultant indicated the leachability of contaminants will be evaluated on 2-3 excavation sidewall and 1-2 excavation floor soil samples with the highest organic vapor readings. The Regional Board requests an evaluation of the contaminant leachability on soil samples with the highest contaminant concentrations detected using conventional soil analytical methods (EPA Method 8015, 8270, and 8260).

Appendix A, Table 2-3
The proposed analytical plan needs to be augmented to include an evaluation of the leachability of PNAs. Historical investigations included an assessment of the presence and leachability of VOCs and PAHs in 3 soil samples with TPH-D concentrations ≤5,100 mg/kg (Ninyo and Moore, 2000). Since up to 11,000 mg/kg TPH-D were encountered during historical investigations (Ninyo and Moore, 2000), additional investigation of the presence and leachability of VOCs and PAHs is required if TPH-D concentrations significantly exceeding 5,100 mg/kg are encountered during this investigation.

Appendix A, Table 2-4
Note the proposed "soil action levels" significantly exceed concentrations established to be protective of ground water quality (California Regional Water Quality Control Board, San Francisco Region, 2005, available at http://www.waterboards.ca.gov/sanfranciscobay/Download.htm). As an example, the proposed benzene action level is 600 ug/kg while the concentration estimated to be protective of water quality is 44 ug/kg. Based on the subsurface conditions encountered during historical investigations (Ninyo and Moore, 2000), the subsurface lithologies have very limited contaminant retention capacity and hence warrant stringent action levels. Additionally, a total SVOC action level (1,700 ug/kg) is proposed, whereas the above referenced environmental guidance document provides screening levels for numerous individual SVOCs and should be used during this investigation.

Appendix C, Section 3.0
Based on contaminant concentrations encountered during historical investigations (Ninyo and Moore, 2000), volume of waste to be excavated, and the proximity of Building 1523, it is highly probable that the proposed activities will, at a minimum, create nuisance conditions and make it difficult for Building 1523 occupants to conduct their normal daily duties. The notification of appropriate Building 1523 management personnel of the proposed activities and potential consequences prior to commencement of field activities may be appropriate and necessary.

WORK PLAN SPECIFIC COMMENTS
Since UST Site 1523 is located in a structurally complex portion of the Base, the Regional Board is recommending the use of a boring method that will allow the extraction of a continuous intact core to assess for the presence of structural features (joints, fractures, etc.), which are known to have a profound effect on contaminant transport. If present, the orientation and attitude of the features need to be measured and noted.

The Regional Board is requesting the following modifications to the proposed ground water monitoring well locations illustrated in Figure 2. Based on the ground water analytical data from wells 1523-MW04 and 1523-MW01 and the direction of ground water flow (Battelle, 2005), it seems the proposed well location southwest of Building 1523 should be moved further southeast to a location that will allow the delineation of the southern extent of the plume, which currently

is undefined. The objective may be achieved by selecting a location that will allow consultants to extrapolate ground water analytical data from ground water monitoring wells 1523MW-1, 1523MW-04, and 1523-MW05. Additionally, based on the orientation and slope of the canyon to the east of Building 1523, it seems that the proposed well location to the east of 1523-RW2 should be moved to the southeast.

RWQCB appreciates submittals of this caliber and looks forward to future collaborative efforts to ensure contaminated sites are investigated and remediated to levels that are protective of water resources and designated beneficial uses. 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, I may be reached by phone at (858) 467-2728 or via e-mail at BGriffey@waterboards.ca.gov.

Sincerely,

Beatrice Griffey, M.Sc., PG
Engineering Geologist
Site Mitigation and Cleanup Unit

BG:jpa:bg D:\My Documents\Facilities\Camp Pendleton\UST Prgrm\Workplan Documents\Interim Remediation WP\1523.doc

Cited References:

Battelle, 2005, Semiannual Groundwater Monitoring Report, Site 1523, Marine Corps Base Camp Pendleton, California, April 12.

California Regional Water Quality Control Board, San Francisco Region, 2005, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final, February.

Ninyo and Moore, 2000, Environmental Site Assessment Report UST Site 1523, Marine Corps Base Camp Pendleton, California, March 31.

CC:

Department of the Navy, Southwest Division Naval Facilities Engineering Command (SWDIV), Attn: Bipin Patel, Code OPCE.BP, 1220 Pacific Highway, San Diego, CA 92132-5190

Battelle, Environmental Restoration Department, Attn: Messer's. Christian Zimmerman and Robert Janosy, 505 King Avenue, Columbus Ohio 43201-2693

Responses to RWQCB Comments on the
Final Interim Remedial Action Plan for Site 1523 and
Letter Work Plan, Marine Corps Base Camp Pendleton

Comment Number	Comment	Response
Responses to RWQCB Specific Comments Regarding the IRAP – Beatrice Griffey		
1	Subsection 5.3.6 The proposed activities involve the possibility of constructing a temporary decontamination pad near UST Site 1523 or at Battelle's contractor's yard. Whereas the location of the Battelle's contractor's yard is not specifically identified in the IRAP, it is assumed to not be located in the vicinity of UST Site 1523 and the Regional Board does not support the use of an offsite decontamination station. Such an approach may have numerous adverse consequences including but not limited to the spread of site related contamination into uncontaminated areas and/or potentially impact receptors.	The location of a possible decontamination pad will be limited to only the vicinity of UST Site 1523 where soil removal activities will occur.
2	Subsection 5.3.10 The proposed stockpile construction requires revision to include the installation of berms, which are required to prevent liquids within the stockpile soils from exiting the stockpile and to prevent surface waters from entering the stockpile soils.	Berms will be included in the construction of temporary stockpiled soils. No saturated soils are expected to be removed from the excavation since the depth limit of the excavation (approximately 12 ft bgs) is well above the water table (approximately 31 ft bgs).
3	Appendix A, Subsection 2.0 The proposed confirmation sampling plan, collection of 6 to 8 soil samples, does not seem adequate based on the size of the excavation. The number proposed in Subsection 2.2.1 seems more appropriate.	The number of proposed confirmatory soil sample stated in Section 2.2.1 will be implemented in the field – up to 8 sidewall and 6 basal grab soil samples will be collected.
4	Appendix A, Subsection 2.3.3 Consider securing the sample label on each container with clear adhesive tape.	Sample labels will be secured using clear adhesive packaging tape.
5.	Appendix A, Subsection 2.4.1 The consultant proposes the use of an analytical laboratory	Careful attention will be given to sample handling and

Responses to RWQCB Comments on the Final Interim Remedial Action Plan for Site 1523 and Letter Work Plan, Marine Corps Base Camp Pendleton

Comment Number	Comment	Response
	located in Sparks, Nevada. The use of an out of state laboratory may be logistically very difficult for this particular investigation due to the limited sample holding time of 48 hours, which is a requirement of the proposed analytical method, 8260B using an En Core sampler. The use of such a lab will require that field staff carefully plan field activities to ensure sample holding times are not exceeded and place a sufficient quantity of ice in each sample cooler to ensure proper sample preservation during transport.	preservation prior to sample delivery via priority overnight delivery to Alpha Analytical of Sparks, Nevada. This will ensure that holding times and sample preservation criteria are met, specifically for En Core samples. Prior notification will be given to the lab so immediate receipt of the samples can be coordinated.
6.	Appendix A, Table 1-2. According to Step 5, if the confirmation soil analytical data indicates constituents are below the action levels, the site will be recommended for closure. The proposed activities solely address only soil contamination; the unauthorized release also has resulted in significant ground water contamination that must be addressed prior to site closure.	The course of action will be revised to recommend No Further Action in Soils (NFA in soils) if confirmation soil analytical data indicates constituents are below action levels.
7.	Appendix A, Table 2-2. The proposed analytical plan involves the analysis of the following VOCs: benzene, toluene, ethylbenzene, and xylene. Based on the presence of other VOCs detected in ground water samples, the analysis of the complete suite of VOCs is required during this investigation. In an email dated June 10, 2005, the consultant indicated the leachability of contaminants will be evaluated on 2-3 excavation sidewall and 1-2 excavation floor soil samples with the highest organic vapor readings. The Regional Board requests an evaluation of the contaminant leachability on soil samples with the highest contaminant concentrations detected using conventional soil analytical methods (EPA Method 8015, 8270, and 8260).	The full suite of VOCs will be analyzed instead of just BTEX. Select soil samples reporting the highest contaminant concentrations for their respective compound (PNAs, VOCs, TPH) will be screened out for leachability tests.
8.	Appendix A, Table 2-3.	PNAs will be added to the list of analytical parameters requiring leachability testing.

Responses to RWQCB Comments on the Final Interim Remedial Action Plan for Site 1523 and Letter Work Plan, Marine Corps Base Camp Pendleton

Comment Number	Comment	Response
	The proposed analytical plan needs to be augmented to include an evaluation of the leachability of PNAs. Historical investigations included an assessment of the presence and leachability of VOCs and PAHs in 3 soil samples with TPH-D concentrations ≤5,100 mg/kg (Ninyo and Moore, 2000). Since up to 11,000 mg/kg TPH-D were encountered during historical investigations (Ninyo and Moore, 2000), additional investigation of the presence and leachability of VOCs and PAHs is required if TPH-D concentrations significantly exceeding 5,100 mg/kg are encountered during this investigation.	
9.	Appendix A, Table 2-4 Note the proposed "soil action levels" significantly exceed concentrations established to be protective of ground water quality (California Regional Water Quality Control Board, San Francisco Region, 2005, available at http://www.waterboards.ca.gov/sanfranciscobay/Download.htm). As an example, the proposed benzene action level is 600 µg/kg while the concentration estimated to be protective of water quality is 44 µg/kg. Based on the subsurface conditions encountered during historical investigations (Ninyo and Moore, 2000), the subsurface lithologies have very limited contaminant retention capacity and hence warrant stringent action levels. Additionally, a total SVOC action level (1,700 µg/kg) is proposed, whereas the above referenced environmental guidance document provides screening levels for numerous individual SVOCs and should be used during this investigation.	Because the nature of the remedial action is "Hot Spot Removal" of bulk heavily contaminated soils (TPH concentrations >1,000 mg/kg), it is the objective of the remedial action to remove those soils to the extent practicable (residual soils likely extend under the building). Both leaching data results and the San Francisco Region, 2005 soil screening levels will be used in conjunction to determine the subsequent course of action if validated soil analytical data following the remedial action indicates soil concentrations above the 1,700 µg/kg (total SVOC) and 44 µg/kg (benzene) screening levels.
10.	Appendix C, Section 3.0. Based on contaminant concentrations encountered during historical investigations (Ninyo and Moore, 2000), volume of waste to be excavated, and the proximity of Building 1523, it is highly probable that the proposed activities will, at a minimum, create nuisance conditions and make it difficult for Building 1523	A meeting with site management personnel and base representatives will be conducted to help plan the logistics of the field activities.

Responses to RWQCB Comments on the Final Interim Remedial Action Plan for Site 1523 and Letter Work Plan, Marine Corps Base Camp Pendleton

Comment Number	Comment	Response
	occupants to conduct their normal daily duties. The notification of appropriate Building 1523 management personnel of the proposed activities and potential consequences prior to commencement of field activities may be appropriate and necessary.	
Responses to RWQCB Specific Comments Regarding the Letter Work Plan – Beatrice Griffey		
1.	Since UST Site 1523 is located in a structurally complex portion of the Base, the Regional Board is recommending the use of a boring method that will allow the extraction of a continuous intact core to assess for the presence of structural features (joints, fractures, etc.), which are known to have a profound effect on contaminant transport. If present, the orientation and attitude of the features need to be measured and noted.	Site 1523 is underlain by the Cretaceous Lusardi Formation (K_{RL}), which is described as a boulder and cobble conglomerate (Furu, 1982). Battelle conducted an excavation at nearby Site 1575 (700 ft north of Site 1523) which consisted predominately of the Lusardi Formation (4 ft to 22ft bgs) (Battelle, 2002). Coring of this formation would not be feasible for the purpose of determining structural features (joints, fractures) as potential pathways for contaminant migration. The upper 15 ft of the Lusardi Formation is comprised of very weathered clasts (breakable by hand) of the basement complex (granodiorite) within a loose silty sand and gravelly matrix. The nature of the diesel release associated with Site 1575 was permeation into the weathered clasts (cobbles and boulders) as well as the matrix. It is anticipated the lithology at Site 1523 will be similar and as described from site assessment boring logs. However, the exception (as with the case of Site 1575) being the subsurface lithology is a conglomerate composed of basement complex clasts and not the basement complex itself.
2.	The Regional Board is requesting the following modifications to the proposed ground water monitoring well locations illustrated in Figure 2. Based on the ground water analytical data from wells 1523-MW04 and 1523-MW01 and the direction of ground water flow (Battelle, 2005), it seems the proposed well location southwest of Building 1523 should be moved further southeast to a location that will allow the delineation of the southern extent of the plume, which currently is undefined. The objective may be achieved by selecting a location that will allow consultants to extrapolate ground water analytical data from ground water monitoring wells 1523MW-1, 1523MW-04, and 1523-MW05.	Battelle concurs. The locations of the two subject (proposed) wells will be shifted (to the extent practicable) toward the southeast to allow for better delineation of the southern extent of the plume as well to line-up along interpreted flow paths.

Responses to RWQCB Comments on the
Final Interim Remedial Action Plan for Site 1523 and
Letter Work Plan, Marine Corps Base Camp Pendleton

Comment Number	Comment	Response
	Additionally, based on the orientation and slope of the canyon to the east of Building 1523, it seems that the proposed well location to the east of 1523-RW2 should be moved to the southeast.	

Battelle. 2002. *Revised Final Corrective Action Plan for Site 1575 (Includes: Documentation of Interim Remedial Action Activities) Marine Corps Base Camp Pendleton*. October.

Zimmerman, Christian T

Subject: FW:

Importance: High

Good morning folks. I have reviewed the RTC for the Final Interim Remedial Action Plan and Letter Work Plan for MCB CP UST Site 1523. All the responses to Regional Board comments (RTC) are adequate. Regarding RTC to IRAP Comment #8, please note the leachability of PNAs is only necessary if TPH-D concentrations significantly exceed 5,100 mg/kg are encountered. The leachability of PNAs was adequately addressed during prior investigations on soil samples with a maximum concentration of 5,100 mg/kg TPH-D. If you have any questions please feel free to contact me.
Have a great 4th of July weekend,

>>> "Storrs CIV Chet C" <chet.storrs@usmc.mil> 06/30/05 05:32PM >>>
Beatrice,
Attached are Response to Regulatory Comments (ref: SMC:50-0634.05:grifb) to the 1523 IRAP and Letter Workplan for Additional Site Assessment. Pending any further comments from RWQCB, we will commence with field work on 11 Jul 05. Your response to this email will act as receipt of the Response to Comments. Thank you for your continued support of the Camp Pendleton Remediation Program.

VR
ccs

C. Christopher Storrs
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